Planning Proposal / LEP Amendment Request
Proponent & Proposal Information Form

Lodge Applications at Ballina Shire Council • 40 Cherry Street • Ballina (Mon-Fri 8.15am to 4.30pm)
mail PO Box 450 Ballina 2478 • **f** 02 6686 7035 • **e** council@ballina.nsw.gov.au
t 1300 864 444 • **w** www.ballina.nsw.gov.au • **abn** 53 929 887 369

This form is to be completed and submitted when a request for an LEP amendment or planning proposal is lodged with Council.

ballina shire council

Proponent Details

All correspondence will be forwarded to this name and address unless alternative details are specified below.

Proponent's Name	Ardill Payne and Partners				
Address	45 River Street, BALLINA, 2478				
Postal Address	PO Box 20, BALLINA, 2478				
Telephone (w)	66863280	(h)		Mobile	
Email Address	info@ardillpayne.com.au			Fax	
Signature				Date	26/5/20

Consultant / Representative Details

Details of consultants/representatives acting on behalf of the proponent are required. Please nominate whether the consultant/ representative will be the principal contact for the proposal.

Name	Dwayne Roberts				
Address	PO Box 20 BALLINA 2478				
Telephone (w)	66863280	Mobile	0479072050	Fax	
Email Address	dwayner@ardillpayne.com.au				

■ Please tick if consultant/representative is to be the principal point of contact with Council.

Description of the Land

Property descriptions of all land holdings the subject of the LEP amendment request/planning proposal are required. Additional properties the subject of the proposal should be documented in the additional information field at the end of the form.

Property Address	6-20 Fitzroy Street WARDELL				
Lot/Portion	Lots 2, 3, 4, 5	Section	Section 10	DP	DP 759050
Property Address					
Lot/Portion		Section		DP	
Property Address					
Lot/Portion		Section		DP	

Office Use Only

Proposal Name:	Type: ☐ Major ☐ Minor	Pre-Lodgement Discussion: ☐ Y ☐ N
Fee Paid: ☑ Y ☐ N Amount: $ 3900.	Date Received: 29/05/20	Receipt No: 1218288
Code 6, Job No: 20001.1001.061		

Landholder Details and Consent

Details of all landholders are to be provided. If landholders do not sign this form, evidence of the consent of landholders for the nomination of their landholding as part of the LEP amendment/planning proposal is required in conjunction with this form. Space is provided at the end of this form for additional landholder details.

Owner's Name(s)	See documentation attached				
Address					
Lot/Portion		Section		DP	
Telephone (w)		(h)		Mobile	
Email Address				Fax	

☐ I/we being the owner(s) of the property identified above, consent to the submission of this planning proposal/LEP amendment.

Signature		Date	

Summary of the LEP Amendment Request / Planning Proposal

Brief outline of the concept or idea underpinning the LEP amendment request / planning proposal.

Rezone/LEP Amendment of 7380m2 of RU2 - Rural Landscape Zoned Land to R3 - Medium Density

List of Information Provided in Support of the LEP Amendment Request / Planning Proposal

Planning Report
Concept Subdivision Plan
Bushfire Strategic Study
SEPP 55 Report

Privacy Protection Notice

The completed application form contains personal information which is being collected for the purpose of assessing this LEP amendment request/planning proposal. Please be aware that information contained in this documentation is public information and may be accessed by other government agencies, service providers, the general community or other organisations. The information will be processed by Council officers and may be made available to public enquiries under the Government Information (Public Access) Act. The information will be stored in Council's electronic document management system.

Disclosure of Political Donations and Gifts

A person who submits an LEP amendment request/planning proposal to Council is required to disclose the following reportable political donations and gifts (if any) made by any person with a financial interest in the proposal within the period commencing two years before the request is made and ending when the proposal is determined:

- All reportable political donations made to any Ballina Shire Councillor; and
- All gifts made to any local Councillor or employee of Ballina Shire Council.

A reference to a reportable political donation made to a 'Councillor' includes a reference to a donation made at the time the person was a candidate for election to the Council.

Significant penalties apply to non-disclosure. For more information and to obtain a political donations and gifts disclosure statement go to the Department of Planning and Infrastructure website at www.planning.nsw.gov.au.

Is a disclosure statement to accompany your application? ☐ Yes ■ No

Additional Information

26 May 2020

The General Manager
Ballina Shire Council
PO Box 450
BALLINA NSW 2478

Dear Sir/Madam

RE: PLANNING PROPOSAL/LEP AMENDMENT REQUEST
Lots 2-5 Section 10 DP 759050, No. 6-20 Fitzroy Street, Wardell

Ardill Payne & Partners (APP) has been commissioned by Snowy Buttons Pty Ltd (owner of the subject land) to provide town planning services in the preparation of a Planning Proposal/LEP Amendment Request to Ballina Shire Council.

Attached herewith is the following:

- signed landowner's authorisation enabling APP act on their behalf
- completed Planning Proposal/LEP Amendment Request Proponent & Proposal Information Form
- 1 x paper and 2 x CD copies of the planning proposal report
- cheque for $3900.00 as advised in email dated 14 May 2020 (copy attached)

Should you have any questions in respect of this matter, please contact me on 6686 3280 or joannek@ardillpayne.com.au.

Yours faithfully

Joanne Kay
ARDILL PAYNE & PARTNERS

ARDILL PAYNE
& P a r t n e r s
www.ardillpayne.com.au e:info@ardillpayne.com.au
ABN: 51 808 558 977

LAND OWNER AUTHORITY

Landowner's name	Wardell No.3 P/L
Landowner's address	Type text here 9/120 Sussex Street Sydney NSW 2000

To prepare certain applications in respect of land known as:

Street	6-20 Fitzroy Street
Town	Wardell
Real property description	Lots 2-5 Sec 10 DP 759050
Development	Rezoning to residential

The owner(s) of the aforementioned land(s) hereby authorises Ardill Payne & Partners or its agents to:

1. Inspect all relevant Council records.
2. Obtain copies of submissions made to Council or other government authorities.
3. Carry out searches and site inspections.
4. Lodge a development, section 4.55, construction certificate, Section 68 and 138, subdivision certificate or any other like application with Ballina Shire Council.

Signed	
Name	Benn Lane (sole Director)
Date	26.9.2020
Phone	0404064608

Dwayne Roberts

From: Leah Toole <Leah.Toole@ballina.nsw.gov.au>
Sent: Thursday, 14 May 2020 11:02 AM
To: Dwayne Roberts
Subject: RE: Wardell PP

Hi Dwayne,

Sorry, I've been preoccupied with trying to finalise a Council report which was due yesterday.

The following fees would be applicable (highlighted):

Planning Proposals and Local Environmental Plan Amendments					
Correction of errors or anomalies	B	No charge	N	No charge	
Minor amendment considered suitable for annual housekeeping LEP amendment process (50% of fee refundable pre-Gateway if not supported by Council. No refund post Gateway)	B	$6,490	N	$6,650	20001.1001.061
Commencement Fee - Stage 1. (No refund provision once considered by Council)	B	$3,790	N	$3,900	20001.1001.061
Planning Proposal Preparation Fee - Stage 2 (No refund provision once planning proposal prepared and or considered by Council)	B	$6,290	N	$6,450	20001.1001.061
Post Gateway Determination Fees - Stage 3					
Major Amendment - Multiple sites consistent with strategic planning framework and applicable s9.1 Directions and where all required studies have been prepared and no independent review required. (Fee to be paid prior to commencement of Stage 3 with no refund provision)	B	$12,970	N	$13,300	20001.1001.061
Major Amendment - Multiple sites or where independent assessment or specialised studies to be completed by Council. (Fee to be paid prior to commencement of Stage 3 with no refund provision. Provision may be made for progress payments depending on complexity and process phases involved)	B	$12,970 plus costs	N	$13,300 plus costs	20001.1001.061
Minor Amendment - Single site or issue generally consistent with strategic planning framework and applicable s9.1 Directions and where no independent assessment or specialised studies to be completed by Council. (Fee to be paid prior to commencement of Stage 3 with no refund provision)	B	$6,490	N	$6,650	20001.1001.061

I cannot recall our conversation in January but have you looked at the planning proposal and associated documents for the Wardell attached dual occupancy development? This was reported to the February 2020 meeting. It may contain some useful information.

Regards,
Leah

Leah Toole
Strategic Planner

ballina shire council

From: Leah Toole [mailto:Leah.Toole@ballina.nsw.gov.au]
Sent: Wednesday, 13 May 2020 11:32 AM
To: Dwayne Roberts <dwayner@ardillpayne.com.au>
Subject: RE: Wardell PP

Hi Dwayne,

No worries, I will arrange for this to be emailed to you shortly.

Regards,
Leah

Leah Toole
Strategic Planner

ballina shire council

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discoverballina.com
p: (02) 6686 1454 | f: (02) 6686 7035 |

From: Dwayne Roberts <dwayner@ardillpayne.com.au>
Sent: Wednesday, 13 May 2020 11:25 AM

To: Leah Toole <Leah.Toole@ballina.nsw.gov.au>
Subject: RE: Wardell PP

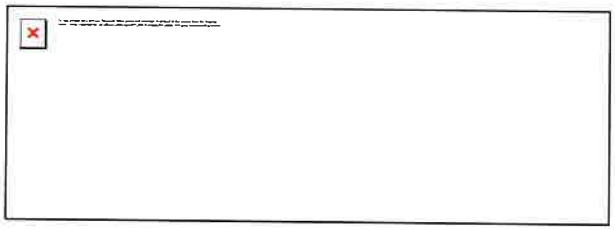
Hi Leah,

Hope all is well.

We are ready to lodge this one now, can you please get someone to email through a fee quote for lodgement purposes?

Kind regards,

Dwayne Roberts
Principal



02 6686 3280 | 45 River Street, Ballina NSW 2478
02 6742 9955 | 285 Conadilly Street, Gunnedah NSW 2380
PO Box 20, Ballina NSW 2478

dwayner@ardillpayne.com.au

From: Leah Toole [mailto:Leah.Toole@ballina.nsw.gov.au]
Sent: Monday, 20 January 2020 9:48 AM
To: Dwayne Roberts <dwayner@ardillpayne.com.au>
Subject: RE: Wardell PP

Hi Dwayne,

I hope you had a good weekend. It was nice to see so much rain finally.

In terms of the reports and information that should be provided upfront with the planning proposal, the following would be required:

- Preliminary contaminated land assessment report to address the requirements of SEPP 55;
- Bushfire assessment report, prepared in accordance with the new requirements of PBP 2019; and
- Preliminary subdivision concept plan.

It is likely that post-Gateway an Aboriginal cultural heritage assessment would be required, and possibly an ecological assessment.

The proposal should also address in general the matters of drainage and access.

I hope this is of assistance. Feel free to call/email should you require anything further.

Kind regards,
Leah

Leah Toole
Strategic Planner

ballina shire council

ballina.nsw.gov.au | MailScanner has detected definite fraud in the website at "scanmail.trustwave.com". Do *not* trust this website: MailScanner has detected definite fraud in the website at "scanmail.trustwave.com". Do *not* trust this website: discoverballina.com
p: (02) 6686 1454 | f: (02) 6686 7035 |

From: Dwayne Roberts <dwayner@ardillpayne.com.au>
Sent: Thursday, 16 January 2020 4:21 PM
To: Leah Toole <Leah.Toole@ballina.nsw.gov.au>
Subject: Wardell PP

Hi Leah,

As discussed, I have been engaged to prepare a PP for the lots shown below. I am just trying to collate a list of what reports Council want upfront?

Talk next week.

Kind regards,

Dwayne Roberts
Principal

02 6686 3280 | 45 River Street, Ballina NSW 2478
02 6742 9955 | 285 Conadilly Street, Gunnedah NSW 2380
PO Box 20, Ballina NSW 2478

dwayner@ardillpayne.com.au

ardillpayne.com.au

Ardill Payne & PARTNERS

ENGINEERS PLANNERS SURVEYORS ENVIRONMENTAL PROJECT MANAGEMENT

PLANNING PROPOSAL/LEP AMENDMENT REQUEST

Submission to Ballina Shire Council

Lots 2-5, Section 10, DP 759050
No. 6-20 Fitzroy Street, Wardell

for:
Snowy Buttons Pty Ltd (ATF Zipper Trust)

May 2020

BALLINA
45 River Street
PO Box 20
BALLINA NSW 2478
02 6686 3280

GUNNEDAH
Germane House
285 Conadilly Street
GUNNEDAH NSW 2380
02 6742 9955

Document Control Sheet

Filename:	10243 Planning Proposal/LEP Amendment Request				
Job No.:	10243				
Job Captain:	Dwayne Roberts				
Author:	Joanne Kay				
Client:	Snowy Buttons Pty Ltd (ATF Zipper Trust)				
File/Pathname	S:\01 Jobs\10200-10299\10243 2-5 Fitzroy Street, Wardell\03 Town Planning\10243 Planning Proposal_LEP Amendment Request (April 2020).jk.docx				
Revision No:	Date:	Checked By		Issued By	
		Name	Signed	Name	Signed
0	13.5.20	P Snellgrove		Jo Kay	
1					
2					

Table of Contents

1. Introduction

This section introduces the proposal and provides a general overview of the project.

1.1 Background

This report comprises/supports a Planning Proposal/LEP Amendment Request and explains the intended effect of, and provides justification for a proposed amendment to the Ballina Local Environmental Plan 2012 (BLEP).

The proposed amendment relates to land described as Lots 2-5, Section 10, DP 759050, No.s 6-20 Fitzroy Street, Wardell and involves:

- rezoning the lots from RU2 – Rural Landscape Zone to R3 – Medium Density Residential Zone and
- replacing the 40ha minimum lot size/subdivision standard with an 800m^2 minimum lot size/subdivision standard for the lots

The proposed R3 zone is the same zone as the adjacent land to the south and south- west. The proposed 800m^2 minimum lot size is the same lot size that applies to the other R3 zoned land in Wardell.

The subject land is mapped as a "Strategic Urban Growth Area" on the Strategic Urban Growth Area Map – Sheet SGA_003A of the BLEP 2012. Contingent upon the rezoning being effected, it will be necessary to remove the "Strategic Urban Growth Area" designation.

This Planning Proposal has been prepared having regard to Section 3.33 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and:

- Planning Proposals – A Guide to Preparing Planning Proposals (NSW Department of Planning and Environment, December 2018)
- Planning Proposals and Local Environmental Plan Amendments: Process Guidelines v4.0 (Ballina Council, 6 February 2020)

This submission comprises and supports the Phase 1: LEP Amendment Initiation process of the Planning Proposal and addresses all of the information on Council's *Planning Proposal/LEP Amendment Request – Proponent & Proposal Information Form*.

There is no Political Donations and Gifts Disclosure required to accompany this request.

1.2 Structure and Scope of Report

This LEP Amendment Initiation Request contains the following:

Section 2	Context and characteristics of the subject land.
Section 3	Details of the strategic planning context of the subject land and proposed LEP amendments.
Section 4	A statement of the **Objectives and Intended Outcomes** of the proposed LEP amendment (Section 2, Part 1 – DP&E, December 2018).
Section 5	An **Explanation of the Provisions** that are to be included in the proposed LEP amendment (Section 2, Part 2 – DP&E, December 2018).
Section 6	**The Justification for those objectives, outcomes and provisions and the process for their implementation** (Section 2, Part 3 – DP& E December 2018).
Section 7	**Details of the Community Consultation in respect of the Planning Proposal** (Section 2, Part 5 – DP&E December 2019).

Attached to this report is the following:

- Preliminary Site Investigation Report (Contaminated Site Investigations Australia Pty Ltd, Ref.: 2203.Wardell_No.3_P/L, Dated 25th March 2020)
- Draft Strategic Bush Fire Study Proposed Rezoning (Bushfire Certifiers, Ref.: 20052, Dated 16th March 2020)

1.3 Background

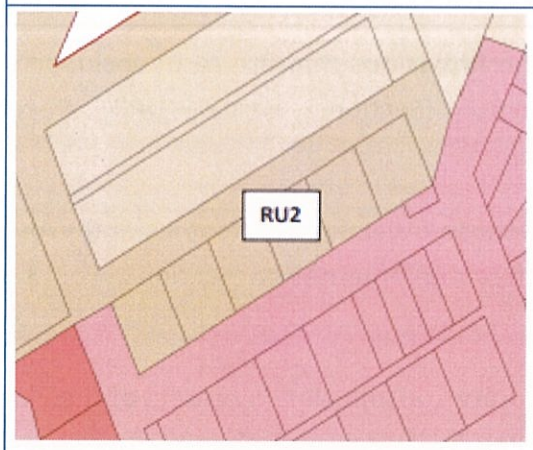
The Wardell Planning and Environmental Study (WP&ES) was prepared in 2015 and was endorsed by Ballina Council at its Ordinary Meeting on the 27th August 2015. The WP&ES identifies the subject property as "Wardell SUGA – Area 3" as shown below:

Wardell SUGA – Area 3 - Bounded by Swap, Fitzroy, Bingal and Wilson Streets (1.1ha - 3 owners)

Extract from SUGA Map

2007 Aerial photo

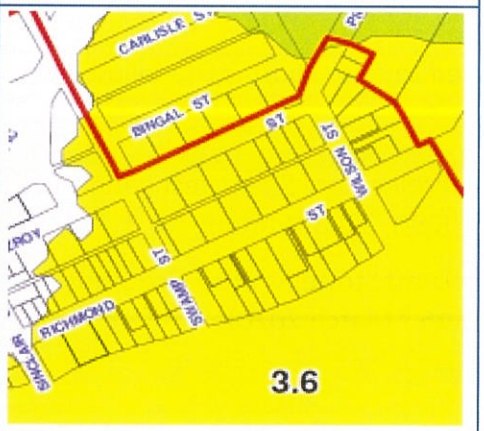
Extract from land zoning map

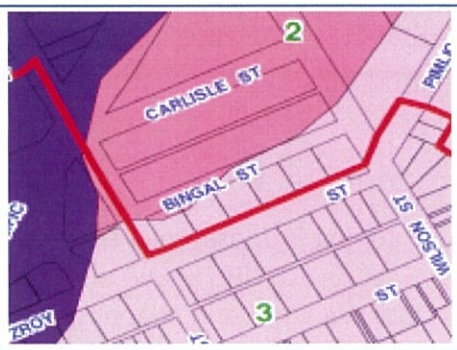


Extract from Contour Map

Extract from 1:100 year Flood Map Current Climate

Extract from 1:100 year Flood Map 2100 Climate



Extract from 2012 Bushfire Prone Land Map	Extract from Acid Sulfate Map
	

Wardell SUGA – Area 3 - Bounded by Swap, Fitzroy, Bingal and Wilson Streets (1.1ha - 3 owners)

Criteria	Score	Comments
Number of owners within SUGA 1 owner = 5; 2 to 5 owners = 4; more than 6 owners = 3	4	3 owners
Topography – General precinct levels (General level across precinct at least 50% of lots meet minimum level) < AHD RL 3.3 metre = 0 AHD RL 3.3 metre to 3.7 metres = 2 AHD RL > 3.7 metre to 4 metres = 3 AHD RL > 4.1 to 4.9 metres = 4 AHD RL > 5 metre = 5	0	Approximate level RL 2m AHD
Precinct potential lot orientation North – South > 75% = 5 North – South 50 to 75% = 3 North – South up to 50% = 2	5	All proposed lots would have a general north-south orientation
Acid Sulfate soil affected Not affected = 5 Class 5 = 4 Class 4 = 3 Class 3 = 2 Class 1 or 2 = 1	2	Predominately likely to be subject to Class 3 Acid Sulfate Soils.
Bushfire Risk (General estimate applied to precinct at least 25% of lots affected) Not affected = 5 Within buffer area = 2 Within flame zone and buffer = 0	0	All lots within flame and or buffer zones.
Flooding (At least 25% of site affected) Not Subject to 1:100 year flood = 5 Subject to 1:100 flood = 2 Subject to 1:50 year flood = 0 Subject to 1:20 year flood or within a floodway = 0	0	Site levels are approximately 2m AHD. At this level the site is affected by the 1 in 50 year flood for current climate (RL2.4 to 2.6mAHD). It is also affected by the 1:20 year floor for 2100 (RL 2.4m to 2.6m AHD). The 1:100 year flood level for 2100 at this site is 3.6m AHD and for current climate 3.2m AHD.
Natural Areas and Habitat Unaffected = 5 Buffer = 3 Significant Area = 0	5	Not within a natural and or habitat significant area or within buffer.
Total Area 3	16 or 46%	This area is rated as having a fair suitability for urban development. Major impediments include flooding, bushfire risk and likely presence of Class 3 Acid Sulfate Soils.

2. Context and Characteristics of Subject Land

This section describes the subject land and identifies the geographical context of the site and its relationship to the surrounding locality.

2.1 Property Details

The Planning Proposal relates to 4 lots that are described in real property terms as Lots 2, 3, 4, 5, Section 10, DP 759050 and are commonly known as Nos. 6-20 Fitzroy Street, Wardell. The lots are square in shape, positioned in a row with common side boundaries with the following approx. dimensions and area:

- 160m north-western boundary (to Bingal Street (unformed) and Lot 10 DP 223266)
- 45m north-eastern boundary (to Lot 6 Section 10 DP 759050)
- 160m southern-eastern boundary (to Fitzroy Street)
- 45m south-western boundary (to Lot 1 Section 10 DP 750050)
- Lot 2 = 1871.7
- Lot 3 = 1846.4m^2
- Lot 4 = 1846.4m^2
- Lot 5 = 1821m^2
- total combined site area = 7385.5m^2

As shown on the below aerial photograph, the subject land is vacant, contains minimal vegetation and is devoid of any structures.

Vehicular access to the site is via Fitzroy Street which is a constructed urban (residential) road with a bitumen seal that ends adjacent to existing Lot 2.

Source: SixMaps (April 2020)

2.2 Other matters

Preliminary planning investigations in respect of the subject land confirm that it is:

- mapped as being bushfire prone as a consequence of Vegetation Category 1 vegetation + 100m buffer
- partly mapped as a "Coastal Use Area" under SEPP (Coastal Management) 2018
- mapped as a "Coastal Environment Area" under SEPP (Coastal Management) 2018
- mapped as being subject to the 1 in 100 year flood event (being in a medium flood hazard area)
- mapped as containing part Class 2 and part Class 3 acid sulfate soils
- mapped as being "Regionally Significant Farmland"
- **not** mapped as containing "Coastal Wetlands" or "Littoral Rainforests" or being "Proximity Area" to such vegetation under SEPP (Coastal Management) 2018
- **not** mapped as containing "Biodiversity Values" vegetation or being proximate to such mapped vegetation on the Biodiversity Values Map and Threshold Tool

- **not** mapped as containing or being proximate to any mapped "Important Population Boundary", "Core Koala Habitat" or "Preferred Koala Habitat" under Council's Koala Management Strategy 2016
- **not** mapped as being in a drinking water catchment
- **not** likely to be contaminated as a consequence of existing or prior land uses (existing vacant lots)
- **not** identified as being or containing an item of environmental heritage or being in a heritage conservation area (per Schedule 5 of the Ballina LEP 2012)
- **not** affected by any road widening or realignment proposal under either Division 2 of Part 3 of the *Roads Act 1993*, any environmental planning instrument or any resolution of Council
- **not** identified as being subject to acquisition by a public authority under the provisions of any environmental planning instrument, deemed or draft environmental planning instrument
- **not** subject to any OLS or ANEF contours of the Ballina Byron Gateway Airport

2.3 Local Context

The subject land comprises 4 x vacant lots with two road frontages. The lots front Fitzroy Street which is a formed road for the bulk of the site's frontage. The lots also front Bingal Street which is not formed.

The subject land is adjoined by residential development and smaller rural residential type lots to the north and residential zoned land to the east, south and west. Lots immediately adjoining to the north-east and south-west contain bushland and a dwelling. Residential land to the south-east across Fitzroy Street is developed low density residential land.

3. Strategic Planning Context

3.1 North Coast Regional Plan 2036 (NCRP)

The subject land is mapped as "Investigation Area – Urban Land" under the NCRP.

Under the circumstances, the proposed application of a residential zone is consistent with the Regional Plan.

3.2 Ballina Shire Growth Management Strategy 2012 (GMS)

The subject land is mapped as a "Strategic Urban Growth Area" under the GMS.

Under the circumstances, the proposed application of a residential zone is consistent with the Strategy.

3.3 The Wardell Planning and Environmental Study (WP&ES)

The subject land is identified as "Wardell SUGA – Area 3 – Bounded by Swamp, Fitzroy, Bingal and Wilson Street (1.1ha – 3 owners)" and scored a 16 or 46% in the Strategic Urban Growth Area Evaluation Tool and is subject to the following comments:

"This area is rated as having a fair suitability for urban development. Major impediments include flooding, bushfire risk and likely presence of Class 3 Acid Sulfate Soils."

Under the circumstances, the proposed application of a residential zone is consistent with the WP&ES.

3.4 Wardell Strategic Plan 2015 – 2035 (WSP)

The WSP was adopted by Ballina Shire Council in January 2016 and *"contains 29 recommendations under 5 themes which have been derived from the elements contained within the vison for the future of Wardell Village. The recommendations of this strategic plan will guide the future development of Wardell Village to 2035"*.

Locality Theme No. 5, Objective No. 24 is to initiate a planning proposal for the rezoning of SUGA designated properties located within and adjacent to the boundaries of Wardell Village.

Under the circumstances, the proposed application of a residential zone is consistent with the WSP.

3.5 Relevant Provisions of BLEP 2012

The subject land is mapped under the BLEP 2012 as follows:

- Acid Sulfate Soils Map – Sheet ASS_003 – part Class 2 and part Class 3 Acid Sulfate Soils
- Building Height Allowance Map – Sheet BHA_003A – N – 3.1m Minimum Level AHD
- Flood Planning Map – Sheet FLD_003 – Flood Planning Area
- Height of Buildings Map – Sheet HOB_003 – I – 8.5m Maximum Building Height
- Lot Size Map – Sheet LSZ_003A – AB2 – 40ha Minimum Lot Size
- Land Zoning Map – Sheet LZN_003A – RU2 – Rural Landscape Zone
- Strategic Urban Growth Area Map – Sheet SGA_003A – Strategic Urban Growth Area

4. Objectives or Intended Outcomes of Proposed LEP

4.1 Objectives of Planning Proposal

The objective of the Planning Proposal is to rezone the subject land to an urban residential zone and to apply an 800m^2 minimum lot size/subdivision standard to facilitate the future residential subdivision of the land into minimum 800m^2 lots, and enable the future construction of medium density residential development on the vacant residential lots (which will subject to separate approval processes).

4.2 Possible Future Subdivision

The lots have a combined area of approx. 7385m^2 and it is proposed to apply an R3 – Medium Density Residential Zone with an 800m^2 minimum lot size/subdivision standard.

Based on an 800m^2 lot size, the subject land could potentially yield up to 9 residential lots. It should be noted that this yield is purely numerical and has not been calculated having regard to any of the constraints that may exist on the subject land.

The Village of Wardell is serviced by all necessary reticulated public infrastructure services, including:

- potable water supply
- sewerage disposal
- electricity supply
- telecommunications
- constructed urban roads (including stormwater)

Any future vacant residential lots would be able to and would have to be connected to and serviced by such systems.

