Preliminary Site Contamination Report

Proposed TAFE Connected Learning Centre
Lot 12 DP 1189646,
No 42 Wallum Place Byron Bay

HEALTH SCIENCE ENVIROMENTAL EDUCATION
ENVIRONMENTAL AUDITOR

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No 42 Wallum Place Byron Bay

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Tim Fitzroy & Associates
ABN: 94120188829
ACN: 120188829

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Tim Fitzroy
Director

Date: 18 May 2021

environmental

Tim Fitzroy
Environmental Health Scientist
Environmental Educator
Environmental Auditor

61 Pine Avenue
East Ballina NSW 2478
T | 02 6686 5183
M | 0448 483 837
tim@timfitzroy.com.au
www.timfitzroy.com.au

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1. Introduction

Tim Fitzroy & Associates (TFA) has been engaged by Byron Shire Council (the client) to undertake a preliminary site contamination investigation to accompany the Development Application (DA) to Byron Shire Council (BSC) for the development of an educational establishment, being a TAFE Connected Learning Centre (CLC), to be located at Bayshore Drive, Byron Bay (Lot 12 DP1189646) (see **Figure 1**).The development will be known as TAFE CLC Byron Bay. This report is limited to the site of the proposed TFAFE within a 3,500m2 parcel along the southern edge of the site.

This report should be read in conjunction with TFA's General limitations to environmental information in Section 1.5.

1.1 Background

The subject site is owned by Byron Shire Council (BSC) and was historically used by BSC for the storage of a range of construction materials, including concrete and timber products, soils, gravels, sands, wood chip and mulch and an assortment of surplus fill materials derived from a multitude of construction works. Over the past 7 years various studies were undertaken to assess the materials on site and to plan the clean-up process culminating in the development of an adopted strategy, formalised in close collaboration with the NSW Environmental Protection Agency (EPA). Following the approval of a Plan of Management submitted by Council, the EPA issued a license for the works. Final approval of the completed clean-up was issued 1st May 2017, with the lifting of the EPA license**.**

An engineering survey of the site located property boundaries and identified significant land features, including stockpiles of various imported materials stored on site. A detail survey provided site contour levels and geographic co-ordinates. More detailed investigation by visual observation and limited site excavation (30 test pits) revealed a range of materials totalling approximately 16,630 m3 stockpiled on site, of which only 2,130 m3 are considered suitable for construction use. This latter and smaller fraction comprised hard rock; road base material; coarse sand; black coastal sands; vegetative mulch and wood chip. The bulk of the stockpiled material 14,500m3 or (27,550t) comprised uncontrolled soils, intermingled with uncontrolled quantities of vegetative matter, concrete fragments and other extraneous materials derived from past Council construction & maintenance works, all of which was unsuitable as select fill material in its current state.

The report provided costs estimates based on limited site investigation and testing of the materials present. More detailed testing of the materials was not considered practical due to the extensive quantities involved and the uncontrolled way the material has been stockpiled. Essential elements of the clean-up included removal of vegetation; removal and disposal of waste building materials; removal of reusable bridge girders and other reusable items; removal of stockpiles of useable construction gravels; levelling and final trimming of the site and habitat enhancement.

In addition to these works, the processing and disposal of the estimated 27,550 tonne of uncontrolled mixed fill stockpiled on the site, was identified as being required. There was at that time, some question as to whether use of the stockpiled materials to fill and level the site, was permissible under the legislation. The report cautioned that there were potential concerns that the mixed fill material may constitute "contamination" under the

State Environment Planning Policy No 55 (SEPP55), requiring special treatment in the clean-up. A SEPP55 Assessment was prepared by BMACK (2014) as part of this study. That report concluded there is no evidence of such contamination, but visual monitoring and limited testing of the stockpile for environmental contaminants as it is disturbed, was recommended.

Importantly, it was also considered relevant to ascertain whether the materials deposited on site should be defined as “waste” under The Contaminated Land Management Amendment Act 2008 (NSW) (Amendment Act), the POEO Act or The Protection of the Environment Operations Amendment (Illegal Waste Disposal) Bill 2013. In this regard the report recommended Council seek legal advice with respect to its legal responsibilities under the legislation, especially those provisions which may allow retrospective action against Council by a purchaser or regulatory authority, for clean-up of the site. The report recommended:

- Council was obliged to clean up the site prior to its development or sale under the legislation.
- Any proposal to clean up the site would involve significant cost, not without some financial risk, given the quantity and uncertain mix and quality of the bulk of the materials stored on site and haphazard nature of its storage.
- Development approval would be required for the cleaning up of the site and subsequent filling.
- Clearing and removal of vegetation on the site was feasible, subject to the constraints and recommendations of the Flora and Fauna assessment.
- Building and demolition waste stored on the site would require disposal to an appropriate waste centre.
- Advantageous use of good quality materials stored on site was feasible, but there was likely some cost benefit in using some of these materials to improve the quality of existing mixed soil stockpiles, rather than exporting them;
- The bulk of the soil material stockpiled on site was of mixed and uncertain quality and was unsuitable to be used as select fill on the site in its current state;
- Screening and sorting of the large soil stockpile (27,550 tonnes) was required to remove extraneous materials such as steel, concrete, timber, vegetation, and other minor items and to provide a graded end product for further processing and improved end use;
- 70% of the mixed soil stockpile (19,295 tonnes) was likely to be of sufficient quality to provide a select fill material to fill the site;
- The balance 30% of the mixed soil stockpile (8,265 tonnes) was likely to remain unsuitable following initial (primary) sorting. The report therefore proposed that this material be further processed and sorted, with waste products to be disposed of as C&D waste, leaving a balance of 6,887 tonne of untested, blended soil and vegetative material.
- Subject to testing and appropriate mix design, this 6,887 tonne of blended material be mixed with suitable products to provide a blended, low grade garden soil mix to be offered for sale through landscape suppliers to recover part or all of the processing costs.

The recommended option for clean-up and restoration of the site included the completion of essential works as described in the report and the filling of 2.7ha of the site to a level of 5.05m AHD using a blend of screened site soils mixed with imported select gravels to yield a select fill. The report observed that the proposed works would likely result in an excess 17,908 tonne of clean fill material which would need to be removed from site.

The report thus recommended either offering the material for separate sale or processing and blending to produce a low-grade garden soil.

As early as 2013, Council advised the NSW Environmental Protection Authority of its intention to clean up the site. In so doing Council sought the advice and assistance of the EPA in completing the works. In a letter dated 8 November 2013, the EPA drew Council's attention to its obligations under the Protection of the Environment Operations Act 1997, indicating it was investigating this matter in relation to alleged breaches. Even so, in a letter of 11th April, 2014, the EPA later welcomed the actions taken by Council to allocate funds for further site investigations aimed at cleaning up of the site, but cautioned that such advice may be accompanied by measures for formalise such work to ensure it progressed in a timely manner. A License was subsequently applied for and issued (License No. 20731).

NSW Environmental Protection Officers conducted routine surveillance of the works, with Departmental Officers inspecting progress on several occasions. These same officers provided practical input and advice to the team throughout.

During the progress of the works, a question regarding the compliance of the processed material with NSW EPA Excavated Natural Material Order 2014 was raised. This classification allows the material to be applied to land as engineering fill for use in earthworks primarily on the site of origin, or at other sites, as the soil is exempt from classification as a waste product. An exemption under the ENM was sought and approved by EPA, thus allowing materials to be used as fill on the site and to be offered for sale to interested third parties.

An extension of the license was sought for delays due to wet weather conditions and other unanticipated complexities arising during the civil works. The extension was approved.

On completion of the works and application for surrender of the license was lodged with the NSW EPA. A final report was lodged with the EPA in Accordance with the License requirements. The EPL was rescinded in May 2017.

Discussion

The assessment with respect to potential site contamination is limited to waste characterisation of existing stockpiles coupled with visual assessment and a couple of grab water samples of surface water. TFA cannot identify any evidence of sampling and analysis of insitu soil or groundwater conditions. Advice from former council employees indicates that the site has been filled with clay, the actual level is unknown. In addition, the site has been filled and levelled to between 4.0 and 5.5mAHD with screen stockpiled material. The depth of fill from across the site is unknown however it is anticipated that fill in the location of the proposed TAFE learning centre is in the order of 1m in depth

Given the focus of the previous preliminary site investigation (BMack, January 2014) on the existing stockpile no appropriate assessment in accordance with the SEPP 55 guidelines of the soil or groundwater has been undertaken.

The historical site investigation appears sound except for the quality and accuracy of the historical aerial photos, lack of Land Titles History and planning certificate.

Conclusion

TFA concluded that a Preliminary Site Investigation under SEPP 55 of the proposed site for the TAFE Learning Centre is required to accompany any future Development Application for the subject site.

1.2 Objectives

This report has been prepared to accompany a Development Application to BSC to specifically address potential contamination issues from past and current uses on the site of the proposed Technical and Further Education (TAFE) Learning Centre Lot 12 DP1189646, No.42 Wallum Street Byron Bay.

State Environmental Planning Policy No. 55 – Remediation of Land (SEPP 55) relates to contaminated land issues. Clause 7(1) of SEPP 55 sets out the obligations a planning authority must consider when granting a development application. Clause 7 relevantly provides:

7 Contamination and remediation to be considered in determining development application

(1) A consent authority must not consent to the carrying out of any development on land unless:
(a) it has considered whether the land is contaminated, and
(b) if the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for the purpose for which the development is proposed to be carried out, and
(c) if the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied that the land will be remediated before the land is used for that purpose.
(2) Before determining an application for consent to carry out development that would involve a change of use on any of the land specified in subclause (4), the consent authority must consider a report specifying the findings of a preliminary investigation of the land concerned carried out in accordance with the contaminated land planning guidelines.
(3) The applicant for development consent must carry out the investigation required by subclause (2) and must provide a report on it to the consent authority. The consent authority may require the applicant to carry out, and provide a report on, a detailed investigation (as referred to in the contaminated land planning guidelines) if it considers that the findings of the preliminary investigation warrant such an investigation.
(4) The land concerned is:
(a) land that is within an investigation area,
(b) land on which development for a purpose referred to in Table 1 to the contaminated land planning guidelines is being, or is known to have been, carried out,
(c) to the extent to which it is proposed to carry out development on it for residential, educational, recreational, or childcare purposes, or for the purposes of a hospital—land:
(i) in relation to which there is no knowledge (or incomplete knowledge) as to whether development for a purpose referred to in Table 1 to the contaminated land planning guidelines has been carried out, and
(ii) on which it would have been lawful to carry out such development during any period in respect of which there is no knowledge (or incomplete knowledge).

As the land has been used for the storage of a range of construction materials, including concrete and timber products, soils, gravels, sands, wood chip and mulch and an assortment of surplus fill materials derived from a multitude of construction works therefore clause 7 applies.

This report has been prepared to satisfy Council that the site is suitable for the use proposed in the development application.

1.3 Proposed Development

The proposed development will involve:

- the construction of a Connected Learning Centre by TAFE NSW. Overall, the development will feature the following: (see **Figure 2**).

Overall, the development will feature the following:

- Two buildings consisting of: -
  - Maker Space:
    - Mobile Training Unit
    - Maker Space
  - Connected Learning Centre:
    - Group Learning Areas
    - Media Lounge
    - Tech Bar
    - Kitchenette
    - Computer Hubs
    - Print Shop
    - Amenities
  - Outdoor Learning Area
  - Landscaping
  - At-grade Carpark

1.4 Summary

The site forms a small part of the north eastern corner of an original land grant of some 446 acres issued in 1923. Portion 305 was established by Land Grant to Andersons Sausages Pty Ltd, on 17 September 1923. Portion 305 had an area of 446 acres. Anecdotal evidence indicates that Andersons used the land as a holding paddock for meatworks stock, primarily cattle, through until the late 1960's. That same evidence also suggests there may have been a small piggery situated to the south of Lot 2 (the subject site), with dilapidated structures reportedly remaining circa 1950-60's.

The subject site is owned by Byron Shire Council (BSC) and was historically used by BSC for the storage of a range of construction materials, including concrete and timber products, soils, gravels, sands, wood chip and mulch and an assortment of surplus fill materials derived from a multitude of construction works. Over the past 7 years various studies were undertaken to assess the materials on site and to plan the clean-up process culminating in the development of an adopted strategy, formalised in close collaboration with the NSW Environmental Protection Agency (EPA). Following the approval of a Plan of Management submitted by Council, the EPA issued a license for the works. Final approval of the completed clean-up was issued 1st May 2017, with the lifting of the EPA license.

This investigation is Tier 1 - preliminary site investigation, which is required to determine if contamination of the site's soil has occurred from past land usage in accordance with NEPM 1999 (2013), DUAP and EPA (1998). The investigation includes obtaining a history of land usage on the site and a preliminary soil-sampling regime.

The results of the soil sample and groundwater analysis are compared with the Health Investigation Levels (HIL's) and Ecological Investigation Levels (EILs) outlined in NEPM 1999 (2013).

A total of 22 soil samples (plus QA samples) for metals, organochlorines, hydrocarbons, PAH and BTEXN and asbestos were collected from across the site for the proposed TAFE coupled with 1 round of sampling from three Groundwater Wells (GW1, GW2 and GW3). 21 soil samples were also collected for asbestos.

All of the soil and groundwater samples show contaminant levels well below the most stringent Australian and New Zealand Environment and Conservation Council (ANZECC), National Environment Protection Measure (NEPM 2013) for the most stringent HILA Residential with garden/accessible soil also includes children's day care centres, preschools and primary schools and Ecological Soil Investigation Levels (NEPM 2013).

A Radiation survey of surface soils conditions across 11 locations indicated compliance with the National Health and Medical Research Council (NHMRC 1984) and NSW EPA Action Level Criteria for dwellings, schools (including playgrounds), businesses, factories, etc. where occupancies by the same individuals occur regularly on a day by day basis, the remedial action level should be 0.7uSv.hr^{-1} for all points at 1 metre above the area of concern on the property.

Based on the extensive site history, site inspection and the laboratory results from soil and groundwater sampling; together with radiation survey of surface soils there is a low level of risk that the proposed site for the TAFE Connected Learning Centre is contaminated with residual chemicals from activities associated with current or past land use.

Based on the outcomes of this PSI there is no impediment to Development Consent being issued for the proposed TAFE Connected Learning Centre as described in Development Plan (see **Figure 2**).

1.5 Scope of Works

The objective of this preliminary investigation has been to determine if land contamination has occurred from historical and current land use activities occurring on site or immediately nearby. To determine if the site poses a significant risk of harm to end users (and nearby sensitive receptors), available historical information has been reviewed and a number of soil and groundwater samples have been collected and analysed for a range of contaminants typically associated with the land uses identified as having occurred on site including metals, hydrocarbons, asbestos, BTEXN. In addition, a survey for radiation has been undertaken.

The results of the soil analysis are compared to relevant National Environmental Protection Measure (NEPM 1999 updated 2013) guidelines in order to assess the significance of risk. This investigation is considered to be Stage 1 of the Managing Land Contamination Planning Guidelines (DUAP and EPA, 1998) or a Preliminary Site

Investigation (PSI; NEPM 1999). If contamination levels exceed the adopted EPA acceptable levels, a detailed investigation is then required (i.e., a Stage 2 investigation or Detailed Site Investigation (DSI)). If the contamination levels are below the relevant acceptable levels, and information gathered as part of the investigation also supports that contamination was unlikely to have occurred; only a Stage 1 (or PSI) investigation would be required.

This preliminary investigation has been used to identify the following:

- Past and present potentially contaminating activities occurring on or near the site; and
- The presence of Potential Contaminants of Concern associated with the identified land uses.

The investigation will also:

- Discuss the site condition;
- Provide a preliminary assessment of the site's contamination status; and
- Assess the need for further investigations.

Relevant documents considered in the preparation of this investigation included:

- ANZECC and NHMRC (1992) Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites;
- Council of Standards Australia (2005) AS 4482.1-2005 Guide to the sampling and investigation of potentially contaminated soil – Non-volatile and semi-volatile compounds;
- NSW DEC (2006) Contaminated Sites – Guidelines for the NSW Site Auditor Scheme 2nd Edition;
- NSW EPA (1995) Contaminated Sites – Sampling Design Guidelines;
- NSW EPA (2011) Guidelines for Consultants Reporting Contaminated Sites; and
- National Environment Protection Council (NEPC) (2013) National Environment Protection (Assessment of Site Contamination) Measure

This preliminary assessment report is written in accordance with the new Contaminated land guidelines (NSW Environment Protection Authority 2020) and the Northern Rivers Regional Councils (NRRC) Regional Policy for the Management of Contaminated Land (NRRC 2006).

1.6 General limitations to environmental information

TFA has conducted the services in a manner consistent with the appropriate levels of care and rigour expected of members of the environmental assessment profession. No warranties or guarantees, expressed or implied, are made.

The findings of this report are strictly limited to identifying the environmental conditions associated with the subject property in regard to site contamination, and does not seek to provide an opinion regarding other aspects of the environment not related to site contamination, or to the suitability of the site in regard to: landuse planning and legal use of the land; and/or regulatory responsibilities or obligations (for which a legal opinion should be sought); and/or the occupational health and safety legislation; and/or the suitability of any engineering design. Reviews of such information are only in relation to the contaminated land aspects of any project or site. If specialist technical review of such documents is required, these should be obtained by an appropriate specialist.

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

Furthermore, the test methods used to characterise the contamination at each sampling location are subject to limitations and provide only an approximation of the contaminant concentrations. Monitoring and chemical analytes are based on the information detailed in the site history. 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 at the site should not be interpreted as a warranty or guarantee that such materials do not exist at the site. Therefore, future work at the site which involves subsurface excavation or removal of structures or parts thereof, should be conducted based on appropriate management plans. These should include, inter alia, environmental management plans, including unexpected findings protocols, hazardous building materials management plans, and occupational health and safety plans.

2. Site identification and Surrounds

2.1 Site Description

The subject site is located approximately 4 km west of the Byron Bay town centre on Bayshore Drive. Situated in the north-western corner of the Byron Bay Arts and Industrial Estate, the land has frontage to Bayshore Drive, Byron Bay, NSW the site. Entrance to the site is approximately 600 metres north of the Ewingsdale Road / Bayshore Drive intersection.

The land the subject of the application is known as Bayshore Drive, Byron Bay, legally defined as Lot 12 in DP1189646 (host lot). The host lot has an approximate area of 5.7 hectares. The portion of the site the subject of the proposed development (the development site) will occupy an area of approximately 0.5 hectares, located in the south east corner of the host lot. A portion of the host lot is identified via the Byron Bay Local Environmental Plan 2014 (LEP) as a Deferred Matter however the development site does not affect this portion of the lot.

Vehicular access is provided by Bayshore Drive to the east, with the surrounding vicinity of the host lot being characterised as mixed use being commercial, industrial and residential land uses. The western boundary of the host lot is adjacent to areas zoned for rural and environmental land use respectively.

The land is owned by Byron Shire Council. The portion of the subject site on which the TAFE is to be located is considered generally level positioned at about RL 4.0m to RL4.35m Australian Height Datum (AHD).

A site locality diagram that shows the subject site is provided in **Figure 1**. A copy of the proposed development plan is located in **Figure 2**.

2.2 Zoning

The development site is zoned B7 Business Park under the Byron Local Environmental Plan (BLEP 2014) (see **Appendix B**).

2.3 Surrounding Landuse

Immediately east of the site on the opposite side of Bayshore Drive is the Sunrise Shopping Centre that contains a small supermarket, some specialty shops and car parking. To the north is the Habitat mixed use development. To the south is an existing light industrial subdivision including a car smash repairs, party hire, plant hire, printers, lemon myrtle products manufacture and a gallery. These uses are predominantly located on 1000 m2 lots created by the aforementioned registration of DP 812667, with a typical 25 m frontage to Centennial Circuit. To the west is the Byron Bay STP constructed wetland area, constructed circa 1989. To the south west is the Byron Regional Sports & Cultural Complex.

2.4 Surrounding Environment

To the north the site is screened by exotic vegetation and Swamp sclerophyll forest (Broad-leaved paperbark) with exotic or disturbed understorey. To the east the site is screened from Bayshore Drive by planted vegetation located along raised mounds around the site entrance and to the south. Species include Weeping bottlebrush, Willow bottlebrush and Lilly pillies. The groundcover is dominated by Guinea grass with patches of Lantana also present.

To the southeast the site is screened from adjacent light industrial users by Swamp sclerophyll forest (Broad-leaved paperbark with disturbed or exotic understorey) and to the southwest by a wide area of Grassland/sedgeland running along the southern boundary. To the west, the site is screened by exotic vegetation and Swamp sclerophyll forest (Broad-leaved paperbark) with heath understorey

2.5 Current Use

The site is unoccupied. Existing improvements include the stripping of site topsoil during the 1980’s and its replacement with imported clay fills material to provide a dry weather hard stand surface. Water and sewer reticulation services run adjacent to the site along Bayshore Drive and service the surrounding industrial and residential areas.