5. Explanation of Provisions

5.1 Explanation of Proposed Amendments

The proposed amendments to the BLEP 2012 involve:

- rezoning the subject lots from RU2 – Rural Landscape Zone to R3 – Medium Density Residential Zone
- applying a 800m^2 minimum lot size to the R3 zoned land

The proposed R3 zone is same zoning as the adjoining/adjacent land to the south west. The existing adjacent medium density residential lots have an 800m^2 minimum lot size.

Contingent upon the zoning change being affected, there will also have to be a consequential change to the Strategic Urban Growth Area map, such that the land is no longer mapped as a "Strategic Urban Growth Area". There may also be a need for a consequential reduction in the extent of the "Land Adjoining Strategic Urban Growth Area" on adjoining lands.

6. Justification for the Proposed Amendments

6.1 Section A – Need for the planning proposal

1. Is the planning proposal a result of any strategy study or report?

The subject land is identified as:

- "Strategic Urban Growth Area" under the Ballina Shire Growth Management Strategy 2012
- "Wardell SUGA – Area 3" under the Wardell Planning and Environmental Study
- "Investigation Area – Urban Land" under the North Coast Regional Plan

2. Is the planning proposal the best means of achieving the objectives or intended outcomes, or is there a better way?

The proposed application of a residential zone is consistent with these strategic planning documents that identify the land as being appropriate for future urban development/use.

It is submitted that an LEP amendment is the best (and only) way in which to achieve the proposed outcomes, with the proposal relating expressly to land use zoning and subdivision.

3. Is there a net community benefit?

The net community benefit that will result from the proposal is:

- additional economic activity generated by the subdivision and development of the land for urban residential purposes
- additional land being available for residential and related development

6.2 Section B – Relationship to strategic planning framework

4. Is the planning proposal consistent with the objectives and actions contained within the applicable regional or sub-regional strategy (including the Sydney Metropolitan Strategy and exhibited draft strategies)?

As detailed elsewhere in this Planning Proposal, the proposal is consistent with the North Coast Regional Plan (mapped as "Investigation Area – Urban Land").

The Planning Proposal involves changes to the zoning and minimum lot size of the subject land to enable the future residential subdivision and development (including the construction of new residential dwellings).

The Planning Proposal will provide for increased housing opportunities which will assist in accommodating the projected local and regional population increase.

The Planning Proposal is thus consistent with the NCRP. The information contained in this Planning Proposal document confirms and supports the capability of the land to accommodate urban residential development, which is thus consistent with the regional planning framework.

5. Is the planning proposal consistent with the local council's Community Strategic Plan, or other local strategic plan?

Ballina Shire Growth Management Strategy 2012 (GMS)

The purpose of the GMS is to provide the framework for the management of population and employment growth in Ballina Shire over the 2012-2031 planning period.

The subject land is mapped as a "Strategic Urban Growth Area" under the GMS, and as such, the application of a residential zone over the land is consistent with the Strategy.

Wardell Planning and Environmental Study (11/2015) (WP&ES)

The purpose of the WP&ES is to provide the framework for the management of population growth, urban expansion and infrastructure servicing needs of the Wardell Village.

The subject land is identified as "Wardell SUGA – Area 3" which is rated as having a fair suitability for urban development under the WP&ES.

Wardell Strategic Plan 2015 – 2035 (WSP)

Locality Theme No. 5, Objective No. 24 of this plan is to initiate a planning proposal for the rezoning of SUGA designated properties located within and adjacent to the boundaries of Wardell Village.

6. Is the planning proposal consistent with applicable state environmental planning policies?

There are a number of SEPP's that are of relevance to the proposal, details of which are as follows:

SEPP Title	Compliance of Planning Proposal
SEPP (Primary Production and Rural Development) 2019	The subject land is mapped as regionally significant agricultural land. The objects of Part 2 of this SEPP are as follows: *(a) to identify State significant agricultural land and to provide for the carrying out of development on that land,* *(b) to provide for the protection of agricultural land—* *(i) that is of State or regional agricultural significance, and* *(ii) that may be subject to demand for uses that are not compatible with agriculture, and* *(iii) if the protection will result in a public benefit.* Land is State significant land if it is listed in Schedule 1 of this SEPP. At the time of preparing this submission, Schedule 1 was blank. The subject land is zoned RU2 – Rural Landscape under the BLEP 2012. The proposed rezoning of the lots to a residential zone will not compromise or prejudice the use of the subject and adjoining land for agricultural purposes, due primarily to the nature and character, existing uses and small size of the subject lots (and of the adjoining lots). The application of a residential zone will not result in increased land use conflicts as there is no adjoining productive agricultural land and the adjoining land has limited potential for agricultural use. It is therefore submitted that the Planning Proposal is consistent with the provisions of this SEPP.
SEPP (Koala Habitat Protection) 2019	The subject land comprises 4 x small rural zoned lots (total combined area of 7385m^2) that are vacant and are devoid of any significant vegetation (mown grass). As shown below, the subject land is not mapped as containing or being proximate to any mapped "Important Population Boundary", "Core Koala Habitat" or "Preferred Koala Habitat" under the Ballina Shire Koala Management Strategy (March 2016).

	 *Extract BSC Online Mapping* Further the subject land is not mapped as containing "Biodiversity Values" vegetation or being proximate to such mapped vegetation on the Biodiversity Values Map and Threshold Tool. It is therefore submitted that the Planning Proposal is consistent with the provisions of and is not contrary to the intent of the SEPP.
SEPP 55 – Remediation of Land	Clause 6(1) of this SEPP requires the planning authority when preparing a Draft LEP to consider whether the land is contaminated and whether the land is suitable for such purpose (as either not being contaminated or requiring remediation to make it suitable). A Preliminary Site Investigation Report (SEPP 55) was prepared to support/inform the Planning Proposal (copy attached) which concluded that: *"..A desktop review of available information and a site visit did not identify evidence of previous development or activities on the site that would suggest any potentially contaminating activities had taken place on the site. Analytical results from surface soils indicated all of the compounds tested returned concentrations that were below the adopted criteria for residential use.* *Based on the sample data collected (5 primary surface soil samples) and the absence of contamination at the site, no further investigation is deemed warranted.... Therefore the site is considered to be free of contamination and suitable for its intended use."* It is therefore submitted that the Planning Proposal is consistent with the provisions of and is not contrary to the intent of the SEPP.
SEPP (Coastal Management) 2018	The subject land is not mapped as containing "Coastal Wetlands" or "Littoral Rainforests" or being "Proximity Area" to such vegetation. The land is partially mapped as "Coastal Use Area" and entirely mapped as "Coastal Environment Area". The subject land is physically and spatially separated from any foreshore area or watercourses and is unlikely to impact on any coastal land/foreshore in any way. Any future subdivision and residential development of the land will not have any adverse or tangible impacts on any part of the coastal foreshore or any public land. It is therefore submitted that the Planning Proposal is consistent with the provisions of and is not contrary the intent of the SEPP.

7. Is the planning proposal consistent with applicable Ministerial Directions (s.9.1 directions)?

Section 9.1 of the *EP & A Act 1979* provides directions that relevant planning authorities must have regard to when preparing planning proposals for new LEPs. The following table identifies

which of these directions are applicable to the proposed rezoning and how the Planning Proposal is consistent with their provisions.

Direction Number	Compliance of Planning Proposal
1. Employment and Resources	
1.1 Business and Industrial Zones	Does not apply to Planning Proposal.
1.2 Rural Zones	Complies – The subject lot is mapped as being "Investigation Area – Urban Land" under the NCRP and is thus able to be justified as a consequence of the NCRP.
1.3 Mining, Petroleum Production and Extractive Industries	Does not apply to Planning Proposal.
1.4 Oyster Aquaculture	Does not apply to Planning Proposal.
1.5 Rural Lands	Complies – Comments in respect of SEPP (Primary Production and Rural Development) 2019are provided in Section 6 above. Further, the proposed rezoning is of relatively minor significance and is consistent with the NCRP in that the subject land is mapped as "Investigation Area – Urban Land".
2. Environment and Heritage	
2.1 Environmental Protection Zones	Does not apply to Planning Proposal.
2.2 Coastal Management	Complies – The proposal is considered to be of a minor nature, resulting in a possible yield of 9 x vacant residential lots. The land is not within a coastal vulnerability area (no map at this time) and is not affected by a current or future coastal hazard in a local environmental plan. The subject land is not mapped as containing "Coastal Wetlands" or "Littoral Rainforests" or being "Proximity Area" to such.
2.3 Heritage Conservation	Complies – The subject land is not identified as containing or comprising a heritage item or place (per Schedule 5 of the BLEP 2012).
2.4 Recreation Vehicle Areas	Does not apply to Planning Proposal.
2.5 Application of E2 and E3 zones and environmental overlays in Far North Coast LEPs	Does not apply to Planning Proposal.
2.6 Remediation of Contaminated Land	Complies – Attached herewith is a Preliminary Site Investigation Report (SEPP 55) which concluded that: *"..A desktop review of available information and a site visit did not identify evidence of previous development or activities on the site that would suggest any potentially contaminating activities had taken place on the site. Analytical results from surface soils indicated all of the compounds tested returned concentrations that were below the adopted criteria for residential use.* *Based on the sample data collected (5 primary surface soil samples) and the absence of contamination at the site, no further investigation is deemed warranted.... Therefore the site is considered to be free of contamination and suitable for its intended use."*
3. Housing, Infrastructure and Urban Development	

3.1 Residential Zones	Complies – Adequate public infrastructure is available in the immediate locality to service the existing lot and any possible future lots. The proposal will facilitate future urban development which is able to connect to and make use of existing infrastructure services.
3.2 Caravan Parks and Manufactured Home Estates	Does not apply to Planning Proposal.
3.3 Home Occupations	Complies – Home occupations are permitted without consent in the R3 zone under the BLEP 2012.
3.4 Integrating Land Use and Transport	Complies – The land is identified as "Investigation Area – Urban Land" under the NCRP. The proposal will facilitate development which is able to make use of existing roads and transport services.
3.5 Development Near Regulated Airports and Defence Airfields	Does not apply to Planning Proposal.
3.6 Shooting Ranges	Does not apply to Planning Proposal.
3.7 Reduction in non-hosted short-term rental accommodation period	Does not apply to Planning Proposal.
4. Hazard and Risk	
4.1 Acid Sulphate Soils	Complies – As shown below, the subject land is mapped as containing part Class 2 and part Class 3 acid sulfate soils. It is noted that the bulk of the site contains Class 3 ASS which relates to soil 1m below the ground surface. The WP&ES identified that ASS may be an impediment to rezoning of the land to residential. Any future development of the subject land would be the subject of an ASS study/management plan to ensure ASS is able to be managed and is not a risk to an R3 zone.  *Extract BSC: Online Mapping*
4.2 Mine Subsidence and Unstable Land	Does not apply to Planning Proposal.
4.3 Flood Prone Land	Complies – The subject land is mapped as being subject to flooding (being within a medium flood hazard). This direction states that a planning proposal must not rezone land within a flood planning areas from a rural to a residential zone unless the planning proposal contains provisions that apply to the flood planning area.. A planning proposal may be inconsistent with this Direction only if the relevant planning authority can satisfy the Director General that: *(a) the planning proposal is in accordance with a floodplain risk management plan prepared in accordance with the principles and guidelines of the Floodplain Development Manual 2005, or* *(b) the provisions of the planning proposal that are inconsistent are of minor significance.* Chapter 2b – Floodplain Management of the BDCP 2012 has been adopted to reflect the findings of the *Ballina Floodplain Risk Management Study and*

	Plan (2012) and preceding studies, including the *Wardell and Cabbage Tree Island Floodplain Risk Management Study (2007).* This chapter of the DCP permits the construction of elevated dwellings and non-filling of sites except for drainage purposes within the Wardell Village, including at the subject site. This means of flood control ensures any future dwellings are more compatible with existing development within the village and reduces the cumulative impact of raising ground levels within an identified flood prone area. Given the proposed planning proposal will allow for future residential development upon the subject site that is subject to flooding, the provisions of this Chapter of the DCP are relevant. These provisions have been formulated as a result of numerous flood studies that have been undertaken for the entire Shire including the Wardell Village. The DCP permits dwellings upon flood prone sites, and as per the WP&ES which identified the subject lots for strategic urban growth, the site is considered to be consistent with the relevant floodplain management plan/controls and is not contrary to this direction.
4.4 Planning for Bushfire Protection	Complies – A Strategic Bush Fire Study has been prepared (attached) in accordance with the provisions of Planning for Bushfire Protection 2019 to support the proposed rezoning and future possible subdivision of the land should the Planning Proposal proceed to Phase 2. The Study has determined that the proposed rezoning is appropriate in the bush fire hazard context. Bush fire mitigation and management measures for the future development can be adequately addressed, with the proposal having the ability to comply with PBP2019. The indicative allotment layout with proposed minimum lot sizes are considered appropriate to accommodate the APZs within future subdivisions.
5. Regional Planning	
5.1 Implementation of Regional Strategies	Complies – The subject land is mapped as '"Investigation Area – Urban Land" under the NCRP.
5.2 Sydney Drinking Water Catchments	Does not apply to Planning Proposal.
5.3 Farmland of State and Regional Significance on the NSW Far North Coast	Complies – While the subject land is mapped as being regionally significant farmland, the land is mapped as "Investigation Area – Urban Land" under the NCRP.
5.4 Commercial and Retail Development along the Pacific Highway, North Coast	Does not apply to the Planning Proposal.
5.5 Development in the Vicinity of Ellalong, Paxton and Millfield (Cessnock LGA)	Revoked 18 June 2010.
5.6 Sydney to Canberra Corridor	Revoked 10 July 2008
5.7 Central Coast	Revoked 10 July 2010
5.8 Second Sydney Airport: Badgerys Creek	Does not apply to the Planning Proposal.
5.9 North West Rail Link Corridor Strategy	Does not apply to the Planning Proposal.
5.10 Implementation of Regional Plans	Complies – The subject land is mapped as "Investigation Area – Urban Land" under the NCRP.

5.11 Development of Aboriginal Land Council Land	Does not apply to the Planning Proposal.
6. Local Plan Making	
6.1 Approval and Referral Requirements	Complies – The Planning Proposal will not introduce any new concurrence or consultation provisions or any additional designated development types.
6.2 Reserving Land for Public Purposes	Does not apply to the Planning Proposal.
6.3 Site Specific Provisions	Complies – The Planning Proposal seeks to apply the existing R3 land use zone and standards of the BLEP 2012, that are compatible with the residential development of the adjoining and adjacent land in Wardell.
7. Metropolitan Planning	
7.1 Implementation A Plan for Growing Sydney	Does not apply to Planning Proposal.
7.2 Implementation of Greater Macarthur Land Release Investigation	Does not apply to Planning Proposal.
7.3 Parramatta Road Corridor Urban Transformation Strategy	Does not apply to Planning Proposal.
7.4 Implementation of North West Priority Growth Area Land Use and Infrastructure Implementation Plan	Does not apply to Planning Proposal.
7.5 Implementation of Greater Parramatta Priority Growth Area Interim Land Use and Infrastructure Implementation Plan	Does not apply to Planning Proposal.
7.6 Implementation of Wilton Priority Growth Area Interim Land Use and Infrastructure Implementation Plan	Does not apply to Planning Proposal.
7.7 Implementation of Glenfield to Macarthur Urban Renewal Corridor	Does not apply to Planning Proposal.
7.8 Implementation of Western Sydney Aerotropolis Interim Land Use and Infrastructure Implementation Plan	Does not apply to Planning Proposal.
7.9 Implementation of Bayside West Precincts 2036 Plan	Does not apply to Planning Proposal.
7.10 Implementation of Planning Principles for the Cooks Cove Precinct	Does not apply to Planning Proposal.

6.3 Section C – Environmental, social and economic impact

8. Is there any likelihood of critical habitat or threatened species, population or ecological communities, or their habitats, will be adversely affected as a result of the proposal?

As evidenced from the aerial photograph in **Section 2.1**, the subject land is vacant and devoid of any significant vegetation (mown grass).

The subject land is **not** mapped as:

- containing or being proximate to any mapped "Important Population Boundary", "Core Koala Habitat" or "Preferred Koala Habitat" under Council's Koala Management Strategy (2016)
- containing any mapped "Biodiversity Values" vegetation or being proximate to such mapped vegetation on the Biodiversity Values Map and Threshold Tool
- containing any mapped "Coastal Wetlands" or "Littoral Rainforests" or being "Proximity Area" to such vegetation under SEPP (Coastal Management) 2018
- containing any mapped "Natural Areas and Habitat" or "Natural Areas and Habitat 50m Buffer" under the BDCP 2012
- containing or being proximate to and mapped "Significant Urban Bushland" under the BDCP 2012
- being in or proximate to a mapped "Wildlife Corridor" under the DBCP 2012

Having regard to the above, the subject land is not likely to contain any critical habitat or threatened species, populations or ecological communities.

9. Are there any other likely environmental effects as a result of the planning proposal and how are they proposed to be managed?

The subject land is mapped as being bushfire prone. A Strategic Bush Fire Study has been prepared (attached) and has assessed the proposed rezoning and concept subdivision plan under the provisions of Planning for Bushfire Protection (PBP) 2019 and in the context of Section 9.1 Direction 4.4, which concluded that:

- the proposed rezoning is appropriate in the bush fire hazard context

- bush fire mitigation and management measures for the future development can be adequately addressed with the proposal having an ability to comply with PBP 2019
- the indicative allotment layout with proposed minimum lot sizes are considered appropriate to accommodate the APZs within future subdivision , with exception of Concept Lot 1 which will require adjustment to accommodate the APZ

The subject land is mapped on Mosquito Management Map – Sheet MM_002_080 of the BDCP 2012 as "Coastal Plain & Lowlands (Below 10m Contour), but is **not** mapped as being "Area of High Mosquito Risk". The whole of Wardell is situated in such an area and it has not been Council's practice to preclude urban residential development in such areas as a consequence of mosquito risk.

In accordance with Council's current controls and strategies (Section 3.6 – Mosquito Management, Chapter 2 – General and Environmental Considerations, DCP 2012), any future dwellings will be required to contain effective screening to all windows, external doors and other openings to habitable rooms (would be conditioned at DA stage for future houses).

As detailed in the attached Preliminary Site Investigation Report (SEPP 55) (CSI Pty Ltd, 25 March 2020):

"..A desktop review of available information and a site visit did not identify evidence of previous development or activities on the site that would suggest any potentially contaminating activities had taken place on the site. Analytical results from surface soils indicated all of the compounds tested returned concentrations that were below the adopted criteria for residential use.

Based on the sample data collected (5 primary surface soil samples) and the absence of contamination at the site, no further investigation is deemed warranted.... Therefore the site is considered to be free of contamination and suitable for its intended use."

10. How has the planning proposal adequately addressed any social and economic effects?

The future subdivision and construction of future houses (post rezoning) will have impacts on the landscape and scenic character of the locality but would not likely have any amenity impacts on adjacent dwellings/residents due to the physical and spatial separation of the land from such. Further the future urban residential development of the subject land is consistent with the long-standing strategic planning for the subject land. These matters would have to be addressed in more detail should the Planning Proposal proceed to Phase 2.

Any future residential lots are able to be connected to all necessary reticulated public infrastructure services and thus there are no significant economic issues with the servicing of any future lots.

6.4 Section D – State and Commonwealth interests

11. Is there adequate public infrastructure for the planning proposal?

The existing locality is connected to and serviced by all necessary reticulated public infrastructure services. There is sufficient capacity for any future new lots to be efficiently and economically connected to and serviced by such services.

12. What are the views of State and Commonwealth public authorities consulted in accordance with the gateway determination?

The views of the Department of Planning & Infrastructure and other relevant Governmental bodies would be obtained should Council resolve to enable the Planning Proposal to proceed.

7. Community Consultation

There has not been any community consultation undertaken in respect of this Planning Proposal at this point in time.

It is likely that a requirement for community consultation will be contained in any Gateway Determination, with such community consultation and advertising having to be duly undertaken by Council in the further processing of this Planning Proposal.

8. Scope of Engagement

This Planning Proposal has been prepared by Ardill Payne & Partners (APP) on behalf of Snowy Buttons Pty Ltd (ATF Zipper Trust) for lodgement with Ballina Shire Council and is not to be used for any other purpose or by any other person or corporation.

This report has been prepared from the information provided to us and from other information obtained as a result of enquiries made by us. APP accepts no responsibility for any loss or damage suffered howsoever arising to any person or corporation who may use or rely on this document for a purpose other than that described above.

APP declares that it does not have, nor expects to have, a beneficial interest in the subject project.

To avoid this advice being used inappropriately it is recommended that you consult with APP before conveying the information to another who may not fully understand the objectives of the report. This report is meant only for the subject site/project and should not be applied to any other.

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DRAFT STRATEGIC BUSH FIRE STUDY

PROPOSED REZONING

Lots 2, 3, 4, 5 section 10 DP 759050,

6-20 Fitzroy Street, Wardell

Prepared for: Mr Benn Lane.

Date: 16 March 2020

Ref: 20052

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DOCUMENT				
Revision	**Date**	**Description**	**Prepared**	**Authorised**
A	16.03.20	Draft report	Peter Thornton	Peter Thornton

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EXECUTIVE SUMMARY

Bushfire Certifiers have been engaged to prepare a Strategic Bushfire Study for the proposed rezoning of existing vacant land located adjacent to the village of Wardell in accordance with Planning for Bushfire Protection 2019 (PBP 2019) and *Environment Planning and Assessment Act 1979* Section 9.1 and Ministerial Direction 4.4 Planning for Bush Fire Protection. The study will be used to establish that the site is suitable for residential rezoning, and has been prepared for referral and consultation with the NSW Rural Fire Service as a means of demonstrating compliance with the EP&A Act 1979 s 9.1 and Ministerial Direction 4.4, and PBP 2019.

The Study has determined that the proposed rezoning is appropriate in the bush fire hazard context. Bush fire mitigation and management measures for the future development can be adequately addressed, with the proposal having the ability to comply with PBP2019. The indicative allotment layout with proposed minimum lot sizes are considered appropriate to accommodate the APZs within future subdivisions.

The proposal includes the potential for approximately 9 residential allotments. The indicative allotment layout with proposed minimum lot sizes are considered appropriate to accommodate the APZs within future subdivisions with exception to indicative Lot No. 1 which will require adjustment. The northern and western perimeter of the development site abuts forest vegetation. The eastern boundary abuts Fitzroy Street. The entire site is located within the buffer to bush fire prone land and is vulnerable to bushfire attack. The assessment assumes the worst bushfire attack scenario on a day of catastrophic fire danger with a Fire Danger Rating (FDI) of 80.

A number of bushfire planning controls have been recommended to reduce the risk from bushfire attack to an appropriate level having regard to the proposed development and the nature of the locality. The proposed rezoning is capable of meeting the bushfire prevention measures of PBP 2019 and Ministerial Direction 4.4, with recommendations including-

- Setbacks from bushfire hazard vegetation (Asset Protection Zones).
- Fuel management within APZ's.
- Access and egress from the proposed allotments via an appropriate well designed road system to support evacuation and fire fighting demands.
- Underground electricity and gas services.
- Compliant water supplies.
- Increased APZ's to accommodate SFPP's and vulnerable development types.

The proposed rezoning will allow future subdivision of the land to meet Planning for Bushfire Protection Guidelines (NSW RFS) 2019 applicable at the time of reporting. Further bushfire assessment will be required at the time of subdivision to accurately determine required APZ's, road upgrade requirements, and landscaping provisions to achieve compliance with standards for subdivisions in NSW. The site is serviced by existing reticulated town water, with the benefit of full street hydrant coverage.

Summary Strategic Bush Fire Study (Table 4.2.1 PBP 2019).

ISSUE	DETAIL	ASSESSMENT CONSIDERATIONS	COMMENT
Bush fire landscape assessment	A bush fire landscape assessment considers the likelihood of a bush fire, its potential severity and intensity and the potential impact on life and property in the context of the broader surrounding landscape.	The bush fire hazard in the surrounding area, including vegetation, topography and weather.	Rezoning suitable
		The potential fire behaviour that might be generated based on the above.	Rezoning suitable
		Any history of bush fire in the area.	Rezoning suitable
		Potential fire runs into the site and the intensity of such fire runs.	Rezoning suitable
		The difficulty in accessing and suppressing a fire, the continuity of bush fire hazards or the fragmentation of landscape fuels and the complexity of the associated terrain.	Rezoning suitable
Land use assessment	The land use assessment will identify the most appropriate locations within the masterplan area or site layout for the proposed land uses.	The risk profile of different areas of the development layout based on the above landscape study.	Rezoning suitable
		The proposed land use zones and permitted uses	Rezoning suitable
		The most appropriate siting of different land uses based on risk profiles within the site (i.e. not locating development on ridge tops, SFPP development to be located in lower risk areas of the site).	Rezoning suitable
		The impact of the siting of these uses on APZ provision.	Rezoning suitable
Access and egress	A study of the existing andproposed road networks both within and external to the masterplan area or site layout.	The capacity for the proposed road networkto deal with evacuating residents and responding emergency services, based on the existing and proposed community profile.	Rezoning suitable subject to Fitzroy Street upgrade.
		The location of key access routes and direction of travel.	Rezoning suitable
		The potential for development to be isolated in the event of a bush fire.	Rezoning suitable
Emergency services	An assessment of the future impact of new development on emergency services.	Consideration of the increase in demand for emergency services responding to a bush fire emergency including the need for new stations/ brigades.	Rezoning suitable
		Impact on the ability of emergency services to carry out fire suppression in a bush fire emergency.	Rezoning suitable
Infrastructure	An assessment of the issues associated with infrastructure and utilities.	The ability of the reticulated water system to deal with a major bush fire event in terms of pressures, flows, and spacing of hydrants.	Rezoning suitable
		Life safety issues associated with fire and proximity to high voltage power lines, natural gas supply lines etc.	Rezoning suitable
Adjoining land	The impact of new development on adjoining landowners and their ability to undertake bush fire management.	Consideration of the implications of a change in land use on adjoining land including increased pressure on BPMs through the implementation of Bush Fire Management Plans.	Future proposed development will result in improvement of current conditions.

1.0 INTRODUCTION

1.1 Purpose

This Strategic Bush Fire Report has been prepared to address bushfire risk and mitigation measures in relation to the proposed rezoning of four existing rural allotments, for residential purposes, adjoining the village of Wardell located on the NSW North Coast. The report makes comment on whether the statutory and policy requirements for development in bushfire prone areas can be achieved. The proposal has been assessed against the requirements of Planning for Bushfire Protection Guidelines (NSW RFS 2019).

The purpose of the strategic bush fire study is to avoid high risk areas, ensure that zoning is appropriate to allow for adequate emergency access, egress, and water supplies, and to ensure that future compliance with this PBP is achievable. The Study provides an assessment as to whether new development is appropriate in the bush fire hazard context, and the implications of future development for bush fire mitigation and management.

1.2 Location

The site is located at Lots 2, 3, 4, 5 section 10, DP 759050, 6-20 Fitzroy Street, Wardell as detailed in Figure 1.

1.3 Legislation

1.3.1 Environmental Planning and Assessment Act

Appropriate consideration of bush fire hazards for the proposed rezoning is required by the *Environmental Planning and Assessment Act 1979* Section 9.1(2), and Direction 4.4 Planning for Bushfire Protection. Clause 4.4.1 of recently adoption of Planning for Bushfire Protection (PBP) 2019 states Direction 4.4 is to be addressed in a Strategic Bush Fire Study at the initial planning stage in accordance with Clause 4.2 of PBP. Consultation with the RFS will require consideration of a bush fire assessment to demonstrate compliance with the Direction and PBP.

The broad principles which apply to the strategic analysis include-

- Ensuring land is suitable for development in the context of bush fire risk;
- Ensuring new development on bushfire prone land will comply with PBP;
- Minimising reliance on performance-based solutions;
- Providing adequate infrastructure associated with emergency evacuation and firefighting operations; and Facilitating appropriate ongoing land management practices.

1.3.2 Rural Fires Act

Future residential subdivision will be assessed under Section 100B of the *Rural Fires Act 1997*, and a Bush Fire Safety Authority (BFSA) must be obtained from the NSW Rural Fire Service (RFS). A

Bushfire Assessment Report will be required, indicating compliance with Planning for Bushfire Protection 2019, in accordance with the requirements of Clause 44 of the Rural Fires Regulation.

This report does not consider the following legislation. In this regard this report should be read in conjunction with the Statement of Environmental Effects submitted with the development application to ensure full compliance has been adequately demonstrated.

- State Environmental Planning Policy No. 44 (Koala Habitat Protection)
- Biodiversity Conservation Act 2016 (NSW)
- Local Land Services Act 2013 (NSW)
- Land Management (Native Vegetation) Code 2017 (NSW)
- National Parks and Wildlife Act 1974 (NSW)
- Environmental Protection and Biodiversity Conservation Act 1999 (Cwlth)

1.3.3 Planning for Bushfire Protection Guidelines 2019

The relevant bush fire protection measures outlined in chapters 5-8 of PBP 2019 have been considered to ensure future development is capable of complying with PBP where appropriate. An indicative development layout has been provided to assess the suitability of the land for the proposed development and to demonstrate required APZs can be met on site. The indicative allotment layout with proposed minimum lot sizes are considered appropriate to accommodate the APZs within future subdivisions with exception to indicative Lot No. 1 which will require adjustment.

Special Fire Protection Purpose (SFPP) developments include developments where occupants may be more vulnerable to bushfire attack. These developments require considerably larger APZs than residential developments and include the following types of uses which may be permitted in the proposed R3 zoning-

- A school (RF Act 100B);
- A child care centre (RF Act 100B);
- A hospital (including a hospital for the mentally ill or mentally disordered) (RF Act 100B);
- A hotel, motel or other tourist accommodation (RF Act 100B);
- A building wholly or principally used as a home or other establishment for mentally incapacitated persons (RF Act 100B);
- Seniors housing within the meaning of State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 (RF Act 100B);
- A group home within the meaning of State Environmental Planning Policy No 9 - Group Homes (RF Act 100B);
- A retirement village (RF Act 100B);
- Any other purpose prescribed by the regulations (RF Act 100B);
- Public assembly buildings greater than 500m^2, including place of public worship (PBP2019 cl.8.3.11);
- Manufactures Home Estates (RF Regs 2013 cl.46 and PBP 2019 cl. 6.3.2);

- A sheltered workshop, or other workplace, established solely for the purpose of employing persons with disabilities (RF Regs 2013 cl.46);
- A respite care centre, or similar centre, that accommodates persons with a physical or mental disability or provides respite for carers of such persons (RF Regs 2013 cl.46);
- Student or staff accommodation associated with a school, university or other educational establishment (RF Regs 2013 cl.46 and PBP 2019 cl. 6.3.2);
- A community bush fire refuge approved by the Commissioner (RF Regs 2013 cl.46).

For these developments the specific objectives of SFPP developments within PBP should be followed in addition to the requirements for residential developments. The specific objectives for SFPP developments as detailed in PBP 2019 are to:

- minimise levels of radiant heat, localised smoke and ember attack through increased APZ, building design and siting;
- provide an appropriate operational environment for emergency service personnel during firefighting and emergency management;
- ensure the capacity of existing infrastructure (such as roads and utilities) can accommodate the increase in demand during emergencies as a result of the development;
- and ensure emergency evacuation procedures and management which provides for the special characteristics and needs of occupants.

Commercial uses are classified in PBP 2019 as "Other Development". These developments need to satisfy the aims and objectives of PBP. Generally, the bushfire protection measures listed in PBP for residential development can be used as a guide and are discussed in the following sections. The aim of PBP is to provide for the protection of human life and minimise impacts on property from the threat of bush fire, while having due regard to development potential, site characteristics and protection of the environment.

The objectives of PBP are to-

a. Afford buildings and their occupants protection from exposure to a bush fire;
b. Provide for a defendable space to be located around buildings;
c. Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings;
d. Ensure that appropriate operational access and egress for emergency service personnel and occupants is available;
e. Provide for ongoing management and maintenance of bush fire protection measures; and
f. Ensure that utility services are adequate to meet the needs of firefighters.

2.0 PROJECT DESCRIPTION

2.1 Existing site

The site adjoins the Wardell township as shown in Figure 1. The total land area subject to the rezoning is approximately 7380m^2. The subject site has previously been cleared and currently supports grassland vegetation. Access to Fitzroy Street is via Wilson Street. Fitzroy Street is sealed for the first 185m from Wilson Street, however does not continue to Swamp Street, forming a dead-end road within the road reserve. There is not an adequate turning area at the end of the sealed section of road for a medium rigid vehicle to turn and exit in a forward direction. The site is described in Table 1.

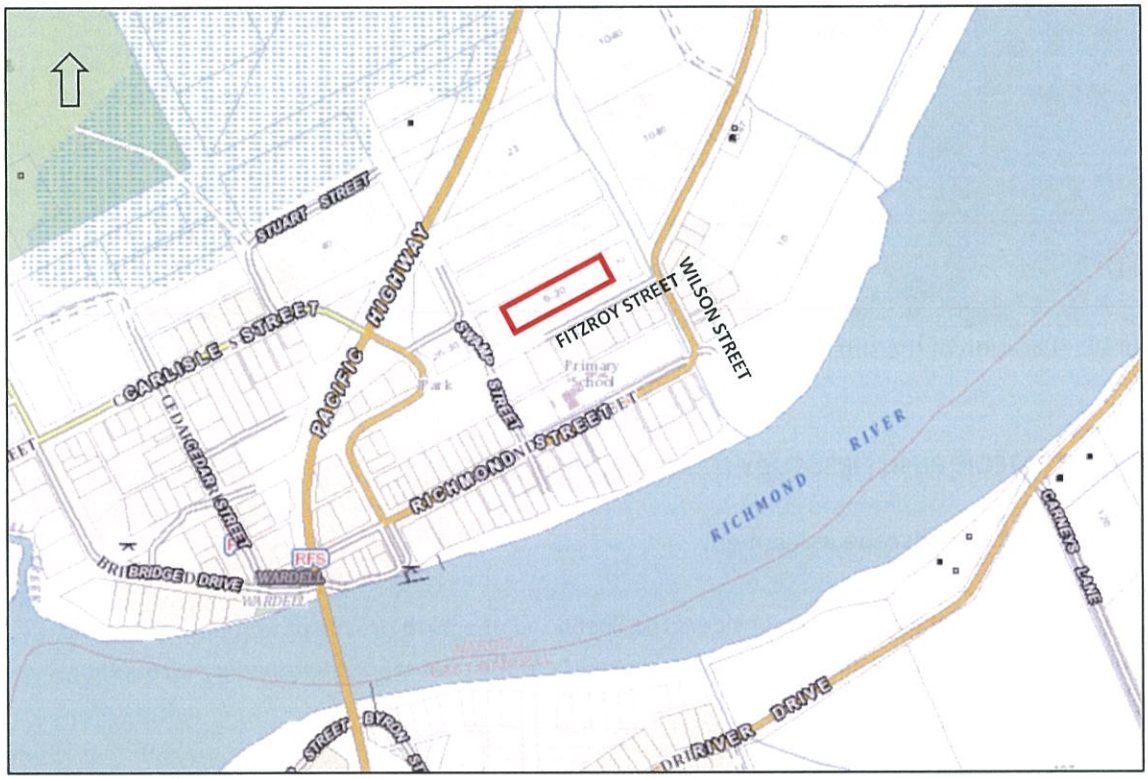


Figure 1 - Locality map

Table 1 - Existing site description

Parameter	Description
Local Government area	Ballina Shire Council.
Property Description	6-20 Fitzroy Street, Wardell NSW, 2477. Lot 2/10/759050, Lot 3/10/759050, Lot 4/10/759050, Lot 5/10/759050.
Site area	7380m^2 (approximately).
Zoning confirm	RU2 - Rural landscape; R2 - Low density residential.
Bushfire Prone Land	Located within the 100m buffer to Category 1 bushfire hazard vegetation.
Flood planning area	Mapped as within the flood planning area.
Fire Station	Wardell Rural Fire Service located within 2km by road from the site.
Police Station	Wardell Police Station located within 2km by road from the site.

2.2 Proposed rezoning

Proposed zoning R3 medium density residential. The indicative allotment layout provides for nine future allotments each having a frontage to Fitzroy Street. The indicative allotment layout is provided in Appendix A.

Figure 2 - Location of the subject land.

3.0 STRATEGIC BUSH FIRE STUDY (TABLE 4.2.1 PBP 2019)

3.1 Bush fire landscape assessment

A bush fire landscape assessment considers the likelihood of a bush fire, its potential severity and intensity and the potential impact on life and property in the context of the broader surrounding landscape.

3.1.1 The bush fire hazard in the surrounding area, including vegetation, topography and weather.

The site is located within the Richmond River floodplain with a generally flat topography. The Richmond River is located approximately 250m to the south and 300m to the east of the site, having a width of 150-200m in the vicinity of the site. The village of Wardell separates the site from the river. A small pocket of remnant vegetation is located along the river approximately 200m south-east of the site. The dominant agricultural land use on the eastern side of the Richmond River is sugar cane farming throughout the floodplain between the Pacific Ocean and the Richmond River.

The Pacific Highway dissects the village in a north-south direction. West of the highway is a wetland with a mixture of forest vegetation, and low and tall heath vegetation. A pocket of exotic (camphor laurel) and rainforest vegetation is located between the site and the highway to the west and north-west. Small areas of Koala Habitat are also located in the vicinity of the highway.
Bordering the wetland to the west is the Pacific Motorway under construction. To the west of the

motorway is a band of open grazing land (grassland) on the foothills of the Blackwall Range. The Blackwall Range extends from Uralba in the north to Bagotville to the south, and is generally forest vegetation with some cleared areas used for grazing, as shown in Figure3 and 4.

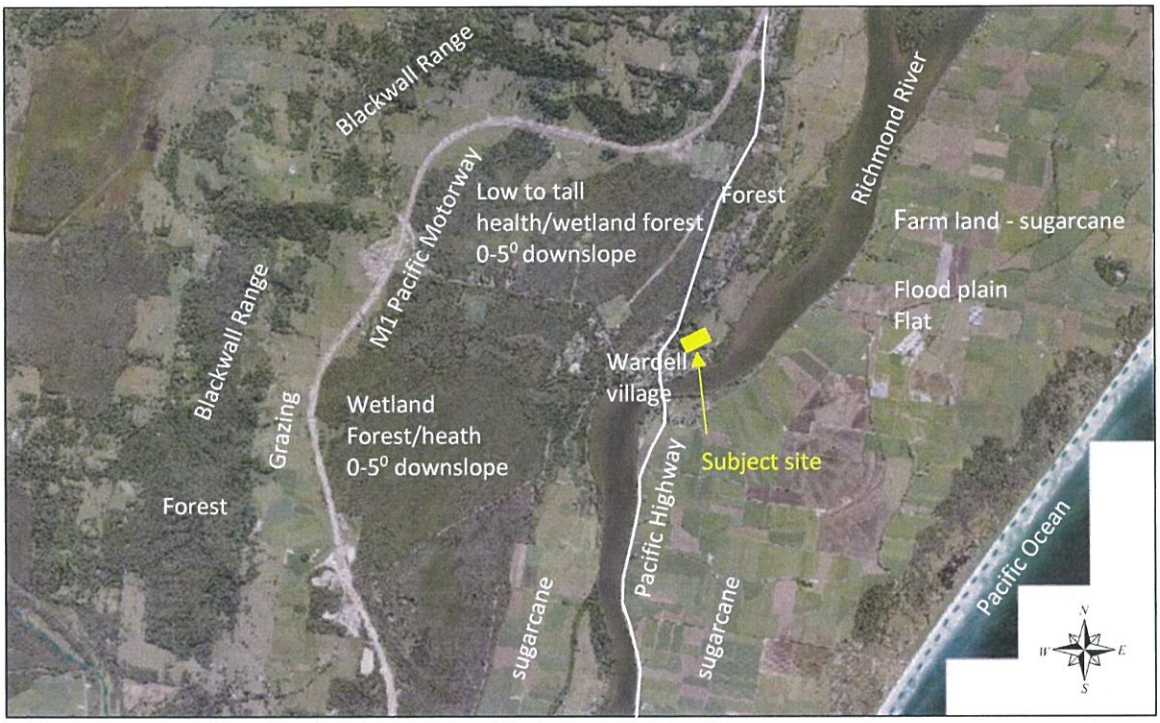


Figure 3 - Vegetation in the broader surrounding landscape.

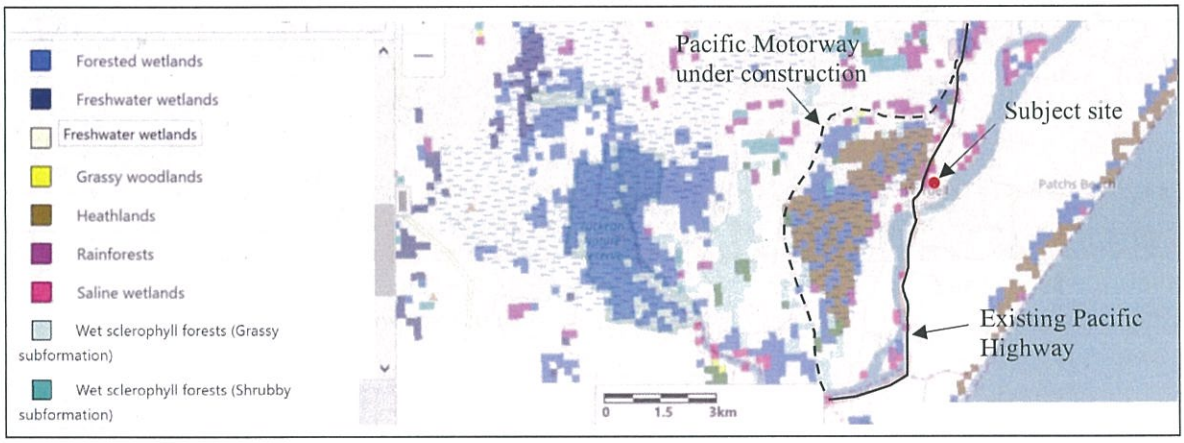


Figure 4 - Vegetation mapping

Vegetation mapping http://www.bionet.nsw.gov.au/

Rainforest vegetation adjoins the north and western boundaries of the site, with managed residential land to the south and east. It is noted that the road reserve has a width of approximately 20m from the edge of the sealed road to the boundary of the subject site. The method of managing the vegetation within the road reserve should be addressed with the subdivision application to ensure the area is managed land, or appropriate APZ's will be required to the southern boundary of

the allotments. Table 2 summarises the bushfire threat. The subject site is designated bushfire prone land, located within the 100m buffer to Category 1 vegetation as shown in Figure 5.

Table 2 – Summary Bushfire Threat Assessment

Table 2: Summary Bushfire Threat Assessment					
ASPECT	**SLOPE**	**VEG. CLASS**	**FDI**	**APZ REQUIRED SINGLE AND MEDIUM DENSITY 29kW/m²**	**APZ REQUIRED FOR SPECIAL FIRE PROTECTION PURPOSE (SFPP)**
North	0° Flat	Rainforest	80	9m	38m
East	n/a	Managed land	80	To boundary	To boundary
West	0° Flat	Rainforest	80	9m	38m
South	n/a	If road reserve is managed.	80	To boundary	To boundary
	0° Flat	If road reserve is not managed land - grassland	80	10m	36m

Photo 1 – Subject site

Photo 2 – Camphor Laurel/Rainforest to the north of the subject site.

Photo 3 - Camphor Laurel/Rainforest to the north of the subject site.

Photo 4 – Camphor laurel over-storey and rainforest plants emerging.

Photo 5 - Table drain within the road reserve.

Photo 6 - Forest vegetation further to the northwest.

3.1.2 The potential fire behaviour that might be generated based on the above.

The assessment assumes the worst bushfire attack scenario on a day of catastrophic fire danger with a Fire Danger Rating (FDI) of 80 in accordance with Planning for Bushfire Protection 2019. The bushfire prone land mapping is not completely accurate in that the mapping indicates Category One vegetation adjacent to the north and west boundary of the subject property. The inspection however identified the vegetation in this area as a combination of exotic camphor laurel and rainforest vegetation.

Further, the vegetation to the north is disconnected by managed residential properties and to the west by grassland vegetation. The remainder of the vegetation beyond this rainforest/exotic vegetation is generally Category One vegetation being a combination of forest, forested wetland and tall heath classifications.

Figure 5 - Bushfire Hazard Map

Figure 6 identifies areas of Koala habitat in proximity to the subject property. Further studies may be required having regard to impact however this will need to be assessed and addressed with the statement of environmental effects.

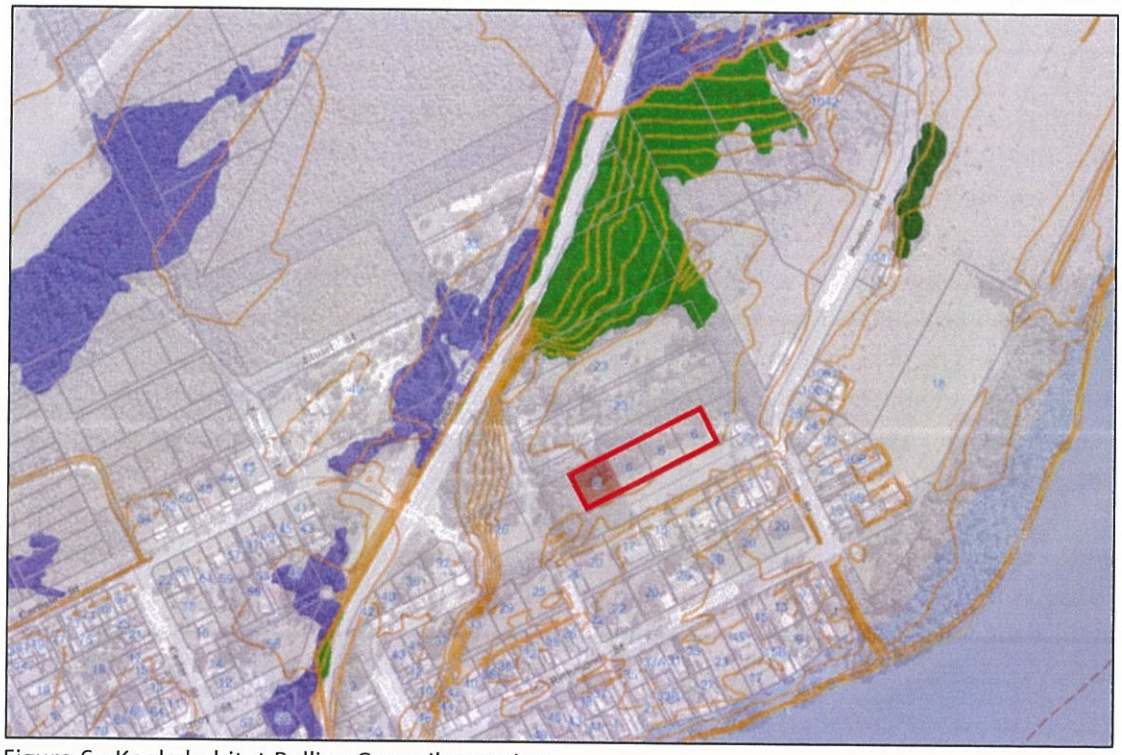


Figure 6 - Koala habitat Ballina Council mapping.

3.1.3 Any history of bushfire in the area.

The area has a history of fires with further details to be provided with the final report. The fire history has been considered and will not impact the outcome of this report.

3.1.4 Potential fire runs into the site and the intensity of such fire runs.

The potential fire runs from the northwest and west are lengthy and considered to be the most likely impact on the subject property if the fire weather is high. These aspects are generally associated with high fire danger days with elevated FDI's. The fire runs are generally through high fuel load areas such as forest and tall heath however there are buffer areas of managed land and grassland between this vegetation and the closed forest vegetation directly adjacent to the subject sites.

Figure 7 – Areas of managed land and grassland are located between the forest/heath vegetation and the remnant closed forest adjacent to the subject property boundaries to the north and west.

3.1.5 The difficulty in accessing and suppressing a fire, the continuity of bush fire hazards or the fragmentation of landscape fuels and the complexity of the associated terrain.

As previously outlined the closed forest adjacent to the subject site is separated from the primary forest hazard by managed land and grassland. There are street hydrants available to assist in firefighting and the existing public road network provide good access for fire fighting purposes. The terrain is relatively flat however it is noted there is a petrol station located approximately 150m to the west which would be a specific hazard of concern in a bushfire event.

3.2 Land use assessment

The land use assessment will identify the most appropriate locations within the site layout for the proposed land uses.

3.2.1 The risk profile of different areas of the development layout based on the above landscape study.

The subject property is relatively small and is essentially impacted by the same level of risk throughout. The western end of the development would be most likely impacted given this is the likely the direction of the most severe bushfire weather.

3.2.2 The proposed land use zones and permitted uses.

The current zoning is RU2 Rural landscape. The proposed land use zone will be R3 Medium density residential. Permitted uses for the proposed rezoning are detailed below.

Zone R3 Medium Density Residential

2. Permitted without consent

Home based child care, home occupations.

3. Permitted with consent

Attached dwellings, boarding houses, child care centres, community facilities, extensive agriculture, group homes, home industries, kiosks, markets, multi-dwelling housing, neighbourhood shops, place of public worship, respite day care centres, roads, roadside stalls, seniors housing, any other development not specified in 2 or 4.

4. Prohibited

Advertising structures, agriculture, air transport facilities, airstrips, amusement centres, animal boarding and training establishments, boat building and repair facilities, charter and tourism boating facilities, commercial premises, correctional centres, crematoria, dairies (pasture based), depots, eco-tourist facilities, farm stay accommodation, forestry, freight transport facilities, heavy industrial storage establishments, highway service centres, industrial retail outlets, industrial training facilities, industries, marinas, mooring pens, moorings, mortuaries, recreation facilities (major), restricted premises, rural industries, rural workers' dwellings, service stations, sex services premises, storage premises, transport depots, truck depots, vehicle body repair workshops, vehicle repair stations, veterinary hospitals, warehouse or distribution centres, waste or resource management facilities, wharf or boating facilities, wholesale supplies.

The sites are considered suitable for single or multi dwelling housing, however some Special Fire Protection Purpose development such as seniors housing, group homes, child care centres, place of worship (depending on size) and potentially boarding houses are not likely to be capable of achieving sufficient asset protection zone widths within the allotments as required by Table A.1.12.1 of Planning for Bushfire Protection 2019 being 38m from the north and western boundaries.

Table A1.12.1

Minimum distances for APZs - SFPP developments (≤10kW/m², 1200K)

KEITH VEGETATION FORMATION	EFFECTIVE SLOPE				
	Up slopes and flat	>0°-5°	>5°-10°	>10°-15°	>15°-20°
	Distance (m) from the asset to the predominant vegetation formation				
Rainforest	38	47	57	69	81
Forest (wet and dry sclerophyll) including Coastal Swamp Forest, Pine Plantations and Sub-Alpine Woodland	67	79	93	100	100
Grassy and Semi-Arid Woodland (including Mallee)	42	50	60	72	85
Forested Wetland (excluding Coastal Swamp Forest)	34	42	51	62	73
Tall Heath	50	56	61	67	72
Short Heath	33	37	41	45	49
Arid-Shrublands (acacia and chenopod)	24	27	30	34	37
Freshwater Wetlands	19	22	25	28	30
Grassland	36	40	45	50	55

Single or multi dwelling (Class 1a – BCA) development must be capable of having the asset protection zone widths required by Table A1.12.3 PBP2019, being 9m for the northern boundary and 9m from the western boundary. It is noted that Lot No. 1 of the indicative subdivision layout will need to be potentially consolidated into Lot 2 in order to enable a 9m APZ from both the north and west boundary whilst supporting minimum size building envelopes.

Table A1.12.3

Minimum distances for APZs - residential development, FFDI 80 areas (≤29kW/m², 1090K)

KEITH VEGETATION FORMATION	EFFECTIVE SLOPE				
	Up slopes and flat	>0°-5°	>5°-10°	>10°-15°	>15°-20°
	Distance (m) from the asset to the predominant vegetation formation				
Rainforest	9	12	15	20	25
Forest (wet and dry sclerophyll) including Coastal Swamp Forest, Pine Plantations and Sub-Alpine Woodland	20	25	31	39	48
Grassy and Semi-Arid Woodland (including Mallee)	11	13	17	21	27
Forested Wetland (excluding Coastal Swamp Forest)	8	10	13	17	22
Tall Heath	16	18	20	22	25
Short Heath	9	10	12	13	15
Arid-Shrublands (acacia and chenopod)	6	7	8	9	10
Freshwater Wetlands	5	6	6	7	8
Grassland	10	11	12	14	16

3.2.3 The most appropriate siting of different land uses based on risk profiles within the site (i.e. not locating development on ridge tops, SFPP development to be located in lower risk areas of the site. Not locating high risk development in hazardous areas of the site.

The village of Wardell is located adjacent to the Richmond River and is generally flat with minor undulations. There are no areas of the site at higher risk from bushfire due to topography or access arrangements. The required APZ's will be an appropriate risk mitigation measure to address the proximity to the bushfire hazard for the proposed rezoning.

3.2.4 The impact of the siting of these uses on APZ provision.

The limited site area and proximity to the bushfire hazard may limit some uses due to the APZ requirements such as SFPP. The proposed allotment layout provides for sufficient lot size for required APZ's for single dwellings on individual allotments, although indicative Lot No. 1 will need to be adjusted to support the required APZs for residential dwellings (Class 1a).

3.3 Access and Egress

A study of the existing andproposed road networks both within and external to the masterplan area or site layout.

3.3.1 The capacity for the proposed road networkto deal with evacuating residents and responding emergency services, based on the existing and proposed community profile.

The road network has been assessed to determine suitability to support evacuation demands as the rezoning includes residential or SFPP development on bush fire prone land. No new public access roads are proposed. Upgrade of Fitzroy Street will be required to ensure compliance with PBP2019.