3. Environmental Setting

3.1 Local Meteorology

A summary of the climatic data from the Cape Byron AWS (located approximately 2.5 km from the site) is shown in Table 3.1.

Table 3.1 Climate Summary Byron Bay Lighthouse Weather Station

	Temperature ^{0}C		Rainfall mm	Mean number of raindays
	Minimum	Maximum	Average monthly	
January	21.3	28.0	153.4	14.6
February	21.1	27.6	156.1	14.9
March	20.2	26.6	150.9	16.9
April	17.6	24.0	168.5	15.1
May	15.1	21.5	89.5	13.2
June	13.2	19.4	174.9	14.3
July	12.3	18.9	80.9	11.4
August	13.1	20.1	72.4	7.8
September	15.3	22.1	52.0	9.3
October	16.9	23.6	91.4	12.6
November	18.6	25.3	87.6	11.2
December	19.9	26.6	123.0	13.5

3.2 Topography and Hydrology

The site is located in the north-western corner of the Byron Bay Arts and Industrial Estate. It has frontage to Bayshore Drive along its eastern boundary. The site is relatively flat and low lying at an original natural level of approximately RL 4 metres AHD. The site generally falls to the south west corner towards a wet, low lying area. Historically the drainage of the site is likely to have been ill-defined, a typical characteristic of the surrounding coastal back-dunal landforms.

The original local topography is understood to have been dominated by a high sand dune immediately to the south and west which formed a catchment boundary between the Cumbebin Swamp to the south and the Belongil Creek to the east. The construction of the Casino to Murwillumbah railway in the 1890's and sand mining in the 1960's reportedly (Appendix A - George Flick) is believed to have significantly changed the surface hydrology and flow patterns.

3.3 Geology and Soils

3.3.1 Geology

Based on the NSW Department of Planning & Environment Soil Landscapes of Central and Eastern NSW mapping (accessed January 2021), the site is located on the Blackrock landscape. Quaternary (Pleistocene) beach and dune sand. The soil materials are similar to Wardell (wa) and some type locations are shared.br1—Black loamy sand overlain bleached sand and black organic peat

The Tyagarah soil landscape typically comprises extremely low level to gently undulating beach ridge plains on Pleistocene beaches and dune sand. Elevation and relief are 1–2 m, slopes <5%. The topography is characterised by dune/swale systems aligned parallel to the coast. Dunes are very low (<3 m) and narrow to moderately broad (20–500 m), swales narrow to moderately broad (100–500 m). Dry and wet heathland occurs in dunes and swales respectively.

3.3.2 Soils

Based on the Atlas of Australian Soils mapping (accessed 19/03/2021), soil types within the area are expected to be Coastal plains, generally low lying, poorly drained, and subject to flooding (lower and middle reaches of river flood-plains, swamps, estuarine areas, and tidal marshes)

3.4 Acid Sulfate Soils

Based on the Atlas of Australian Acid Sulfate Soils, the site is mapped as an area of low probability of acid sulfate soils at 1 – 3 m below ground surface. This depth refers to natural soils however, i.e., aeolian alluvial soils at depths of 2 - 4 m.

A Geotechnical Investigation and Acid Sulfate Soil Assessment has been prepared by Douglas Partners and is submitted as part of the accompanying Development Application. The Preliminary Acid Sulfate Soil (ASS) Assessment states the following:

- *The existing plus potential acidity was calculated to be equal to or greater than 0.03%S in two of the sample tested; Bore 1 at 2m depth with a net acidity of 0.03% and Bore 6 at 0.5m depth with a net acidity of 0.06%.*
- *Further examination of the Scr results indicates the elevated existing plus potential acidity is due to TAA and therefore the soil assessed to be non ASS and as such, acid sulfate soil management plan (ASSMP_ will not be required if less than 1,000t (or 500m3) of soil is to be disturbed.*
- *If more than 1,000t is to be disturbed then the results indicate that an ASSMP will be required. Irrespective, due to the nature acidity in the soil, neutralisation against potential environmental harm will be required.*

3.5 Hydrogeology

Groundwater was observed between 1.15m and 1.5m below surface levels when auguring which infers an approximate groundwater level between RL 3.2 and 3.5m AHD. This is consistent with the low-lying nature of the site.

A search of NSW Department of Primary Industries Office of Water licensed bores within a 2km radius of the site identified 31 registered bores. The results of the groundwater bore search are summarised in **Table 3.2** below and included in full in **Appendix B**.

Table 3.2 Registered Groundwater Drillers Logs in the Locale

Groundwater No	Drillers Log	Distance	Direction
GW300897	0.00m-11.50m Sand	161m	South East
GW072870	0.00m-4.00m Indurated Sand	173m	East
GW070817	0.00m-4.00m Indurated Sand	247m	East
GW304393	0.00m-2.50m SAND GREY FINE 2.50m-11.30m COFFEE ROCK BROWN MG SOFT 11.30m-12.50m FREE FLOWING SAND LT BROWN MG	273m	East
GW072040	0.00m-10.00m Sand	290m	South East
GW303762	0.00m-1.00m FILL 1.00m-3.00m SAND GREY FINE 3.00m-11.00m COFFEE ROCK BROWN MG SOFT 11.00m-11.80m FREE FLOWING SAND LT BROWN MG	324m	South East
GW304408	0.00m-2.80m SAND GREY FINE 2.80m-10.50m COFFEE ROCK BROWN MG SOFT 10.50m-11.90m FREE FLOWING SAND LT BROWN MG	339m	East
GW302834	0.00m-2.00m Quartzose Sand	494m	North East
GW303501	0.00m-1.20m sand grey mg 1.20m-4.20m sand white 4.20m-11.80m coffee rock brown mg soft 11.80m-13.00m free flowing sand	543m	East
GW307517	0.00m-0.50m Soil; sandy, loamy 0.50m-1.20m Sand; graded brown to fine white 1.20m-4.50m Sand; grey, medium/fine 4.50m-4.60m Sand; firm, indurated 4.60m-5.80m Sand; medium, grey 5.80m-5.90m Sand; firm, indurated	592m	North East
GW303815	0.00m-0.90m SAND GREY FINE 0.90m-3.30m SAND WHITE FINE 3.30m-11.30m COFFEE ROCK BROWN MG SOFT 11.30m-12.20m FREE FLOWING SAND LT BROWN MG	601m	East
GW303829	0.00m-0.50m SAND GREY FINE 0.50m-3.00m SAND WHITE FINE 3.00m-12.50m COFFEE ROCK BROWN MG SOFT 12.50m-13.70m FREE FLOWING SAND LT BROWN MG	626m	South East
GW305127	0.00m-1.00m grey sand fine 1.00m-1.35m dark brown indurated sand (coffee rock0 1.35m-3.00m dark brown sand soft	637m	South West
GW303491	0.00m-0.80m fill 0.80m-4.00m sand white fine 4.00m-12.00m coffee rock 12.00m-13.00m free flowing sand	680m	South East
GW306890	0.00m-3.00m SAND GREY FINE 3.00m-12.20m ROCK COFFEE BROWN,SOFT 12.20m-13.00m SAND FREE FLOWING LT BROWN	708m	South East
GW302983	0.00m-2.40m Sand White Sand 2.40m-10.70m Coffee Rock Dark Brown 10.70m-12.20m Coffee Rock Brown 12.20m-12.80m Coffee Rock Light Brown 12.80m-13.40m Free Flowing Sand 13.40m-16.00m Sand Yellow	744m	South East
GW302840	0.00m-0.30m Organic Rich Sand 0.30m-3.00m Quartzose Sand 3.00m-3.70m Indurated Sand - Coffee Rock	758m	South
GW306448	0.00m-0.30m Soil, loose, peaty, saturated 0.30m-0.40m Peat. compacted, low permeability 0.40m-1.40m Sand, fine, grey, saturated, darker colour & odour with depth 1.40m-1.44m Rock, coffee rock base encountered, unable to penetrate with hand auger	758m	South West
GW302838	0.00m-0.20m Organic Rich Sand 0.20m-2.20m Quartzose Sand 2.20m-2.50m Coffee Rock - Indurated Sand	841m	West
GW302839	0.00m-0.50m Peat/Organic Silt 0.50m-3.00m Mud - Gel Like 3.00m-3.50m Quartzose Sand	841m	West
GW068851	0.00m-3.60m Sandy Soil 3.60m-12.00m Brown Clay 12.00m-13.00m Sandy Clay16.50m-20.70m Sandy Clay 20.70m-29.50m Clay & Stone 29.50m-34.00m Slippery Black Clay 34.00m-35.70m Clay With Rock Layers 35.70m-38.50m Hard Granite	887m	South East
GW306445	0.00m-2.20m Soil, sandy/silty, dark, rich, moist, very little seepage	928m	South West
GW306449	0.00m-0.35m Soil, dry, peaty 0.35m-0.45m Peat, compacted, low permeability 0.45m-2.08m Sand, fine, grey, saturated, darker colour & odour with depth. No bottom encountered	928m	South West
GW302841	0.00m-0.20m Organic Rich Sand 0.20m-2.00m Quartzose Sand	1003m	North
GW306447	0.00m-0.28m Soil, peaty, saturated, instant seepage from 0.05m 0.28m-0.40m Peat, compacted, low permeability 0.40m-1.40m Sand, fine, grey, saturated, darker colour & odour with depth 1.40m-1.40m Rock, coffee rock base encountered, unable to penetrate with hand auger	1051m	South West
GW306450	0.00m-0.10m Soil, reddish peaty organic matter 0.10m-0.45m Soil, peaty, saturated, instant seepage from 0.05m 0.45m-1.45m Sand, fine, grey, saturated, dark colour 1.45m-1.45m Rock, coffee rock base encountered, unable to penetrate with hand auger	1051m	South
GW306446	0.00m-0.28m Soil, peaty, saturated, instant seepage	1054m	South West
GW305135	0.00m-0.10m topsoil 0.10m-4.30m fine sand pale dark grey 4.30m-5.00m fine sand med brown - red 5.00m-6.00m indurated fine sand med brown - red	1259m	North
GW302842	0.00m-0.50m Soil/Road Base 0.50m-0.75m Fibric Peat 0.75m-1.80m Silty Sand 1.80m-2.00m Clayey Sand 2.00m-3.20m Sandy Mud 3.20m-3.50m Fine to course Sand	1395m	West

4. Site History

4.1 Land Use Summary

Based on the information provided within the historical aerial photographs and historical land title search's, the following key points into a timeline:

The site forms a small part of the north eastern corner of an original land grant of some 446 acres issued in 1923 (Appendix A). Portion 305 was established by Land Grant to Andersons Sausages Pty Ltd, on 17 September 1923. Portion 305 had an area of 446 acres. Anecdotal evidence indicates that Andersons used the land as a holding paddock for meatworks stock, primarily cattle, through until the late 1960's. That same evidence also suggests there may have been a small piggery situated to the south of Lot 2 (the subject site), with dilapidated structures reportedly remaining circa 1950-60's (Appendix A - George Flick).

Land Titles records show the transfer of the land to Andersons Meat Packaging Pty. Ltd. on the 8 June 1967, at which time the property reportedly (Appendix A - various interviewees) continued to be used as a holding paddock for stock for slaughter at the meatworks.

A further transfer of Portion 305 was registered on 6 June 1968, to F.J. Walkers (Byron Bay) Pty Ltd, the new owner / operator of the meatworks. The new owner continued to use the site as a holding paddock for stock (Appendix A - various interviewees). The title deed for Portion 305 was cancelled on 19 January 1981 and a new title issued registering new Lots 1 & 2 in Deposited Plan No. 613937. The site was included in the newly created Lot 1.

A later subdivision creating industrial lots in Centennial Circuit, Byron Bay Industrial Estate is recorded in the registration of DP 812667. The subject site was included in the residual vacant allotment, Lot 25 of that subdivision. Byron Shire Council purchased Lot 25 DP 812667 in 1981 and subdivided it into 4 lots in 1998. Council retains ownership of lots 1, 2 and 4 of Deposited Plan (DP 1004514) which is shown at Appendix A. The sale of Lot 3 DP 1004514 was finalised in January 2000.

Sand mining is known to have occurred in the area in the 1960's. Byron Bay was reportedly home to the first sand mining operations in Australia which took place as early as 1934 when Zircon-Rutile Ltd formed to mine the beach sands along the coast of New South Wales. Byron Bay was chosen because the area contained a high concentration of mineral sands which were previously mined by gold prospectors.

The use of dredge mining had the potential to dramatically change the landscape. To establish a dredge mine the high dunes were levelled and vegetation stripped to create a dredge pond. The dredge used in what was described in a "wet extraction process" was continually moving, leaving behind the tailings sand as it progressed. Anecdotal evidence recalls that the West Byron area was thus mined by Cudgen RZ **(Appendix A - Ray Clark**) in the 1960's in what was known as the "high back dune" located to the south and west of the subject site, towards the existing Ozigo Service Station at the Ewingsdale Road / Bayshore Drive intersection (Appendix a - George Flick). These recollections are supported by aerial photographs dating back to 1947 which show disturbance of the sand dunes clearly visible (Appendix A). Department of Mineral Resources search (Appendix A - Trade & Investment, Regional Infrastructure & Services) locates a mineral lease formally operated by Cudgen RZ and approximately 400 metres to the south and passing within 150 metres to the west of the subject site. Remnants of an open drain, reportedly constructed by the sand mining company to deliver sea water pumped from the end of Greys Lane for wet extraction processing (Appendix A - George Flick) were evident in this proximity on the sewerage treatment plant site during its construction circa 1989 (Appendix A - Brian Mackney). Black mineral sands thus extracted were then delivered by truck to a dry processing plant at what is now the Woolworth's site in Byron Bay (Appendix A - Ray Clark). Following secondary "dry" processing the extracted minerals were bagged and transported by road to other ports.

It is also reported (Appendix A - George Flick) there may have been gold exploration within these same sand dunes in earlier times. Such recollections are consistent with Sweet (Queensland Historical Atlas), but no confirmed history of gold mining has been uncovered in this investigation, leading the author to the conclusion that if it did occur it was small scale.

Review of aerial photographs dating back to 1947 shows no disturbance on the subject site, although evidence of the aforementioned sand mining is clearly visible. Such observation is consistent with anecdotal reports (Appendix A - George Flick) that any mining focussed on the larger sand dune to the south and south west and within the sand mining lease area (Appendix A) some distance to the south and west.

Since purchase by BSC, the subject site has been used as a temporary depot for stockpiling and handling of Council construction materials.

Interview with Council Staff and Residents (BMack 2014)

Interviews were held with Council Staff and Residents were held with Brian Mackney as part of a Preliminary Site Contamination Assessment conducted in January 2014 (see **Appendix A**). Interviews were conducted with nineteen (19) past and present residents, including Byron Shire Council (BSC) staff, a former sand mining employee and a local farmer provide anecdotal evidence of the historical use of the site. These include interviews with the following

1. Chris Shevellar – former Shire Clerk BSC & long term resident
2. George Flick – local farmer and long term resident
3. Jim Clark – former accountant F.J. Walkers and long term resident
4. Garry MacDonald – former Shire Engineer & Chief Town Planner BSC and long term resident
5. Bill Knobel – former Deputy Shire Engineer BSC & resident.
6. Wes Johnstone – former Works Engineer BSC and long term resident
7. Brian Mackney – former Engineering Services Manager BSC & long term resident

8. Ian Cook – former senior assistance engineer BSC and long term resident
9. Ray Clark – former sand mining plant operator and BSC overseer & engineering assistant & long term resident
10. Col Hadwell – former Assistant Town Planner & Engineering Assistant and long term resident
11. Ian Pickles – former Chief Town Planner BSC
12. Harry Wilson – former BSC ganger and overseer and long term resident
13. Wayne Bertram, Development Compliance Manager, BSC
14. Tony Nash – BSC Works Manager
15. Kristian Penrose – BSC Works Engineer
16. Tony Buckley – BSC Overseer and long term resident
17. Rob King – BSC Overseer and long term resident
18. Alex Dichiera, Plant Operator / Truck Driver BSC and long term resident
19. Paul Green, BSC Truck Driver & Plant Operator & long term resident

These interviews provide anecdotal evidence of past landuses broadly described as follows:

Date	Registered Proprietor	Land Use
1923	Andersons Sausages Pty Ltd	Stock Holding Paddock for cattle. Possibility of a small piggery on the land during this period.
1950s-1960s	Cudgen RZ	Sand Mining on areas to the south, including rutile and possible earlier gold exploration.
1967	Andersons Meat Packaging Pty. Ltd.	Stock Holding Paddock
1968	F.J. Walkers (Byron Bay) Pty. Ltd.	Stock Holding Paddock
1981	Byron Shire Council	Vacant Land. Majority of the site stripped of topsoil and replaced by imported clay material to provide a “hard stand” work area.
1981-2020	Byron Shire Council	Council use as a storage area for construction materials and surplus excavated materials.
2020-Present	Byron Shire Council	Vacant Land

Anecdotal reports (Appendix A - Paul Green) indicate that following acquisition of the site, Council stripped the existing topsoil and replaced it with excess clay fill materials imported from construction of the Pacific Vista Estate in Byron Bay. Site inspection and excavation of test pits (Appendix A - Australian Soil & Cement) reveal local soils at depth overlain by a clay material similar in characteristic to the Pacific Vista materials and support these anecdotal reports.

The site remains unoccupied and without constructed improvements, although heavily disturbed, having been previously cleared, but now covered in extensive weeds, grasses and native regrowth. Interviews with Council works personnel, including present and past engineers, overseers and plant operators, indicate the materials deposited on the site over a twenty year period have been highly variable in quality. Site inspection suggests that these soils and gravel materials may be divided into three broad categories:

(i) Quality, well sorted materials such as hard rock, road base, and sands, suitable for use on construction projects;
(ii) Blended materials such as topsoil and quality fill material suitable for reuse on Council projects; and
(iii) Mixed materials of varying and uncontrolled quality with an expected highest use in their current condition, as cover material at the Myocum landfill.

Miscellaneous construction materials, including bridge timbers and concrete products, were also stored on the site. Council works staff report that some effort was made over time to maintain, as far as possible, the integrity of materials stockpiles on the site (Appendix A - Paul Green, Alec Dechiera & Ray Clark). Materials delivered to site have been routinely sorted and unsuitable waste materials disposed of at Myocum landfill. Clark also advised that he had directed an extensive clean up of the site during the 1990's in anticipation of a proposed sale of the property during that time. Despite this, the interviewees noted that the bulk fill material stockpile towards the centre of the site is likely to contain very poor quality excavated materials from road shoulders and drains, including possible quantities of vegetative matter and other extraneous matter, such as bottles and cans, rocks and pieces of concrete and the like, as might be expected to be recovered from maintenance works and is unlikely to be suitable for select fill.

The site has been partly accessible to the public since Council assumed ownership, implying a potential lack of control over illegal dumping on the site during that time. No confirmed evidence of such practices has been uncovered in this investigation, but the possibility that this occurred at times, remains (BMack 2014).

Visual observation, engineering survey and limited site excavation revealed the following range of soil and gravel materials were stored on site, totalling approximately 16,500 cubic metres. Only approximately 2,000 cubic metres were considered competent and suitable for construction use, in its present condition.
These materials included:

- Hard rock (360 cubic metres) derived from a variety of road construction works. Includes basalt rock of varying sizes extracted from NSW Roads & Traffic Authority roadworks during construction of a recent highway upgrade at Banora Point;
- Road base material (450 cubic metres) of unknown original;
- Fine sand (10 cubic metres) from an unknown source, possibly river washed;
- Black coastal sands (1,150 cubic metres), believed to be topsoil strippings largely derived from recent construction works at the adjacent Byron Regional Sports & Cultural Complex (constructed on part of the former Portion 305);
- Minor remnants of vegetative mulch and wood chip derived from various Council works (160 cubic metres). This material has been reportedly used in the past to mix with the coastal sands and other suitable topsoil material to provide a blended topsoil material for use on Council gardens and construction projects;
- A substantial stockpile (14,500 cubic metres) comprising a mix of a variety of soils of varying quality, derived from Council construction and maintenance works including road widenings, shoulder maintenance, pavement reconstruction, drainage construction and maintenance, street sweepings and miscellaneous works;

- A clay “blinding layer” (quantity unknown, but estimate of the possible order of 10,000 cubic metres) spread over a substantial portion of the site, reportedly derived from construction by Byron Shire of the Pacific Vista residential estate during the 1980’s, covering underlying coastal sands.