The existing public road network in the vicinity of the site, based on the potential volumes of traffic, are generally considered capable to support the increased volumes of traffic in the event of a bush fire emergency. However Fitzroy Street will either need to be extended to link back into the existing public road network to the west or be provided with a turn-around area compliant with Table 5.3b and Appendix 3 of Planning for Bushfire Protection 2019. Fitzroy Street whilst generally complying with the minimum 5.5m sealed carriageway will require some upgrading at the western end.

The existing street hydrants appear to provide adequate coverage of potential building envelopes i.e. within 70m, however this will need to be confirmed at subdivision stage. In any case there is capability for compliance to be achieved. On this basis there should be no specific bushfire requirements for property access roads with standard driveway designs being adequate.

The rezoning to residential use of the small portion of land will not support a perimeter road, however the inspection noted the residential development further to the north and to the west essentially isolating the small remnant closed forest adjacent to the boundaries. It is noted that the northern boundary of the site adjoins a paper road reserve which supports part of the hazard vegetation.

Figure 8 – Driveway and road providing fire brigade access to the hazard vegetation.

Further detailed traffic reporting from a person competent in this field will be required however from a high level assessment relating to bushfire it appears the rezoning will not have an adverse impact on evacuation, and apart from some upgrading required to Fitzroy Street the existing public road network has sufficient width and travel options not to preclude the proposed rezoning.

3.3.2 The location of key access routes and direction of travel.

There are a number of access and egress routes available which include traveling south from Fitzroy street then west toward the Highway where an option to travel north or south is available. There is also an option to travel north from Fitzroy street toward Pimlico and rejoin the Pacific Highway south of Ballina. It is also possible to travel via River Drive with a ferry crossing the Richmond River to Ballina.

3.3.3 The potential for the development to be isolated in the event of a bushfire.

The development is on the urban edge of Wardell and therefore is not considered to be isolated with egress available away from the existing bushfire hazard.

Figure 9 – Existing access to Fitzroy Street

Existing sealed access road in Fitzroy approximately 185m long to a dead-end street. In this regard the 4m wide section of Fitzroy Street will need upgrading to 5.5m width and a turn-around area provided in accordance with Table 5.3b and Appendix 3 of PBP2019 allowing adequate fire brigade intervention whilst occupants may be evacuating. Alternatively, Fitzroy Street would be linked back into the existing public road system.


Photo 7 –Fitzroy Street will require a turn-around or continue through to the public road system.


Photo 8 – Fitzroy Street.

Photo 9 –Public road north toward Pimlico.

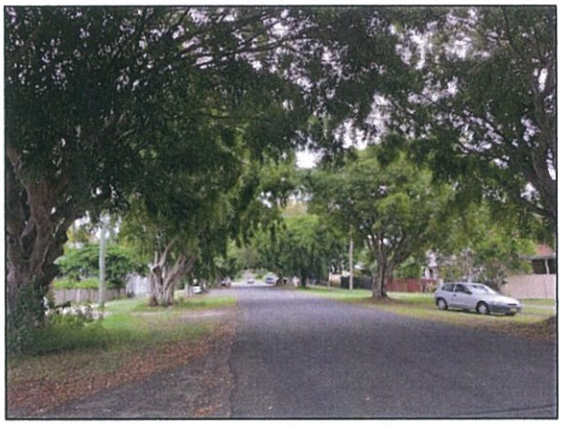


Photo 10 – Existing public roads in Wardell are adequate for evacuation.

Photo 11 – Pacific Highway allows egress to the north and south.

3.4 Emergency Services

An assessment of the future impact of new development on emergency services.

3.4.1 Consideration of the increase in demand for emergency services responding to a bush fire emergency including the need for new stations/brigades.

The proposed development is within 2km by road of Wardell RFS and Police Station. The increase in population is not considered significant in the context of the overall existing village of Wardell and it is considered the existing RFS Station and Police Station will not require any adjustment.

3.4.2 Impact on the ability of emergency services to carry out fire suppression in a bush fire emergency.

The proposal is considered to have negligible impact for emergency services to carry out fire suppression in a bush fire emergency. The development is likely to improve the function of Fitzroy Street having regard to fire brigade intervention.

3.5 Infrastructure

An assessment of the issues associated with infrastructure and utilities.

3.5.1 The ability of the reticulated water system to deal with a major bush fire event in terms of pressures, flows, and spacing of hydrants.

Reticulated town water supply is provided by Ballina Shire Council from Marom Creek Weir and the Ellis Road and Lindendale Bores. The existing supply services the township and the existing street hydrant system. The existing reticulated water supply and hydrant mains are located along Fitzroy Street and will provide coverage of the site. The water supply network has not been tested, however as it is a reticulated village system currently relied upon by NSW RFS, it is considered sufficient for fire fighting purposes for the proposed allotments. Pressure and flow testing should be undertaken at subdivision stage.

Photo 12 - Existing street hydrants located in Fitzroy Street.

3.5.2 Life safety issues associated with fire and proximity to high voltage power lines, natural gas lines etc.

Existing above ground power transmission lines along the southern side of Fitzroy Street are external to the site. All new power lines should be located underground in accordance with PBP2019.

The site is not known to be serviced by reticulated natural gas.

3.6 Adjoining land

The impact of new development on adjoining landowners and their ability to undertake bush fire management.

3.6.1 Consideration of the implications of a change in land use on adjoining land including increased pressure on BPMs through the implementation of Bush Fire Management Plans.

It is considered by developing the land for residential purposes and applying compliant asset protection zones and landscaping requirement together with construction standards to the buildings, the development will decrease the fuel loads currently impacting adjacent development. The fuel loads consist of essentially grassland vegetation which can increase the fire spread through the subject property to adjacent residential development.

4.0 CONCLUSION

The Study has determined the proposed rezoning is appropriate in the bush fire hazard context. Bush fire mitigation and management measures for the future development can be adequately addressed with the proposal having the ability to comply with PBP2019. The indicative allotment layout with proposed minimum lot sizes are considered appropriate to accommodate the APZs within future subdivisions, with exception to indicative Lot No. 1 which will require adjustment to accommodate the APZ.

This report has been prepared for referral and consultation with the NSW Rural Fire Service as a means of demonstrating compliance with the EP&A Act 1979 s 9.1 and Ministerial Direction 4.4, and PBP 2019 as applicable to the proposed rezoning.

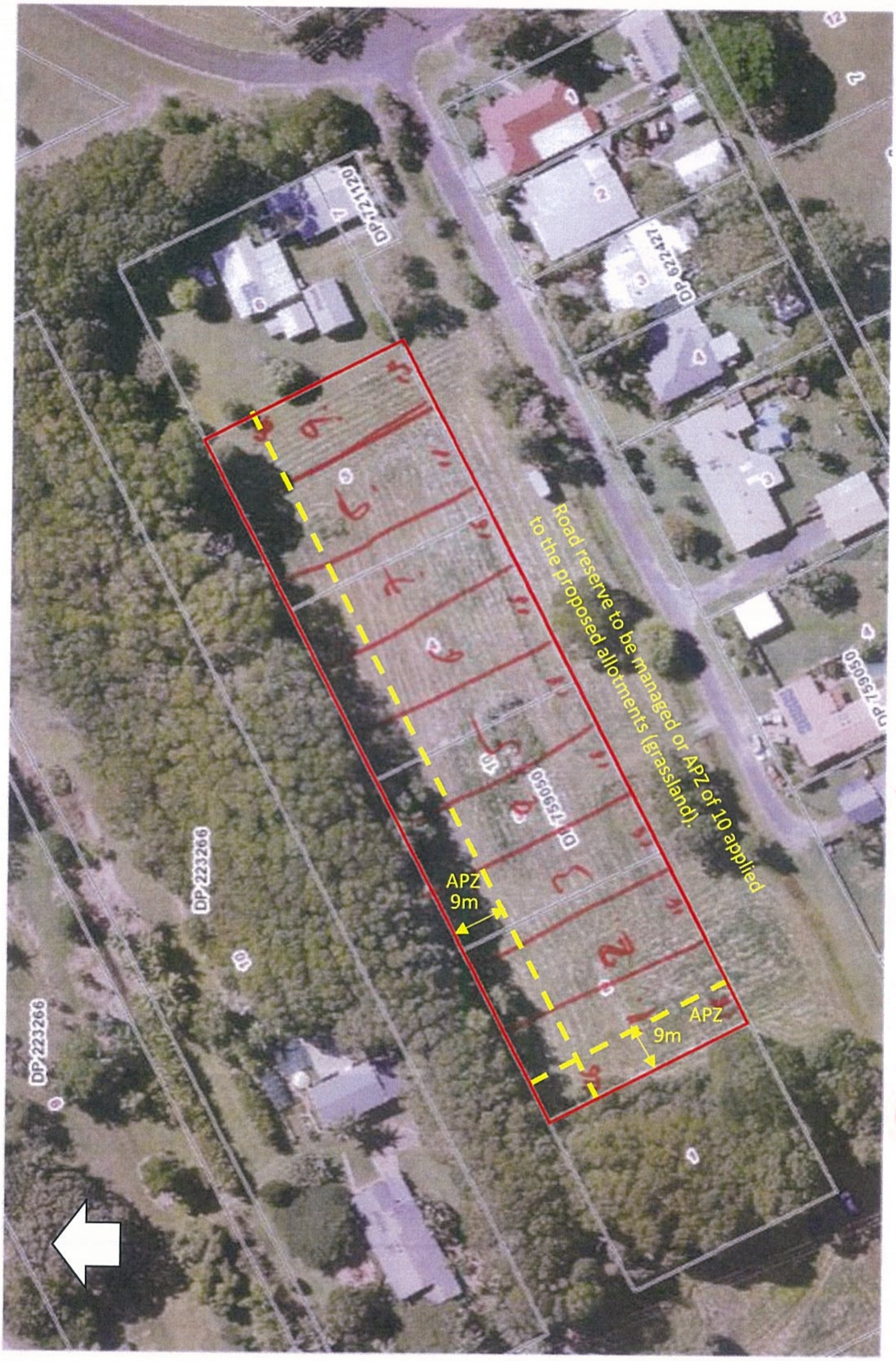
Disclaimer

While every reasonable effort has been made to ensure that this document is correct at the time of printing, BCA Check Pty Ltd t/a Bushfire Certifiers and its agents and employees, disclaim any and all liability to any person in respect of anything or the consequences of anything done or omitted to be done in reliance or upon the whole or any part of this document for purposes other than for the purpose for which it was commissioned and in accordance with the contract between BCA Check Pty Ltd and Ardill Payne and Partners. Unauthorised use of this report in any form is prohibited.

All dimensions indicated within this report are indicative only, and are subject to detailed survey. To the best of our knowledge this report does not contain any false, misleading or incorrect information.

Appendix A

Indicative subdivision plan



830m² x 9 lots.

PRELIMINARY SITE INVESTIGATION REPORT
6-20 FITZROY STREET WARDELL, NSW

Contents

1.0 Introduction

Contaminated Site Investigations Australia Pty Ltd (CSI Aus) was commissioned by Benn Lane of Justice Fox property group (acting on behalf of Wardell No.3 Pty Ltd) on 11 March 2020 to conduct a Preliminary Site Investigation (PSI) for the property located at 6-20 Fitzroy Street, Wardell, NSW (the site).

The site is proposed to be rezoned from rural to low density residential lots (4). The rezoning of the site from rural to residential, triggers the requirement for a PSI to be conducted under State Environmental Planning Policy 55 - Remediation of Land (SEPP – 55).

2.0 Objective

The objective of the PSI is to identify potential contamination of surface soils or potentially contaminating historical activities at the site and make an assessment of the sites' suitability for residential use, or further investigation. This objective will be met via desktop research of government sources, a site visit and walk-over, surface soil sampling and subsequent laboratory analysis.

3.0 Scope of Work

- Desktop assessment of site location, setting and historical building and development applications;
- Review of available historical aerial photography and historical title searches;
- Site visit and walk-over (see photos in report);
- Collection of x 5 primary samples (spread across the proposed four Lots) to assess for contaminants; of potential concern (COPC);
- Chain of Custody documentation;
- Analysis of samples via a NATA accredited laboratory; and
- Preparation of this PSI report.

4.0 Site Details

4.1 Location and Setting

The site is located at 6-20 Fitzroy Street, Wardell, NSW on the Northern side of the road, as shown on Figure 1 over page.

The site is located in a predominantly residential area which is bordered to the north by rural properties and the Pacific Highway. To the east, west and south, the site is bordered by residential properties and streets.

The site is formally identified as Lots 2, 3, 4 and 5 in Section 10 of DP759050, in the Parish of Bingal, County of Rous. Coordinates for the centre of the site are approximately 28° 56'58.27" S and 153°28'05.84" E.

The four lots have a total area of approximately 7,384 square metres.

The site is relatively flat with a slight dip to the northern and eastern boundaries. It is approximately 2 metres above sea level and the Richmond River is located approximately 270 metres to the south.

4.2 Geology/Soils

The site soils were relatively uniform in lithology and consisted of a firm and well compacted brown to red medium grained clayey sand (basalt soils and coastal sands dominate the area). Shallow soils contained basalt gravels up to 30mm diameter and organic material - grass rootlets.

A total of x 6 soil samples were collected from surface soils and submitted for analysis by a NATA accredited laboratory.

FIGURE 1
SITE LAYOUT, SETTING & SOIL SAMPLE LOCATIONS

6-20 Fitzroy Street Wardell. Source: NSW Government - https://maps.six.nsw.gov.au/

4.3 Historical Title Search

Limited information on previous site use and ownership was obtained from the NSW land registry services. See Appendix 4 for results.

Table 1 –

Historical Title Search

Date	Information
15/9/1914	State of NSW offered grant of land for sale at Auction and not sold, it was granted to Harry King, a fisherman.
19/10/1914	Title was transferred to Louisa May Lumley (wife of Clarence Thomas Lumley (butcher).
23/5/1983	Title transferred to Maisie Muter (occupation and land use unknown)
5/5/1994	New Title and Folio created 2/10/759050
11/11/2019	Lots 2 and 3 owned by Wardell No.3 Pty Ltd – Vacant land that is disused

4.4 Historical Aerial Photograph Review

The NSW Government spatial services were contacted to obtain historical aerial photographs. Three photographs were received for the years 1958, 1979 and 1991.

PHOTOGRAPH 1 – AERIAL PHOTOGRAPH 1991

PHOTOGRAPH 2 – AERIAL PHOTOGRAPH 1979

PHOTOGRAPH 3 – AERIAL PHOTOGRAPH 1958

As can be seen in the above aerial photographs taken in 1958, 1979 and 1991, the site has been vacant and has no visual indicators of current or previous use or development other than clearing of vegetation.

4.5 Ballina Shire Council BA/DA Search Results

A request for historical building and development applications (BA & DA) was submitted to Ballina Shire Council (BSC) to investigate if any of the four lots have been previously developed, occupied or used in any way. The search results provided eight documents which all relate to the same activity, which was the filling of the site to raise the elevation to a similar height as lots to the south and east.

Fill material was brought onto the site and compacted to raise the site above the flood level of 2.53m AHD. The activity was done in accordance with the DA submitted to Ballina Shire Council in 1997. See Appendix 5.

4.6 Site Visit and Observations

Site visits were conducted by Dane Egelton of CSI Aus on 16 March 2020 and again on 24 March 2020. The site was vacant and cleared of trees. The surface was grass covered and there were no observations made of previous dwellings, buildings or sheds. The grass was at a height of 1.2 metre across most of the site and this made a thorough visual assessment of the surface difficult.

The filling of the site identified in the BSC DA search was visible across the centre of the site which is slightly raised through lots 2, 3 and 4.

There appeared to be evidence of a burn pile in the centre of the site (border of lots 3 and 4) which is overgrown with vegetation. Only natural materials like tree stumps, branches and organic material could be observed within the burn pile. Only a visual assessment was conducted and the burn pile was *not* physically disturbed to sift through the material due to the overgrowth.

No other visual or olfactory indicators of surface contamination or potential sub-surface contamination were identified during the site visit. No potential asbestos containing material, concrete rubble, brick or other obvious fill materials were observed on the site surface and the site does not appear to have been developed previously.

PHOTOGRAPH 4
CURRENT SITE LAYOUT AND SETTING – VIEW FROM FITZROY ST LOOKING NORTH

5.0 Contaminants of Potential Concern (COPC)

After review of the information presented in Section 4, COPC were identified to be minimal in range and unlikely in presence. In such a circumstance the default compounds for analysis are:

- Heavy metals – indicator of human occupation or activity onsite.
    - arsenic (As)
    - cadmium (Cd)
    - chromium (Cr)
    - copper (Cu)
    - mercury (Hg)
    - nickel (Ni)
    - lead (Pb)
    - zinc (Zn)

- Pesticides – Persistent in soils and can indicate previous agricultural use.
    - Organochlorine pesticides (OCP)
    - Organophosphate pesticides (OPP)

Although unlikely to be present on the site, a conservative approach was adopted and a primary and duplicate sample will be analysed for:

- Hydrocarbons – An indicator of machinery use onsite, various activities or uncontrolled filling
  - Total Recoverable Hydrocarbons (TRH)
  - Benzene, Toluene, Ethylbenzene and Xylene (BTEX)
  - Polyaromatic Hydrocarbons (PAHs)

Following a desktop review of site history and a site visit, there are no impacts expected on groundwater at the site resulting from previous use, and therefore, soil vapour and groundwater were not investigated (or considered necessary) as part of this PSI.

6.0 Guidelines & Criteria

The criteria within the NEPM (NEPC 2013a) are endorsed by NSW EPA and Ballina Shire Council. Residential criteria are relevant to the assessment to determine the suitability of the site for the proposed use.

6.1 Soil – NEPC (2013a)

Health Investigation Levels - HILs are the concentrations of a contaminant above which further appropriate investigation and evaluation will be required. HILs are generic to all soil types and generally apply to the top 3m of soil.

TABLE 2

Assessment Criteria

Element / Compound	Health-based Investigation levels (mg/kg)			
1,2,3	Residential A	Residential B	Recreational C	Commercial / Industrial D
		Metals		
Arsenic	100	500	300	3,000
Cadmium	20	150	90	900
Chromium (VI)	100	500	300	3,600
Copper	6,000	30,000	17,000	240,000
Lead	300	1,200	600	1,500
Nickel	400	1,200	1,200	6,000
Zinc	7,400	60,000	30,000	40,000
Mercury	40	120	80	730
		Organochlorine Pesticides		
DDT+DDE+DDD	240	600	400	3600
Aldrin & Dieldrin	6	10	10	45
Chlordane	50	90	70	530
Endosulfan	270	400	340	2,000
Endrin	10	20	20	100
Heptachlor	6	10	10	50
HCB	10	15	10	80
Methoxychlor	300	500	400	2,500
Toxaphene	20	30	30	160
		Total Recoverable Hydrocarbons & PAHs		
F1 TRH (C6 – C10) less BTEX	45			
F2 TRH (>C10 – C16) Less Napthalene	110			
PAHs	300			

Notes: 1: NEPC (2013) – Health Screening Levels for Vapour Intrusion (HSL-A&B Low-high density residential) for Sand.
2: CRC Care (2011) - Health Screening Levels for Vapour Intrusion. Low-high density residential) for Sand. 0.15mbgs.
3: NEPC (2013) – Interim Health Investigation Levels. Residential Setting A. (Low density residential).

6.2 Data Quality Objectives

Data quality objectives (DQOs) were developed to define the type and quality of data required to achieve the potential soil contamination assessment and, if required, remediation investigation objectives. Development of the DQOs was based on guidelines in the US EPA *Guidance for the Data Quality Objectives Process* (2000), and with reference to relevant guidelines published by the NSW EPA (1997 and 1998), ANZECC 2000, and NEPC 2013, which define minimum data requirements and quality control procedures.

The DQO process comprises a seven-step planning approach. Using this approach, CSI Aus has developed the sampling design for data collection activities that support the objectives of the soil investigation and facilitate decision-making. Table 3 below lists the seven steps and identifies the sections within this report that addresses those steps.

TABLE 3

Data Quality Objectives Process

DQO Step	Discussion and Detailed description
1. Define the problem	Assessment of soil samples from the site proposed to be rezoned. Soil data has not previously been obtained at the site and site history is largely unknown.
2. Identify the decision	If identified COPC are detected in surface soils exceed Tier 1 or Tier 2 Risk Assessment Criteria. If the 95% UCL does not exceed Tier 1 and/or Tier 2 Risk Assessment Criteria a human health pathway is considered to not exist.
3. Identify the inputs of the decision	Correct collection of soil samples, sample preservation and use of a NATA accredited laboratory. Surface soil samples collected from five locations selected judgmentally across the site. Analysis of soil samples for 8 common heavy metals and persistent pesticides Tier 1, and if required Tier 2 Risk Assessment.
4. Define the investigation boundaries	The property boundary to Lots 2, 3, 4 and 5.
5. Develop a decision rule – analytical approach	Acceptable limits for analytical approach are presented in Data Quality Indicators Table 4 below. The analytical method can achieve detection limits below Tier 1 Risk Assessment Criteria.
6. Specify tolerable limits on decision errors	The limits on decision errors expressed as per cent error for the investigative activities should be no greater than 10 per cent. The aggregate sampling and analysis error may be greater, but error resulting from sampling procedures or the nature of the sample matrix is not quantifiable.

7. Optimise the design for obtaining data	By implementing statistically valid sampling plan and adopting the 95% UCL to compare against the Tier 1 / 2 Risk Assessment Criteria we have adopted a 5% level of significance, i.e. adopting a 5% probability we will make the wrong decision (Type 1 / Type 2 error). The data must fall within the range of DQIs to be considered reliable. Presented in Sections 6 &7 of this PSI. All available resources were used to collate historical data. Physical data was obtained by soil sampling.

6.3 Data Quality Indicators

Quality Assurance and Quality Control QA/QC is tested by review of data against Data Quality Indicators (DQIs) to ensure data precision, accuracy, representativeness, comparability and completeness. A summary of DQIs for samples to be collected as part of the investigation are presented in the table below:

TABLE 4

Data Quality Indicators

Data Quality Objectives	Frequency	Data Quality Indicator
Precision		
Duplicate samples	1 per 10 samples	RPD <50%
Accuracy		
Laboratory control samples	1 per day	General analytes recovery of 70–130%
Analysis blank	1 per day	Non-detect
Representativeness		
Samples analysed within specified holding times	Soil Samples	<30 days Within specific analyte holding times
Samples transported under COC conditions	N/A	All samples will be transported under chain of custody documentation
Reliability of field measured data	N/A	
Comparability		
Industry best practise for all sample media	All samples, all analytes	Experienced staff
Consistent sampling techniques	All samples all analytes	Same staff and method for the project
Appropriate laboratory reporting limits	All samples, all analytes	-
Completeness		Appropriate sample design to meet objectives

6.4 Field Data QA/QC Acceptance Criteria

For all samples, field sample QA/QC was be conducted in accordance with AS 4482.1–2005 (Australian Standard, 2005) and consist of the following:

- Sample Duplicates – 1 per 10 samples;

AS 4482.1–2005 (Australian Standard, 2005) indicate an acceptable RPD range of 30-50%, and that the variation can be expected to be higher for organic analysis than inorganics, and for low concentrations of analytes.

Field and Laboratory Quality Control/Quality Assurance (QA/QC) procedures were conducted in accordance with NEPC (2013) and AS 4482.1–2005.

All soil samples were collected in new sample media jars provided by the laboratory and the soil sampling trowel was thoroughly washed between sample locations to prevent cross contamination. Samples were not composited but rather individual samples taken from each location identified in Figure 1.

The acceptance criteria for QA/QC samples are detailed in Table 5 below:

6.5 Laboratory QA/QC

- At least one analysis blank per batch
- Duplicate analysis at a rate of one per batch or one per ten samples, whichever is smaller
- Laboratory Control Samples at a rate of one per batch

The nominated laboratory must comply with the minimum QA procedures documented in Schedule B(3) in NEPC (2013) National Environmental Protection (Assessment of Site Contamination) Measure and include, but not be limited to:

- Matrix spikes, and
- Surrogate Spikes

A review of SGS's quality report in Appendix 2 indicates that all QA procedures were satisfactory and no significant outliers were reported.

In the event the acceptance criteria are not met, the variation is taken into consideration and its implications assessed in regard to the context of the investigation.

6.6 Transporting Samples

Before sample transportation, appropriate methods for test specific handling requirements were reviewed. Samples were transported and delivered within documented holding times using ice bricks to preserve samples. To avoid breakages, all glass containers were well cushioned. Samples were taken directly to the lab and delivered by CSI Aus without the need for freight subcontractors. The original chain of custody record accompanied the samples to the analytical laboratory, see Appendix 2.

6.8 Sampling Rationale

The desktop assessment did not identify any activities or previous site uses that would indicate the potential for contamination of soils or groundwater. In order to make an assessment of the sites' contamination status and suitability for residential use, five primary soil samples were collected and analysed. If these samples detect concentrations of the COPC above the residential criteria, further investigation would be required.

Surface soil sample locations have been judgmentally selected to target the portion of the site to be developed for residential dwellings.

7.0 Results

The results for soil analysis have been summarised in Table 5 below. Laboratory certificate of analysis and QA/QC assessment is provided at the end of this report in Appendices 1 and 2.

TABLE 5

Soil Analytical Results Summary

Analyte	Criteria 1,2,3	PQL	Concentrations in mg/kg					
			1a	2a	3a	D1	4a	5a
Arsenic	100	2	1	2	2	3	3	1
Cadmium	20	0.2	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium	100	2	11	3.9	2.4	2.1	1.8	23
Copper	6,000	2	11	5.3	9.4	8.4	7.0	18
Lead	300	2	10	14	12	13	16	5
Mercury	40	0.05	<0.05	<0.05	<0.05	<0.05	0.05	<0.05
Nickel	400	2	5.6	1.6	2.5	2.5	2.0	18
Zinc	7,400	2	25	31	96	78	32	29
OCP/OPP - 37 compounds	7-260	1-1.7	ND	ND	ND	ND	ND	ND
Total BTEX	-	0.6	NT	NT	<0.6	<0.6	NT	NT
TRH F1	45	25	NT	NT	<25	<25	NT	NT
TRH F2	110	210	NT	NT	<210	<210	NT	NT
Total PAHs	300	0.8	NT	NT	<0.8	<0.8	NT	NT

Notes: 1: NEPC (2013) – Health Screening Levels for Vapour Intrusion (HSL-A&B Low-high density residential) for Sand.
2: CRC Care (2011) - Health Screening Levels for Vapour Intrusion. Low-high density residential) for Sand. 0.15mbgs.
3: NEPC (2013) – Interim Health Investigation Levels. Residential Setting A. (Low density residential).
ND = Non-Detect
NT = Not tested
OCP/OPP = Organochlorine and Organophosphate Pesticides

7.1 Discussion

As can be seen from the data summary table above there were no exceedances of the residential criteria and all results for the compounds tested were either non-detect (pesticides, PAHs and hydrocarbons) or significantly below the human health investigation limits (metals). The collection of further data is not warranted and the surface of the site is free of contamination in the areas sampled.

7.2 Laboratory QA/QC Assessment

SGS Alexandria (Sydney), was the chosen NATA accredited laboratory for soil analysis. The primary sample was identified as 3a and the duplicate was identified as D1. As be seen from Table 6 below, all relative percentage difference (RPD) values met the +/-50% acceptance criteria.