Historical Titles Search

The following sources of information were accessed to assess the history of the Site and the surrounding area:

1. Historical Titles
2. Historical Aerial Photographs
3. Interviews with Staff and Residents
4. Council Records
5. Historical Maps
6. Historical Business Directories
7. Historical Mining and Exploration Licences

4.2 Land Titles Search

A Land Titles search (see **Table 4.1**) was undertaken by InfoTrack.

Table 4.1 Land Titles Search

- **Summary of Owners Report**

Address: - 42 Wallum Place, Byron Bay

Description: - Lot 12 D.P 1189646

The early title to this land is Crown Title.

We are aware of the following: -

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
23.05.1884	Within Village Reserve No. 1053 – South Extension	Revoked 11.02.1924
22.10.1887	Within Tweed and Richmond Rivers Gold Field	
13.03.1907	Within Crown Reserve No. 41426 for Drainage	Revoked 11.02.1924
01.08.1922 (1922 to 1929)	Oswald Joseph Byrne (Farmer)	Crown Tenure Special Lease 1922/7 Lismore (for Grazing and Agriculture) Now Crown Tenure Conditional Purchase 1923/19 Lismore
02.05.1929 (1929 to 1936)	Mary Ellen Byrne (Married Woman)	Crown Tenure Conditional Purchase 1923/19 Lismore (Book 1568 No. 936)
26.11.1936 (1936 to 1955)	Alfred William Anderson (Manufacturer) Elizabeth Maud Anderson (Married Woman)	Crown Tenure Conditional Purchase 1923/19 Lismore (Book 1776 No. 951)
28.01.1955 (1955 to 1967)	Andersons Sausages Pty Ltd	Crown Tenure Conditional Purchase 1923/19 Lismore (Book 2476 No. 781) Now Vol 7807 Fol 103
08.06.1967 (1967 to 1968)	Anderson Meat Packing Co Pty Limited	Vol 7807 Fol 103
06.06.1968 (1968 to 1981)	F.J. Walker (Byron Bay) Pty Ltd	Vol 7807 Fol 103 Now Vol 14331 Fol 24
18.09.1984 (1984 to date)	# Council of the Shire of Byron	Vol 14331 Fol 24 Now

 # Denotes current registered proprietor

Leases: - NIL

Easements: -

- 25.09.2013 (D.P. 1008947) Easement for Services 7 wide
- 25.09.2013 (D.P. 1008947) Easement for Drainage of Sewerage 7 wide
- 25.09.2013 (D.P. 1008947) Easement for Water Supply 7 wide
- 25.09.2013 (D.P. 1008947) Easement for Sewer Rising Main 7 wide

The Land Titles Search and additional information supplied in **Appendix A** provides a continuous timeline of land ownership and site uses based on land title summarised as follows:

- The document shows registration of various mortgages and transfers from 1959 until 1970 involving Andersons Sausages P/L, Andersons Meat Packing P/L, FJ Walker (Byron Bay);
- A Resumption of Land for Public Road by Byron Shire is noted at 26 November 1971 (registered 2 February 1972 by DP 613937);
- DP 613937 (Shire Clerk's Certificate 30/9/1980 - subdivision No 85/80) created Lot 1 being 19.98 ha bordering the western side of Bayshore Drive, purchased from F J Walker P/L by Byron Shire Council on 19 August 1981 and the residue 160.2ha being owned by F J Walker P/L;
- DP 812667 (Shire Clerk's Certificate to Subdivision No 40/91 dated 30 August 1991, registered 26 September 1991) created the extension of Centennial Circuit and Brigantine Street in the industrial subdivision (24 Lots) of the southern part of Lot 1, and a residue lot (Lot 25) of 15.65 ha. The subject site was in the southern part of Lot 25 so created;
- DP 1004514 (Shire Clerk's Certificate to Subdivision No 76/98 dated 2 October 1998) involved the subdivision of Lot 25 into 4 lots, of which Lot 2 (2.91 ha) comprises the major part of the subject site.

4.3 Historical Aerial Photography Review

A search of historical aerial photographs was conducted of the subject site in an attempt to identify past uses on or about the future building envelopes. Aerial photographs were reviewed for the following years: 1947, 1958, 1966, 1971, 1974, 1979, 1987, 1991, 1997, 2006, 2009, 2016 and 2020 (see **Appendix B**). Information garnered from the historical photographs is summarised in **Table 2.3** below:

Table 4.2 Review of Historical Aerial Photographs

Photograph	Site Observations
1947	The 1947 Aerial Photo shows the subject land and surrounds as undisturbed in its natural state
1958	The 1958 photograph shows some disturbance in the location of the proposed TAFE
1966	The 1966 aerial photography remains constant with the 1958 photograph.
1971	The 1971 photograph shows clearing of the southern portion of the site and adjoining sites
1979	In 1979 the aerial photography shows the subject site has been predominantly cleared northward to the North Coast Rail Line
1987	In 1987 the aerial photography shows that much of the subject site has been further disturbed (matching interview information that stripping had been carried out and stockpiling of soil, residue from drain clearing, and road construction material had begun);
1991	In 1991 the aerial photography shows no significant changes on the site.
1997	In 1997 the aerial photography shows cleared areas and storage of material across the site and in the area of the proposed TAFE.
2006	In 2006 the aerial photography shows more storage of materials in the northern east side of the site with some regrowth in the location of the proposed TAFE

Photograph	Site Observations
2009	In 2006 the aerial photography the areas of storage stockpiles is more evident in the north eastern portion of the site There is some limited disturbance in the location of the proposed TAFE
2015	In 2015 most of the stockpiled material appears to have been removed. The north eastern area remains disturbed while the area of the proposed TAFE is mostly revegetated.
2020	In 2020 the previously disturbed areas, including the site of the proposed TAFE are covered with grass.

4.3 Council Records

A search of Byron Shire Council (BSC) records provided no additional information or records;

4.5 Historic Use of Adjacent Land

Historically, the general location has been dominated by commercial activities including the Zircon Mineral Sand Mining Processing Plant to the immediate north and commercial retail activities to the east and south. In addition, the discussed railway line is located to the west of the subject site (see historical photos in **Appendix B**).

4.6 Australian and NSW Heritage Register

On 1 March 2021 a search of the:

- Australian Heritage Trust database did not reveal any heritage listed items on within close proximity of the subject site
- Commonwealth Heritage List did not reveal any heritage listed items on within close proximity of the subject site
- NSW State Heritage Items did not reveal any heritage listed items on within close proximity of the subject site
- Byron Local Environmental Plan Heritage did not reveal any heritage listed items on within close proximity of the subject site.

4.7 State and Local Authority Records

4.7.1Contaminated Land Record Search

4.7.1.1 Contaminated Land Record

A search of the Contaminated Land Record (EPA 2010b) for the Byron Shire Council Local Government Area (LGA) did not identify any notices on or near the subject site (see **Appendix B**).

4.7.2 Protection of the Environmental Operations Act Licenses

A search of the current list (EPA 2010c) of licensed activities as per Schedule 1 of the Protection of the Environment Operations Act 1997 identified two (2) licensed activities with the vicinity of the subject site:

- The Railway line (John Holland Rail Pty Ltd (Environment Protection Licence 13421) 22m north of the subject site and
- The Byron Sewerage Treatment Works adjoins the site (located some 300m from the proposed TAFE.

4.7.3 Cattle Tick Dip Sites

A search of the NSW Department of Primary Industry (DPI) Cattle Dip Site Locator tool (https://www.dpi.nsw.gov.au/animals-and-livestock/beef-cattle/health-and-disease/parasitic-andprotozoal- diseases/ticks/cattle-dip-site-locator) indicated that there are no cattle dip sites within the 200m nominal EPA residential investigation zone of proposed development.

As the closest dip lies well outside the 200m residential investigation buffer to the proposed development therefore no further investigation is considered necessary.

4.8 Underground services and stormwater

Underground assets such as electricity and communications provide preferential pathways for contaminant migration. A dial before you dig search was conducted that showed Essential Energy, Telstra, Byron Shire Council, NBN Co, Optus and/ or Uecomm have assets leading into the site.

4.9 Integrity Assessment

The site history information documented above is generally consistent with the aerial photographs, and the physical condition of the site. Based on the information available, TFA considers that sufficient historical information and site condition information has been obtained to allow for a thorough investigation of the environmental condition of the site.

5.0 Sampling & Quality Assurance Plan

5.1 Overview of DQO Process

The DQOs process is a planning tool developed to ensure that any data collected is of sufficient quality and quantity to support defensible decision making. It is a process used to define the type, quantity and quality of data needed to support decisions relating to the environmental condition of a site and provides a systematic approach for defining the criteria that a data collection design should satisfy.

It is recognised that the most efficient way to accomplish these goals is to establish criteria for defensible decision making before the data collection begins, and then develop a data collection design based on these criteria. By using the DQOs process to plan the investigation effort, the relevant parties can improve the effectiveness, efficiency and defensibility of a decision in a resource and cost-effective manner. DQOs have been developed to detail the type of data that is needed to meet the overall objectives of this project. The DQO's presented in this document have been developed with procedures stated in the following guidelines:

Prior to conducting site works, TFA undertook the data quality objectives (DQOs) planning process.

Table 5.1 DQOs Planning Process Output – Estimation Process

Step 1 – State the problem Summarise the contamination problem that will require new environmental data and identify the resources available to resolve the problem.	
1.1	Write a brief summary of the contamination problem: A Preliminary Site Investigation under SEPP 55 has been triggered by the proposed development application for a TAFE on industrially zoned land. The subject site is owned by Byron Shire Council (BSC) and was historically used by BSC for the storage of a range of construction materials, including concrete and timber products, soils, gravels, sands, wood chip and mulch and an assortment of surplus fill materials derived from a multitude of construction works. The assessment with respect to potential site contamination is limited to waste characterisation of existing stockpiles coupled with visual assessment and a couple of grab water samples of surface water. TFA cannot identify any evidence of sampling and analysis of insitu soil or groundwater conditions. Advice from former council employees indicates that the site has been filled with clay, the actual level is unknown. In addition, the site has been filled and levelled to between 4.0 and 5.5mAHD with screen stockpiled material. The depth of fill from across the site is unknown however it is anticipated that fill in the location of the proposed TAFE learning centre is in the order of 1m in depth Given the focus of the previous preliminary site investigation (BMack, January 2014) on the existing stockpile no appropriate assessment in accordance with the SEPP 55 guidelines of the soil or groundwater has been undertaken. The historical site investigation appears sound except for the quality and accuracy of the historical aerial photos, lack of Land Titles History and planning certificate. Potential contamination sources includes asbestos, pesticides, metals, BTEXN which may be present in subsurface soil and groundwater. There is also a minor concern that radiation may be present in soils.

<table>
<tr><td colspan="7">Step 1 – State the problem
Summarise the contamination problem that will require new environmental data and identify the resources available to resolve the problem.</td></tr>
<tr><td></td><td colspan="6"></td></tr>
<tr><td rowspan="4">1.2</td><td colspan="6">Identify members of the planning team:</td></tr>
<tr><td colspan="2">Person</td><td colspan="2">Organisation</td><td colspan="2">Role</td></tr>
<tr><td colspan="2">Tim Fitzroy</td><td colspan="2">TFA</td><td colspan="2">Project Director</td></tr>
<tr><td colspan="2">Jacob Fitzroy</td><td colspan="2">TFA</td><td colspan="2">Environmental Economist</td></tr>
<tr><td>1.3</td><td colspan="6">Develop/refine the conceptual site model (CSM) (see Figure 3):
A graphical representation of the conceptual site model for the site is included as Figure 3.
Details are included of historical land use and areas of concern.</td></tr>
<tr><td rowspan="7">1.4</td><td colspan="6">Define the summary exposure scenarios (Y/N)*:</td></tr>
<tr><td>Soil/Dust</td><td>Y</td><td>Groundwater</td><td>Y</td><td>Surface Water</td><td>Y</td></tr>
<tr><td>Dermal</td><td>R/M</td><td>Dermal</td><td></td><td>Dermal</td><td>-</td></tr>
<tr><td>Ingestion</td><td>R/M</td><td>Ingestion</td><td></td><td>Ingestion</td><td>-</td></tr>
<tr><td>Inhalation</td><td>R/M</td><td>Inhalation</td><td></td><td>Inhalation</td><td>-</td></tr>
<tr><td>Ecological</td><td>-</td><td>Ecological</td><td>R/M</td><td>Ecological</td><td>Y</td></tr>
<tr><td colspan="6">* R = residential, RC = recreational, C = commercial worker, M = maintenance worker (i.e., during site works/construction); B = local bores
add additional if required</td></tr>
</table>

<table>
<tr><td colspan="2">Step 2 - Identify the decision
To identify the decision that requires new environmental data to address the contamination problem.</td></tr>
<tr><td>2.1</td><td>If identified Contaminants of Concern are detected in soils or groundwater exceed Tier 1 or Tier 2 Risk Assessment Criteria. If the 95% UCL does not exceed Tier 1 of Tier 2 Risk Assessment Criteria a Human health/ ecological pathway is considered to not exist</td></tr>
</table>

<table>
<tr><td colspan="2">Step 3 – Identify the inputs to the decision
To identify the information that will be required to support the decision and specify which inputs require new environmental measurements.</td></tr>
<tr><td rowspan="4">3.1</td><td>Identify the information that will be required to resolve the decision statements, including existing information and new environmental data, and identify the sources for each item of information required:</td></tr>
<tr><td>Existing information:</td></tr>
<tr><td>No previous reports for this property</td></tr>
<tr><td>New environmental data:</td></tr>
</table>

Step 3 – Identify the inputs to the decision To identify the information that will be required to support the decision and specify which inputs require new environmental measurements.	
	Measurements of soil, groundwater contamination concentrations with potential contaminants of concern (PCOCs). Soil Total recoverable hydrocarbons (TRH), benzene, toluene, ethyl-benzene, xylenes, naphthalene (BTEXN), 11 metals (arsenic, cadmium, chromium, copper, lead, nickel, zinc, mercury, beryllium, boron and Cobalt), polycyclic aromatic hydrocarbons (PAHs), organochlorine pesticides (OCPs), Arsenic, asbestos and radiation Groundwater 13 metals (arsenic, aluminium, silver, cadmium, chromium, copper, lead, nickel, zinc, mercury, selenium, manganese and iron) (Total recoverable hydrocarbons (TRH), benzene, toluene, ethyl-benzene, xylenes, naphthalene (BTEXN)
3.2	Identify the information needed to establish the action level: For soil land use category D (commercial/industrial) should be applied". For waters, the appropriate criteria are based on the National Environment Protection (Assessment of Site Contamination) Measure (NEPM) (2013) and in particular those applicable for the protection of freshwater ecosystems. It is specified that the 95% species protection levels are to be applied for slightly to moderately disturbed ecosystems (most urban catchments), and the 99% species protection levels for pristine or vulnerable ecosystems, or where the contaminants are intractable (e.g., bio accumulative). The drinking water criteria from NHMRC/NRMMC (2011) and NHMRC (2008) with respect to recreational water use will be adopted in this assessment for comparison purposes.
3.3	Confirm that appropriate analytical methods exist to provide the necessary data: Feasible analytical methods, both field and laboratory will be consistent with existing guidance including being in accordance with NEPM, 1999. Laboratories to be used are NATA accredited and use analytical methods based on USEPA and APHA methods.

Step 4 - Define the boundaries of the study To define the spatial and temporal boundaries that the data must represent to support the decisions.	
4.1	Specify the characteristics that define the population of interest: The investigation area is limited to the areas of the site identified for the proposed TAFE Investigation areas are presented in Figures 4.
4.2	Define the geographic area and media to which the decision statement applies: The investigation boundary is shown on Figure 1. Media is also stratified depending on the nature of the material encountered (i.e., fill material/natural soil), groundwater. Groundwater is defined as the upper 2m of the first water bearing zone encountered during investigation.
4.3	When appropriate, divide the populations into strata that have relatively homogenous characteristics: Populations consist of, fill material, natural soil, and groundwater beneath the site.
4.4	Determine the time frame to which the decision applies: This timeframe may be affected by other external factors, which may include the following: Access to Driller Inclement weather delaying progress
4.5	Determine when to collect data:

Step 4 - Define the boundaries of the study To define the spatial and temporal boundaries that the data must represent to support the decisions.	
	Rain or flood conditions will likely limit access. Works will be undertaken during normal working hours.
4.6	Define the scale of the decision making: Update as required
4.7	Identify any practical constraints on data collection: The following constraints are likely to impact data collection: Rain and flood conditions will likely limit access Presence of underground services Advancement into areas cleared of building structures and underground services grass areas only

Step 5 - Develop the analytic (statistical) approach Develop a logical "if …, then …, else …" statement that defines the conditions that would cause the decision maker to choose among alternative actions.	
5.1	Specify the statistical parameter that characterises the population of interest, such as mean, median, maximum or proportion, etc.: The 95% UCL for will be the key characteristic. Other data evaluation will entail: No sample will exceed 250% of the criteria Standard deviation will be < 50% criteria 95% UCL is < criteria
5.2	Specify the action level for the decision: Analytical actions levels based on commercial/industrial criteria in NEPM 1999, amended 2013. The criteria is not clean-up criteria; therefore, exceedances will be screened to determine whether further investigation is required.
5.3	Confirm that measurement detection will allow reliable comparisons with the action level: Samples will be collected and submitted for NATA accredited laboratory analysis to determine site conditions. Standard limits of reporting (LOR) are less than the criteria. Hydrocarbon gas readings will be obtained using calibrated equipment.
5.4	Combine the outputs from the previous DQOs steps and develop an "if ..., then ..., else ..." theoretical decision rule based on the chosen action level: If the statistical parameters of the data exceed applicable action levels, further **r**emediation/assessment or management will be required at the site. If not, no further remediation will be required at the site.

Step 6 – Specify performance or acceptance criteria To specify probability limits for false rejection and false acceptance decision errors.	
6.1	Specify the decision rule as a statistical hypothesis test: Null hypothesis (HO) is the 95% UCL for concentration for soil is > action level; and Alternative hypotheses (HA) the 95% UCL for concentration for soil is ≤ action level.
6.2	Examine consequences of making incorrect decisions from the test: False rejection or Type I error of determining the site is suitable when it is not (wrongly rejects a true HO). Consequence is potential risks to human health and/or the environment. False acceptance or Type II error of determining the site is not suitable when it is (wrongly accepts a false HO). Consequence is unnecessary expenditure of resources or a site not being used for its highest value.
6.3	Place acceptable limits on the likelihood of making decision errors: Decision errors occur when accurate analytical results generated from tiny samples (sampling unit) are assumed to represent the concentrations of much larger volumes of matrix, but that extrapolation is invalid because confounding variables have not been acknowledged or controlled. No sample result will exceed 250% of the criteria. Standard deviation will be < 50% criteria. 95% UCL is < criteria.

<table>
<tr><td colspan="5">Step 7 – Optimise the design for obtaining data
To identify a resource effective sampling and analysis design for generating data that are expected to satisfy the DQOs.</td></tr>
<tr><td>7.1</td><td colspan="4">Document the final sampling and analysis design, along with a discussion of the key assumptions underlying this design:

Refer to SAQP section of report.</td></tr>
<tr><td>7.2</td><td colspan="4">Detail how the design should be implemented, together with contingency plans for unexpected events:

Refer to SAQP section of report.</td></tr>
<tr><td rowspan="8">7.3</td><td colspan="4">Determine the quality assurance and quality control (QA/QC) procedures that would be performed to detect and correct problems to ensure defensible results:

The field QA, and the field and laboratory QC, are described in the sampling, analysis and quality plan (SAQP). In summary, the following QC soil and groundwater samples are proposed in accordance with the NEPM 2013.</td></tr>
<tr><td colspan="2">Field QC samples</td><td colspan="2">Lab QC samples</td></tr>
<tr><td>Blind duplicate</td><td>≥ 5%</td><td>Lab blank</td><td>≥ 1/lab batch</td></tr>
<tr><td>Blind triplicate</td><td>≥ 5%</td><td>Surrogate spike</td><td></td></tr>
<tr><td>Rinsate sample</td><td>≥ day</td><td>LCS</td><td>≥ 1/lab batch</td></tr>
<tr><td>Trip blank (vol)</td><td>≥ 1/field batch</td><td>Matrix spike</td><td>≥ 1/media type</td></tr>
<tr><td>Trip spike (vol)</td><td>≥ 1/field batch</td><td>Lab duplicate</td><td>≥ 10%</td></tr>
<tr><td colspan="4"></td></tr>
<tr><td>7.4</td><td colspan="4">Document the operational details and theoretical assumptions of the selected design in the sampling, analysis, and quality plan (SAQP):</td></tr>
</table>

5.2 Possible Contaminant Sources

Despite the lack of recent use of chemicals at the site, historical use may be possible at the site. **Table 5.2** below lists the sources of potential contamination at the site and their associated contaminants of concern. The site has been subject to a number of lands uses that have the potential to be contaminating activities. Based on the site history information, site inspection and surrounding land uses, the potentially contaminating activities were identified as:

- Unknown potential spills/leaks of petroleum hydrocarbons associated with former land uses.
- Site filling with material from unknown source.
- Potential radioactivity associated with mineral sands mining
- Asbestos

Table 5.2 Potential Contaminants of Concern for Identified Activities

Potential contaminants of concern (PCOC) related to these suspected activities are presented below

Potential contaminants of concern (PCOC)	Suspected Activities (source)
Organochlorine/organophosphorus pesticide	residual chemicals used for pest, vermin control especially in agricultural activities (fill material).
Heavy Metals	metals including arsenic, cadmium, copper chromium, lead, mercury, nickel, lead and zinc. Found in metal fabricating, grinding, pesticides, lead batteries and many waste products.
Petroleum Hydrocarbons	occur in fuels, solvents and oils and therefore may be sourced from historic. petroleum hydrocarbons are generally quantified by analytical laboratories as total recoverable hydrocarbons (TRH), and as four fractions of hydrocarbons grouped into ranges of volatility.
Monocyclic Aromatic Hydrocarbons	including benzene, toluene, ethylbenzene and xylenes (BTEX) are found in fuels and used as solvents
Polycyclic Aromatic Hydrocarbons (PAHs)	related to some petroleum hydrocarbon use, waste and lubricating oils,
Radioactivity	Generally, Thorium & descendants associated with tailings from mineral sands processing.
Asbestos	Uncontrolled fill

Technical guidance considered in preparing these DQOs **includes:**

- NSW EPA (formerly Office of Environment and Heritage (OEH)) (2011) Guidelines for
- Consultants Reporting on Contaminated Sites.
- NSW EPA (2017) Guidelines for the NSW Site Auditor Scheme (3rd edition).
- NSW EPA (2012) Guidelines for the Assessment and Management of Sites Impacted by Hazardous Ground Gases.
- National Environment Protection Council (NEPC) National Environment Protection
- (Assessment of Site Contamination) Measure 1999 (ASC NEPM (2013)) – Schedule
- B2: Guideline on Site Characterisation (2013).

5.3 Relevant Environmental media

The environmental media considered relevant for the investigation consisted of site soils and groundwater.

5.4 Relevant Environmental Criteria

5.4.1 Soil (General Contaminates)

For soil, the appropriate and adopted criteria are based on the ASC NEPM 2013, in particular the health investigation levels (HILs), environmental investigation levels (EILs), environmental screening levels (ESLs) applicable for residential A land use. Different criteria have been adopted for the health screening levels (HSLs), which is discussed further below.

Commercial/Industrial land use criteria has been adopted as the proposed development will be commercial

HSLs and ESLs – soil type
Based on the nature of the soil, sandy soil criteria have been used as the soil type for deriving the HSLs and ESLs.

Aesthetic considerations for petroleum hydrocarbons - Management Limits
In addition to appropriate consideration and application of the HSLs and ESLs, there are a number of policy considerations which reflect the nature and properties of petroleum hydrocarbons:

- formation of observable light non-aqueous phase liquids (LNAPL);
- fire and explosive hazards; and
- effects on buried infrastructure, e.g. penetration of, or damage to, in-ground services by hydrocarbons.

Management limits have been adopted within this investigation to avoid or minimise these potential effects.

5.4.2 Groundwater

For waters, the appropriate criteria are based on the National Environment Protection (Assessment of Site Contamination) Measure (NEPM) (2013) and in particular those applicable for the protection of freshwater ecosystems. It is specified that the 95% species protection levels are to be applied for slightly to moderately disturbed ecosystems (most urban catchments), and the 99% species protection levels for pristine or vulnerable ecosystems, or where the contaminants are intractable (e.g., bio accumulative).

The drinking water criteria from NHMRC/NRMMC (2011) and NHMRC (2008) with respect to recreational water use will be adopted in this assessment for comparison purposes. NHMRC recommend applying a multiplication factor of 10 to 20 to the Australian Drinking Water Guidelines for assessment of the acceptability of recreational water quality.

The Guidelines on the Duty to Report Contamination under the Contaminated Land Management (CLM) Act 1997 (EPA, September 2015) describes where contamination is considered significant enough to warrant regulation and requires reporting to EPA.

This includes scenarios where groundwater concentrations exceed the drinking water criteria (in combination with other factors).

5.4.3 Soil (Radiation)

The National Health and Medical Research Council (NHMRC)* have adopted a set of standards relating to the clean up and disposal of residues from commercial operations involving mineral sands. These standards cover:

- Action level criteria;
- Remedial action criteria;
- Disposal action criteria; and
- Protection of disposal sites.

For the purposes of this contaminated site assessment the action level criteria (NHMRC 1984)* have been adopted as follows:

Action Level Criteria

1. For dwellings, schools (including playgrounds), businesses, factories, etc. where occupancies by the same individuals occur regularly on a day by day basis, the remedial action level should be 0.7uSv.hr^{-1} for all points at 1 metre above the area of concern on the property.
2. For other areas, where occupancies are for a few hours per week by the same individuals or by differing individuals and for garden areas, the remedial action level should be 1.0uSv.hr^{-1} for all points at 1 metre above the surface.
3. For roads, paths, and other areas with intermittent occupancy, the remedial action level should be 2.5uSv.hr^{-1}
4. All values quoted above include a value for natural background of 0.1 uSv.hr^{-1}.

Background radiation is naturally present in our environment in variable amounts. People living on mineralised sands or in granite areas are exposed to more terrestrial radiation, while people living or working at higher altitudes are exposed to more cosmic radiation (World Nuclear Association, 2007). Exposure arising from unaltered natural radiation is deemed *uncontrollable* and to be excluded from the regulatory system (ICRP Publication 82, 2003).

**The NHMRC standards mirror RSIS no 12 (Radiation Safety Information Series) issued by New South Wales Department of Health in 1984, and still referred to by the NSW Environment Protection Authority, Radiation Control Branch). Present NSW EPA advice to developers of residential subdivision estates who find contamination arising from past Heavy Mineral Sands Mining has been to seek to remediate the site to a gamma does rate of about 0.35 micro Sieverts per hour.*

In 2002 RSIS 12 was reviewed by the NSW EPA Radiation Control Branch, and found to be still supportable, based on more recent advice given in ICRP Publication 82, “Protection of the Public in Situations of Prolonged Radiation Exposure: The Application of the Commission’s System of Radiological Protection to Controllable Radiation Exposure Due To Natural Sources and Long-Lived Radioactive Residues (publ. International Commission on Radiological Protection, 2003).

ICRP 82 stated that the remediation of pre-existing contamination in circumstances where eth annual does not exceed 10 milli Sieverts per year is never justified. For full *time residential occupation this would imply a dose rate of 1.14 micro sieverts per hour. Thus, the NSW guidance has significant inherent conservatism.*

Table 5.3 describes the expected exposure to radiation that is likely to occur on an annual basis. As exposure to natural sources cannot be avoided and already exceeds the recommended dose limit, the limits are more relevant to artificial sources (MARCO 2002).

Table 5.3 Likely Annual Radiation Exposure Levels for a Single Person

(MARCO 2002, adapted from Merke & Ackland)

	Sources Dose in mSv/yr (mSv=10^{-3} Sv)
Natural	
Cosmic radiation, sea level	0.3
Soil, rock, building materials	0.3
Human tissue ($_{40}$K, $_{226}$Ra)	0.4
Radon ($_{222}$Rn) in the air	2
Total	**3**
Artificial	
Medical & dental X-Rays	0.4
Nuclear Medicine	0.1
Nuclear power	0.01
TV tubes, industry	0.02
Nuclear test fallout	0.04
Total	**0.6**
Total from all sources	**3.6**

6 Site Assessment

6.1 Preliminary Site Investigations

The field work was undertaken in general accordance with the DQOs. Field works were conducted on:

- 16 April 2021 for the soil investigation; and
- 22 April 2021 for the groundwater investigation.

All fieldwork was completed by Tim Fitzroy (TFA) and Glen Chisnall of Cavvanba Consulting.

The sampling and analytical strategy and methodology are described below. The results of the assessment are provided in Section 7. Soil and groundwater sample locations are shown on **Figure 5**.

On the days of the site assessments the weather was clear. Photographs of the subject site can be seen in **Appendix C**.

6.2 Methodology

The objective of this preliminary investigation is to gather information with regard to the type, location, concentration and distribution of contaminants to determine if the subject site (prior to demolition of existing structures) represents a risk of harm to end users and sensitive receptors. To determine this, soil sampling and laboratory analysis has been conducted upon surface soils collected from the study area.

The following sampling, analysis and data quality objectives have been adopted for this site investigation:

- to confirm the soils and groundwater in the accessible area of the site (pre demolition of the existing commercial buildings and amenities building) do not pose a risk to human health or the environment through soil contamination.
- to employ quality assurance when sampling, assessing and during evaluation of the subject soils.
- to ensure that decontamination techniques are applied during the sampling procedure and that no cross contamination of samples occurs.

6.2.1 Soil (General Contaminates)

Eleven (11) boreholes were drilled evenly across the site of the proposed TAFE covering an area of about 3,500m2 by Geotech Investigations using a truck-mounted drill rig with a solid flight auger on 16 April 2021 (see **Illustration 6.1** Soil Sample Locations) .

Soil samples were collected from the solid flight auger, ensuring that soil sampled had not been in direct contact with the auger. During sampling, a photo-ionisation detector

(PID) was used to screen soil samples for volatile organic compounds (VOCs), to aid in the selection process for samples to be analysed. PID calibration records are included in **Appendix D**, and geological logs are included in **Appendix E**.

All soil samples were collected into laboratory supplied glass jars and placed directly into chilled eskies and transported to the laboratory under chain of custody documentation, in accordance with TFA fieldwork procedures.

Soil samples were also collected from the 11 boreholes for asbestos and placed in Ziplock plastic bags then doubled bagged and transported to the laboratory under chain of custody documentation, in accordance with TFA fieldwork procedures.

6.2.2 Soil (Radiation)

Surface radiation readings were undertaken with the proposed footprint and immediate vicinity of the proposed TAFE. Radiation levels were established using a Rotem Ram-Gene 1 Radiation Meter (Mark II), which detects beta and gamma radiation (ANSTO, 2000).

Surface Readings were taken with the instrument at 1 metre above ground level covering a grid pattern at approximately 20 metre, (in accordance with NHMRC Standards) (see **Figure 5)**.

6.2.2 Groundwater

Monitoring Well Installation

Three monitoring wells, GW1 (south west) GW2 (east) and GW3 (north) were installed using a truck-mounted drill rig with a solid flight auger. Groundwater well construction was consistent with the Minimum Construction Requirements for Water Bores in Australia (Land and Water Biodiversity Committee, 2003).

The monitoring wells were installed to a maximum depth of approximately 2.0 - 3.0 m, and screened in the first water bearing zone encountered. All wells were constructed of 50 mm diameter Class 18 uPCV casing and screen, sand extended 0.5 m above the pipe screen, with a bentonite seal of minimum thickness 0.5 m was present above this. Groundwater wells were developed following installation. A new bailer was used for each well.

Groundwater sampling

Sampling was conducted by Glen Chisnall in accordance with Cavvanba Fieldwork Procedures for Groundwater sampling, which generally meets NEPM requirements. Low flow sampling was conducted, using a peristaltic pump with a new length of disposable tubing for each well. The flow rate was set so that minimal disturbance of the standing water level occurs. All wells were gauged and sampled. Groundwater sampling logs are included as **Appendix E**.

To ensure that representative samples were collected

− water was collected into a flow-through cell for the collection of water quality parameters, including pH, temperature, conductivity, redox and dissolved oxygen (DO), which was measured using a calibrated Horiba water quality meter; and

− water quality parameters was recorded and consecutive readings were within 10%prior to sampling.

Samples were collected directly from the low flow tubing into appropriately preserved laboratory prepared and supplied sample bottles and quickly capped with no headspace remaining to minimise the loss of any volatiles.
A pair of disposal gloves was worn during collection and all groundwater samples will be placed directly into chilled eskies and transported to the laboratory under chain of custody documentation.

6.3 Data Usability

A background to data usability is provided in **Appendix F.** All site work was completed in accordance with standard *TFA sampling protocols*, including a QA/QC programme and standard operating procedures.

A data usability assessment has been performed for the sampling undertaken during this investigation, as summarised in **Appendix F** and includes:

- Summary of field quality assurance/quality control
- Field quality control soil samples summary
- Summary of laboratory quality assurance/quality control.

Following this discussion, the data usability assessment shows that the data is of suitable quality to support the conclusions made in this report.

6.4 Conditions Encountered

The site is grassed and drains to the north. Ranging from approximately RL 4.0 m to 4.35mAHD (Australian Height Datum – all referred levels will be assumed as AHD).

The results of the fieldwork are detailed on the Engineering Log attached in **Appendix E**, along with explanatory notes. The subsurface profile encountered in the boreholes generally consisted of fill material to depths of between 1.2m and 1.6m, overlying natural medium dense to dense sands. **Table 6.1** below provide a summary of the subsurface conditions encountered within the boreholes.

For descriptions of the subsurface conditions at specific locations, refer to the geological logs in **Appendix E,** and for specific samples, refer to results in **Appendix G**.

Cavaanba Consulting visited the site on 22 April 2021 and purged the groundwater wells between 15 and 20 minutes with a low flow peristaltic pump using dedicated tubing set at the screened interval to achieve steady state conditions. Field measurements were collected using a Horiba multi-parameter meter and a sample was taken from each of the Groundwater Wells (GW1, GW2 and GW3) plus 2 QA/QC (duplicate and triplicate) samples were collected laboratory supplied appropriate containers, with appropriate preservatives. Samples subject to analysis for soluble metals were field-filtered. The samples were stored at <5°C and delivered to the NATA-registered Environmental Analysis Laboratory at Southern Cross University for analysis (see Appendix 10). Results recorded are summarised in Table 6.1.

7.0 Analytical Results

The analytical results are presented below, split by media type

7.1 Soil

Table 7.1 Results of Laboratory Analysis of Soil for Metals, BTEX, TRH, PAHs, OCs and Asbestos

Analyte	Health Criteria 0m to <1m	Ecological Criteria	Management Limits	Site Data			
	HIL/HSL mg/kg	EIL/ESL (mg/kg)	ML (mg/kg)	No. samples analysed*	Number of exceedances	Max mg/kg	Meets Screening criteria?
Heavy Metals							
Arsenic	500	100		28	0	10	Yes
Lead	1500	1,100			0	26	Yes
Cadmium	100	-			0	1.0	Yes
Chromium	500	410			0	26	Yes
Copper	5,000	230			0	35	Yes
Nickel	600	270			0	28	Yes
Zinc	35000	770			0	138	Yes
Mercury	75	-			0	<0.1	Yes
BETX							
Benzene	5	10		28	0	ND	Yes
Toluene	160	65			0	ND	Yes
Ethylbenzene	55	40			0	ND	Yes
Total m/p-Xylenes	40	1.6			0	ND	Yes
o-Xylene					0	ND	Yes
Naphthalene	3	170			0	ND	Yes
TRHs							
F1 TRHC6-C10	45	180		28	0	ND	Yes
F2 >C10-C16	110	120	1,000		0	22	Yes
F3 >C16-C34	28000-	1,700	3,500		0	120	Yes
F4 >C34-C40	280000	3,300	10,000		0	<100	Yes
PAHs							
Benzo(a)pyrene	-	0.7		28	0	0.5	Yes
Total PAH	100	-			0	7.5	Yes
OCs							
Endrin	50	NL		28	0	<0.2	Yes
Dieldrin	50	NL			0	<0.2	Yes
DDD, DDE and DDT	1000	180			0	<0.2	Yes
Asbestos	0.01(%w/w)	NL		25	0	<0.01	Yes

*Includes QA/QC samples

The results of soil analysis from all boreholes onsite indicate compliance with all nominated Health and Ecological Criteria. The laboratory analytical reports are included in **Appendix G.**

7.2 Radiation

The results of the Surface Radiation Survey are shown below in **Table 7.2.**

Table 7.2 Results of the Surface Radiation Survey

Project: Development Application Proposed TAFE, Bayshore Drive Byron Bay
Client: Byron Shire Council
Site Assessment Date: 16 April 2021

Location	**Radiation 1 metre above ground uSvhr^{-1}**	**Compliance (Yes/No)**
TFA 1	0.10	Yes
TFA 2	0.08	Yes
TFA 3	0.09	Yes
TFA 4	0.07	Yes
TFA 5	0.08	Yes
TFA 6	0.10	Yes
TFA 7	0.08	Yes
TFA 8	0.06	Yes
TFA 9	0.09	Yes
TFA10A	0.08	Yes
TFA11A	0.09	Yes

Notes for Table 7.2:

Readings taken with a RAM-Gene II Radiation Meter.

7.3 Groundwater

A sample of the groundwater results from GW1, GW2 and GW3 are summarised below. The laboratory analytical reports are included in **Appendix G.**

Table 7.3 Results of GW1 Laboratory Analysis of Groundwater for Metals, BTEXN and TRH

Analyte	Marine Water	Drinking Water	Health Screening Levels	Recreational	Site Maximum Concentration	Meets Screening criteria?
Metals						
Arsenic	2.3/4.5	10	-	100	0.016	Yes
Cadmium	0.7	2	-	20	<0.001	Yes
Chromium	4.4	50	-	500	0.001	Yes
Copper	1.3	2,000	-	20,000	<0.001	Yes
Lead	4.4	10	-	100	<0.001	Yes
Nickel	7	20	-	200	0.002	Yes
Zinc	15	-	-	-	0.009	Yes
Mercury	0.1	1	-	10	0.0005	Yes
BTEX						
Benzene	500	1	800	10	<0.5	Yes
Toluene	-	800	NL	8,000	<0.5	Yes
Ethyl benzene	-	300	NL	3,000	<0.5	Yes
Xylenes	-	600	NL	6,000	<1	Yes
Napthalene	50	-	NL	-	<0.5	Yes
Total Recoverable Hydrocarbons						
F1 TRH C6-C10	-	-	1,000	-	<50	Yes
F2 TRH C10-C16	-	-	NL	-	<50	Yes
F3 TRH >C16-C34	-	-	NL	-	<100	Yes
F4 TRH >C34-C40	-	-	NL	-	<50	Yes
Sum TF+RH C10-C36	-	-	NL	-	<100	Yes

Table 7.4 Results of GW2 Laboratory Analysis of Groundwater Metals, TRH and BTEXN

Analyte	Marine Water	Drinking Water	Health Screening Levels	Recreational	Site Maximum Concentration	Meets Screening criteria?
Metals						
Arsenic	2.3/4.5	10	-	100	0.010	Yes
Cadmium	0.7	2	-	20	<0.001	Yes
Chromium	4.4	50	-	500	0.004	Yes
Copper	1.3	2,000	-	20,000	<0.001	Yes
Lead	4.4	10	-	100	0.001	Yes
Nickel	7	20	-	200	0.005	Yes
Zinc	15	-	-	-	0.011	Yes
Mercury	0.1	1	-	10	<0.0005	Yes
BTEX						
Benzene	500	1	800	10	<0.5	Yes
Toluene	-	800	NL	8,000	<0.5	Yes
Ethyl benzene	-	300	NL	3,000	<0.5	Yes
Xylenes	-	600	NL	6,000	<1	Yes

Analyte	Marine Water	Drinking Water	Health Screening Levels	Recreational	Site Maximum Concentration	Meets Screening criteria?
Napthalene	50	-	NL	-	<0.5	Yes
Total Recoverable Hydrocarbons						
F1 TRH C6-C10	-	-	1,000	-	<40	Yes
F2 TRH C10-C16	-	-	NL	-	<50	Yes
F3 TRH >C16-C34	-	-	NL	-	<100	Yes
F4 TRH >C34-C40	-	-	NL	-	<50	Yes
Sum TF+RH C10-C36	-	-	NL	-	<100	Yes

Table 7.5 Results of GW3 Laboratory Analysis of Groundwater Metals, TRH and BTEXN

Analyte	Marine Water	Drinking Water	Health Screening Levels	Recreational	Site Maximum Concentration	Meets Screening criteria?
Metals						
Arsenic	2.3/4.5	10	-	100	0.007	Yes
Cadmium	0.7	2	-	20	<0.001	Yes
Chromium	4.4	50	-	500	0.001	Yes
Copper	1.3	2,000	-	20,000	<0.001	Yes
Lead	4.4	10	-	100	<0.001	Yes
Nickel	7	20	-	200	0.007	Yes
Zinc	15	-	-	-	0.012	Yes
Mercury	0.1	1	-	10	<0.0005	Yes
BTEX						
Benzene	500	1	800	10	<0.5	Yes
Toluene	-	800	NL	8,000	<0.5	Yes
Ethyl benzene	-	300	NL	3,000	<0.5	Yes
Xylenes	-	600	NL	6,000	<1	Yes
Napthalene	50	-	NL	-	<0.5	Yes
Total Recoverable Hydrocarbons						
F1 TRH C6-C10	-	-	1,000	-	<40	Yes
F2 TRH C10-C16	-	-	NL	-	<50	Yes
F3 TRH >C16-C34	-	-	NL	-	320	Yes
F4 TRH >C34-C40	-	-	NL	-	350	Yes
Sum TF+RH C10-C36	-	-	NL	-	670	Yes

All groundwater results from round 1 and Round 2 were in compliance with Marine, Drinking, Drinking Water, Health Screening and Recreational criteria.