TABLE 6

RPD Values

Compound	Relative Percentage Difference (RPD)
Arsenic	40
Cadmium	0
Chromium	-13
Copper	-11
Lead	8
Mercury	0
Nickel	0
Zinc	-21
TRH	0
OCP	0
OPP	0

Based on the DQI criteria being met, all data collected in this investigation is considered to be representative of site conditions and satisfactory for use in this assessment.

8.0 Concluding Comments

CSI Aus has undertaken a Preliminary Site Investigation to assess the contamination status of the site under SEPP 55. A desktop review of available information and a site visit did *not* identify evidence of previous development or activities on the site that would suggest any potentially contaminating activities had taken place on the site. Analytical results from surface soils indicated all of the compounds tested returned concentrations that were below the adopted criteria for residential use.

Based on the sample data collected (5 primary surface soil samples) and the absence of contamination at the site, no further investigation is deemed warranted. A review of laboratory data against the data quality indicators outlined in this report demonstrate that the data is representative and satisfactory for use in the assessment.

Therefore, the site is considered to be free of contamination and suitable for its intended use.

9.0 Limitations

The findings of this report are based on the objectives and scope of work outlined above. CSI Aus performed the services in a manner consistent with the normal level of care and expertise exercised by members of the environmental assessment industry. No warranties or guarantees, express or implied, are made. Subject to the scope of work, CSI Aus' assessment is limited strictly to identifying typical environmental conditions associated with the subject property and does not include evaluation of any other issues.

This report does not comment on any regulatory obligations based on the findings, for which a legal opinion should be sought. This report relates only to the objectives and scope of work stated, and does not relate to any other works undertaken for the Client.

The report and conclusions are based on the information obtained at the time of the assessment. Changes to the subsurface conditions may occur subsequent to the investigation described herein, through natural process or through the intentional or accidental addition of contaminants, and these conditions may change with space and time.

The site history, and associated uses, areas of use, and potential contaminants, were determined based on the activities described in the scope of work. Additional site history information held by the Client, regulatory authorities, or in the public domain, which was not provided to CSI Aus or was not sourced by CSI Aus under the scope of work, may identify additional uses, areas of use and/or potential contaminants. The information sources referenced have been used to determine site history and desktop information regarding local subsurface conditions. While CSI Aus has used reasonable care to avoid reliance on data and information that is inaccurate or unsuitable, CSI Aus is not able to verify the accuracy or completeness of all information and data made available.

Further chemicals or categories of chemicals may exist at the site, which were not identified in the site history, and which may not be expected at the site. The absence of any identified hazardous or toxic materials on the

subject property should not be interpreted as a warranty or guarantee that such materials do not exist on the site. If additional certainty is required, additional site history or desktop studies, or environmental sampling and analysis, should be commissioned.

The results of this assessment are based upon site inspection and fieldwork conducted by CSI Aus personnel and information provided by the Client. Samples were collected at specific locations and should be considered to be an approximation of the condition of the sample. All conclusions regarding the property area are the professional opinions of CSI Aus personnel involved with the project, subject to the qualifications made above.

While normal assessments of data reliability have been made, CSI Aus assumes no responsibility or liability for errors in any data obtained from regulatory agencies, information from sources outside of CSI Aus. CSI Aus accepts no responsibility for any loss or damage suffered howsoever arising to any person or corporation who may use or rely on this document for a purpose other than that described above.

Appendix 1 – Laboratory Certificate of Analysis

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS		LABORATORY DETAILS	
Contact	DANE EGELTON	Manager	Huong Crawford
Client	CSI AUSTRALIA	Laboratory	SGS Alexandria Environmental
Address	PO BOX 389 ALSTONVILLE NSW 2477	Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	(Not specified)	Telephone	+61 2 8594 0400
Facsimile	(Not specified)	Facsimile	+61 2 8594 0499
Email	dane@csiaus.com.au	Email	au.environmental.sydney@sgs.com
Project	**2203 Wardell**	SGS Reference	**SE204063 R0**
Order Number	**2203**	Date Received	17 Mar 2020
Samples	6	Date Reported	24 Mar 2020

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(4354).

SIGNATORIES

Akheeqar BENIAMEEN
Chemist

Bennet LO
Senior Organic Chemist/Metals Chemis

Huong CRAWFORD
Production Manager

Ly Kim HA
Organic Section Head

Parameter	Units	LOR	Sample Number: SE204063.001 Sample Matrix: Soil Sample Date: 17 Mar 2020 Sample Name: 1a	SE204063.002 Soil 17 Mar 2020 2a	SE204063.003 Soil 17 Mar 2020 3a	SE204063.004 Soil 17 Mar 2020 4a
VOC's in Soil Method: AN433 Tested: 23/3/2020						
Monocyclic Aromatic Hydrocarbons						
Benzene	mg/kg	0.1	-	-	<0.1	-
Toluene	mg/kg	0.1	-	-	<0.1	-
Ethylbenzene	mg/kg	0.1	-	-	<0.1	-
m/p-xylene	mg/kg	0.2	-	-	<0.2	-
o-xylene	mg/kg	0.1	-	-	<0.1	-
Polycyclic VOCs						
Naphthalene	mg/kg	0.1	-	-	<0.1	-
Surrogates						
d4-1,2-dichloroethane (Surrogate)	%	-	-	-	115	-
d8-toluene (Surrogate)	%	-	-	-	108	-
Bromofluorobenzene (Surrogate)	%	-	-	-	99	-
Totals						
Total Xylenes	mg/kg	0.3	-	-	<0.3	-
Total BTEX	mg/kg	0.6	-	-	<0.6	-
Volatile Petroleum Hydrocarbons in Soil Method: AN433 Tested: 23/3/2020						
TRH C6-C10	mg/kg	25	-	-	<25	-
TRH C6-C9	mg/kg	20	-	-	<20	-
Surrogates						
d4-1,2-dichloroethane (Surrogate)	%	-	-	-	115	-
d8-toluene (Surrogate)	%	-	-	-	108	-
Bromofluorobenzene (Surrogate)	%	-	-	-	99	-
VPH F Bands						
Benzene (F0)	mg/kg	0.1	-	-	<0.1	-
TRH C6-C10 minus BTEX (F1)	mg/kg	25	-	-	<25	-

Parameter	Units	LOR	Sample Number: SE204063.001 Sample Matrix: Soil Sample Date: 17 Mar 2020 Sample Name: 1a	SE204063.002 Soil 17 Mar 2020 2a	SE204063.003 Soil 17 Mar 2020 3a	SE204063.004 Soil 17 Mar 2020 4a
TRH (Total Recoverable Hydrocarbons) in Soil Method: AN403 Tested: 23/3/2020						
TRH C10-C14	mg/kg	20	-	-	<20	-
TRH C15-C28	mg/kg	45	-	-	<45	-
TRH C29-C36	mg/kg	45	-	-	<45	-
TRH C37-C40	mg/kg	100	-	-	<100	-
TRH C10-C36 Total	mg/kg	110	-	-	<110	-
TRH >C10-C40 Total (F bands)	mg/kg	210	-	-	<210	-
TRH F Bands						
TRH >C10-C16	mg/kg	25	-	-	<25	-
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	-	-	<25	-
TRH >C16-C34 (F3)	mg/kg	90	-	-	<90	-
TRH >C34-C40 (F4)	mg/kg	120	-	-	<120	-
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 Tested: 23/3/2020						
Naphthalene	mg/kg	0.1	-	-	<0.1	-
2-methylnaphthalene	mg/kg	0.1	-	-	<0.1	-
1-methylnaphthalene	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)fluoranthene	mg/kg	0.1	-	-	<0.1	-
Benzo(k)fluoranthene	mg/kg	0.1	-	-	<0.1	-
Benzo(a)pyrene	mg/kg	0.1	-	-	<0.1	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	-	-	<0.1	-
Dibenzo(ah)anthracene	mg/kg	0.1	-	-	<0.1	-
Benzo(ghi)perylene	mg/kg	0.1	-	-	<0.1	-
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	-	-	<0.2	-
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	-	-	<0.3	-
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	-	-	<0.2	-
Total PAH (18)	mg/kg	0.8	-	-	<0.8	-
Total PAH (NEPM/WHO 16)	mg/kg	0.8	-	-	<0.8	-
Surrogates						
d5-nitrobenzene (Surrogate)	%	-	-	-	**100**	-
2-fluorobiphenyl (Surrogate)	%	-	-	-	**96**	-
d14-p-terphenyl (Surrogate)	%	-	-	-	**91**	-
OC Pesticides in Soil Method: AN420 Tested: 23/3/2020						
Hexachlorobenzene (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
Lindane	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
Aldrin	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
Delta BHC	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
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
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
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE204063.001 Soil 17 Mar 2020 1a	SE204063.002 Soil 17 Mar 2020 2a	SE204063.003 Soil 17 Mar 2020 3a	SE204063.004 Soil 17 Mar 2020 4a
OC Pesticides in Soil Method: AN420 Tested: 23/3/2020 (continued)							
o,p'-DDD	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2		<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
p,p'-DDT	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
Endrin Aldehyde	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
Endrin Ketone	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
Total CLP OC Pesticides	mg/kg	1		<1	<1	<1	<1
Surrogates							
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-		103	103	115	105
OP Pesticides in Soil Method: AN420 Tested: 23/3/2020							
Dichlorvos	mg/kg	0.5		<0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5		<0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5		<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2		<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.2		<0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2		<0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2		<0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2		<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.5		<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.2		<0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2		<0.2	<0.2	<0.2	<0.2
Total OP Pesticides*	mg/kg	1.7		<1.7	<1.7	<1.7	<1.7
Surrogates							
2-fluorobiphenyl (Surrogate)	%	-		92	90	95	86
d14-p-terphenyl (Surrogate)	%	-		100	96	90	94
Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES Method: AN040/AN320 Tested: 23/3/2020							
Arsenic, As	mg/kg	1		1	2	2	3
Cadmium, Cd	mg/kg	0.3		<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5		11	3.9	2.4	1.8
Copper, Cu	mg/kg	0.5		11	5.3	9.4	7.0
Nickel, Ni	mg/kg	0.5		5.6	1.6	2.5	2.0
Lead, Pb	mg/kg	1		10	14	12	16
Zinc, Zn	mg/kg	2		25	31	96	32
Mercury in Soil Method: AN312 Tested: 23/3/2020							
Mercury	mg/kg	0.05		<0.05	<0.05	<0.05	0.05

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE204063.001 Soil 17 Mar 2020 1a	SE204063.002 Soil 17 Mar 2020 2a	SE204063.003 Soil 17 Mar 2020 3a	SE204063.004 Soil 17 Mar 2020 4a
Moisture Content Method: AN002 Tested: 23/3/2020							
% Moisture	%w/w	1		27.3	10.0	7.6	13.3

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE204063.005 Soil 17 Mar 2020 5a	SE204063.006 Soil 17 Mar 2020 D1
VOC's in Soil Method: AN433 Tested: 23/3/2020					
Monocyclic Aromatic Hydrocarbons					
Benzene	mg/kg	0.1	-	<0.1	
Toluene	mg/kg	0.1	-	<0.1	
Ethylbenzene	mg/kg	0.1	-	<0.1	
m/p-xylene	mg/kg	0.2	-	<0.2	
o-xylene	mg/kg	0.1	-	<0.1	
Polycyclic VOCs					
Naphthalene	mg/kg	0.1	-	<0.1	
Surrogates					
d4-1,2-dichloroethane (Surrogate)	%	-	-	**109**	
d8-toluene (Surrogate)	%	-	-	**105**	
Bromofluorobenzene (Surrogate)	%	-	-	**94**	
Totals					
Total Xylenes	mg/kg	0.3	-	<0.3	
Total BTEX	mg/kg	0.6	-	<0.6	
Volatile Petroleum Hydrocarbons in Soil Method: AN433 Tested: 23/3/2020					
TRH C6-C10	mg/kg	25	-	<25	
TRH C6-C9	mg/kg	20	-	<20	
Surrogates					
d4-1,2-dichloroethane (Surrogate)	%	-	-	**109**	
d8-toluene (Surrogate)	%	-	-	**105**	
Bromofluorobenzene (Surrogate)	%	-	-	**94**	
VPH F Bands					
Benzene (F0)	mg/kg	0.1	-	<0.1	
TRH C6-C10 minus BTEX (F1)	mg/kg	25	-	<25	

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE204063.005 Soil 17 Mar 2020 5a	SE204063.006 Soil 17 Mar 2020 D1
TRH (Total Recoverable Hydrocarbons) in Soil Method: AN403 Tested: 23/3/2020					
TRH C10-C14	mg/kg	20		-	<20
TRH C15-C28	mg/kg	45		-	<45
TRH C29-C36	mg/kg	45		-	**74**
TRH C37-C40	mg/kg	100		-	<100
TRH C10-C36 Total	mg/kg	110		-	<110
TRH >C10-C40 Total (F bands)	mg/kg	210		-	<210
TRH F Bands					
TRH >C10-C16	mg/kg	25		-	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25		-	<25
TRH >C16-C34 (F3)	mg/kg	90		-	<90
TRH >C34-C40 (F4)	mg/kg	120		-	<120
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 Tested: 23/3/2020					
Naphthalene	mg/kg	0.1		-	<0.1
2-methylnaphthalene	mg/kg	0.1		-	<0.1
1-methylnaphthalene	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)fluoranthene	mg/kg	0.1		-	<0.1
Benzo(k)fluoranthene	mg/kg	0.1		-	<0.1
Benzo(a)pyrene	mg/kg	0.1		-	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1		-	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1		-	<0.1
Benzo(ghi)perylene	mg/kg	0.1		-	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2		-	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3		-	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2		-	<0.2
Total PAH (18)	mg/kg	0.8		-	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8		-	<0.8
Surrogates					
d5-nitrobenzene (Surrogate)	%	-		-	**103**
2-fluorobiphenyl (Surrogate)	%	-		-	**95**
d14-p-terphenyl (Surrogate)	%	-		-	**90**
OC Pesticides in Soil Method: AN420 Tested: 23/3/2020					
Hexachlorobenzene (HCB)	mg/kg	0.1		<0.1	<0.1
Alpha BHC	mg/kg	0.1		<0.1	<0.1
Lindane	mg/kg	0.1		<0.1	<0.1
Heptachlor	mg/kg	0.1		<0.1	<0.1
Aldrin	mg/kg	0.1		<0.1	<0.1
Beta BHC	mg/kg	0.1		<0.1	<0.1
Delta BHC	mg/kg	0.1		<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1		<0.1	<0.1
o,p'-DDE	mg/kg	0.1		<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2		<0.2	<0.2
Gamma Chlordane	mg/kg	0.1		<0.1	<0.1
Alpha Chlordane	mg/kg	0.1		<0.1	<0.1
trans-Nonachlor	mg/kg	0.1		<0.1	<0.1
p,p'-DDE	mg/kg	0.1		<0.1	<0.1

Parameter	Units	LOR	Sample Number: SE204063.005 Sample Matrix: Soil Sample Date: 17 Mar 2020 Sample Name: 5a	Sample Number: SE204063.006 Sample Matrix: Soil Sample Date: 17 Mar 2020 Sample Name: D1
OC Pesticides in Soil Method: AN420 Tested: 18/3/2020 (continued)				
Dieldrin	mg/kg	0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1	<1
Surrogates				
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	**106**	**115**
OP Pesticides in Soil Method: AN420 Tested: 23/3/2020				
Dichlorvos	mg/kg	0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2
Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7
Surrogates				
2-fluorobiphenyl (Surrogate)	%	-	**86**	**0**
d14-p-terphenyl (Surrogate)	%	-	**90**	**0**

Parameter	Units	LOR	Sample Number: SE204063.005 Sample Matrix: Soil Sample Date: 17 Mar 2020 Sample Name: 5a	Sample Number: SE204063.006 Sample Matrix: Soil Sample Date: 17 Mar 2020 Sample Name: D1
Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES Method: AN040/AN320 Tested: 23/3/2020				
Arsenic, As	mg/kg	1	**1**	**3**
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	**23**	**2.1**
Copper, Cu	mg/kg	0.5	**18**	**8.4**
Nickel, Ni	mg/kg	0.5	**18**	**2.5**
Lead, Pb	mg/kg	1	**5**	**13**
Zinc, Zn	mg/kg	2	**29**	**78**
Mercury in Soil Method: AN312 Tested: 23/3/2020				
Mercury	mg/kg	0.05	<0.05	<0.05
Moisture Content Method: AN002 Tested: 23/3/2020				
% Moisture	%w/w	1	**39.9**	**9.4**

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage.* Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

Mercury in Soil Method: ME-(AU)-[ENV]AN312

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Mercury	LB195597	mg/kg	0.05	<0.05	0 - 12%	94%	90%

OC Pesticides in Soil Method: ME-(AU)-[ENV]AN420

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Hexachlorobenzene (HCB)	LB195313	mg/kg	0.1	<0.1	0%	NA	NA
	LB195577	mg/kg	0.1	<0.1		NA	
Alpha BHC	LB195313	mg/kg	0.1	<0.1	0%	NA	NA
	LB195577	mg/kg	0.1	<0.1		NA	
Lindane	LB195313	mg/kg	0.1	<0.1	0%	NA	NA
	LB195577	mg/kg	0.1	<0.1		NA	
Heptachlor	LB195313	mg/kg	0.1	<0.1	0%	119%	111%
	LB195577	mg/kg	0.1	<0.1		110%	
Aldrin	LB195313	mg/kg	0.1	<0.1	0%	117%	109%
	LB195577	mg/kg	0.1	<0.1		107%	
Beta BHC	LB195313	mg/kg	0.1	<0.1	0%	NA	NA
	LB195577	mg/kg	0.1	<0.1		NA	
Delta BHC	LB195313	mg/kg	0.1	<0.1	0%	113%	105%
	LB195577	mg/kg	0.1	<0.1		104%	
Heptachlor epoxide	LB195313	mg/kg	0.1	<0.1	0%	NA	NA
	LB195577	mg/kg	0.1	<0.1		NA	
o,p'-DDE	LB195313	mg/kg	0.1	<0.1	0%	NA	NA
	LB195577	mg/kg	0.1	<0.1		NA	
Alpha Endosulfan	LB195313	mg/kg	0.2	<0.2	0%	NA	NA
	LB195577	mg/kg	0.2	<0.2		NA	
Gamma Chlordane	LB195313	mg/kg	0.1	<0.1	0%	NA	NA
	LB195577	mg/kg	0.1	<0.1		NA	
Alpha Chlordane	LB195313	mg/kg	0.1	<0.1	0%	NA	NA
	LB195577	mg/kg	0.1	<0.1		NA	
trans-Nonachlor	LB195313	mg/kg	0.1	<0.1	0%	NA	NA
	LB195577	mg/kg	0.1	<0.1		NA	
p,p'-DDE	LB195313	mg/kg	0.1	<0.1	0%	NA	NA
	LB195577	mg/kg	0.1	<0.1		NA	
Dieldrin	LB195313	mg/kg	0.2	<0.2	0%	116%	107%
	LB195577	mg/kg	0.2	<0.2		105%	
Endrin	LB195313	mg/kg	0.2	<0.2	0%	118%	109%
	LB195577	mg/kg	0.2	<0.2		107%	
o,p'-DDD	LB195313	mg/kg	0.1	<0.1	0%	NA	NA
	LB195577	mg/kg	0.1	<0.1		NA	
o,p'-DDT	LB195313	mg/kg	0.1	<0.1	0%	NA	NA
	LB195577	mg/kg	0.1	<0.1		NA	
Beta Endosulfan	LB195313	mg/kg	0.2	<0.2	0%	NA	NA
	LB195577	mg/kg	0.2	<0.2		NA	
p,p'-DDD	LB195313	mg/kg	0.1	<0.1	0%	NA	NA
	LB195577	mg/kg	0.1	<0.1		NA	
p,p'-DDT	LB195313	mg/kg	0.1	<0.1	0%	106%	99%
	LB195577	mg/kg	0.1	<0.1		97%	
Endosulfan sulphate	LB195313	mg/kg	0.1	<0.1	0%	NA	NA
	LB195577	mg/kg	0.1	<0.1		NA	
Endrin Aldehyde	LB195313	mg/kg	0.1	<0.1	0%	NA	NA
	LB195577	mg/kg	0.1	<0.1		NA	
Methoxychlor	LB195313	mg/kg	0.1	<0.1	0%	NA	NA
	LB195577	mg/kg	0.1	<0.1		NA	
Endrin Ketone	LB195313	mg/kg	0.1	<0.1	0%	NA	NA
	LB195577	mg/kg	0.1	<0.1		NA	
Isodrin	LB195313	mg/kg	0.1	<0.1	0%	NA	NA

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage.* Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

OC Pesticides in Soil Method: ME-(AU)-[ENV]AN420 (continued)

				MB	DUP %RPD	LCS %Recovery	MS %Recovery
Isodrin	LB195577	mg/kg	0.1	<0.1		NA	
Mirex	LB195313	mg/kg	0.1	<0.1	0%	NA	NA
	LB195577	mg/kg	0.1	<0.1		NA	
Total CLP OC Pesticides	LB195313	mg/kg	1	<1	0%	NA	NA
	LB195577	mg/kg	1	<1		NA	

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Tetrachloro-m-xylene (TCMX) (Surrogate)	LB195313	%	-	104%	3%	103%	100%
	LB195577	%	-	99%		99%	

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage.* Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

OP Pesticides in Soil **Method: ME-(AU)-[ENV]AN420**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Dichlorvos	LB195313	mg/kg	0.5	<0.5	0%	90%	108%
	LB195577	mg/kg	0.5	<0.5		75%	
Dimethoate	LB195313	mg/kg	0.5	<0.5	0%	NA	NA
	LB195577	mg/kg	0.5	<0.5		NA	
Diazinon (Dimpylate)	LB195313	mg/kg	0.5	<0.5	0%	92%	113%
	LB195577	mg/kg	0.5	<0.5		78%	
Fenitrothion	LB195313	mg/kg	0.2	<0.2	0%	NA	NA
	LB195577	mg/kg	0.2	<0.2		NA	
Malathion	LB195313	mg/kg	0.2	<0.2	0%	NA	NA
	LB195577	mg/kg	0.2	<0.2		NA	
Chlorpyrifos (Chlorpyrifos Ethyl)	LB195313	mg/kg	0.2	<0.2	0%	92%	114%
	LB195577	mg/kg	0.2	<0.2		79%	
Parathion-ethyl (Parathion)	LB195313	mg/kg	0.2	<0.2	0%	NA	NA
	LB195577	mg/kg	0.2	<0.2		NA	
Bromophos Ethyl	LB195313	mg/kg	0.2	<0.2	0%	NA	NA
	LB195577	mg/kg	0.2	<0.2		NA	
Methidathion	LB195313	mg/kg	0.5	<0.5	0%	NA	NA
	LB195577	mg/kg	0.5	<0.5		NA	
Ethion	LB195313	mg/kg	0.2	<0.2	0%	89%	110%
	LB195577	mg/kg	0.2	<0.2		71%	
Azinphos-methyl (Guthion)	LB195313	mg/kg	0.2	<0.2	0%	NA	NA
	LB195577	mg/kg	0.2	<0.2		NA	
Total OP Pesticides*	LB195313	mg/kg	1.7	<1.7	0%	NA	NA
	LB195577	mg/kg	1.7	<1.7		NA	

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
2-fluorobiphenyl (Surrogate)	LB195313	%	-	82%	2 - 12%	80%	101%
	LB195577	%	-	86%		88%	
d14-p-terphenyl (Surrogate)	LB195313	%	-	92%	2 - 14%	80%	96%
	LB195577	%	-	80%		90%	

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage.* Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: ME-(AU)-[ENV]AN420

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Naphthalene	LB195313	mg/kg	0.1	<0.1	0%	98%	109%
2-methylnaphthalene	LB195313	mg/kg	0.1	<0.1	0%	NA	NA
1-methylnaphthalene	LB195313	mg/kg	0.1	<0.1	0%	NA	NA
Acenaphthylene	LB195313	mg/kg	0.1	<0.1	0%	94%	98%
Acenaphthene	LB195313	mg/kg	0.1	<0.1	0%	102%	107%
Fluorene	LB195313	mg/kg	0.1	<0.1	0%	NA	NA
Phenanthrene	LB195313	mg/kg	0.1	<0.1	0%	93%	110%
Anthracene	LB195313	mg/kg	0.1	<0.1	0%	104%	107%
Fluoranthene	LB195313	mg/kg	0.1	<0.1	0%	86%	106%
Pyrene	LB195313	mg/kg	0.1	<0.1	0%	88%	114%
Benzo(a)anthracene	LB195313	mg/kg	0.1	<0.1	0%	NA	NA
Chrysene	LB195313	mg/kg	0.1	<0.1	0%	NA	NA
Benzo(b&j)fluoranthene	LB195313	mg/kg	0.1	<0.1	0%	NA	NA
Benzo(k)fluoranthene	LB195313	mg/kg	0.1	<0.1	0%	NA	NA
Benzo(a)pyrene	LB195313	mg/kg	0.1	<0.1	0%	98%	100%
Indeno(1,2,3-cd)pyrene	LB195313	mg/kg	0.1	<0.1	0%	NA	NA
Dibenzo(ah)anthracene	LB195313	mg/kg	0.1	<0.1	0%	NA	NA
Benzo(ghi)perylene	LB195313	mg/kg	0.1	<0.1	0%	NA	NA
Carcinogenic PAHs, BaP TEQ <LOR=0	LB195313	TEQ (mg/kg)	0.2	<0.2	0%	NA	NA
Carcinogenic PAHs, BaP TEQ <LOR=LOR	LB195313	TEQ (mg/kg)	0.3	<0.3	0%	NA	NA
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	LB195313	TEQ (mg/kg)	0.2	<0.2	0%	NA	NA
Total PAH (18)	LB195313	mg/kg	0.8	<0.8	0%	NA	NA
Total PAH (NEPM/WHO 16)	LB195313	mg/kg	0.8	<0.8			

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
d5-nitrobenzene (Surrogate)	LB195313	%	-	86%	0 - 8%	84%	98%
	LB195577	%	-	%			
2-fluorobiphenyl (Surrogate)	LB195313	%	-	82%	2 - 12%	80%	101%
	LB195577	%	-	%			
d14-p-terphenyl (Surrogate)	LB195313	%	-	92%	2 - 14%	80%	96%
	LB195577	%	-	%			

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage.* Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES Method: ME-(AU)-[ENV]AN040/AN320

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Arsenic, As	LB195591	mg/kg	1	<1	5 - 8%	102%	98%
Cadmium, Cd	LB195591	mg/kg	0.3	<0.3	0%	92%	91%
Chromium, Cr	LB195591	mg/kg	0.5	<0.5	2%	90%	99%
Copper, Cu	LB195591	mg/kg	0.5	<0.5	8 - 22%	100%	100%
Nickel, Ni	LB195591	mg/kg	0.5	<0.5	13 - 15%	97%	106%
Lead, Pb	LB195591	mg/kg	1	<1	1 - 19%	99%	93%
Zinc, Zn	LB195591	mg/kg	2	<2	2 - 13%	95%	105%

TRH (Total Recoverable Hydrocarbons) in Soil Method: ME-(AU)-[ENV]AN403

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
TRH C10-C14	LB195313	mg/kg	20	<20	0%	108%	98%
TRH C15-C28	LB195313	mg/kg	45	<45	0%	118%	93%
TRH C29-C36	LB195313	mg/kg	45	<45	0%	83%	85%
TRH C37-C40	LB195313	mg/kg	100	<100	0%	NA	NA
TRH C10-C36 Total	LB195313	mg/kg	110	<110	0%	NA	NA
TRH >C10-C40 Total (F bands)	LB195313	mg/kg	210	<210	0%	NA	NA

TRH F Bands

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
TRH >C10-C16	LB195313	mg/kg	25	<25	0%	108%	95%
TRH >C10-C16 - Naphthalene (F2)	LB195313	mg/kg	25	<25	0%	NA	NA
TRH >C16-C34 (F3)	LB195313	mg/kg	90	<90	0%	98%	98%
TRH >C34-C40 (F4)	LB195313	mg/kg	120	<120	0%	80%	NA

VOC's in Soil Method: ME-(AU)-[ENV]AN433

Monocyclic Aromatic Hydrocarbons

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Benzene	LB195314	mg/kg	0.1	<0.1	0%	93%	85%
Toluene	LB195314	mg/kg	0.1	<0.1	0%	95%	87%
Ethylbenzene	LB195314	mg/kg	0.1	<0.1	0%	103%	86%
m/p-xylene	LB195314	mg/kg	0.2	<0.2	0%	103%	86%
o-xylene	LB195314	mg/kg	0.1	<0.1	0%	100%	86%

Polycyclic VOCs

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Naphthalene	LB195314	mg/kg	0.1	<0.1	0%	NA	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
d4-1,2-dichloroethane (Surrogate)	LB195314	%	-	102%	1 - 5%	88%	100%
d8-toluene (Surrogate)	LB195314	%	-	101%	2 - 9%	80%	101%
Bromofluorobenzene (Surrogate)	LB195314	%	-	106%	0 - 7%	81%	94%

Totals

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Total Xylenes	LB195314	mg/kg	0.3	<0.3	0%	NA	NA
Total BTEX	LB195314	mg/kg	0.6	<0.6	0%	NA	NA

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage.* Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

Volatile Petroleum Hydrocarbons in Soil **Method: ME-(AU)-[ENV]AN433**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
TRH C6-C10	LB195314	mg/kg	25	<25	0%	97%	94%
TRH C6-C9	LB195314	mg/kg	20	<20	0%	94%	95%

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
d4-1,2-dichloroethane (Surrogate)	LB195314	%	-	102%	1 - 5%	88%	100%
d8-toluene (Surrogate)	LB195314	%	-	101%	2 - 9%	80%	101%
Bromofluorobenzene (Surrogate)	LB195314	%	-	106%	0 - 7%	81%	94%

VPH F Bands

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Benzene (F0)	LB195314	mg/kg	0.1	<0.1	0%	NA	NA
TRH C6-C10 minus BTEX (F1)	LB195314	mg/kg	25	<25	0%	95%	97%

METHOD	METHODOLOGY SUMMARY
AN002	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN040	A portion of sample is digested with Nitric acid to decompose organic matter and Hydrochloric acid to complete the digestion of metals and then filtered for analysis by ASS or ICP as per USEPA Method 200.8.
AN040/AN320	A portion of sample is digested with nitric acid to decompose organic matter and hydrochloric acid to complete the digestion of metals. The digest is then analysed by ICP OES with metals results reported on the dried sample basis. Based on USEPA method 200.8 and 6010C.
AN312	Mercury by Cold Vapour AAS in Soils: After digestion with nitric acid, hydrogen peroxide and hydrochloric acid, mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). F2 is reported directly and also corrected by subtracting Naphthalene (from VOC method AN433) where available.
AN403	Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Recoverable Hydrocarbons - Silica (TRH-Si) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents .
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependent on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN420	(SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN420	SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN433	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.

FOOTNOTES

IS	Insufficient sample for analysis.	LOR	Limit of Reporting
LNR	Sample listed, but not received.	↑↓	Raised or Lowered Limit of Reporting
*	NATA accreditation does not cover the performance of this service.	QFH	QC result is above the upper tolerance
		QFL	QC result is below the lower tolerance
**	Indicative data, theoretical holding time exceeded.	-	The sample was not analysed for this analyte
		NVL	Not Validated

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calcuated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the " Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.
Note that in terms of units of radioactivity:

a. 1 Bq is equivalent to 27 pCi
b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au/en-gb/environment-health-and-safety.

Appendix 2 – Laboratory QA Report

STATEMENT OF QA/QC PERFORMANCE

SE204063 R0

CLIENT DETAILS		LABORATORY DETAILS	
Contact	DANE EGELTON	Manager	Huong Crawford
Client	CSI AUSTRALIA	Laboratory	SGS Alexandria Environmental
Address	PO BOX 389 ALSTONVILLE NSW 2477	Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	(Not specified)	Telephone	+61 2 8594 0400
Facsimile	(Not specified)	Facsimile	+61 2 8594 0499
Email	dane@csiaus.com.au	Email	au.environmental.sydney@sgs.com
Project	**2203 Wardell**	SGS Reference	**SE204063 R0**
Order Number	**2203**	Date Received	17 Mar 2020
Samples	6	Date Reported	24 Mar 2020

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document.
This QA/QC Statement must be read in conjunction with the referenced Analytical Report.
The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met with the exception of the following:

Surrogate	OP Pesticides in Soil	2 items

SAMPLE SUMMARY

HOLDING TIME SUMMARY

SE204063 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
1a	SE204063.001	LB195597	17 Mar 2020	17 Mar 2020	14 Apr 2020	23 Mar 2020	14 Apr 2020	24 Mar 2020
2a	SE204063.002	LB195597	17 Mar 2020	17 Mar 2020	14 Apr 2020	23 Mar 2020	14 Apr 2020	24 Mar 2020
3a	SE204063.003	LB195597	17 Mar 2020	17 Mar 2020	14 Apr 2020	23 Mar 2020	14 Apr 2020	24 Mar 2020
4a	SE204063.004	LB195597	17 Mar 2020	17 Mar 2020	14 Apr 2020	23 Mar 2020	14 Apr 2020	24 Mar 2020
5a	SE204063.005	LB195597	17 Mar 2020	17 Mar 2020	14 Apr 2020	23 Mar 2020	14 Apr 2020	24 Mar 2020
D1	SE204063.006	LB195597	17 Mar 2020	17 Mar 2020	14 Apr 2020	23 Mar 2020	14 Apr 2020	24 Mar 2020

Moisture Content

Method: ME-(AU)-[ENV]AN002

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
1a	SE204063.001	LB195581	17 Mar 2020	17 Mar 2020	31 Mar 2020	23 Mar 2020	28 Mar 2020	24 Mar 2020
2a	SE204063.002	LB195581	17 Mar 2020	17 Mar 2020	31 Mar 2020	23 Mar 2020	28 Mar 2020	24 Mar 2020
3a	SE204063.003	LB195315	17 Mar 2020	17 Mar 2020	31 Mar 2020	18 Mar 2020	23 Mar 2020	23 Mar 2020
4a	SE204063.004	LB195581	17 Mar 2020	17 Mar 2020	31 Mar 2020	23 Mar 2020	28 Mar 2020	24 Mar 2020
5a	SE204063.005	LB195581	17 Mar 2020	17 Mar 2020	31 Mar 2020	23 Mar 2020	28 Mar 2020	24 Mar 2020
D1	SE204063.006	LB195315	17 Mar 2020	17 Mar 2020	31 Mar 2020	18 Mar 2020	23 Mar 2020	23 Mar 2020

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
1a	SE204063.001	LB195577	17 Mar 2020	17 Mar 2020	31 Mar 2020	23 Mar 2020	02 May 2020	24 Mar 2020
2a	SE204063.002	LB195577	17 Mar 2020	17 Mar 2020	31 Mar 2020	23 Mar 2020	02 May 2020	24 Mar 2020
3a	SE204063.003	LB195313	17 Mar 2020	17 Mar 2020	31 Mar 2020	18 Mar 2020	27 Apr 2020	23 Mar 2020
4a	SE204063.004	LB195577	17 Mar 2020	17 Mar 2020	31 Mar 2020	23 Mar 2020	02 May 2020	24 Mar 2020
5a	SE204063.005	LB195577	17 Mar 2020	17 Mar 2020	31 Mar 2020	23 Mar 2020	02 May 2020	24 Mar 2020
D1	SE204063.006	LB195313	17 Mar 2020	17 Mar 2020	31 Mar 2020	18 Mar 2020	27 Apr 2020	23 Mar 2020

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
1a	SE204063.001	LB195577	17 Mar 2020	17 Mar 2020	31 Mar 2020	23 Mar 2020	02 May 2020	24 Mar 2020
2a	SE204063.002	LB195577	17 Mar 2020	17 Mar 2020	31 Mar 2020	23 Mar 2020	02 May 2020	24 Mar 2020
3a	SE204063.003	LB195313	17 Mar 2020	17 Mar 2020	31 Mar 2020	18 Mar 2020	27 Apr 2020	24 Mar 2020
4a	SE204063.004	LB195577	17 Mar 2020	17 Mar 2020	31 Mar 2020	23 Mar 2020	02 May 2020	24 Mar 2020
5a	SE204063.005	LB195577	17 Mar 2020	17 Mar 2020	31 Mar 2020	23 Mar 2020	02 May 2020	24 Mar 2020
D1	SE204063.006	LB195313	17 Mar 2020	17 Mar 2020	31 Mar 2020	18 Mar 2020	27 Apr 2020	24 Mar 2020

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
1a	SE204063.001	LB195577	17 Mar 2020	17 Mar 2020	31 Mar 2020	23 Mar 2020	02 May 2020	24 Mar 2020
2a	SE204063.002	LB195577	17 Mar 2020	17 Mar 2020	31 Mar 2020	23 Mar 2020	02 May 2020	24 Mar 2020
3a	SE204063.003	LB195313	17 Mar 2020	17 Mar 2020	31 Mar 2020	18 Mar 2020	27 Apr 2020	24 Mar 2020
4a	SE204063.004	LB195577	17 Mar 2020	17 Mar 2020	31 Mar 2020	23 Mar 2020	02 May 2020	24 Mar 2020
5a	SE204063.005	LB195577	17 Mar 2020	17 Mar 2020	31 Mar 2020	23 Mar 2020	02 May 2020	24 Mar 2020
D1	SE204063.006	LB195313	17 Mar 2020	17 Mar 2020	31 Mar 2020	18 Mar 2020	27 Apr 2020	24 Mar 2020

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
1a	SE204063.001	LB195591	17 Mar 2020	17 Mar 2020	13 Sep 2020	23 Mar 2020	13 Sep 2020	24 Mar 2020
2a	SE204063.002	LB195591	17 Mar 2020	17 Mar 2020	13 Sep 2020	23 Mar 2020	13 Sep 2020	24 Mar 2020
3a	SE204063.003	LB195591	17 Mar 2020	17 Mar 2020	13 Sep 2020	23 Mar 2020	13 Sep 2020	24 Mar 2020
4a	SE204063.004	LB195591	17 Mar 2020	17 Mar 2020	13 Sep 2020	23 Mar 2020	13 Sep 2020	24 Mar 2020
5a	SE204063.005	LB195591	17 Mar 2020	17 Mar 2020	13 Sep 2020	23 Mar 2020	13 Sep 2020	24 Mar 2020
D1	SE204063.006	LB195591	17 Mar 2020	17 Mar 2020	13 Sep 2020	23 Mar 2020	13 Sep 2020	24 Mar 2020

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
1a	SE204063.001	LB195577	17 Mar 2020	17 Mar 2020	31 Mar 2020	23 Mar 2020	02 May 2020	24 Mar 2020
2a	SE204063.002	LB195577	17 Mar 2020	17 Mar 2020	31 Mar 2020	23 Mar 2020	02 May 2020	24 Mar 2020
3a	SE204063.003	LB195313	17 Mar 2020	17 Mar 2020	31 Mar 2020	18 Mar 2020	27 Apr 2020	23 Mar 2020
4a	SE204063.004	LB195577	17 Mar 2020	17 Mar 2020	31 Mar 2020	23 Mar 2020	02 May 2020	24 Mar 2020
5a	SE204063.005	LB195577	17 Mar 2020	17 Mar 2020	31 Mar 2020	23 Mar 2020	02 May 2020	24 Mar 2020
D1	SE204063.006	LB195313	17 Mar 2020	17 Mar 2020	31 Mar 2020	18 Mar 2020	27 Apr 2020	23 Mar 2020

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref

HOLDING TIME SUMMARY

SE204063 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

VOC's in Soil (continued)

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
3a	SE204063.003	LB195314	17 Mar 2020	17 Mar 2020	31 Mar 2020	18 Mar 2020	27 Apr 2020	23 Mar 2020
D1	SE204063.006	LB195314	17 Mar 2020	17 Mar 2020	31 Mar 2020	18 Mar 2020	27 Apr 2020	23 Mar 2020

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
3a	SE204063.003	LB195314	17 Mar 2020	17 Mar 2020	31 Mar 2020	18 Mar 2020	27 Apr 2020	23 Mar 2020
D1	SE204063.006	LB195314	17 Mar 2020	17 Mar 2020	31 Mar 2020	18 Mar 2020	27 Apr 2020	23 Mar 2020

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	1a	SE204063.001	%	60 - 130%	103
	2a	SE204063.002	%	60 - 130%	103
	3a	SE204063.003	%	60 - 130%	115
	4a	SE204063.004	%	60 - 130%	105
	5a	SE204063.005	%	60 - 130%	106
	D1	SE204063.006	%	60 - 130%	115

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	1a	SE204063.001	%	60 - 130%	92
	2a	SE204063.002	%	60 - 130%	90
	3a	SE204063.003	%	60 - 130%	95
	4a	SE204063.004	%	60 - 130%	86
	5a	SE204063.005	%	60 - 130%	86
	D1	SE204063.006	%	60 - 130%	0 †
d14-p-terphenyl (Surrogate)	1a	SE204063.001	%	60 - 130%	100
	2a	SE204063.002	%	60 - 130%	96
	3a	SE204063.003	%	60 - 130%	90
	4a	SE204063.004	%	60 - 130%	94
	5a	SE204063.005	%	60 - 130%	90
	D1	SE204063.006	%	60 - 130%	0 †

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	3a	SE204063.003	%	70 - 130%	96
	D1	SE204063.006	%	70 - 130%	95
d14-p-terphenyl (Surrogate)	3a	SE204063.003	%	70 - 130%	91
	D1	SE204063.006	%	70 - 130%	90
d5-nitrobenzene (Surrogate)	3a	SE204063.003	%	70 - 130%	100
	D1	SE204063.006	%	70 - 130%	103

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	3a	SE204063.003	%	60 - 130%	99
	D1	SE204063.006	%	60 - 130%	94
d4-1,2-dichloroethane (Surrogate)	3a	SE204063.003	%	60 - 130%	115
	D1	SE204063.006	%	60 - 130%	109
d8-toluene (Surrogate)	3a	SE204063.003	%	60 - 130%	108
	D1	SE204063.006	%	60 - 130%	105

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	3a	SE204063.003	%	60 - 130%	99
	D1	SE204063.006	%	60 - 130%	94
d4-1,2-dichloroethane (Surrogate)	3a	SE204063.003	%	60 - 130%	115
	D1	SE204063.006	%	60 - 130%	109
d8-toluene (Surrogate)	3a	SE204063.003	%	60 - 130%	108
	D1	SE204063.006	%	60 - 130%	105

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Mercury in Soil — Method: ME-(AU)-[ENV]AN312

Sample Number	Parameter	Units	LOR	Result
LB195597.001	Mercury	mg/kg	0.05	<0.05

OC Pesticides in Soil — Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB195313.001		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
		Alpha BHC	mg/kg	0.1	<0.1
		Lindane	mg/kg	0.1	<0.1
		Heptachlor	mg/kg	0.1	<0.1
		Aldrin	mg/kg	0.1	<0.1
		Beta BHC	mg/kg	0.1	<0.1
		Delta BHC	mg/kg	0.1	<0.1
		Heptachlor epoxide	mg/kg	0.1	<0.1
		Alpha Endosulfan	mg/kg	0.2	<0.2
		Gamma Chlordane	mg/kg	0.1	<0.1
		Alpha Chlordane	mg/kg	0.1	<0.1
		p,p'-DDE	mg/kg	0.1	<0.1
		Dieldrin	mg/kg	0.2	<0.2
		Endrin	mg/kg	0.2	<0.2
		Beta Endosulfan	mg/kg	0.2	<0.2
		p,p'-DDD	mg/kg	0.1	<0.1
		p,p'-DDT	mg/kg	0.1	<0.1
		Endosulfan sulphate	mg/kg	0.1	<0.1
		Endrin Aldehyde	mg/kg	0.1	<0.1
		Methoxychlor	mg/kg	0.1	<0.1
		Endrin Ketone	mg/kg	0.1	<0.1
		Isodrin	mg/kg	0.1	<0.1
		Mirex	mg/kg	0.1	<0.1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	104
LB195577.001		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
		Alpha BHC	mg/kg	0.1	<0.1
		Lindane	mg/kg	0.1	<0.1
		Heptachlor	mg/kg	0.1	<0.1
		Aldrin	mg/kg	0.1	<0.1
		Beta BHC	mg/kg	0.1	<0.1
		Delta BHC	mg/kg	0.1	<0.1
		Heptachlor epoxide	mg/kg	0.1	<0.1
		Alpha Endosulfan	mg/kg	0.2	<0.2
		Gamma Chlordane	mg/kg	0.1	<0.1
		Alpha Chlordane	mg/kg	0.1	<0.1
		p,p'-DDE	mg/kg	0.1	<0.1
		Dieldrin	mg/kg	0.2	<0.2
		Endrin	mg/kg	0.2	<0.2
		Beta Endosulfan	mg/kg	0.2	<0.2
		p,p'-DDD	mg/kg	0.1	<0.1
		p,p'-DDT	mg/kg	0.1	<0.1
		Endosulfan sulphate	mg/kg	0.1	<0.1
		Endrin Aldehyde	mg/kg	0.1	<0.1
		Methoxychlor	mg/kg	0.1	<0.1
		Endrin Ketone	mg/kg	0.1	<0.1
		Isodrin	mg/kg	0.1	<0.1
		Mirex	mg/kg	0.1	<0.1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	99

OP Pesticides in Soil — Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result
LB195313.001	Dichlorvos	mg/kg	0.5	<0.5
	Dimethoate	mg/kg	0.5	<0.5
	Diazinon (Dimpylate)	mg/kg	0.5	<0.5
	Fenitrothion	mg/kg	0.2	<0.2
	Malathion	mg/kg	0.2	<0.2

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

OP Pesticides in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB195313.001		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2
		Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2
		Bromophos Ethyl	mg/kg	0.2	<0.2
		Methidathion	mg/kg	0.5	<0.5
		Ethion	mg/kg	0.2	<0.2
		Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2
	Surrogates	2-fluorobiphenyl (Surrogate)	%	-	82
		d14-p-terphenyl (Surrogate)	%	-	92
LB195577.001		Dichlorvos	mg/kg	0.5	<0.5
		Dimethoate	mg/kg	0.5	<0.5
		Diazinon (Dimpylate)	mg/kg	0.5	<0.5
		Fenitrothion	mg/kg	0.2	<0.2
		Malathion	mg/kg	0.2	<0.2
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2
		Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2
		Bromophos Ethyl	mg/kg	0.2	<0.2
		Methidathion	mg/kg	0.5	<0.5
		Ethion	mg/kg	0.2	<0.2
		Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2
	Surrogates	2-fluorobiphenyl (Surrogate)	%	-	86
		d14-p-terphenyl (Surrogate)	%	-	80

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB195313.001		Naphthalene	mg/kg	0.1	<0.1
		2-methylnaphthalene	mg/kg	0.1	<0.1
		1-methylnaphthalene	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(a)pyrene	mg/kg	0.1	<0.1
		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
		Dibenzo(ah)anthracene	mg/kg	0.1	<0.1
		Benzo(ghi)perylene	mg/kg	0.1	<0.1
		Total PAH (18)	mg/kg	0.8	<0.8
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	86
		2-fluorobiphenyl (Surrogate)	%	-	82
		d14-p-terphenyl (Surrogate)	%	-	92

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result
LB195591.001	Arsenic, As	mg/kg	1	<1
	Cadmium, Cd	mg/kg	0.3	<0.3
	Chromium, Cr	mg/kg	0.5	<0.5
	Copper, Cu	mg/kg	0.5	<0.5
	Nickel, Ni	mg/kg	0.5	<0.5
	Lead, Pb	mg/kg	1	<1
	Zinc, Zn	mg/kg	2	<2

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result
LB195313.001	TRH C10-C14	mg/kg	20	<20
	TRH C15-C28	mg/kg	45	<45
	TRH C29-C36	mg/kg	45	<45
	TRH C37-C40	mg/kg	100	<100
	TRH C10-C36 Total	mg/kg	110	<110

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB195314.001	Monocyclic Aromatic Hydrocarbons	Benzene	mg/kg	0.1	<0.1
		Toluene	mg/kg	0.1	<0.1
		Ethylbenzene	mg/kg	0.1	<0.1
		m/p-xylene	mg/kg	0.2	<0.2
		o-xylene	mg/kg	0.1	<0.1
	Polycyclic VOCs	Naphthalene	mg/kg	0.1	<0.1
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	102
		d8-toluene (Surrogate)	%	-	101
		Bromofluorobenzene (Surrogate)	%	-	106
	Totals	Total BTEX	mg/kg	0.6	<0.6

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB195314.001		TRH C6-C9	mg/kg	20	<20
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	102

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE204063.006	LB195597.021	Mercury	mg/kg	0.05	<0.05	0.06	133	12
SE204242.003	LB195597.014	Mercury	mg/kg	0.05	<0.05	<0.05	200	0

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE204036.010	LB195313.014		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Lindane	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor	mg/kg	0.1	<0.1	<0.1	200	0
			Aldrin	mg/kg	0.1	<0.1	<0.1	200	0
			Beta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Delta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Dieldrin	mg/kg	0.2	<0.2	<0.2	200	0
			Endrin	mg/kg	0.2	<0.2	<0.2	200	0
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	200	0
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Ketone	mg/kg	0.1	<0.1	<0.1	200	0
			Isodrin	mg/kg	0.1	<0.1	<0.1	200	0
			Mirex	mg/kg	0.1	<0.1	<0.1	200	0
			Total CLP OC Pesticides	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.16	0.15	30	3
SE204038.005	LB195313.024		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Lindane	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor	mg/kg	0.1	<0.1	<0.1	200	0
			Aldrin	mg/kg	0.1	<0.1	<0.1	200	0
			Beta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Delta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Dieldrin	mg/kg	0.2	<0.2	<0.2	200	0
			Endrin	mg/kg	0.2	<0.2	<0.2	200	0
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	200	0
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Ketone	mg/kg	0.1	<0.1	<0.1	200	0
			Isodrin	mg/kg	0.1	<0.1	<0.1	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: .RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

OC Pesticides in Soil (continued) — Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE204038.005	LB195313.024		Mirex	mg/kg	0.1	<0.1	<0.1	200	0
			Total CLP OC Pesticides	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.17	0.17	30	3

OP Pesticides in Soil — Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE204036.010	LB195313.027		Dichlorvos	mg/kg	0.5	<0.5	0	200	0
			Dimethoate	mg/kg	0.5	<0.5	0.0020054166	200	0
			Diazinon (Dimpylate)	mg/kg	0.5	<0.5	0.0179910588	200	0
			Fenitrothion	mg/kg	0.2	<0.2	0	200	0
			Malathion	mg/kg	0.2	<0.2	0	200	0
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	0	200	0
			Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	0	200	0
			Bromophos Ethyl	mg/kg	0.2	<0.2	0	200	0
			Methidathion	mg/kg	0.5	<0.5	0	200	0
			Ethion	mg/kg	0.2	<0.2	0	200	0
			Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	0.0139789752	200	0
			Total OP Pesticides*	mg/kg	1.7	<1.7	0	200	0
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4852079891	30	12
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.4828137548	30	14
SE204038.005	LB195313.025		Dichlorvos	mg/kg	0.5	<0.5	<0.5	200	0
			Dimethoate	mg/kg	0.5	<0.5	<0.5	200	0
			Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	200	0
			Fenitrothion	mg/kg	0.2	<0.2	<0.2	200	0
			Malathion	mg/kg	0.2	<0.2	<0.2	200	0
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	200	0
			Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	200	0
			Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	200	0
			Methidathion	mg/kg	0.5	<0.5	<0.5	200	0
			Ethion	mg/kg	0.2	<0.2	<0.2	200	0
			Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	200	0
			Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	200	0
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	2
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	2

PAH (Polynuclear Aromatic Hydrocarbons) in Soil — Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE204036.010	LB195313.026		Naphthalene	mg/kg	0.1	<0.1	0.0009747688	200	0
			2-methylnaphthalene	mg/kg	0.1	<0.1	0.0021363624	200	0
			1-methylnaphthalene	mg/kg	0.1	<0.1	0	200	0
			Acenaphthylene	mg/kg	0.1	<0.1	0.0020125688	200	0
			Acenaphthene	mg/kg	0.1	<0.1	0	200	0
			Fluorene	mg/kg	0.1	<0.1	0.0003237799	200	0
			Phenanthrene	mg/kg	0.1	<0.1	0.0089271288	200	0
			Anthracene	mg/kg	0.1	<0.1	0.0084131322	200	0
			Fluoranthene	mg/kg	0.1	<0.1	0.0158444733	200	0
			Pyrene	mg/kg	0.1	<0.1	0.0179970064	200	0
			Benzo(a)anthracene	mg/kg	0.1	<0.1	0.0093274506	200	0
			Chrysene	mg/kg	0.1	<0.1	0.0085209397	200	0
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	0.0138902687	200	0
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	0.0144685090	200	0
			Benzo(a)pyrene	mg/kg	0.1	<0.1	0.0070027432	200	0
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	0.0072710247	200	0
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	0.0004280770	200	0
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	0.0094520372	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2	0	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	0.242	134	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	0.121	175	0
			Total PAH (18)	mg/kg	0.8	<0.8	0	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.4740908535	30	8
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4852079891	30	12
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.4828137548	30	14

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE204038.005	LB195313.024		Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluorene	mg/kg	0.1	<0.1	<0.1	200	0
			Phenanthrene	mg/kg	0.1	<0.1	<0.1	200	0
			Anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Chrysene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=0	mg/kg	0.2	<0.2	<0.2	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	mg/kg	0.3	<0.3	<0.3	134	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	mg/kg	0.2	<0.2	<0.2	175	0
			Total PAH (18)	mg/kg	0.8	<0.8	<0.8	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.4	30	0
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	2
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	2