8 Discussion and Conceptual Site Plan

8.1 Discussion

The results of preliminary site investigation assessment of the site for the proposed TAFE indicate compliance with all relevant NEPM 2013 criteria for both groundwater and soil. A Conceptual Site model has been prepared with respect to investigation post demolition and prior to the commencement of construction of the proposed multi use development.

8.2 Conceptual Site Model

The conceptual site model (CSM) is a representation of site-related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The CSM for the site, following the site investigation is detailed in Table 8.1 below.

Table 8.1 CSM Discussion

Element	Site Specific Information
Potential sources of contamination and contaminants of concern,	Metals, asbestos, hydrocarbons, BTEXN and radiation.
Potentially affected media, such as soil, groundwater, surface water and air, including extent and magnitude, and potential variations, e.g., preferential pathways etc	Media consists of soil and groundwater.
Human and ecological receptors.	Potential human & ecological receptors include: • Construction workers; • Future residents and shopkeepers and patrons; • Groundwater users • Groundwater system • Belongil Creek
Potential and complete exposure pathway to human and/or environmental receptors.	• Subsurface infrastructure; • Groundwater aquifers

9.0 Conclusions

This investigation is Tier 1 - preliminary site investigation, which is required to determine if contamination of the site's soil has occurred from past land usage in accordance with NEPM 1999 (2013), DUAP and EPA (1998). The investigation includes obtaining a history of land usage on the site and a preliminary soil-sampling regime. The results of the soil sample and groundwater analysis are compared with the Health Investigation Levels (HIL's) and Ecological Investigation Levels (EILs) outlined in NEPM 1999 (2013).

A total of 22 soil samples (plus QA samples) for metals, organochlorines, hydrocarbons, PAH and BTEXN and asbestos were collected from across the site for the proposed TAFE coupled with 1 round of sampling from three Groundwater Wells (GW1, GW2 and GW3). 21 soil samples were also collected for asbestos.

All of the soil and groundwater samples show contaminant levels well below the most stringent Australian and New Zealand Environment and Conservation Council (ANZECC), National Environment Protection Measure (NEPM 2013) for the most stringent HILA Residential with garden/accessible soil also includes children's day care centres, preschools and primary schools and Ecological Soil Investigation Levels (NEPM 2013).

A Radiation survey of surface soils conditions across 11 locations indicated compliance with the National Health and Medical Research Council (NHMRC 1984) and NSW EPA Action Level Criteria for dwellings, schools (including playgrounds), businesses, factories, etc. where occupancies by the same individuals occur regularly on a day by day basis, the remedial action level should be 0.7uSv.hr^{-1} for all points at 1 metre above the area of concern on the property.

Based on the extensive site history, site inspection and the laboratory results from soil and groundwater sampling; together with radiation survey of surface soils there is a low level of risk that the proposed site for the TAFE Connected Learning Centre is contaminated with residual chemicals from activities associated with current or past land use.

Based on the outcomes of this PSI there is no impediment to Development Consent being issued for the proposed TAFE Connected Learning Centre as described in Development Plan (see **Figure 2**).

This report has been prepared by Tim Fitzroy of Tim Fitzroy & Associates.

Tim Fitzroy
Environmental Health Scientist
Environmental Auditor

References

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Tables

Table 1: Soil Analytical Summary – Sample Description and Analytical Summary

Sample	Depth (m)	Date sampled	Description	8 Metals	TRHs	BTEXN	PAHs	Ocs	Asbestos
TFA 1 A	0-0.1m	16/04/2021	Dark clay	●	●	●	●	●	●
TFA 1 B	1-1.2m	16/04/2021	Clay						●
TFA 1 C	1.4-1.5m	16/04/2021	Natural	●	●	●	●	●	
TFA 2 A	0-0.1m	16/04/2021	Clay	●	●	●	●	●	●
TFA 2 B	0.6-0.7m	16/04/2021	Light Clay						●
TFA 2 C	1.1-1.2m	16/04/2021	Natural	●	●	●	●	●	
TFA 3 A	0-0.1m	16/04/2021	Fill clay	●	●	●	●	●	●
TFA 3 B	0.5-0.6m	16/04/2021	Fill clay						●
TFA 3 C	0.8-0.9m	16/04/2021	Fill	●	●	●	●	●	
TFA 4 A	0-0.1m	16/04/2021	Fill	●	●	●	●	●	●
TFA 4 B	0.5-0.6m	16/04/2021	Fill clay						●
TFA 4 C	1.2-1.3m	16/04/2021	Natural	●	●	●	●	●	
TFA 5 A	0-0.1m	16/04/2021	Dark clay	●	●	●	●	●	●
TFA 5 B	0.9-1m	16/04/2021	Light clay						●
TFA 5 C	1.4-1.5m	16/04/2021	Natural sand	●	●	●	●	●	
TFA 6 A	0-0.1m	16/04/2021	Clay	●	●	●	●	●	●
TFA 6 B	0.5-0.6m	16/04/2021	Light clay						●
TFA 6 C	1.2-1.3m	16/04/2021	Natural sand	●	●	●	●	●	
TFA 7 A	0-0.1m	16/04/2021	Clay	●	●	●	●	●	●
TFA 7 B	0.5-0.6m	16/04/2021	Mixed fill						●
TFA 7 C	1.2-1.3m	16/04/2021	Natural Sand	●	●	●	●	●	
TFA 8 A	0-0.1m	16/04/2021	Dark clay	●	●	●	●	●	●

Sample	Depth (m)	Date sampled	Description	8 Metals	TRHs	BTEXN	PAHs	Ocs	Asbestos
TFA 8 B	1-1.1m	16/04/2021	Light clay						●
TFA 8 C	1.3-1.4m	16/04/2021	Natural sand	●	●	●	●	●	
TFA 9 A	0-0.1m	16/04/2021	Grey clay	●	●	●	●	●	●
TFA 9 B	1-1.1m	16/04/2021	Light clay						●
TFA 9 C	1.3-1.4m	16/04/2021	Sand	●	●	●	●	●	
TFA 10 A	0-0.1m	16/04/2021	Natural black sand	●	●	●	●	●	●
TFA 10 B	0.3-0.4m	16/04/2021	Black sand (fill silty)						●
TFA 10 C	1.4-1.5m	16/04/2021	Indurated sand	●	●	●	●	●	
TFA 11 A	0-0.1m	16/04/2021	Clay	●	●	●	●	●	●
TFA 11 B	0.3-0.4m	16/04/2021	Clay						●
TFA 11 C	1.6-1.7m	16/04/2021	Sand	●	●	●	●	●	

Table 2: Soil Analytical Summary – Metals

Sample	Depth (m)	Arsenic	Lead	Cadmium	Chromium	Copper	Nickel	Zinc	Mercury	Beryllium	Boron	Cobalt
LORs		5	5	1	2	5	2	5	0.1	20	3,000	100
Analytical - Soil Borings												
TFA 1 A	0-0.1m	5	26	<0.5	16	33	12	101	<0.1	1	<2	8
TFA 1 C	1.4-1.5m	<2	2	<0.5	3	2	<1	3	<0.1	<0.5	<2	0
TFA 2 A	0-0.1m	3	13	<0.5	13	14	8	42	<0.1	<0.5	<2	5
TFA 2 C	1.1-1.2m	<2	<1	<0.5	<2	<1	<1	1	<0.1	<0.5	<2	0
TFA 3 A	0-0.1m	7	18	<0.5	17	15	21	47	<0.1	<0.5	<2	5
TFA 3 C	0.8-0.9m	4	5	<0.5	6	8	3	15	<0.1	<0.5	<2	1
TFA 4 A	0-0.1m	2	7	<0.5	11	9	10	34	<0.1	<0.5	<2	6
TFA 4 C	1.2-1.3m	<2	<1	<0.5	<2	1	<1	2	<0.1	<0.5	3	0
TFA 5 A	0-0.1m	4	23	<0.5	20	25	13	113	<0.1	<0.5	2	13
TFA 5 C	1.4-1.5m	<2	1	<0.5	<2	2	<1	4	<0.1	<0.5	<2	0
TFA 6 A	0-0.1m	9	14	<0.5	12	20	8	39	<0.1	1	3	1
TFA 6 C	1.2-1.3m	<2	<1	<0.5	<2	2	<1	3	<0.1	<0.5	<2	0
TFA 7 A	0-0.1m	3	22	1	11	24	8	100	<0.1	<0.5	<2	4
TFA 7 C	1.2-1.3m	<2	<1	<0.5	<2	<1	<1	2	<0.1	<0.5	<2	0
TFA 8 A	0-0.1m	3	20	<0.5	25	22	15	89	<0.1	1	<2	14
TFA 8 C	1.3-1.4m	<2	3	<0.5	3	5	2	7	<0.1	<0.5	4	0
TFA 9 A	0-0.1m	3	13	<0.5	10	9	5	37	<0.1	<0.5	<2	2
TFA 9 C	1.3-1.4m	<2	<1	<0.5	<2	1	<1	3	<0.1	<0.5	<2	0
TFA 10 A	0-0.1m	<2	2	<0.5	5	1	<1	6	<0.1	<0.5	3	0
TFA 10 C	1.4-1.5m	<2	<1	<0.5	<2	<1	<1	1	<0.1	<0.5	<2	0
TFA 11 A	0-0.1m	4	16	<0.5	12	26	28	111	<0.1	1	6	29
TFA 11 C	1.6-1.7m	<2	<1	<0.5	2	2	2	10	<0.1	<0.5	<2	1
Statistics												
Samples analysed		22	22	22	22	22	22	22	22	22	22	22
Detects		3	11	1	15	12	13	14	0	0	0	0
% detect		14%	50%	5%	68%	55%	59%	64%	0%	0%	0%	0%

Sample	Depth (m)	Arsenic	Lead	Cadmium	Chromium	Copper	Nickel	Zinc	Mercury	Beryllium	Boron	Cobalt
Maximum		9	26	1	25	33	28	113	nd	1	6	29
Mean		4.2	12.3	1.0	11.1	11.7	10.4	35.0	<0.1	0.6	3.5	4.1
Median		3.6	10.1	nd	11.9	9.3	9.8	24.3	<0.1	<0.5	<0.6	2.9
Minimum		<5	<5	<1	<2	<5	<2	<5	<0.1	<0.1	<0.1	<0.1
Criteria												
Commercial/industrial landuse with sandy soils (HSLs D)												
HILs - Residential A		100	300	20	100	6,000	400	7,400	40	20	3,000	100
EILs - Urban residential and public open space (aged)		100	1,100	-	410	230	270	770	-	-	-	-

Table 3: Soil Analytical Summary – BTEX & TRHs

Sample	Depth (m)	Benzene	Toluene	Ethylbenzene	meta - & para-Xylenes	ortho-Xylene	F1 TRHs C6 - C10	F1 TRHs C10 - C14	F1 TRHs C15 - C28	F1 TRHs C29 - C36	F1 TRHs C37 - C40
LORs		0.2	0.5	0.5	0.5	0.5	10	50	100	100	100
Analytical - Soil Borings											
TFA 1 A	0-0.1m	<0.1	<0.1	<0.1	<0.2	<0.1	<25	<20	66	70	<100
TFA 1 C	1.4-1.5m	<0.1	<0.1	<0.1	<0.2	<0.1	<25	<20	<45	<45	<100
TFA 2 A	0-0.1m	<0.1	<0.1	<0.1	<0.2	<0.1	<25	<20	46	56	<100
TFA 2 C	1.1-1.2m	<0.1	<0.1	<0.1	<0.2	<0.1	<25	<20	<45	<45	<100
TFA 3 A	0-0.1m	<0.1	<0.1	<0.1	<0.2	<0.1	<25	<20	58	120	<100
TFA 3 C	0.8-0.9m	<0.1	<0.1	<0.1	<0.2	<0.1	<25	<20	<45	46	<100
TFA 4 A	0-0.1m	<0.1	<0.1	<0.1	<0.2	<0.1	<25	<20	<45	<45	<100
TFA 4 C	1.2-1.3m	<0.1	<0.1	<0.1	<0.2	<0.1	<25	<20	<45	<45	<100
TFA 5 A	0-0.1m	<0.1	<0.1	<0.1	<0.2	<0.1	<25	<20	54	62	<100
TFA 5 C	1.4-1.5m	<0.1	<0.1	<0.1	<0.2	<0.1	<25	<20	<45	<45	<100
TFA 6 A	0-0.1m	<0.1	<0.1	<0.1	<0.2	<0.1	<25	<20	<45	<45	<100
TFA 6 C	1.2-1.3m	<0.1	<0.1	<0.1	<0.2	<0.1	<25	<20	<45	<45	<100
TFA 7 A	0-0.1m	<0.1	<0.1	<0.1	<0.2	<0.1	<25	<20	90	72	<100
TFA 7 C	1.2-1.3m	<0.1	0.5	0.1	0.9	0.4	<25	22	60	<45	<100
TFA 8 A	0-0.1m	<0.1	<0.1	<0.1	<0.2	<0.1	<25	<20	46	56	<100
TFA 8 C	1.3-1.4m	<0.1	<0.1	<0.1	<0.2	<0.1	<25	<20	<45	60	<100
TFA 9 A	0-0.1m	<0.1	<0.1	<0.1	<0.2	<0.1	<25	<20	64	75	<100
TFA 9 C	1.3-1.4m	<0.1	<0.1	<0.1	<0.2	<0.1	<25	<20	<45	<45	<100
TFA 10 A	0-0.1m	<0.1	<0.1	<0.1	<0.2	<0.1	<25	<20	<45	55	<100

Sample	Depth (m)	Benzene	Toluene	Ethylbenzene	meta - & para-Xylenes	ortho-Xylene	F1 TRHs C6 - C10	F1 TRHs C10 - C14	F1 TRHs C15 - C28	F1 TRHs C29 - C36	F1 TRHs C37 - C40
TFA 10 C	1.4-1.5m	<0.1	<0.1	<0.1	<0.2	<0.1	<25	<20	<45	<45	<100
TFA 11 A	0-0.1m	<0.1	<0.1	<0.1	<0.2	<0.1	<25	<20	<45	<45	<100
TFA 11 C	1.6-1.7m	<0.1	<0.1	<0.1	<0.2	<0.1	<25	<20	<45	<45	<100
Statistics											
Samples analysed		22	22	22	22	22	22	22	22	22	22
Detects		0	1	0	1	1	0	0	0	1	0
% detect		0%	5%	0%	5%	5%	0%	0%	0%	5%	0%
Maximum		nd	1	nd	0.9	nd	nd	nd	nd	120	nd
Mean		nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Median		nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Minimum		<0.2	<0.5	<0.5	<0.5	<0.5	<10	<50	<100	<100	<100
Criteria											
Commercial/industrial landuse with sandy soils (HSLs D)											
Health levels 0m to <1m		3	NL	NL	230	NL	260	NL	NL	NL	NL
Health levels 1m to <2m		3	NL	NL	NL	NL	370	NL	NL	NL	NL
Health levels 2m to <4m		3	NL	NL	NL	NL	630	NL	NL	NL	NL
Health levels 4m+		3	NL	NL	NL	NL	NL	NL	NL	NL	NL
Residential landuse with sandy soils (HIls A, ESLs, EILs, Management Limits)											
Health investigation level		-	-	-	-	-	-	-	-	-	-
Ecological levels		50	85	70	105	180	120	180	120	300	2,800
Management limits		-	-	-	-	700	1,000	700	1,000	3,500	10,000

Table 4: Soil Analytical Summary – PAHs

Sample	Depth (m)	Naphthalene	2-methylnaphthalene	1-methylnaphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b&j)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenzo(ah)anthracene	Benzo(ghi)perylene
LORs		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Analytical - Soil Borings																			
TFA 1 A	0-0.1m	nd	nd	nd	nd	nd	nd	0.4	0.1	0.9	0.9	0.3	0.4	0.4	0.3	0.4	0.4	nd	0.3
TFA 1 C	1.4-1.5m	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
TFA 2 A	0-0.1m	nd	nd	nd	nd	nd	nd	0.2	nd	0.5	0.6	0.2	0.2	0.3	0.2	0.3	0.2	nd	0.2
TFA 2 C	1.1-1.2m	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
TFA 3 A	0-0.1m	nd	nd	nd	nd	nd	nd	0.2	nd	0.3	0.4	0.2	0.3	0.9	0.5	0.8	0.9	nd	0.8
TFA 3 C	0.8-0.9m	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
TFA 4 A	0-0.1m	nd	nd	nd	nd	nd	nd	nd	nd	0.1	0.1	nd	nd	nd	nd	nd	nd	nd	nd
TFA 4 C	1.2-1.3m	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
TFA 5 A	0-0.1m	nd	nd	nd	0.2	nd	nd	0.5	0.2	1.4	1.4	0.4	0.5	0.5	0.5	0.7	0.5	nd	0.7
TFA 5 C	1.4-1.5m	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
TFA 6 A	0-0.1m	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
TFA 6 C	1.2-1.3m	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
TFA 7 A	0-0.1m	nd	nd	nd	nd	nd	nd	nd	nd	0.2	0.2	nd	nd	nd	nd	nd	nd	nd	nd
TFA 7 C	1.2-1.3m	nd	0.1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
TFA 8 A	0-0.1m	nd	nd	nd	nd	nd	nd	0.2	nd	0.6	0.5	0.2	0.2	0.2	0.2	0.3	0.1	nd	0.2
TFA 8 C	1.3-1.4m	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
TFA 9 A	0-0.1m	nd	nd	nd	0.4	nd	nd	0.7	0.3	1.4	1.6	0.5	0.7	0.5	0.5	0.8	0.4	nd	0.6
TFA 9 C	1.3-1.4m	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
TFA 10 A	0-0.1m	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
TFA 10 C	1.4-1.5m	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd

Sample	Depth (m)	Naphthalene	2-methylnaphthalene	1-methylnaphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b&j)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenzo(ah)anthracene	Benzo(ghi)perylene
TFA 11 A	0-0.1m	nd	nd	nd	0.1	nd	nd	0.3	0.3	0.7	0.7	0.2	0.3	0.2	0.2	0.3	0.2	nd	0.3
TFA 11 C	1.6-1.7m	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Statistics																			
Samples analysed		22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
Detects		0	0	0	0	0	0	2	0	3	3	2	2	3	3	3	2	2	3
% detect		0%	0%	0%	0%	0%	0%	9%	0%	14%	14%	9%	9%	14%	14%	14%	9%	9%	14%
Maximum		nd	nd	nd	nd	nd	nd	0.7	nd	1.4	1.6	0.5	0.7	0.9	0.5	0.8	0.9	nd	0.8
Mean		nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Median		nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Minimum		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Criteria																			
Commercial/industrial landuse with sandy soils (HSLs D)																			
HILs - Residential A		NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL
EILs - Urban residential and public open space (aged)		NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	0.7	NL	NL	NL