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE204063.006	LB195591.021	Arsenic, As	mg/kg	1	3	4	58	8
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.5	2.1	2.2	53	2
		Copper, Cu	mg/kg	0.5	8.4	9.1	36	8
		Nickel, Ni	mg/kg	0.5	2.5	2.9	49	15
		Lead, Pb	mg/kg	1	13	16	37	19
		Zinc, Zn	mg/kg	2	78	76	33	2
SE204242.003	LB195591.014	Arsenic, As	mg/kg	1	16	15	36	5
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	184	0
		Chromium, Cr	mg/kg	0.5	11	11	35	2
		Copper, Cu	mg/kg	0.5	6.5	8.1	37	22
		Nickel, Ni	mg/kg	0.5	1.6	1.8	60	13
		Lead, Pb	mg/kg	1	11	11	39	1
		Zinc, Zn	mg/kg	2	21	24	39	13

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE204036.010	LB195313.026		TRH C10-C14	mg/kg	20	<20	0	200	0
			TRH C15-C28	mg/kg	45	<45	0	200	0
			TRH C29-C36	mg/kg	45	<45	0	200	0
			TRH C37-C40	mg/kg	100	<100	0	200	0
			TRH C10-C36 Total	mg/kg	110	<110	0	200	0
			TRH >C10-C40 Total (F bands)	mg/kg	210	<210	0	200	0
		TRH F Bands	TRH >C10-C16	mg/kg	25	<25	0	200	0
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	0	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	0	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	0	200	0
SE204038.005	LB195313.024		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	<45	<45	200	0
			TRH C29-C36	mg/kg	45	<45	<45	200	0
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	200	0
		TRH F Bands	TRH >C10-C16	mg/kg	25	<25	<25	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

TRH (Total Recoverable Hydrocarbons) in Soil (continued) — Method: ME-(AU)-[ENV]AN403

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE204038.005	LB195313.024	TRH F Bands	TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0

VOC's in Soil — Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE204036.010	LB195314.014	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
			Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	11.0	11.2	50	1
			d8-toluene (Surrogate)	mg/kg	-	10.4	10.7	50	2
			Bromofluorobenzene (Surrogate)	mg/kg	-	10.3	10.2	50	0
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0
SE204063.006	LB195314.023	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
			Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.9	11.5	50	5
			d8-toluene (Surrogate)	mg/kg	-	10.5	11.5	50	9
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.4	10.0	50	7
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0

Volatile Petroleum Hydrocarbons in Soil — Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE204036.010	LB195314.014		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	11.0	11.2	30	1
			d8-toluene (Surrogate)	mg/kg	-	10.4	10.7	30	2
			Bromofluorobenzene (Surrogate)	mg/kg	-	10.3	10.2	30	0
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0
SE204063.006	LB195314.023		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.9	11.5	30	5
			d8-toluene (Surrogate)	mg/kg	-	10.5	11.5	30	9
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.4	10.0	30	7
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in Green when within suggested criteria or Red with an appended dagger symbol (†) when outside suggested criteria.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB195597.002	Mercury	mg/kg	0.05	0.19	0.2	70 - 130	94

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB195313.002		Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	119
		Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	117
		Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	113
		Dieldrin	mg/kg	0.2	0.2	0.2	60 - 140	116
		Endrin	mg/kg	0.2	0.2	0.2	60 - 140	118
		p,p'-DDT	mg/kg	0.1	0.2	0.2	60 - 140	106
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.15	0.15	40 - 130	103
LB195577.002		Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	110
		Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	107
		Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	104
		Dieldrin	mg/kg	0.2	0.2	0.2	60 - 140	105
		Endrin	mg/kg	0.2	0.2	0.2	60 - 140	107
		p,p'-DDT	mg/kg	0.1	0.2	0.2	60 - 140	97
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.15	0.15	40 - 130	99

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB195313.002		Dichlorvos	mg/kg	0.5	1.8	2	60 - 140	90
		Diazinon (Dimpylate)	mg/kg	0.5	1.8	2	60 - 140	92
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	1.8	2	60 - 140	92
		Ethion	mg/kg	0.2	1.8	2	60 - 140	89
	Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	80
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	80
LB195577.002		Dichlorvos	mg/kg	0.5	1.5	2	60 - 140	75
		Diazinon (Dimpylate)	mg/kg	0.5	1.6	2	60 - 140	78
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	1.6	2	60 - 140	79
		Ethion	mg/kg	0.2	1.4	2	60 - 140	71
	Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	88
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	90

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB195313.002		Naphthalene	mg/kg	0.1	3.9	4	60 - 140	98
		Acenaphthylene	mg/kg	0.1	3.8	4	60 - 140	94
		Acenaphthene	mg/kg	0.1	4.1	4	60 - 140	102
		Phenanthrene	mg/kg	0.1	3.7	4	60 - 140	93
		Anthracene	mg/kg	0.1	4.1	4	60 - 140	104
		Fluoranthene	mg/kg	0.1	3.4	4	60 - 140	86
		Pyrene	mg/kg	0.1	3.5	4	60 - 140	88
		Benzo(a)pyrene	mg/kg	0.1	3.9	4	60 - 140	98
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	84
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	80
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	80

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB195591.002	Arsenic, As	mg/kg	1	330	318.22	80 - 120	102
	Cadmium, Cd	mg/kg	0.3	5.0	5.41	80 - 120	92
	Chromium, Cr	mg/kg	0.5	34	38.31	80 - 120	90
	Copper, Cu	mg/kg	0.5	290	290	80 - 120	100
	Nickel, Ni	mg/kg	0.5	180	187	80 - 120	97
	Lead, Pb	mg/kg	1	89	89.9	80 - 120	99
	Zinc, Zn	mg/kg	2	260	273	80 - 120	95

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in Green when within suggested criteria or Red with an appended dagger symbol (†) when outside suggested criteria.

TRH (Total Recoverable Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN403

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB195313.002		TRH C10-C14	mg/kg	20	43	40	60 - 140	108
		TRH C15-C28	mg/kg	45	47	40	60 - 140	118
		TRH C29-C36	mg/kg	45	<45	40	60 - 140	83
	TRH F Bands	TRH >C10-C16	mg/kg	25	43	40	60 - 140	108
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	98
		TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	80

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB195314.002	Monocyclic	Benzene	mg/kg	0.1	4.7	5	60 - 140	93
	Aromatic	Toluene	mg/kg	0.1	4.7	5	60 - 140	95
		Ethylbenzene	mg/kg	0.1	5.1	5	60 - 140	103
		m/p-xylene	mg/kg	0.2	10	10	60 - 140	103
		o-xylene	mg/kg	0.1	5.0	5	60 - 140	100
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.8	10	70 - 130	88
		d8-toluene (Surrogate)	mg/kg	-	8.0	10	70 - 130	80
		Bromofluorobenzene (Surrogate)	mg/kg	-	8.1	10	70 - 130	81

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB195314.002		TRH C6-C10	mg/kg	25	89	92.5	60 - 140	97
		TRH C6-C9	mg/kg	20	75	80	60 - 140	94
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.8	10	70 - 130	88
		Bromofluorobenzene (Surrogate)	mg/kg	-	8.1	10	70 - 130	81
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	59	62.5	60 - 140	95

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE204124.001	LB195597.004	Mercury	mg/kg	0.05	0.23	0.05	0.2	90

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE204036.001	LB195313.004		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	-	-
			Lindane	mg/kg	0.1	<0.1	<0.1	-	-
			Heptachlor	mg/kg	0.1	0.2	<0.1	0.2	111
			Aldrin	mg/kg	0.1	0.2	<0.1	0.2	109
			Beta BHC	mg/kg	0.1	<0.1	<0.1	-	-
			Delta BHC	mg/kg	0.1	0.2	<0.1	0.2	105
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	-	-
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	-	-
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	-	-
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	-	-
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	-	-
			Dieldrin	mg/kg	0.2	0.2	<0.2	0.2	107
			Endrin	mg/kg	0.2	0.2	<0.2	0.2	109
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	-	-
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	-	-
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	-	-
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	-	-
			p,p'-DDT	mg/kg	0.1	0.2	<0.1	0.2	99
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	-	-
			Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	-	-
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	-	-
			Endrin Ketone	mg/kg	0.1	<0.1	<0.1	-	-
			Isodrin	mg/kg	0.1	<0.1	<0.1	-	-
			Mirex	mg/kg	0.1	<0.1	<0.1	-	-
			Total CLP OC Pesticides	mg/kg	1	1	<1	-	-
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.15	0.14	-	100

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE204036.001	LB195313.026		Dichlorvos	mg/kg	0.5	2.2	<0.5	2	108
			Dimethoate	mg/kg	0.5	<0.5	<0.5	-	-
			Diazinon (Dimpylate)	mg/kg	0.5	2.3	<0.5	2	113
			Fenitrothion	mg/kg	0.2	<0.2	<0.2	-	-
			Malathion	mg/kg	0.2	<0.2	<0.2	-	-
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	2.3	<0.2	2	114
			Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	-	-
			Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	-	-
			Methidathion	mg/kg	0.5	<0.5	<0.5	-	-
			Ethion	mg/kg	0.2	2.2	<0.2	2	110
			Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	-	-
			Total OP Pesticides*	mg/kg	1.7	8.9	<1.7	-	-
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	-	101
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.4	-	96

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE204036.001	LB195313.025	Naphthalene	mg/kg	0.1	4.3	<0.1	4	109
		2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		Acenaphthylene	mg/kg	0.1	3.9	<0.1	4	98
		Acenaphthene	mg/kg	0.1	4.3	<0.1	4	107
		Fluorene	mg/kg	0.1	<0.1	<0.1	-	-
		Phenanthrene	mg/kg	0.1	4.4	<0.1	4	110

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued) — Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE204036.001	LB195313.025		Anthracene	mg/kg	0.1	4.3	<0.1	4	107
			Fluoranthene	mg/kg	0.1	4.3	<0.1	4	106
			Pyrene	mg/kg	0.1	4.6	<0.1	4	114
			Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	-	-
			Chrysene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(a)pyrene	mg/kg	0.1	4.0	<0.1	4	100
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	-	-
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	4.0	<0.2	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	4.1	<0.3	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	4.1	<0.2	-	-
			Total PAH (18)	mg/kg	0.8	34	<0.8	-	-
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	-	98
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	-	101
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.4	-	96

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES — Method: ME-(AU)-[ENV]AN040/AN320

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE204124.001	LB195591.004	Arsenic, As	mg/kg	1	50	1	50	98
		Cadmium, Cd	mg/kg	0.3	45	<0.3	50	91
		Chromium, Cr	mg/kg	0.5	52	2.0	50	99
		Copper, Cu	mg/kg	0.5	55	5.0	50	100
		Nickel, Ni	mg/kg	0.5	54	1.3	50	106
		Lead, Pb	mg/kg	1	73	27	50	93
		Zinc, Zn	mg/kg	2	81	28	50	105

TRH (Total Recoverable Hydrocarbons) in Soil — Method: ME-(AU)-[ENV]AN403

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE204036.001	LB195313.025		TRH C10-C14	mg/kg	20	39	<20	40	98
			TRH C15-C28	mg/kg	45	<45	<45	40	93
			TRH C29-C36	mg/kg	45	<45	<45	40	85
			TRH C37-C40	mg/kg	100	<100	<100	-	-
			TRH C10-C36 Total	mg/kg	110	<110	<110	-	-
			TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	-	-
		TRH F Bands	TRH >C10-C16	mg/kg	25	38	<25	40	95
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	34	<25	-	-
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	40	98
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	-	-

VOC's in Soil — Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE204036.001	LB195314.004	Monocyclic Aromatic	Benzene	mg/kg	0.1	4.2	<0.1	5	85
			Toluene	mg/kg	0.1	4.4	<0.1	5	87
			Ethylbenzene	mg/kg	0.1	4.3	<0.1	5	86
			m/p-xylene	mg/kg	0.2	8.7	<0.2	10	86
			o-xylene	mg/kg	0.1	4.3	<0.1	5	86
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.0	10.5	10	100
			d8-toluene (Surrogate)	mg/kg	-	10.1	9.6	10	101
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.4	10.4	10	94
		Totals	Total Xylenes	mg/kg	0.3	13	<0.3	-	-
			Total BTEX	mg/kg	0.6	26	<0.6	-	-

Volatile Petroleum Hydrocarbons in Soil — Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE204036.001	LB195314.004		TRH C6-C10	mg/kg	25	87	<25	92.5	94
			TRH C6-C9	mg/kg	20	76	<20	80	95
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	10.0	10.5	10	100
			d8-toluene (Surrogate)	mg/kg	-	10.1	9.6	10	101
			Bromofluorobenzene (Surrogate)	mg/kg	-	9.4	10.4	-	94

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Volatile Petroleum Hydrocarbons in Soil (continued)

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE204036.001	LB195314.004	VPH F Bands	Benzene (F0)	mg/kg	0.1	4.2	<0.1	-	-
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	61	<25	62.5	97

MATRIX SPIKE DUPLICATES

SE204063 R0

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here: https://www.sgs.com.au/~/media/Local/Australia/Documents/Technical Documents/MP-AU-ENV-QU-022 QA QC Plan.pdf

*	NATA accreditation does not cover the performance of this service.
**	Indicative data, theoretical holding time exceeded.
-	Sample not analysed for this analyte.
IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.

①	At least 2 of 3 surrogates are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Recovery failed acceptance criteria due to sample heterogeneity.
⑩	LOR was raised due to high conductivity of the sample (required dilution).
†	Refer to relevant report comments for further information.

Appendix 3 – Chain of Custody and Sample Receipt

CHAIN OF CUSTODY & ANALYSIS REQUEST

Page _1___ of _1___

Contaminated Site Investigations Australia Pty Ltd

Company Name:	CSI Australia P/L	Project Name/No:	2203 Wardell
Address:	933 Wardell Rd Meerschaum Vale	Purchase Order No:	
		Results Required By:	Normal TAT
Contact Name:	Dane Egelton	Telephone:	0499 859 528
		Facsimile:	
		Email Results:	dane@csiaus.com.au

Client Sample ID	Date Sampled	Lab Sample ID	WATER	SOIL	PRESERVATIVE	NO OF CONTAINERS	Metals (8)	OCP/OPP	TPH/BTEX/PAH
1a	17/3/2020	1		X		1	✓	✓	
2a	17/3/2020	2		X		1	✓	✓	
3a	17/3/2020	3		X		1	✓	✓	✓
4a	17/3/2020	4		X		1	✓	✓	
5a	17/3/2020	5		X		1	✓	✓	
D1	17/3/2020	6		x		1	✓	✓	✓

Relinquished By: Dane Egelton	Date/Time: 6pm 17/3/2020	Received By:	Date/Time 17/3/20 @ 5pm
Relinquished By:	Date/Time:	Received By:	Date/Time
Samples Intact: ~~Yes~~/ No	Temperature: Ambient / ~~Chilled~~	Sample Cooler Sealed: ~~Yes~~/ No	Laboratory Quotation No:
	Comments		

SE204063

Appendix 4 – Title Search Information

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: AUTO CONSOL 2512-218

SEARCH DATE	TIME	EDITION NO	DATE
24/3/2020	9:05 AM	4	11/11/2019

LAND

LAND DESCRIBED IN SCHEDULE OF PARCELS
AT WARDELL
LOCAL GOVERNMENT AREA BALLINA
PARISH OF BINGAL COUNTY OF ROUS
TITLE DIAGRAM CROWN PLAN 8.1688

FIRST SCHEDULE

WARDELL NO.3 PTY LTD (T AP667138)

SECOND SCHEDULE (2 NOTIFICATIONS)

1 LAND EXCLUDES MINERALS AND IS SUBJECT TO RESERVATIONS AND CONDITIONS IN FAVOUR OF THE CROWN - SEE CROWN GRANT(S)
2 AP667139 MORTGAGE TO MAX SWADLING EARTHMOVING PTY LTD

NOTATIONS

UNREGISTERED DEALINGS: NIL

SCHEDULE OF PARCELS

LOTS 2-3 SEC. 10 IN DP759050.

*** END OF SEARCH ***

HAZ-ROSS- PRINTED ON 24/3/2020

Hazlett
INFORMATION SERVICES
Level 4, 122 Castlereagh Street, Sydney 2000 | DX 1078 SYDNEY | GPO Box 96, Sydney 2001
Ph: 02 92615211 Fax: 02 92647752 | R Hazlett & Co. ABN 20 104 470 340 | www.hazlett.com.au

No. 1914/2478 — State of New South Wales. — [LAND GRANT.]

NEW SOUTH WALES FIVE SHILLINGS STAMP DUTY. SYDNEY N. S. W.

REGISTER BOOK, VOL. 2512 FOL. 218

CANCELLED W
ON ISSUE OF NEW FOLIO AutoConsol 2512-218

GRANT OF LAND ~~OFFERED~~ FOR SALE AT AUCTION AND NOT SOLD.

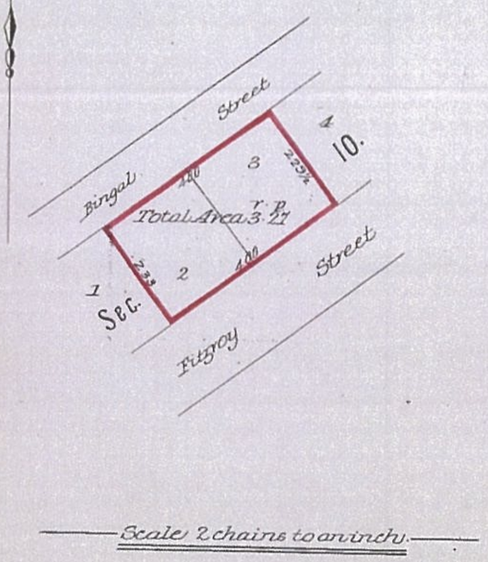
N.S.W. DEPARTMENT 15.9.14K OF STAMP DUTIES

GEORGE V, by the Grace of God, of the United Kingdom of Great Britain and Ireland, and of the British Dominions beyond the Seas, King, Defender of the Faith, Emperor of India.
TO ALL to whom these Presents shall come, Greeting.

759050

Whereas the Land hereinafter described was offered for sale by public auction at *Wardell* in Our State of New South Wales but the same was not sold And Whereas *Harry King of Wardell aforesaid Fisherman* ~~in Our said State~~ duly applied to purchase such Land at the upset price thereof and such application was approved Now Know Ye That for and in consideration of the sum of *Twelve pounds* Sterling being the upset price as aforesaid well and truly paid into the Treasury of Our said State before these Presents are issued and of all and singular the premises We have Granted and for Us Our Heirs and Successors Do Hereby Grant unto the said *Harry King* *his* Heirs and Assigns subject to the Reservations and Exceptions hereinafter contained All that Allotment or Parcel of Land in Our said State containing by Admeasurement *Three roods twenty seven perches* be the same more or less situated in the County of *Rous* Parish of *Bingal Town of Wardell*

Allotments 2 and 3 of Section 10



Commencing on the South Eastern side of Bingal Street at the Western corner of allotment four and bounded thence on the North West by that Street bearing South fifty three degrees fifty minutes West four chains on the South West by the North Eastern boundary of allotment one bearing South thirty six degrees ten minutes East two chains thirty three links to Fitzroy Street on the South East by Fitzroy Street bearing North fifty three degrees twenty minutes East four chains and on the North East by the South Western boundary of allotment four aforesaid bearing North thirty six degrees ten minutes West two chains twenty nine links and one half of a link to the point of commencement

As per plan in the margin hereof With all the Rights and Appurtenances whatsoever thereto belonging To Hold unto the said *Harry King* *his* Heirs and Assigns for ever Provided Nevertheless and We do Hereby Reserve and Except unto Us Our Heirs and Successors all minerals which the said Land contains with full power and authority for Us Our Heirs and Successors and such person or persons as shall from time to time be authorised by Us or them to enter upon the said Land and to search for mine dig and remove the said minerals And also all such parts and so much of the said Land as may hereafter be required for public ways viaducts canals railways tramways dams sewers or drains in over and through the same to be set out by Our Governor for the time-being of Our said State or some person by him authorised in that respect And also all sand clay stone gravel and indigenous timber and all other materials the natural produce of the said land which may be required at any time hereafter for the construction and repair of any public ways bridges or canals or for naval purposes or railways and tramways or any fences embankments viaducts dams sewers or drains necessary for the same together with the right of taking and removing all such materials by such person or persons as may be authorised in that behalf by the Governor as aforesaid Provided Lastly and We do Hereby Reserve for Us Our Heirs and Successors and for the Governor as aforesaid by such person or persons as shall be by Us them or him authorised in that behalf full power to make and conduct through in under upon or over the said Land or any portion thereof all public ways viaducts railways tramways canals and all common or public drains and sewers which may be deemed expedient And the right of full and free ingress egress and regress into out of and upon the said Land for the several purposes aforesaid or any of them In Testimony Whereof We have caused this Our Grant to be Sealed with the Seal of our said State.

W.S. Ashford *9010*

WITNESS Our Trusty and Well-beloved Sir Gerald Strickland, Count della Catena, Knight Grand Cross of Our Most Distinguished Order of Saint Michael and Saint George, Our Governor of Our State of New South Wales and its Dependencies, in the Commonwealth of Australia, at Sydney, in Our said State, this *first* day of *September* in the fifth year of Our Reign, and in the year of Our Lord One thousand nine hundred and fourteen

G. Strickland

Governor

RECORDED and ENROLLED in the Registrar General's Office, at Sydney, in New South Wales, this 15th day of September 1914.

Deputy Registrar General.

No. A 143745 TRANSFER dated 19th October 1914
from the said Harry King To Louisa May Lumley wife of Clarence Thomas Lumley of Windell, Butcher
of the land within described
Produced and entered 12th November 1914
at 58 mts fit 12 o'clock in the after noon

REGISTRAR GENERAL

REGISTERED PROPRIETOR Maisie Muter by
Transmission T540729 T548839 registered
23-5-1983

REGISTRAR GENERAL

COMPUTER FOLIO . NO FURTHER
DEALINGS TO BE REGISTERED.

T548839/ak

Appendix 5 – BSC DA/BA Search Information

Ballina Shire Council

Cnr. Cherry & Tamar Streets
P.O. Box 450, BALLINA, N.S.W. 2478
DX 27789, BALLINA
TELEPHONE No. 86 4444 (STD 066)
FAX No. (066) 86 7035

ENQUIRIES REFER

IN REPLY PLEASE QUOTE
DA-1997/158 97/5765

FORM 7

ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979.

NOTICE TO APPLICANT OF DETERMINATION OF A DEVELOPMENT APPLICATION

Gallen Hart & Associates
PO Box 851
LISMORE 2480

being the applicant in respect of development application No. **1997/158** for the following use:

To undertake the filling of land. ***(SLY)***

Pursuant to Section 92 of the Act, notice is hereby given of the determination by Ballina Shire Council of the abovementioned development application relating to land described as Lots 2, 3, 4 and 5 DP 759050 Section 10 Fitzroy Street, Wardell.

The development application has been determined by granting of consent subject to the following conditions:

1. Development of the site shall be undertaken generally in accordance with the plans and associated documentation prepared by *Gallen Hart & Associates Pty Ltd (dated 5/2/97 ref No. 2753)* and submitted with the development application, subject to such amendment as required by any condition specified hereinafter.

   REASON: To ensure the development is carried out in accordance with the terms and limitations of the development application and this consent.

2. Effective erosion and sediment control measures are to be adopted before and during construction, to the satisfaction of Council's Engineer and Health and Building Surveyor.

3. During and after construction, measures shall be undertaken to minimise erosion of soil due to wind. Disturbed areas shall be revegetated with grass seed to promote early grass cover. To prevent wind erosion whilst the grass cover is establishing, all disturbed areas may be covered with straw mulch or equivalent. All disturbed areas shall be revegetated as they are completed.

4. The site shall be filled to a minimum level of RL 2.53m AHD in accordance with Council's current flood policy. The current policy is based on the highest recorded flood level for the Wardell Village. The recently completed Ballina "Floodplain Management Study - Final Report (Draft)" indicates the 100 year peak flood level for the site to be 3.24m AHD. Based on this flood level the minimum floor level of any building erected on the site shall be 3.54m AHD (using a floor level of 300mm above flood level).

Cont.....

5. Filling of the proposed site is to be carried out in accordance with AS 2870 - 1996, Residential Slabs and Footing Code. The face of the fill works shall be battered at a maximum slope of 3.0 Horizontal to 1.0 vertical.

6. The applicant shall submit details of the source of the proposed fill to Council's Engineering Department for approval prior to the placement of fill on the site.

7. Certification from a suitably qualified practising Geotechnical or Structural Engineer, verifying such site filling being done in accordance with AS 2870 - 1996, and having adequate bearing capacity for dwelling construction, is to be submitted to Council upon completion of the filling works.

8. A works-as-executed drawing depicting the completed fill levels shall be submitted upon completion.

9. Dish gutters shall be constructed on the side boundaries such that no stormwater is discharged from the site onto the adjoining properties. The adjoining properties shall be drained at the common boundary with the site such that no water ponds on this neighbouring property due to filling the site. The stormwater drainage shall be discharged to Council's street drainage system.

10. During the importation of fill material to the site, dust suppression measures shall be undertaken along the unsealed portion of Fitzroy Street to the satisfaction of Council's Chief Engineer.

11. The applicant shall be responsible for the removal of any soil material deposited on the local road network during the importation of fill material to the site. This includes cleaning any roads affected by -

    a) Spillage from the haulage trucks.
    b) Soil deposits from the tyres of the haulage trucks.

FOOTNOTE: Council's assessment of this development application has concluded that the above conditions of consent and reasons therefore, warrant attachment for the following general reasons:

* to ensure compliance with the provisions of the Ballina Local Environmental Plan 1987;

* to protect the existing and likely future amenity of the locality;

* to maintain, as far as practicable, the public interest.

THIS CONSENT IS FOR THE USE OF THE PROPERTY ONLY AND IS NOT A BUILDING PERMIT WHICH MUST ALSO BE OBTAINED FROM COUNCIL'S HEALTH AND BUILDING DEPARTMENT BEFORE ANY STRUCTURAL WORK COMMENCES. THE BUILDING PERMIT WILL CONTAIN ADDITIONAL CONDITIONS.

Endorsement of the date of consent - 8th April, 1997

for RA Willis
CHIEF TOWN PLANNER

8/4/1997

(See notations on reverse hereof.)

NOTATIONS

(1) To ascertain the date upon which development consent becomes effective refer to Section 93 of the Environmental Planning and Assessment Act.

(2) To ascertain the extent to which the development consent is liable to lapse refer to Section 99 of the Environmental Planning and Assessment Act.

(3) Section 97 of the Act confers on an applicant who is dissatisfied with the determination of a consent authority, a right of appeal to the Land and Environment Court exercisable within 12 months after receipt of this notice.

Appeal forms are available from any Court House upon request.

(4) This notification relates to development consent for the use of the land only and is not a building permit.

(5) Where the application involves subdivision, this approval is also subdivision consent for the purpose of Part XII of the Local Government Act 1919 (as saved). To ascertain the extent to which the subdivision consent is liable to lapse refer to Section 103 of the Local Government Act 1993.

BALLINA SHIRE COUNCIL
Cnr. Cherry & Tamar Streets
P.O. Box 450
BALLINA NSW. 2478

DX 27789 BALLINA
Phone: (066) 86 4444
Fax: (066) 86 9514

OFFICE USE ONLY
DA No.: 1997/158
Fee: 183.
Rec. No.: 56027
Date Recd: 14/2/97

Please process
A/11/2.

ENVIRONMENTAL PLANNING & ASSESSMENT ACT, 1979
SECTION 77(3)
DEVELOPMENT APPLICATION

A. APPLICANT'S NAME: GALLEN HART & ASSOCIATES
(BLOCK LETTERS PLEASE)

ADDRESS: P.O. Box 851
LISMORE 2480

APPLICANT'S REFERENCE: 2753

TELEPHONE OR CONTACT DURING BUSINESS HOURS: 066-221177

SIGNATURE: [signature] For Gallen Hart & Associates DATE: 5/2/97

B. REGISTERED OWNER OF PROPERTY/~~BUILDING~~: M.L. & R.F. SLY

ADDRESS: LOT 17 BATH ST WARDELL 2477

I hereby consent to the making of this development application.

SIGNATURE: M.L. Sly DATE: 5/2/97

N.B.: Where the registered owner of the property/building is a company or organisation, the persons who have an interest in that company or organisation (i.e. owners, directors, etc.) must be disclosed to Council.

DIRECTORS/OWNERS: —

It is extremely important that this section is signed by the registered owner of the property. Council is NOT ABLE to determine a development application which does not have the written consent of the owner.

C. DESCRIPTION OF THE LAND TO WHICH THE APPLICATION RELATES:

Address: No.: ..... Street/~~Road~~: FITZROY ST.
~~Locality~~/Town: WARDELL

Real Property Description: Lot/~~Portion~~: 23485 Section: 10
D.P.: 759050 Parish: BINGAL

N.B.: In order for Council to readily and accurately identify the subject land, concise property details are to be provided.

D. DESCRIPTION OF DEVELOPMENT OR OTHER ACTIVITY FOR WHICH DEVELOPMENT CONSENT IS SOUGHT:

FILLING OF LAND TO RL 2.53 AHD HEIGHT.

WITH NO FILL ENCROACHMENT TO AJOINING LAND.

IMPORTANT: The following section which pertains to the development described in 'D' above must be fully completed before addressing the following pages.

D1. Where the development involves the **ERECTION OF A BUILDING,** what will be the proposed use of that building when erected?

N/A

Do any buildings exist on the land? If so what is the current use of such?

NIL EXIST.

D2. Where the development involves the **SUBDIVISION OF LAND OR PREMISES,** the following information is required. It should be noted that if it is intended to create separate titles for residential flat or dual occupancy developments (ie strata title subdivision of the development referred to in 'D' above) the following section must also be completed.

Proposed subdivision type: N/A

No. of existing lots: — No. of lots to be created: —

Areas: Existing: —

Proposed: —

Intended use of each lot: —

D3. Where the development involves **SHOPS, COMMERCIAL PREMISES, OFFICES OR INDUSTRIAL USES,** the following information is required: N/A

Hours of operation: Mon-Fri: — Sat: — Sun: —

Plant and machinery: —

Type, size, quantity etc of goods to be manufactured/transported/stored on the site:

—

Loading and unloading: —

D4. Where the development involves the **DEMOLITION** of existing buildings, the following information is required:

Age of building: N/A Condition of building: —

D5. Are there any other special circumstances which should be brought to Council's attention in relation to the proposed development and subject development application?

THE PROPOSED FILL WILL BE TO A SIMILAR HEIGHT TO ADJACENT LAND TO THE SOUTH AND EAST OF THE SUBJECT LAND

E. **ESTIMATED COST OF DEVELOPMENT** (where the application pertains to the erection of a building or the carrying out of work):

$ 11,000-00 (SPREAD & COMPACTION ONLY - SUPPLY COST MINIMAL)

NB: The development application fee as determined by Council and which is to accompany this application, is based upon an accurate estimate of the cost of development. Where the estimated cost of the development appears deficient, Council will carry out its own assessment of costs to ascertain the application fee.

F. ENVIRONMENTAL IMPACT OF PROPOSED DEVELOPMENT

This application must be accompanied by either:

~~a) An environmental impact statement in the case of designated development. The N.S.W. Department of Planning should be consulted for information pertaining to the formulation of such environmental impact statement; or~~

b) A statement of environmental effects containing information as to the likely environmental impact of the proposal.
ALSO REFER TO SECTION 90 ASSESSMENT ATTACHED.

(Delete whichever is not applicable)

Answering the following questions will generally satisfy the required information for a statement of environmental effects. Consideration should also be given to proposed steps to be taken to mitigate any likely adverse environmental impact.

1. In what ways will the site be altered by the development (eg tree removal, cut and fill, demolition etc)?

INCREASE IN FINISHED GROUND LEVEL TO A SIMILAR TO ADJACENT LAND

2. What waste products will be generated by the proposal (eg noise, effluent, odours, pollution etc)? If any please identify types and quanties and proposed means of disposal or mitigation.

HAULAGE VEHICLES NOISE AND DUST - OWNER WILL MITIGATE BY ADOPTING INFREQUENT TRUCK MOVEMENTS AND RESTRICT HOURS TO BETWEEN 7.00 AM & 5.00 PM.

3. Will the development, when completed, generate any additional traffic (eg vehicular, pedestrian etc.)? If yes please identify types and forecast numbers.

NO ADDITIONAL TRAFFIC AFTER COMPLETION

4. Will the development produce any overshadowing or loss of privacy on adjacent properties? If yes, provide details.

NO OVERSHADOWING OR LOSS OF PRIVACY ANTICIPATED

5. Are there any other special or significant factors of which Council should be aware?

FLOOD IMPACT WILL BE INSIGNIFICANT DUE TO NON DIVERSION OF WATER TOWARDS URBAN AREAS ~~AND~~ WITH FILL BEING OF SIMILAR ~~HEIGHT~~ TO ADJACENT URBAN LAND.

It is extremely important that all of the relevant sections of this application form are completed, and that all required documentation (e.g. plans, statement of environmental effects, owner's endorsement, E.I.S. etc..) accompanies this application. This will enable Council to determine the application promptly. Please contact Council's Town Planning Department for assistance.

REFERENCE SHOULD BE MADE TO THE EXPLANTORY NOTES OVERLEAF.

EXPLANATORY NOTES

It is noted that this is Council's sole development application form and hence only those parts which are relevant to the type of development being proposed need be completed.

The development application must contain sufficient information to enable Council to understand what the development proposal is and what its environmental effects are likely to be.

Three (3) copies of the plans and accompanying documentation are required to be provided with this application. In some instances additional copies may be required where referral to other Government Authorities (eg Traffic Authority of N.S.W.) is required.

The plans shall indicate the following:

a) The location, boundary dimensions, site area and north point of the land;

b) The existing vegetation on the land;

c) The location and uses of existing buildings on the land;

d) The existing levels/contours of the land;

e) The location and uses of buildings on adjoining sites.

Where applicable, the plans shall also indicate the following:

a) The location of the proposed buildings or works (including extensions or additions to existing buildings or works) in relation to boundaries of the land;

b) Floor plans of proposed buildings showing layout, partitioning, intended use of each part of the building and room sizes;

c) Elevations and sections showing proposed external finishes and heights in relation to Australian Height Datum and also giving the level of the top of the kerb adjacent to the site;

d) Proposed finished levels of the land in relation to buildings and roads;

e) Building perspectives where necessary to illustrate the proposed building;

f) Proposed parking arrangements, vehicular ingress, egress and movements on the land (including dimensions where applicable);

g) Proposed landscaping and treatment of the site (indicating plant types and their heights at maturity);

h) Proposed methods of draining the land. Where an easement over adjoining properties is required letters of agreement from the owners of those properties to grant the necessary easement rights are to be submitted with the application (sites are to be drained to Council's drainage system);

i) Details of any hazardous materials and associated safety procedures.

Development applications should be supported with additional material (e.g. photographs, written statements accompanying plans, sections, plans or letters from adjoining owners) if appropriate. Such submissions should demonstrate how the proposal achieves relevant Council Codes and L.E.P. objectives. Details of any departures from Council's requirements should be noted and justification provided.

IT IS EXTREMELY IMPORTANT THAT ALL OF THE RELEVANT SECTIONS OF THE APPLICATION FORM ARE COMPLETED. THIS WILL ENABLE COUNCIL TO DETERMINE THE APPLICATION PROMPTLY.

1. SECTION 90 ASSESSMENT

The compliance with the relevant sub-sections of Section 90 are discussed below:-

(a) The provisions of -

i. any environmental planning instrument;

ii. any draft environmental planning instrument that is or has been placed on exhibition pursuant to Section 47(b) or 66(1)(b);

iii. any draft State environmental planning policy which has been submitted to the Minister in accordance with Section 37 and details of which have been notified to the consent authority; and

iv. any development control plan in force under Section 51A or 72 that applies to the land to which the development application relates;

The principal document applying to this land is the Ballina Local Environmental Plan 1987, which zones the land Rural 1(b) (Secondary Agricultural Land). This LEP has adopted, where appropriate the Model Provision. In this regard Clause 34 of the Model Provision has been adopted. Clause 34 required the carrying out of any work in a flood prone area to obtain Council consent.

(a1) the provisions of -

i. any conservation agreement entered into under the National Parkes and Wildlife Act 1974 and applying to the whole or part of the land to which the development application relates; and

ii. any plan of management adopted under that Act for the conservation area to which the agreement relates;

Not applicable.

(b) the impact of that development on the environment (whether or not the subject of an environmental impact statement) and, where harm to the environment is likely to be caused, any means that may be employed to protect the environment or to mitigate that harm;

The cleared and vacant land consists of sand based natural soils. The proposed fill will be a sand type and be compatible to the existing soils which will promote growth of similar vegetation and have no effect on local fauna activity. There is a possibility of adverse flood effects. This is discussed under Clause (g) of this document.

(c) the effect of that development on the landscape or scenic quality of the locality;

The adjoining land to the south and east has been filled for residential use. The subject fill will be of similar height and will not conflict with the landscape or scenic quality of the locality.

(c1) the effect of that development on any wilderness area (within the meaning of the Wilderness Act 1987) in the locality;
Not applicable

(c2) the effect of that development on critical habitat;

The cleared site does not currently encourage or promote an active habitat environment. Therefore no critical habitat degrading is anticipated.

(c3) whether there is likely to be a significant effect on threatened species, populations or ecological communities, or their habitats;

No significant effect is expected due to the adjoining dense flora environment. Movement of all species into this area from the site would have already taken place. The site is currently cleared.

(c4) any relevant recovery plan or threat abatement plan;
Not applicable

(c5) the effect of that development on any other protected fauna or protected native plants within the meaning of the National Parks and Wildlife Act 1974;

No effect due to reasons given above.

(d) the social effect and the economic effect of that development in the locality;

The proposed fill will provide for a suitable dwelling site on the land. This future dwelling will be compatible with the adjoining residential environment. Therefore no negative social or economic effect can be anticipated.

(e) ***the character, location, siting, bulk, scale, shape, size, height, density, design or external appearance of that development;***

All of these aspects will not stand out due to the similarity of the proposed development with the adjoining filled residential land.

(f) the size and shape of the land to which that development application relates, the siting of any building or works thereon and the area to be occupied by that development;

The land will appear to be a natural extension of the residential areas of Wardell, notwithstanding the future construction of only one dwelling on the land.

(g)whether the land to which that development application relates is unsuitable for that development by reason of its being, or being likely to be, subject to flooding, tidal inundation, subsidence, slip or bush fire or to any other risk;

The site is subject to flooding and bushfire. In relation to flooding, the proposed fill height of R.L. 2.53 AHD is a minimum level nominated verbally by Council in November 1996.

It will be recognised the site is immediately downstream of Wardell's 'high land' and existing filled residential land. It is therefore protected from the immediate flood flow path but will still have an effect on the floodplain. This effect is considered to be insignificant due to its non-protrusion into the flood flow because of the diversion of flood waters caused by the high land just west of the site. Flows will be away from the site as indicated by figures 2.9, 2.11, 2.13 and 2.15 of the "Ballina Floodplain Management Study - Final Report (Draft)" - July 1996.

The additional fill in the floodplain will displace floodwater. However the small area and volume(7500 sq.m/ 7200 cu. m) compared to the available floodplain for a 10 year peak flood will produce an insignificant increase in water height. An actual figure has not been calculated due to the small site area and its location within the floodplain. Its effect on the 20, 50 and 100 year peak flood heights is of a less impact.

In relation to bushfire, the site is clear and vacant. Extensive tree growth and vegetation adjoins the site on the western and northern sides. The anticipated or future rural dwelling and associated buildings will require fire protection requirements, however the proposed fill will only improve the fire protection to the adjoining residential land. The fill is inert to any fire hazard from adjacent land.

(h) ***the relationship of that development to development on adjoining land or on other land in the locality;***

It will be very compatible to the adjoining residential land. It will not conflict with the other land in the locality due to the items covered above.

(i) ***whether the proposed means of entrance to and exit from that development and the land to which that development application relates are adequate and whether adequate provision has been made for the loading, unloading, manoeuvring and parking of vehicles within that development or on that land;***

The proposed means of vehicular access will be from the existing Fitzroy Street road pavement and existing piped access onto the land. The size of the land will allow all vehicles to enter and exit in a forward direction as well as an adequate area to park on site.

(j) ***the amount of traffic likely to be generated by the development, particularly in relation to the capacity of the road system in the locality & the probable effect of that traffic on the movement of traffic on that road system;***

The fill will be delivered generally on an infrequent basis. The existing road carriageway within Wardell and its rural area are of adequate width to accept the additional truck loads of fill. Frequency is anticipated to be not more than one truck per hour on an average basis.

(k) whether public transport services are necessary and, if so, whether they are available and adequate for that development;
Not applicable

(l) whether utility services are available and adequate for that development;

Verbal advice from Council indicated that both water supply and sewerage will be available to the site for a future rural dwelling and associated buildings.

(m) whether adequate provision has been made for the landscaping of the land to which that development application relates and whether any trees or other vegetation on the land should be preserved;

There are no established trees on the site and the four established species on the footpath will not be effected. It is anticipated that the future development of the filled site will provide acceptable landscaping.

(m1) whether that development is likely to cause soil erosion;

Soil erosion and sediment control devices will be constructed to contain this within the site.

(n) any representations made by a public authority in relation to that development application, or to the development of the area, and the rights and powers of that public authority;
Not applicable

(o) the existing and likely future amenity of the neighbourhood;

This development will be compatible and blend in with the existing and likely future amenity of the neighbourhood because adjacent sites have been filled to a similar height.

(p) any submission made under Section 87;
Not applicable

p1) without limiting the generality of paragraph (a), any matter specified in an environmental planning instrument as a matter to be taken into consideration or to which the consent authority shall otherwise have regard in determining the development
Not applicable

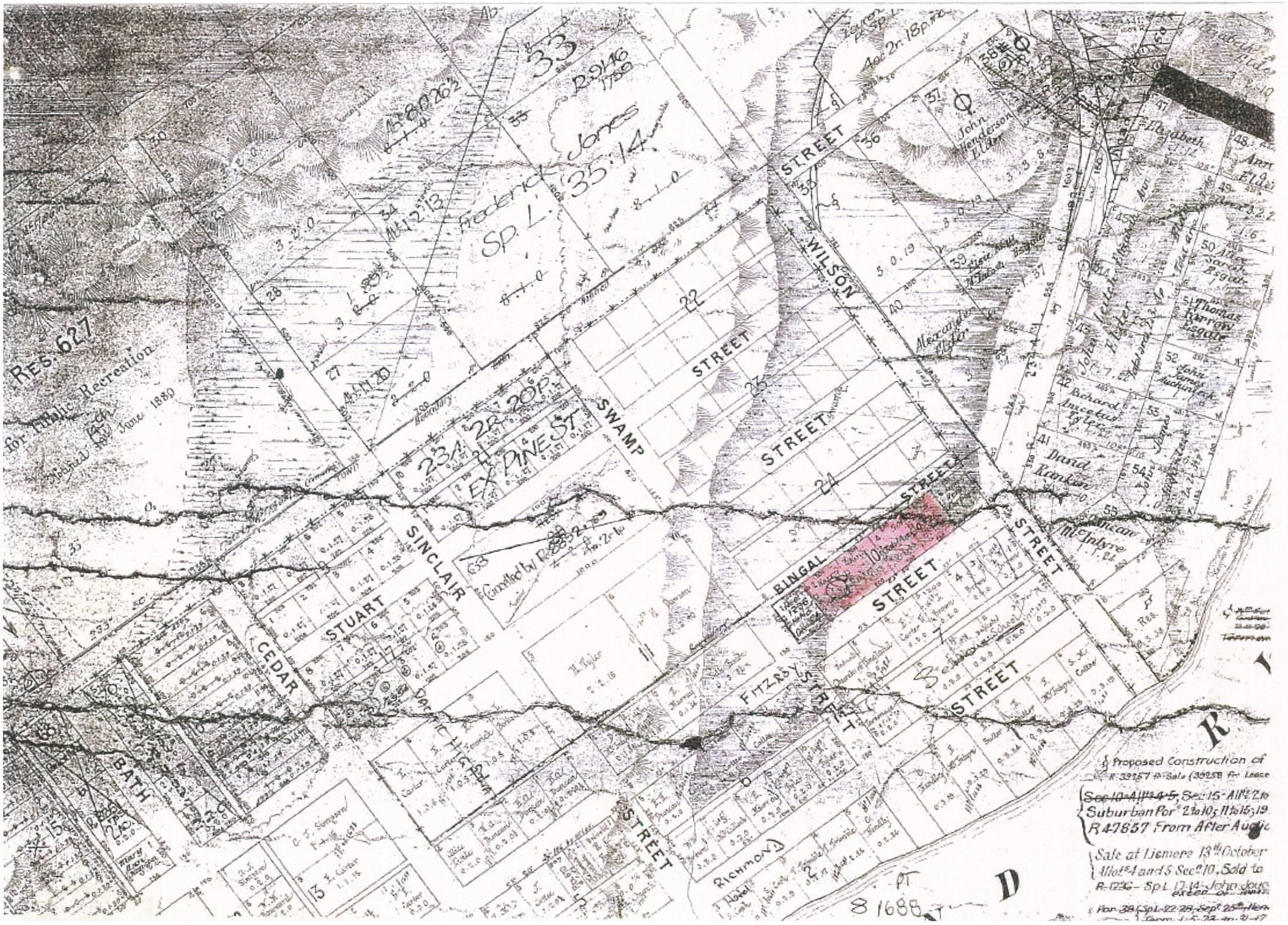
(q)the circumstances of the case

This proposal is located alongside the Wardell village zone. Much of the land within the village adjacent to this property is already filled to a height equal, or greater, than that proposed.

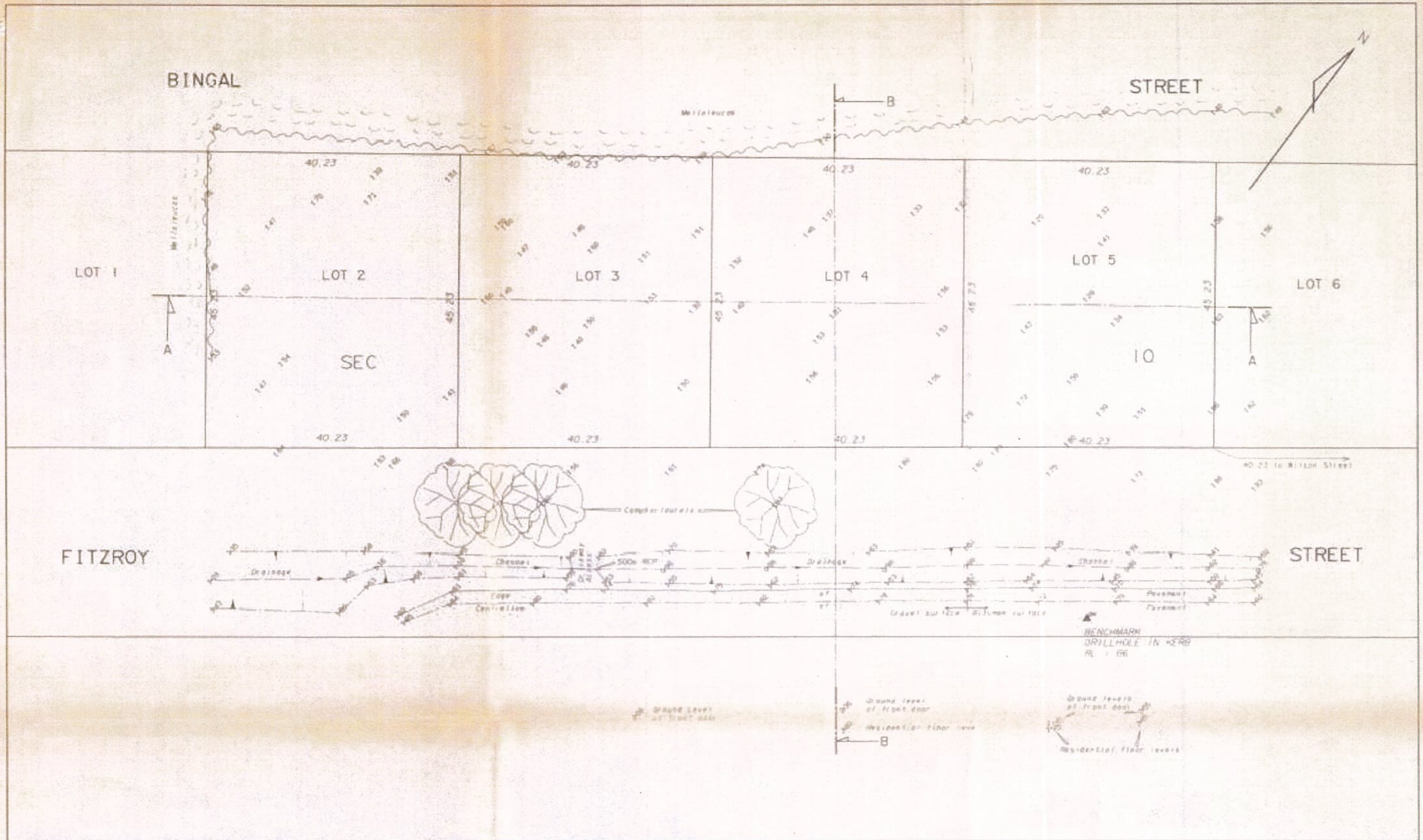
(r) the public interest;

The site is adjacent to dwellings constructed within the village zone of Wardell. The rural area and volume of this filling with respect to the available floodplain will produce an insignificant increase in flood levels in the immediate vicinity.

(s) any other prescribed matter
Not applicable



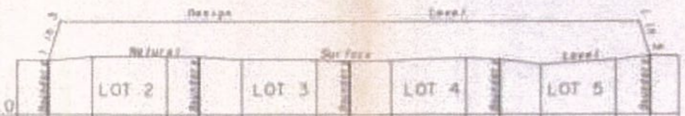
RES. 627
for Public Recreation
STREET
WILSON
SWAMP
STREET
STREET
STREET
SINCLAIR
STUART
CEDAR
BATH
BINGAL
STREET
FITZROY
STREET
STREET
RICHMOND
STREET
EX PINE ST.
231 2R 20P.
Frederick Jones
Sp. L. 35:14
33
R 9146 1750
John Henderson Elder
Alexander Elder
David Rankin
Richard Ancetus Tyler
Duncan McIntyre
Thomas Farrow Esquire
Cancelled by R 8883
8 1688
Proposed Construction of
Suburban Por^s 2 to 10; 11 to 15; 19
R 47857 From After Auction
Sale at Lismore 13^th October
Allot^s 4 and 5 Sec^n 10. Sold to
R
D



ISS / DESCRIPTION / DATE / APP	LOCALITY: WARDELL	DATUM: AHD	PROJECT: DEVELOPMENT APPLICATION	GALLEN HART & ASSOC.PTY.LTD. Registered Land & Engineering Surveyors
	MUNICIPALITY/SHIRE: BALLINA	ORIGIN OF LEVELS: SSM 64279		88 Magellan St LISMORE 2480 Phone (066) 221177 / 101 Summerland Way KYOGLE 2474 Phone (066) 322310
	CITY:	AZIMUTH OF SURVEY:		
	PARISH: BINGAL	SCALE: 1 : 400	CLIENT: MAL SLY	
	COUNTY: ROUS			

DRAWING TITLE: DETAIL AND SPOT LEVELS LOTS 2,3,4 & 5 in SECTION 10

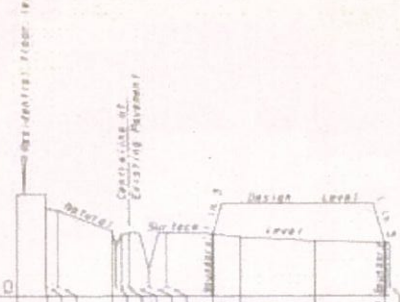
SURVEYOR	DRAWN	CHECKED	DATE	TITLE	C/FILE	#	SHEET NO.	ISSUE	REF NO.
TB/VC	TB	DS	5.2.97	A2A2	2753PLN1		1 OF 2		2753



Datum R.L. 0.0	0.00	8.25	20.00	40.00	49.50	60.00	80.00	86.75	100.00	120.00	128.90	140.00	160.00	165.21	175.88
			LOT 2			LOT 3				LOT 4			LOT 5		
FILL (HEIGHT)		0.00	1.05	0.94	0.96	1.03	1.03	1.08	1.05	0.98	1.02	1.15	1.03	0.00	
DESIGN LEVEL		1.48	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	2.53	1.61	
NATURAL SURFACE	1.50	1.48	1.48	1.59	1.57	1.50	1.50	1.45	1.48	1.55	1.51	1.38	1.50	1.61	1.50
PEGGED CHAINAGE	0.00	8.25	20.00	40.00	49.50	60.00	80.00	86.75	100.00	120.00	128.90	140.00	160.00	165.21	175.88

SECTION A-A

Scales Horizontal 1:1000
Vertical 1:100



Datum R.L. 0.0															
FILL (HEIGHT)											0.00	0.90	1.00	0.00	
DESIGN LEVEL											1.73	2.53	2.53	1.47	
NATURAL SURFACE	[illegible]	[illegible]	[illegible]	[illegible]	1.60	1.40	1.70	1.34	0.96	1.74	1.73	1.63	1.53	1.47	1.49
PEGGED CHAINAGE	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	10.00	22.58	30.00	50.00	58.88	75.00

SECTION B-B

Scales Horizontal 1:1000
Vertical 1:100

LOCALITY: WARDELL	DATUM: AHD	PROJECT: DEVELOPMENT APPLICATION	GALLEN HART & ASSOC.PTY.LTD. Registered Land & Engineering Surveyors
MUNICIPALITY/SHIRE: BALLINA	ORIGIN OF LEVELS: SSM 64279		68 Magellan St, LISMORE 2480, Phone (066) 221171
CITY:	AZIMUTH OF SURVEY:		101 Summerland Way, KYOGLE 2474, Phone (066) 322330
PARISH: BINGAL	SCALE: AS SHOWN	CLIENT: MAL SLY	DRAWING TITLE: LONG SECTIONS
COUNTY: ROUS			

ISS	DESCRIPTION	DATE	APP

SURVEYOR	DRAWN	CHECKED	DATE	TITLE	C/FILE	#	SHEET NO.	ISSUE	REF NO.
TB/VG	TB	DS	5.2.97	A2A2	[illegible]		2		2753