Table 5: Soil Analytical Summary – OCs

Sample	Depth (m)	Sum of Endosulfan	Dieldrin	Endrin
LORs		0.05	0.05	0.05
Analytical - Soil Borings				
TFA 1 A	0-0.1m	nd	nd	nd
TFA 1 C	1.4-1.5m	nd	nd	nd
TFA 2 A	0-0.1m	nd	nd	nd
TFA 2 C	1.1-1.2m	nd	nd	nd
TFA 3 A	0-0.1m	nd	nd	nd
TFA 3 C	0.8-0.9m	nd	nd	nd
TFA 4 A	0-0.1m	nd	nd	nd
TFA 4 C	1.2-1.3m	nd	nd	nd
TFA 5 A	0-0.1m	nd	nd	nd
TFA 5 C	1.4-1.5m	nd	nd	nd
TFA 6 A	0-0.1m	nd	nd	nd
TFA 6 C	1.2-1.3m	nd	nd	nd
TFA 7 A	0-0.1m	nd	nd	nd
TFA 7 C	1.2-1.3m	nd	nd	nd
TFA 8 A	0-0.1m	nd	nd	nd
TFA 8 C	1.3-1.4m	nd	nd	nd
TFA 9 A	0-0.1m	nd	nd	nd
TFA 9 C	1.3-1.4m	nd	nd	nd
TFA 10 A	0-0.1m	nd	nd	nd
TFA 10 C	1.4-1.5m	nd	nd	nd
TFA 11 A	0-0.1m	nd	nd	nd
TFA 11 C	1.6-1.7m	nd	nd	nd
Statistics				
Samples analysed		22	22	22
Detects		0	0	0
% detect		0%	0%	0%
Maximum		nd	nd	nd
Mean		nd	nd	nd
Median		nd	nd	nd
Minimum		<0.05	<0.05	<0.05
Criteria				
Commercial/industrial landuse with sandy soils (HSLs D)				
HILs - Residential A		270	6	10
EILs - Urban residential and public open space (aged)		NL	NL	NL

Table 6: Soil Analytical Summary – Asbestos

Sample	Depth (m)	Asbestos
LORs		<0.01
Analytical - Soil Borings		
TFA 1 A	0-0.1m	<0.01
TFA 1 B	1-1.2m	<0.01
TFA 2 A	0-0.1m	<0.01
TFA 2 B	0.6-0.7m	<0.01
TFA 3 B	0.5-0.6m	<0.01
TFA 4 A	0-0.1m	<0.01
TFA 4 B	0.5-0.6m	<0.01
TFA 5 A	0-0.1m	<0.01
TFA 5 B	0.9-1m	<0.01
TFA 6 A	0-0.1m	<0.01
TFA 6 B	0.5-0.6m	<0.01
TFA 7 A	0-0.1m	<0.01
TFA 7 B	0.5-0.6m	<0.01
TFA 8 A	0-0.1m	<0.01
TFA 8 B	1-1.1m	<0.01
TFA 9 A	0-0.1m	<0.01
TFA 9 B	1-1.1m	<0.01
TFA 10 A	0-0.1m	<0.01
TFA 10 B	0.3-0.4m	<0.01
TFA 11 A	0-0.1m	<0.01
TFA 11 B	0.3-0.4m	<0.01
TFA ASB Field Dup		<0.01
TFA ASB Lab Dup		<0.01
Statistics		
Samples analysed		21
Detects		0
% detect		0%
Maximum		nd
Mean		nd
Median		nd
Minimum		<0.01
Criteria		
Commercial/industrial landuse with sandy soils (HSLs D)		
HILs - Residential A		<0.01
EILs - Urban residential and public open space (aged)		<0.01

Table 7: Soil Analytical Summary, Quality Control

Analyte	LOR mg/kg	TFA 1A	TFA 1A	**RPD**	TFA 2A	Lab Dup 1	**RPD**	TFA 3A	Lab Dup 2	**RPD**	Field Blank	**RPD**
Type	-	Primary	Duplicate	%	Primary	Inter-laboratory Duplicate	%	Primary	Inter-laboratory Duplicate	%	-	%
Media	Soil	Soil	Soil	-	Soil	Soil	-	Soil	Soil	-	-	-
Heavy metals												
Arsenic	5	5	4.4	13%	3	10	**191%**	7	-	nd	-	nd
Lead	5	26	25.8	1%	13	15	14%	18	-	nd	-	nd
Cadmium	1	<0.5	<0.5	nd	<0.5	<0.5	nd	<0.5	-	nd	-	nd
Chromium	2	16	22.3	37%	13	26	**104%**	17	-	nd	-	nd
Copper	5	33	35.2	6%	14	10	28%	15	-	nd	-	nd
Nickel	2	12	15.2	23%	8	6	24%	21	-	nd	-	nd
Zinc	5	101	137.8	36%	42	33	20%	47	-	nd	-	nd
Mercury	0.1	<0.1	<0.1	nd	<0.1	<0.1	nd	<0.1	-	nd	-	nd
Beryllium	20	1	0.5	0%	<0.5	<0.5	nd	<0.5	-	nd	-	nd
Boron	3,000	<2	<2	nd	<2	<2	nd	<2	-	nd	-	nd
Cobalt	100	8	5.7	27%	5	4	29%	5	-	nd	-	nd
BTEXN, TRHs												
Benzene	0.2	<0.1	<0.1	nd	<0.1	<0.1	nd	<0.1	<0.1	nd	<0.1	nd
Toluene	0.5	<0.1	<0.1	nd	<0.1	<0.1	nd	<0.1	<0.1	nd	<0.1	nd
Ethylbenzene	0.5	<0.1	<0.1	nd	<0.1	<0.1	nd	<0.1	<0.1	nd	<0.1	nd
meta - & para-Xylenes	0.5	<0.2	<0.2	nd	<0.2	<0.2	nd	<0.2	<0.2	nd	<0.2	nd
ortho-Xylene	0.5	<0.1	<0.1	nd	<0.1	<0.1	nd	<0.1	<0.1	nd	<0.1	nd
F1 TRHs C6 - C10	10.0	<25	<25	nd	<25	<25	nd	<25	<25	nd	<25	nd
F1 TRHs C10 - C14	50.0	<20	<20	nd	<20	<20	nd	<20	<20	nd	<20	nd
F1 TRHs C15 - C28	100.0	66	89.0	35%	46	<45	nd	58	<45	22%	<45	nd
F1 TRHs C29 - C36	100.0	70	100.0	43%	56	<45	nd	120	<45	**63%**	<45	nd
F1 TRHs C37 - C40	100.0	<100	<100	nd	<100	<100	nd	<100	<100	nd	<100	nd
PAHs												

Analyte	LOR mg/kg	TFA 1A	TFA 1A	**RPD**	TFA 2A	Lab Dup 1	**RPD**	TFA 3A	Lab Dup 2	**RPD**	Field Blank	**RPD**
Naphthalene	0.5	<0.1	<0.1	nd	<0.1	<0.1	nd	<0.1	<0.1	nd	-	nd
2-methylnaphthalene	0.5	<0.1	<0.1	nd	<0.1	<0.1	nd	<0.1	<0.1	nd	-	nd
1-methylnaphthalene	0.5	<0.1	<0.1	nd	<0.1	<0.1	nd	<0.1	<0.1	nd	-	nd
Acenaphthylene	0.5	<0.1	0.1	nd	<0.1	<0.1	nd	<0.1	<0.1	nd	-	nd
Acenaphthene	0.5	<0.1	<0.1	nd	<0.1	<0.1	nd	<0.1	<0.1	nd	-	nd
Fluorene	0.5	<0.1	<0.1	nd	<0.1	<0.1	nd	<0.1	<0.1	nd	-	nd
Phenanthrene	0.5	0.4	0.6	nd	0.2	<0.1	nd	0.2	<0.1	nd	-	nd
Anthracene	0.5	0.1	0.2	nd	<0.1	<0.1	nd	<0.1	<0.1	nd	-	nd
Fluoranthene	0.5	0.9	1.4	nd	0.5	<0.1	nd	0.3	0.1	nd	-	nd
Pyrene	0.5	0.9	1.2	nd	0.6	<0.1	nd	0.4	0.1	nd	-	nd
Benzo(a)anthracene	0.5	0.3	0.4	nd	0.2	<0.1	nd	0.2	<0.1	nd	-	nd
Chrysene	0.5	0.4	0.5	nd	0.2	<0.1	nd	0.3	<0.1	nd	-	nd
Benzo(b&j)fluoranthene	0.5	0.4	0.4	nd	0.3	<0.1	nd	0.9	<0.1	nd	-	nd
Benzo(k)fluoranthene	0.5	0.3	0.4	nd	0.2	<0.1	nd	0.5	<0.1	nd	-	nd
Benzo(a)pyrene	0.5	0.4	0.5	nd	0.3	<0.1	nd	0.8	<0.1	nd	-	nd
Indeno(1,2,3-cd)pyrene	0.5	0.4	0.3	nd	0.2	<0.1	nd	0.9	<0.1	nd	-	nd
Dibenzo(ah)anthracene	0.5	<0.1	<0.1	nd	<0.1	<0.1	nd	<0.1	<0.1	nd	-	nd
Benzo(ghi)perylene	0.5	0.3	0.4	nd	0.2	<0.1	nd	0.8	<0.1	nd	-	nd
Ocs												
Sum of Endosulfan	0.1	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	nd
Dieldrin	0.1	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	nd
Endrin	0.1	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	nd
Data Quality Indicator	-	-	-	<50%	-	-	<50%	-	-	<50%	-	70-130%

Table 8: Groundwater Analytical Summary

Sample Location	Date Sampled	Depth to water (m)	BTEXN						TRH			
			Benzene	Toluene	Ethylbenzene	m/p-Xylene	o-Xylene	Naphthalene	F1 TRHs C6 - C10	F1 TRHs C10 - C14	F1 TRHs C15 - C28	F1 TRHs C29 - C36
LORs		-	1	2	2	2	2	2	20	100	100	100
Analytical - Soil Borings												
GW1	22/04/2021	1.52	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<40	<50	<100	<50
GW2	22/04/2021	1.45	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<40	<50	<100	<50
GW3	22/04/2021	1.15	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<40	<50	320	<50
Statistics												
Samples analysed			3	3	3	3	3	3	3	3	3	3
Detects			0	0	0	0	0	0	0	0	0	0
% detect			0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Maximum			nd	<0.5	nd	nd	nd	nd	<40	<50	<100	<50
Mean			nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Median			nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Minimum			<1	<2	<2	<2	<2	<2	<20	<100	<100	<100
Criteria - Residential												
Health levels 2 m - <4m			800	NL	NL	NL	NL	NL	-	1,000	NL	NL
Marine water			500	-	-	-	-	50	-	-	-	-
Drinking Water			1	800	300	600	-	-	-	-	-	-
Recreational Criteria			10	8,000	3,000	6,000	-	-	-	-	-	-

Table 9: Groundwater Analytical – Metals

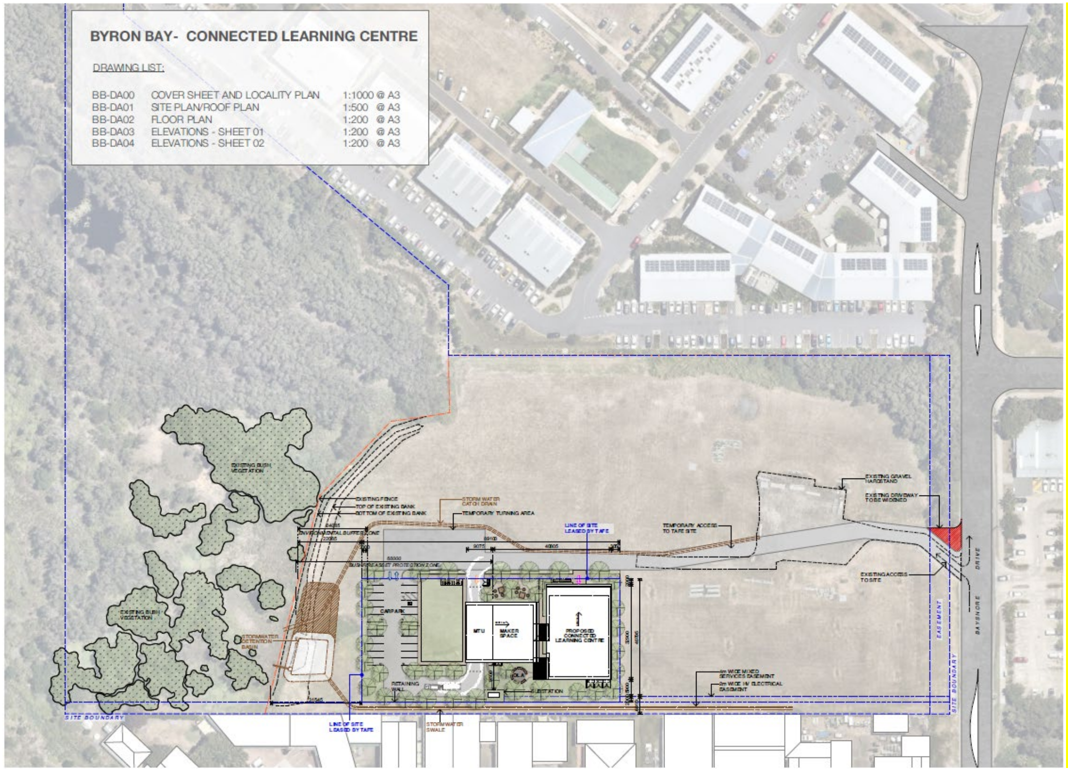
Sample Location	Date Sampled	Depth to water (m)	Silver	Aluminium	Arsenic	Cadmium	Chromium	Copper	Iron	Manganese	Nickel	Lead	Selenium	Zinc	Mercury
LORs		-	1	1	1	0.1	1	1	1	1	1	1	1	5	1
Analytical - Soil Borings															
GW1			nd	nd	nd	nd	nd	nd	44.8	nd	nd	nd	nd	nd	nd
GW2			nd	2.7	nd	nd	nd	nd	11.8	nd	nd	nd	nd	nd	nd
GW3			nd	nd	nd	nd	nd	nd	20.2	3.5	nd	nd	nd	nd	nd
Statistics															
Samples analysed			3	3	3	3	3	3	3	3	3	3	3	3	3
Detects			0	1	0	0	0	0	3	1	0	0	0	0	0
% detect			0%	33%	0%	0%	0%	0%	100%	33%	0%	0%	0%	0%	0%
Maximum					nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Mean			nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Median			nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Minimum			<1	<1	<1	<0.1	<1	<1	<1	<1	<1	<1	<1	<5	<1
Criteria - Residential															
GILs - Drinking Water			0.1	0.2	10	2	50*	2,000	0.3	0.1	20	10	0.01	-	1
GILs - Marine water			1	-	2.3 / 4.5	0.7	4.4	1.3	-	-	7	4.4	1	15	0.1
Recreational Criteria			-	-	100	20	500	20,000	-	-	200	100	-	-	10

Table 10: Groundwater Analytical – Quality Control

Analyte	LOR ug/L	GW1	GW1	**RPD**	GW1	**RPD**
Type	-	Primary	Duplicate	%	Inter-laboratory Duplicate of GW1	%
Date	-			-		-
Metals						
Silver	1	<0.001	<0.001	nd	<0.001	nd
Aluminium	1	0.11	0.15	40%	0.11	1%
Arsenic	1	0.02	0.02	2%	0.02	3%
Cadmium	0.1	<0.001	<0.001	nd	<0.001	nd
Chromium	1	0.00	0.00	5%	0.00	13%
Copper	1	<0.001	<0.001	nd	<0.001	nd
Iron	1	44.81	43	-3%	45	0%
Manganese	1	0.40	0.4	-7%	0.4	4%
Nickel	1	0.00	0.00	-10%	0.00	23%
Lead	1	<0.001	<0.001	nd	<0.001	nd
Selenium	1	0.00	<0.001	nd	<0.001	nd
Zinc	5	0.01	0.01	-13%	0.01	27%
Mercury	1	0.00	<0.0005	nd	<0.0005	nd
Benzene	1	<0.5	<0.5	nd	<0.5	nd
Toluene	2	<0.5	<0.5	nd	<0.5	nd
Ethylbenzene	2	<0.5	<0.5	nd	<0.5	nd
m/p-Xylene	2	<1	<1	nd	<1	nd
o-Xylene	2	<0.5	<0.5	nd	<0.5	nd
Naphthalene	2	<0.5	<0.5	nd	<0.5	nd
F1 TRHs C6 - C10	20	<40	<40	nd	<40	nd
F1 TRHs C10 - C14	100	<50	<50	nd	<50	nd
F1 TRHs C15 - C28	100	<100	<100	nd	<100	nd
F1 TRHs C29 - C36	100	<50	<50	nd	<50	nd
Data Quality Indicator	-	-	-	<50%	-	<50%

Figures

Figure 1 Location map



Source Brewster North Architects 2021

Figure 2 Proposed Development Plan

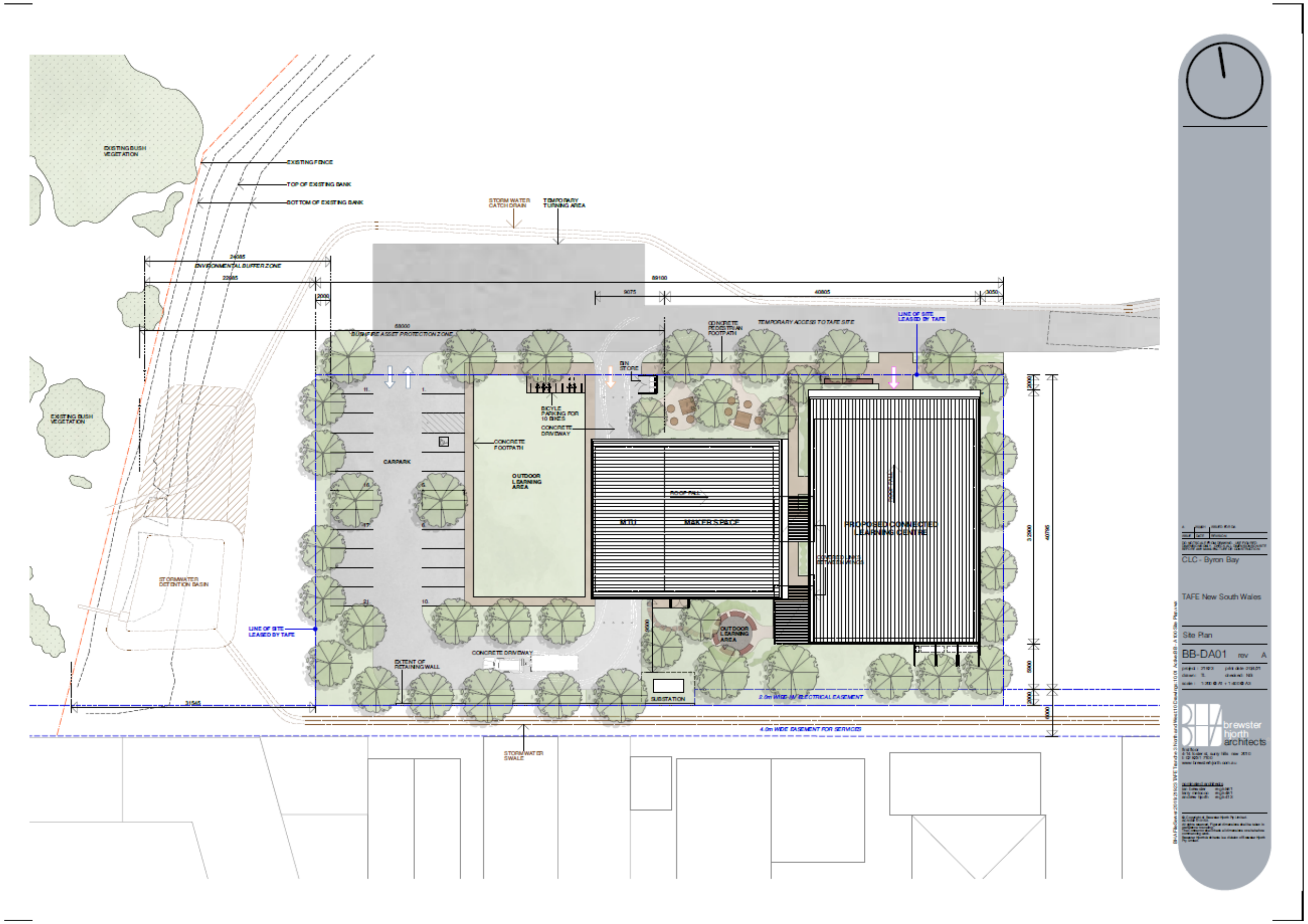


Figure 3 Investigation Area

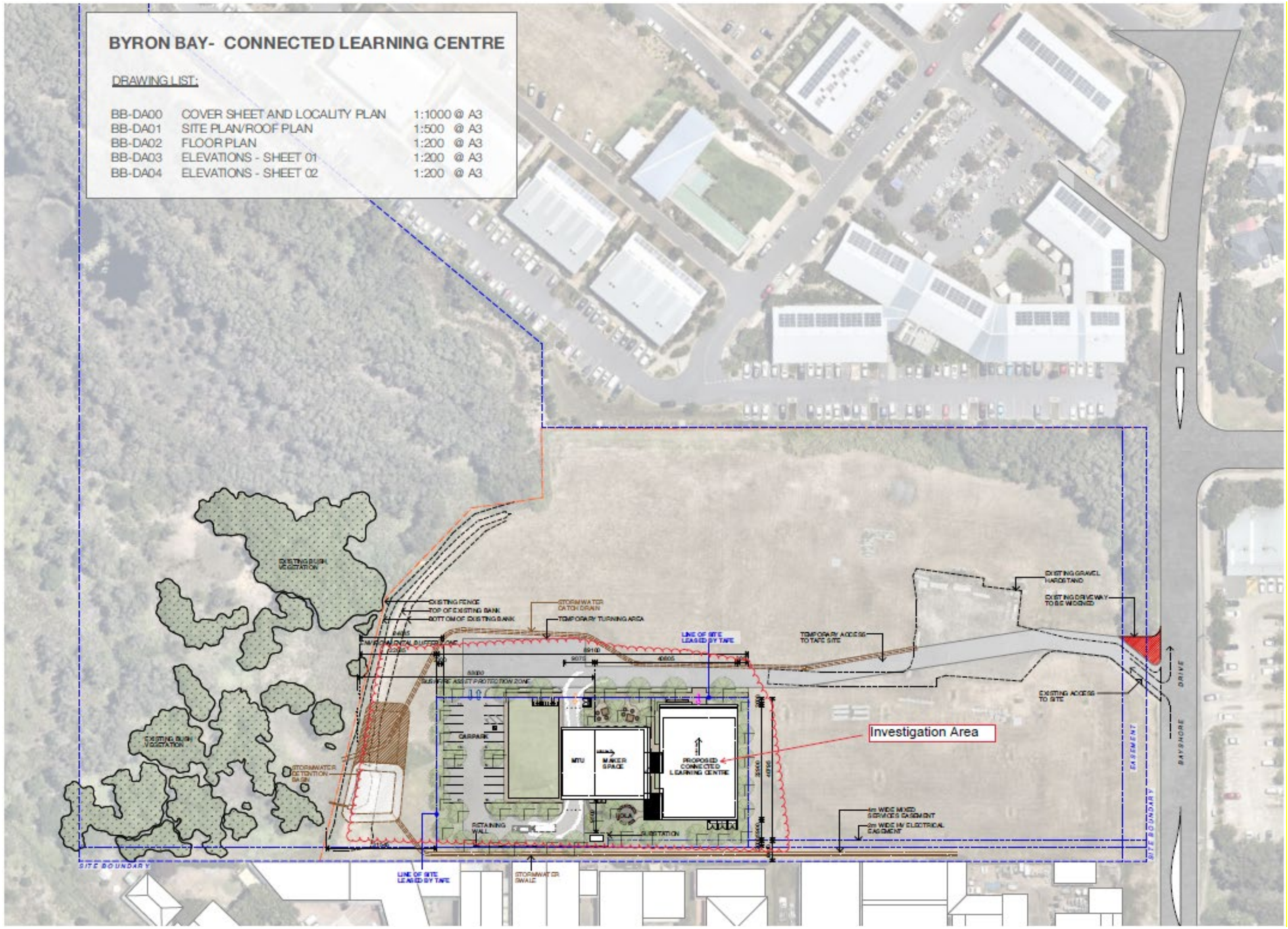


Figure 4

Groundwater Sampling Locations

Preliminary Site Inspection Proposed TAFE

Lot 12 DP1189646 / No.42 Wallum Place, Byron Bay

PREPARED BY:

tim fitzroy & associates

A Preliminary Site Investigation (BMack 2014)

BMACK
PROJECT MANAGEMENT
SERVICES

SEPP 55 – Preliminary Contamination Assessment: Lot 2 Bayshore Drive, Byron Bay Byron Shire Council

January 2014

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CONTENTS

EXECUTIVE SUMMARY

Byron Shire Council proposes to amalgamate the access handle of Lot 1 DP 1004514 with Lot 2 DP 1004514 Bayshore Drive Byron Bay with the intention to sell or develop the site for industrial use.

The EP & A Act 1979 requires Council, as the consent authority, to consider "the suitability of the site for the development' which includes potential risk to health and the environment". SEPP 55 - Remediation of Land - Managing Land Contamination sets out the duty of Councils to include risks of work safety issues, disturbance of contaminated material and off-site movement of contaminants during construction and operation.

For the purposes of the Act, Contamination of land means the presence in, on or under the land of a substance at a concentration above the concentration at which the substance is normally present in, on or under (respectively) land in the same locality, being a presence that presents a risk of harm to human health or any other aspect of the environment.

As the consent authority, Council cannot make a judgement that the site is suitable in its contaminated state (or will be suitable, after remediation) for the purpose for which the development / change of use is proposed to be carried out, unless a preliminary contamination investigation is provided.

Guidelines are provided to Councils for the preliminary assessment of lands under SEPP55.

If the results of the preliminary contamination investigation establish no or minimal/ negligible presence of contaminants and minimal risks or hazards for the specified purpose (i.e. light industrial type development) and Council as the consent authority is satisfied in this regard, then no detailed investigation is required. If a judgement is made by the consent authority that there may be some risk, then Council could impose a 'deferred commencement' condition requiring further work/ site audit/ Remediation Action Plan etc before the consent is activated.

The purpose of this SEPP55 preliminary investigation is therefore to identify any past or present potentially contaminating activities and provide a preliminary assessment of any site contamination and, if required, provide a basis for a more detailed investigation or clean-up action. It's objective is then to determine whether any constraints exist with respect to SEPP55 which might prevent or constrain the future development of the land.

The baseline or "null" hypothesis for this study asserts that "claims that ***the subject site is not contaminated under the CLM Act are false.*** *" Based on the results of this study there is insufficient evidence to support such an hypothesis. Indeed each stage of this assessment has shown the site is unlikely to contain contamination as defined under the Contaminated Lands Management Act.*

The conceptual site model as summarised in the following table, demonstrates that the risk that the site does contain contamination as defined under the Contaminated Lands Management Act is low.

This Preliminary SEPP55 Assessment Under SEPP55 concludes that the subject site does not contain contamination as defined under the Contaminated Lands Management Act. As such it is considered suitable for the proposed use of an industrial estate development.

The sources of information on which this assessment has been based are many and varied. The integrity of the gathered data is arguably confirmed by its consistency with information supplied by resident interviews, formal historical records, site investigation, visual inspection, test pits and targeted sampling and chemical testing. Each assessment stage has been built on the information previously gathered including the site's characteristics, history, and preliminary targeted site investigations.

Engineering consideration of the most appropriate way to deal with fill materials stored on site is beyond the scope of this report and is the subject of separate report1. It is understood that, subject to separate economic considerations, it is proposed to improve the engineering properties of these stockpiled materials by sorting, grading and processing to remove extraneous refuse and litter and vegetative matter, followed by a blending process to yield a select fill suitable for reuse.

It is considered that refining and processing of these materials in this manner would provide Council with greater certainty in discharging their responsibilities with respect to the Act if/when approving the future development of land for industrial purposes.

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[1] Site Cleanup & Restoration Lot 2 Bayshore Drive, Byron Bay - BMack January, 2014.

Possible Contaminant	Conceptual Site Model Hypothesis	Possible Source	Probable extent	Risk	Comment	Further investigation	Conclusion	Mitigation on this site
Elevated radiation levels	Elevated radiation levels present.	Past Sandmining activities or naturally occurring	Historical evidence suggests sand not deposited on this site, topsoil subsequently removed, and area covered with clay.	low	Visual site evidence confirms topsoils removed or covered with clay	Nil.	Grid checks for elevated radiation levels. SCU radiation survey confirms background levels of radiation only. There is no evidence to suggest the site has been impacted by mineral sand mining or contains elevated radiation levels.	Monitor earthworks,. Develop prior to works commencing, suitable response in the event of significant discovery of these materials.
Asbestos	Minor amounts of asbestos brake sweepings present within imported materials.	Brake linings from street sweepings and possible broken water pipe or other litter	Likely to be insignificant quantities, and likely to be contained within imported soil and material from maintenance cleaning.	low	Unlikely to be able to isolate or identify asbestos sweepings due to small volumes and particle size within material.	Nil.	Site not likely to be contaminated by asbestos, but may contain isolated larger pieces of asbestos pipe or similar.	Eliminate dust generation. Maintain exported loads damp as precaution and dispose of at landfill. Monitor earthworks, excavation and loading. Develop prior to works commencing, suitable response in the event of significant discovery of these materials.
Lead and petroleum products, and pesticides	Elevated levels of hydrocarbons and pesticides present.	Site Machinery Fuel, Oils and Grease	No evidence of contamination or any history of storage on site. If present, likely to be localised and minor	low	Visual site inspection has shown no evidence of contamination, nor have odours been detected.	Nil.	Minor presence detected	Monitor earthworks, excavation and loading. Develop prior to works commencing, suitable response in the event of significant discovery of

Possible Contaminant	Conceptual Site Model Hypothesis	Possible Source	Probable extent	Risk	Comment	Further investigation	Conclusion	Mitigation on this site
			from isolated point sources (eg leaking / refuelling plant working intermittently on site).					these materials.
	Elevated levels of lead present.	Street Sweepings	Historical evidence suggests street sweepings present in stockpile. Given rural roads source, unlikely to contain signficant concentrations of lead.	low	Unlikely to be able to isolate or identify lead content in sweepings due to small volumes and particle size within material.	Nil	All 10 samples returned results within expected background levels, and less than the limits set in the NSW EPA Contaminated Sites - Guidelines for the NSW Site Auditors Scheme (2006) for "Residential development with gardens and accessible soil including children's' daycare centres, preschools, primary schools, town houses or villas".	Monitor earthworks, excavation and loading. Develop prior to works commencing, suitable methodology for response in the event of significant discovery of these materials. Test for presence of lead.
	Elevated levels of lead or pesticides, litter and refuse present.	Drainage and Road Maintenance	Historical evidence suggests material from drainage maintenance present in stockpile. Limited contaminants to drains expected (litter, road runoff, light industry,	low	Visual evidence of litter and inert refuse. Unlikely to be able to isolate or identify lead or pesticide content in material due to small volumes and particle size within material.	Nil.	Pesticides: no concentrations above detection limits. Lead: refer street sweeping above. **Sparse refuse** and litter present.	Monitor earthworks, excavation and loading. Develop prior to works commencing, suitable methodology for response in the event of significant discovery of these materials.

Possible Contaminant	Conceptual Site Model Hypothesis	Possible Source	Probable extent	Risk	Comment	Further investigation	Conclusion	Mitigation on this site
			agriculture). Expect litter & inert refuse. Lead & pesticides, possible but unlikely to be at significant concentrations.					
Vegetative Material and soil mix	Significant quantities of vegetative matter present..	Drainage and Road maintenance	Historical evidence suggests material from drainage & road maintenance present in stockpile. Limited vegetative material within mixed soils & gravels.	low	Unlikely to contain contamination. However, material has poor engineering properties which need to be addressed for development.	Nil	Vegetative material unlikely to significantly contaminate but renders site fill materials unsuitable as select fill.	Monitor earthworks, excavation and loading. Develop prior to works commencing, suitable methodology for response in the event of significant discovery of these materials.
	Quantities of these materials evident in existing stockpiles.	Mulching & composting	Historical evidence suggests mulching & composting material present in stockpile. Limited vegetative material within mixed soils & gravels.	low	Unlikely to contain contamination. However, material has poor engineering properties which need to be addressed for development.	Nil	Vegetative material should be identified and stockpiles removed from site.	Monitor excavation, loading and removal from site to appropriate location. Develop prior to works commencing, suitable methodology.
General (litter, bottles, cans,	Materials present on site.	Drainage and Road maintenance, and	Historical evidence suggests material from drainage /	low	Unlikely to contain contamination. However, material has poor engineering	Nil	Litter and inert refuse material unlikely to contaminate, but should be	Sort and remove from site. Dispose of to landfill and/or

Possible Contaminant	Conceptual Site Model Hypothesis	Possible Source	Probable extent	Risk	Comment	Further investigation	Conclusion	Mitigation on this site
plastics and steel)		Street Sweeping	road maintenance & street sweeping present in stockpile. Limited litter & inert refuse within mixed soils & gravels.		properties which need to be addressed for development.		collected and removed from site to a suitable location.	recycle where practical.

INTRODUCTION & PURPOSE

Byron Shire Council proposes to amalgamate the access handle of Lot 1 DP 1004514 with Lot 2 DP 1004514 Bayshore Drive Byron Bay with the intention to sell or develop the site for industrial use. Separate advice to Council confirms that Development Approval (DA) is required to allow the proposed subdivision to occur[2]. Assessment of the DA requires consideration of a preliminary assessment report for the potential for land contamination on the site under State Planning Policy No. 55 (SEPP55).

Guidelines[3] are provided to Councils by the Environmental Protection Authority for the preliminary assessment of lands under SEPP55.

The purpose of this preliminary investigation is therefore to identify any past or present potentially contaminating activities and provide a preliminary assessment of any site contamination and, if required, provide a basis for a more detailed investigation or clean-up action.

The Guidelines (section 3.3.2) set out instances where further information is required:

"*After carrying out an initial evaluation, if there are indications that contamination is, or may be, present and the planning authority has insufficient information on which to make a planning decision, the proponent should be asked to provide further information.*

A planning authority may need to seek further information when:

- *the subject site or land in the vicinity is, or may be, associated with activities listed in Table 1 but it is not known whether contamination exists;*
- *the land was, or is, regulated by the EPA or other regulatory authority in relation to land contamination, and there is insufficient information available about the nature and extent of contamination;*
- *the land has been investigated or remediated but there is insufficient information available about the nature and extent of contamination, or the circumstances have changed;*
- *there are restrictions on, or conditions attached to, the use of the site by regulatory or planning authorities that are, or may be, related to contamination, but there is insufficient information available about the nature and extent of contamination;*
- *council records have demonstrated that the land is associated with complaints about pollution or illegal dumping of wastes but it is not known whether contamination exists;*

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[2] Site Cleanup & Restoration Lot 2 Bayshore Drive, Byron Bay – BMACK Jan 2014

[3] Managing Land Contamination Planning Guidelines - Department of Urban Affairs & Planning 1998

- *a use such as residential, educational, recreational, hospital or childcare is proposed on the land and records on the site history are unclear about whether the land has been used in the past for a purpose listed in Table 1.*

A site history may be 'unclear' if there are significant gaps in historical information, or land uses are not described in sufficient detail to identify the presence or absence of uses listed in Table 1 during periods in which such uses were permissible under the zoning."

Section 79C(1) of the E P & A Act 1979 requires the consent authority to consider 'the suitability of the site for the development'. The potential risk to health and the environment must be included in this assessment (see ALEC FINDLAYSON P/L V ARMIDALE CITY COUNCIL & ANOR 51FCR378). Section 4.3 of the "Planning Guidelines SEPP 55 - Remediation of Land - Managing Land Contamination" sets out the duty of Councils - consideration of risks include **risks during construction and operation of the development, work safety issues, disturbance of contaminated material, off-site movement of contaminants.**

Contamination of land, for the purposes of this Act, means the presence in, on or under the land of a substance at a concentration above the concentration at which the substance is normally present in, on or under (respectively) land in the same locality, being a presence that presents a risk of harm to human health or any other aspect of the environment.

Council as the consent authority cannot make a judgement that the site and its component parts (having regard for its history) **is suitable in its contaminated state (or will be suitable, after remediation) for the purpose for which the development / change of use is proposed to be carried out,** unless a preliminary contamination investigation as required by Clause 7 (2) is provided. The onus is on the applicant to demonstrate that the site is or will be suitable in its contaminated state or is not contaminated for the proposed development.

If the results of the preliminary contamination investigation establish no or minimal/ negligible presence of contaminants and minimal risks or hazards for light industrial type development, and Council as the consent authority is satisfied in this regard, then no detailed investigation is required. If a judgement is made by the consent authority that there may be some risk, then Council could impose a 'deferred commencement' condition requiring further work/ site audit/ Remediation Action Plan etc before the consent is activated.

SCOPE OF WORK

The Scope of Works for this study is limited to the following:

- Site identification and survey;
- Search of DPI records of land ownership;
- Review of aerial photographs to ascertain historical land usage;
- Interviews with persons believed to have some past association with or knowledge of the usage of the land;
- Identification of potential or intended future land uses;
- Site inspection and preliminary assessment of the site and its surrounds;
- Preliminary assessment of the potential for land contamination and identification of potential contaminants;
- Review of the integrity of information obtained concerning the site; and
- Conclusions and recommendations.

Figure 1: Regional Setting

Figure 2: Local Setting

Plate 1: Site Layout & Contours

SITE IDENTIFICATION

The subject site is located approximately 4 km west of the Byron Bay town centre on Bayshore Drive. Situated in the north-western corner of the Byron Bay Arts and Industrial Estate, the land has frontage to Bayshore Drive, Byron Bay, NSW the site. Entrance to the site is approximately 600 metres north of the Ewingsdale Road / Bayshore Drive intersection.

The land comprises Lot 2 DP 1004514 and the narrow access handle to Lot 1 DP 1004514 and is here-in referred to as “the subject site” or “the site”.

The land is owned by Byron Shire Council.

Details of the property, including scale and north point, are provided on a DP 1004514 in Appendix A.

A detail survey of the site is contained in Appendix B showing geographic co-ordinates related to the nearby cadastral State Survey Control Marker SSM61807 and local water drainage and other local environmentally significant features.

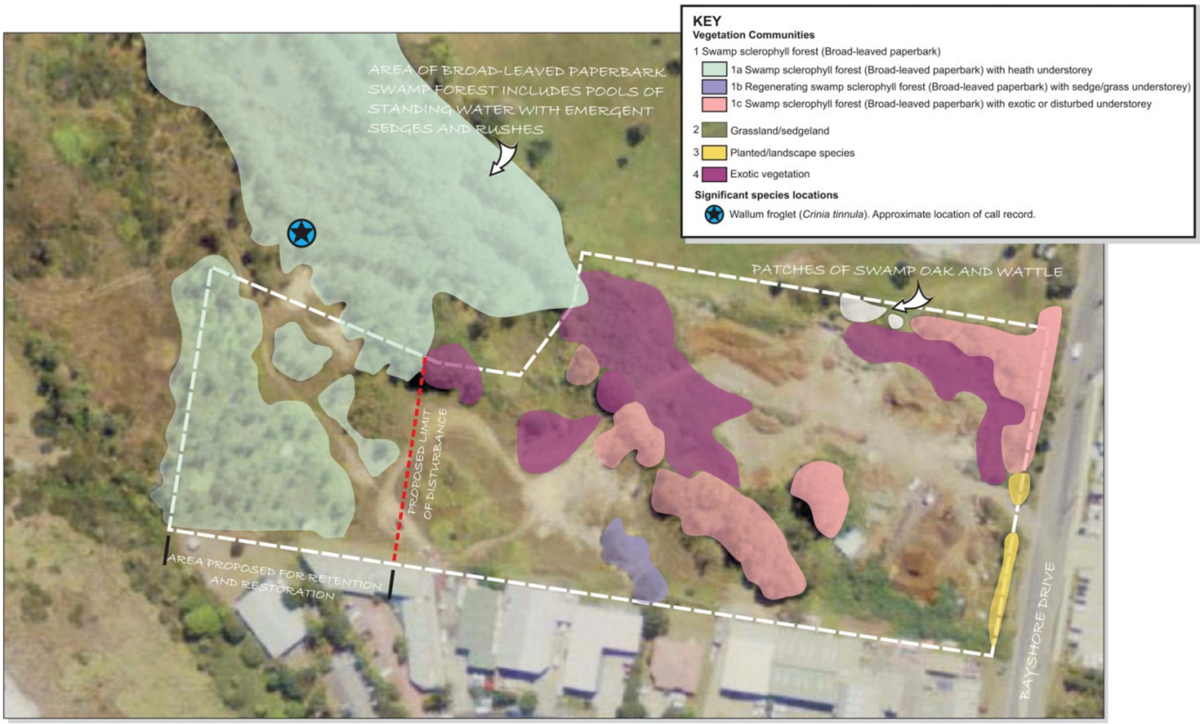

Plate 2: Site Vegetation (Source Blackwood Ecological Services Report)

SITE HISTORY

ZONING

The site is zoned predominantly 4(a) Industrial Zone (Lot 2), with the access handle to Lot 1 being 2 (v) Village zone under *Byron Local Environmental Plan 1988.* Byron Shire wide DCP Chapter 15 (Industrial Development) provides additional controls and standards relevant to the dominant zone.

Future Zoning will depend on the outcomes of the new Byron LEP. The most recent version of the draft Shire Wide LEP for Byron as supported by Council for exhibition in 2012 has nominated the majority of Lot 3 and the access handle to Lot 1 as B7 Business Park. An area on the western edge of Lot 3 has been nominated as E2 Environmental Conservation.

The site is unoccupied, having no constructed improvements nor historical development nor building approvals records.

LAND USE

The site forms a small part of the north eastern corner of an original land grant of some 446 acres issued in 1923 (Appendix D).

Portion 305 was established by Land Grant to Andersons Sausages Pty Ltd, on 17 September 1923. Portion 305 had an area of 446 acres. Anecdotal evidence indicates that Andersons used the land as a holding paddock for meatworks stock, primarily cattle, through until the late 1960's. That same evidence also suggests there may have been a small piggery situated to the south of Lot 2 (the subject site), with dilapidated structures reportedly remaining circa 1950-60's (Appendix F - George Flick).

Land Titles records show the transfer of the land to Andersons Meat Packaging Pty. Ltd. on the 8 June 1967, at which time the property reportedly (Appendix F - various interviewees) continued to be used as a holding paddock for stock for slaughter at the meatworks.

A further transfer of Portion 305 was registered on 6 June 1968, to F.J. Walkers (Byron Bay) Pty Ltd, the new owner / operator of the meatworks. The new owner continued to use the site as a holding paddock for stock (Appendix F - various interviewees).

The title deed for Portion 305 was cancelled on 19 January 1981 and a new title issued registering new Lots 1 & 2 in Deposited Plan No. 613937. The site was included in the newly created Lot 1.

A later subdivision creating industrial lots in Centennial Circuit, Byron Bay Industrial Estate is recorded in the registration of DP 812667. The subject site was included in the residual vacant allotment, Lot 25 of that subdivision.

Byron Shire Council purchased Lot 25 DP 812667 in 1981 and subdivided it into 4 lots in 1998. Council retains ownership of lots 1, 2 and 4 of Deposited Plan (DP 1004514) which is shown at Appendix A. The sale of Lot 3 DP 1004514 was finalised in January 2000.

Sand mining is known to have occurred in the area in the 1960's. Byron Bay was reportedly home to the first sand mining operations in Australia which took place as early as 1934 when Zircon-Rutile Ltd formed to mine the beach sands along the coast of New South Wales. Byron Bay was chosen because the area contained a high concentration of mineral sands which were previously mined by gold prospectors[4].

The use of dredge mining had the potential to dramatically change the landscape. To establish a dredge mine the high dunes were levelled and vegetation stripped to create a dredge pond. The dredge used in what was described in a "wet extraction process" was continually moving, leaving behind the tailings sand as it progressed. Anecdotal evidence recalls that the West Byron area was thus mined by Cudgen RZ (Appendix F - Ray Clark) in the 1960's in what was known as the "high back dune" located to the south and west of the subject site, towards the existing Ozigo Service Station at the Ewingsdale Road / Bayshore Drive intersection (Appendix F - George Flick). These recollections are supported by aerial photographs dating back to 1947 which show disturbance of the sand dunes clearly visible (Appendix E).

Department of Mineral Resources search (Appendix G - Trade & Investment, Regional Infrastructure & Services) locates a mineral lease formally operated by Cudgen RZ and approximately 400 metres to the south and passing within 150 metres to the west of the subject site. Remnants of an open drain, reportedly constructed by the sand mining company to deliver sea water pumped from the end of Greys Lane for wet extraction processing (Appendix F - George Flick) were evident in this proximity on the sewerage treatment plant site during its construction circa 1989 (Appendix F - Brian Mackney). Black mineral sands thus extracted were then delivered by truck to a dry processing plant at what is now the Woolworth's site in Byron Bay (Appendix F - Ray Clark). Following secondary "dry" processing the extracted minerals were bagged and transported by road to other ports.

It is also reported (Appendix F - George Flick) there may have been gold exploration within these same sand dunes in earlier times. Such recollections are consistent with Sweet (Queensland Historical Atlas), but no confirmed history of gold mining has been uncovered in this investigation, leading the author to the conclusion that if it did occur it was small scale.

Review of aerial photographs dating back to 1947 (Appendix E) shows no disturbance on the subject site, although evidence of the aforementioned sand mining is clearly visible. Such observation is consistent with anecdotal reports (Appendix F - George Flick) that any mining focussed on the larger sand dune to the south and south west and within the sand mining lease area (Appendix G) some distance to the south and west.

Since purchase by Council, the subject site has been used as a temporary depot for stockpiling and handling of Council construction materials.

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[4] Queensland Historical Atlas - Colin Sweet

EXISTING INFRASTRUCTURE

The site is unoccupied. Existing improvements include the stripping of site topsoil during the 1980's and its replacement with imported clay fills material to provide a dry weather hard stand surface.

Water and sewer reticulation services run adjacent to the site along Bayshore Drive and service the surrounding industrial and residential areas.

SURROUNDING LAND USE

Immediately east of the site on the opposite side of Bayshore Drive is the Sunrise Shopping Centre that contains a small supermarket, some specialty shops and car parking.

To the south is an existing light industrial subdivision including a car smash repairs, party hire, plant hire, printers, lemon myrtle products manufacture and a gallery. These uses are predominantly located on 1000 m2 lots created by the aforementioned registration of DP 812667, with a typical 25 m frontage to Centennial Circuit.

To the west is the Byron Bay STP constructed wetland area, constructed circa 1989.

To the south west is the recently completed Byron Regional Sports & Cultural Complex.

INTERVIEWS WITH STAFF AND RESIDENTS

Interviews with nineteen (19) past and present residents, including Byron Shire Council (BSC) staff, a former sand mining employee and a local farmer provide anecdotal evidence of the historical use of the site. (Appendix F). These include interviews with the following:

1. Chris Shevellar – former Shire Clerk BSC & long term resident
2. George Flick – local farmer and long term resident
3. Jim Clark – former accountant F.J. Walkers and long term resident
4. Garry MacDonald – former Shire Engineer & Chief Town Planner BSC and long term resident
5. Bill Knobel – former Deputy Shire Engineer BSC & resident.
6. Wes Johnstone – former Works Engineer BSC and long term resident
7. Brian Mackney – former Engineering Services Manager BSC & long term resident
8. Ian Cook – former senior assistance engineer BSC and long term resident
9. Ray Clark – former sand mining plant operator and BSC overseer & engineering assistant & long term resident
10. Col Hadwell – former Assistant Town Planner & Engineering Assistant and long term resident
11. Ian Pickles – former Chief Town Planner BSC

12. Harry Wilson – former BSC ganger and overseer and long term resident
13. Wayne Bertram, Development Compliance Manager, BSC
14. Tony Nash – BSC Works Manager
15. Kristian Penrose – BSC Works Engineer
16. Tony Buckley – BSC Overseer and long term resident
17. Rob King – BSC Overseer and long term resident
18. Alex Dichiera, Plant Operator / Truck Driver BSC and long term resident
19. Paul Green, BSC Truck Driver & Plant Operator & long term resident

These interviews record a continuous and consistent timeline and understanding of occupation and landuse and provide anecdotal evidence of past landuses broadly described as follows:

Date	Registered Proprieter	Land Use
1923	Andersons Sausages Pty Ltd	Stock Holding Paddock for cattle. Possibility of a small piggery on the land during this period.
1950-60's	Cudgen RZ	Sand Mining on areas to the south, including rutile and possible earlier gold exploration.
1967	Andersons Meat Packaging Pty. Ltd.	Stock Holding Paddock
1968	F.J. Walkers (Byron Bay) Pty. Ltd.	Stock Holding Paddock
1981	Byron Shire Council	Vacant Land. Majority of the site stripped of topsoil and replaced by imported clay material to provide a "hard stand" work area.
1981 to present	Byron Shire Council	Council use as a storage area for construction materials and surplus excavated materials.

TABLE 1 – ANECDOTAL EVIDENCE OF LAND USES

Anecdotal reports (Appendix F - Paul Green) indicate that following acquisition of the site, Council stripped the existing topsoil and replaced it with excess clay fill materials imported from construction of the Pacific Vista Estate in Byron Bay. Site inspection and excavation of test pits (Appendix C - Australian Soil & Cement) reveal local soils at depth overlain by a clay material similar in characteristic to the Pacific Vista materials and support these anecdotal reports.

The site remains unoccupied and without constructed improvements, although heavily disturbed, having been previously cleared, but now covered in extensive weeds, grasses and native regrowth[5].

Interviews with Council works personnel, including present and past engineers, overseers and plant operators, indicate the materials deposited on the site over a twenty year period have been highly variable in quality. Site inspection suggests that these soils and gravel materials may be divided into three broad categories:

(i) Quality, well sorted materials such as hard rock, road base, and sands, suitable for use on construction projects;

(ii) Blended materials such as topsoils and quality fill material suitable for reuse on Council projects; and

(iii) Mixed materials of varying and uncontrolled quality with an expected highest use in their current condition, as cover material at the Myocum landfill.

Miscellaneous construction materials, including bridge timbers and concrete products, are also stored on the site.

Council works staff report that some effort was made over time to maintain, as far as possible, the integrity of materials stockpiles on the site (Appendix F - Paul Green, Alec Dechiera & Ray Clark). Materials delivered to site have been routinely sorted and unsuitable waste materials disposed of at Myocum landfill. Clark also advised that he had directed an extensive cleanup of the site during the 1990's in anticipation of a proposed sale of the property during that time. Despite this, the interviewees noted that the bulk fill material stockpile towards the centre of the site is likely to contain very poor quality excavated materials from road shoulders and drains, including possible quantities of vegetative matter and other extraneous matter, such as bottles and cans, rocks and pieces of concrete and the like, as might be expected to be recovered from maintenance works and is unlikely to be suitable for select fill.

The site has been partly accessible to the public since Council assumed ownership, implying a potential lack of control over illegal dumping on the site during that time. No confirmed evidence of such practices has been uncovered in this investigation, but the possibility that this occurred at times, remains.

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[5] Blackwood Ecological Services, Ecological Assessment, July 2013

Visual observation, engineering survey and limited site excavation revealed the following range of soil and gravel materials are stored on site, totalling approximately 16,500 cubic metres. Only approximately 2,000 cubic metres are considered competent and suitable for construction use, in its present condition.

These materials include:

- Hard rock (360 cubic metres) derived from a variety of road construction works. Includes basalt rock of varying sizes extracted from NSW Roads & Traffic Authority roadworks during construction of a recent highway upgrade at Banora Point;
- Road base material (450 cubic metres) of unknown original;
- Fine sand (10 cubic metres) from an unknown source, possibly river washed;
- Black coastal sands (1,150 cubic metres), believed to be topsoil strippings largely derived from recent construction works at the adjacent Byron Regional Sports & Cultural Complex (constructed on part of the former Portion 305);
- Minor remnants of vegetative mulch and wood chip derived from various Council works (160 cubic metres). This material has been reportedly used in the past to mix with the coastal sands and other suitable topsoil material to provide a blended topsoil material for use on Council gardens and construction projects;
- A substantial stockpile (14,500 cubic metres) comprising a mix of a variety of soils of varying quality, derived from Council construction and maintenance works including road widenings, shoulder maintenance, pavement reconstruction, drainage construction and maintenance, street sweepings and miscellaneous works;
- A clay “blinding layer” (quantity unknown, but estimate of the possible order of 10,000 cubic metres) spread over a substantial portion of the site, reportedly derived from construction by Byron Shire of the Pacific Vista residential estate during the 1980’s, covering underlying coastal sands;

Byron Shire Council proposes to amalgamate the access handle of Lot 1 DP 1004514 with Lot 2 DP 1004514 Bayshore Drive Byron Bay with the intention to sell or develop the site for industrial use.

HISTORICAL RECORDS

A search of historical records was conducted at the Land and Property Information Head Office in Sydney to confirm land ownership and locate available aerial photographic records pertaining to the site. Copies of relevant documents are provided in Appendix A and Appendix D and E.

A continuous timeline of land ownership and site uses based on land title and aerial photography information is outlined below:

- Grant of Land (Crown) Purchased by Conditional Sale in 1923 concerning Portion 305 (446 acres - 180.5 ha);

- The document shows registration of various mortgages and transfers from 1959 until 1970 involving Andersons Sausages P/L, Andersons Meat Packing P/L, FJ Walker (Byron Bay);
- The 1947 Air Photo shows the subject land and surrounds as undisturbed in its natural state;
- The 1958 Air Photo shows some disturbance by what appears to be some clearing of only a part of the site;
- The 1966 Air Photo shows similar disturbance of part of the site, with no additional disturbance;
- A Resumption of Land for Public Road by Byron Shire is noted at 26 November 1971 (registered 2 February 1972 by DP 613937);
- The 1979 Air Photo shows that the whole of land has been predominantly cleared northward to the North Coast Rail Line;
- DP 613937 (Shire Clerk's Certificate 30/9/1980 - subdivision No 85/80) created Lot 1 being 19.98 ha bordering the western side of Bayshore Drive, purchased from F J Walker P/L by Byron Shire Council on 19 August 1981 and the residue 160.2 ha being owned by F J Walker P/L;
- The 1987 Air Photo shows that much of the subject site has been further disturbed (matching interview information that stripping had been carried out and stockpiling of soil, residue from drain clearing, and road construction material had begun);
- DP 812667 (Shire Clerk's Certificate to Subdivision No 40/91 dated 30 August 1991, registered 26 September 1991) created the extension of Centennial Circuit and Brigantine Street in the industrial subdivision (24 Lots) of the southern part of Lot 1, and a residue lot (Lot 25) of 15.65 ha. The subject site was in the southern part of Lot 25 so created;.
- DP 1004514 (Shire Clerk's Certificate to Subdivision No 76/98 dated 2 October 1998) involved the subdivision of Lot 25 into 4 lots, of which Lot 2 (2.91 ha) comprises the major part of the subject site.

Searches of Council's records provided no additional information or records;

- A search of Byron Shire Council's aerial photographic library indicated no additional aerial photographs were held by Council.
- No historical record of complaints due to contamination issues have been found.
- No historical record of dip sites in the locality were identified.

No other relevant historical records have been identified.

These search outcomes provide a continuous timeline of land ownership as shown in Table 2.

Date	Registered Proprietor	Land Use
prior to 1923	Crown	Undisturbed natural state
1923	Andersons Sausages Pty Ltd	Stock Holding Paddock including cattle and possible piggery
1967	Andersons Meat Packaging Pty. Ltd.	Stock Holding Paddock
1968	F.J. Walkers (Byron Bay) Pty. Ltd.	Stock Holding Paddock
1981	Byron Shire Council	Vacant Land. Materials storage area

TABLE 2 – LAND OWNERSHIP

INTEGRITY ASSESSMENT OF THE INFORMATION

The sources of historical information include government records, Council records, past and present Council staff, long term residents, and staff of previous occupiers of the site. These sources of information are considered reliable.

The combined information provides a continuous narrative of the site's history, namely:

- Detailed descriptions of activities on the site enabling identification of non-contaminating uses;
- No significant gaps in the site history that might hide a contaminating use.

The integrity of the information provided is arguably confirmed by the consistency between resident interviews and formal historical records available from government agencies and Council.

The information also matches the results of the site investigation and visual inspection which revealed a clay layer overlaying a large portion of the site which is similar in appearance to clay subsoils from the Pacific Vista Estate. Excavated test pits towards the Bayshore Drive frontage of the site uncovered similar material at depth underlying the hard-stand gravel pad on the eastern part of the site and supporting anecdotal evidence that this imported material was used to provide a hard stand prior to importation and storage of construction materials.

Excavation of the large stockpile of fill material on site revealed a mix of poor quality material similar to that which would be expected from drainage and shoulder maintenance, consistent with anecdotal evidence provided by Council staff (Appendix F – Alex Dichiera/Paul Green). Other stockpiled materials are directly evident by visual inspection.

SITE CONDITION AND SURROUNDING ENVIRONMENT

TOPOGRAPHY

The site is located in the north-western corner of the Byron Bay Arts and Industrial Estate. It has frontage to Bayshore Drive along its eastern boundary.

The site is relatively flat and low lying at an original natural level of approximately RL 4 metres AHD. (refer Plate 1 & Appendix B). The site generally falls to the south west corner towards a wet, low lying area. Historically the drainage of the site is likely to have been ill-defined, a typical characteristic of the surrounding coastal back-dunal landforms.

The original local topography is understood to have been dominated by a high sand dune immediately to the south and west which formed a catchment boundary between the Cumbebin Swamp to the south and the Belongil Creek to the east. The construction of the Casino to Murwillumbah railway in the 1890's and sand mining in the 1960's reportedly (Appendix F - George Flick) is believed to have significantly changed the surface hydrology and flow patterns. These flow patterns were impacted as follows:

(i) by providing a clear drainage pathway in an easterly direction along the railway line to the mouth of the Belongil (Appendix F – Brian Mackney)

(ii) by introducing drainage pathways from the west and north to Greys Lane via constructed channels, railway timber bridges & culverts and a newly constructed drain which flowed diagonally from the north west delivering pumped sea water for sand mining wet processing activities; and by construction of a drain to the west of the Byron Industrial Estate which now forms the boundary between the Industrial Estate and the recently constructed Byron Regional Sports & Cultural Complex.

(iii) by enhancement of drainage to the east during the 1980's ahead of the construction of the Sunrise Beach Estate residential subdivision;

(iv) by formalisation of drainage to the west and south as part of the later expansion of the Byron Bay industrial estate and Byron Regional Sport & Cultural Complex (Appendix F – Brian Mackney).

Significant disturbance and the importation of fill in the recent past, particularly in the eastern and central portions of the site, has changed the natural ground levels and the pre-existing natural drainage patterns. The establishment of a number of stockpiles of up to 3 metres in height (RL 8m AHD) has further altered these natural patterns.

CONDITION OF BOUNDARIES AND VEGETATION

Access to the site is presently constrained by a variety of site boundary conditions, including buildings to the southern boundary, wetlands to the west and northwest, and earthen mounds to the northern and eastern boundaries. Vegetation and surface drains across the site also inhibit access. There is a locked gate at the only formal access to the site at Bayshore Drive. Unapproved access appears to have been obtained from the adjoining industrial estate through the rear of connecting properties.

The flat topography ensures low surface flow / drainage velocities and dictates there is minimal soil disturbance adjacent to the boundaries. There is no evidence of erosion.

The site is well screened by vegetation (refer Plate 2). The disturbed and stockpiled areas in the eastern part of the site are separated and screened on all sides from neighbouring lots by vegetation. Although the site vegetation has experienced significant disturbance and contains extensive weeds and exotics, plant growth is vigorous. There is no apparent evidence of plant stress due to the presence of contamination.

- To the north the site is screened by exotic vegetation and Swamp sclerophyll forest (Broad-leaved paperbark) with exotic or disturbed understorey.
- To the east the site is screened from Bayshore Drive by planted vegetation located along raised mounds around the site entrance and to the south. Species include Weeping bottlebrush, Willow bottlebrush and Lilly pillies. The groundcover is dominated by Guinea grass with patches of Lantana also present.
- To the southeast the site is screened from adjacent light industrial users by Swamp sclerophyll forest (Broad-leaved paperbark with disturbed or exotic understorey) and to the southwest by a wide area of Grassland/sedgeland running along the southern boundary.
- To the west native vegetation the site is screened by exotic vegetation and Swamp sclerophyll forest (Broad-leaved paperbark) with heath understorey

There is no evidence of over-land contaminant migration pathways. The Byron Bay sewerage treatment plant to the west drains in a south / southwest direction; industrial allotments in Centennial Drive to the south drain to that street frontage; Bayshore Drive drains to the east and south east; while undeveloped allotments to the north drain to the north and east and are isolated from the subject site by a high earthen bund. Water grab samples at the downstream boundary of the site (Appendix C) showed no evidence of contamination.

SIGNS OF CONTAMINATION, WASTES OR FILL MATERIAL

Under the Contaminated Land Management Act, Contamination of land means *"the presence in, on or under the land of a substance at a concentration above the concentration at which the substance is normally present in, on or under (respectively) land in the same locality, being a presence that presents a risk of harm to human health or any other aspect of the environment."* In this regard the in-situ soils and materials on site appear to be relatively stable and free of contamination, with the exception of sparse vegetative matter, tree stumps, steel debris, bottles, cans and other inert refuse. No evidence was found on site of contamination as defined in the act.

That said, there has been significant site disturbance, particularly in the eastern and central sections. Elsewhere natural levels have been altered through stripping of topsoils and importation and placement of clay fill to cover the in-situ sands over a large portion of the site. This is not local material and its appearance is consistent with anecdotal evidence that site topsoil was stripped and the clay material imported from construction of the Pacific Vista Estate in Byron Bay, with the local topsoil believed to have been taken to replace the clay as topsoil on newly created residential allotments (Plates 3 to 10).

Plate 3

Plate 4

Plate 5

Plate 6

Plate 7

Plate 8

Plate 9

Plate 10

The eastern sector of the site contains a number of substantial stockpiles up to 3 metres in height (RL 8m AHD) comprising various gravels and soils (see Plates 11 to 16), as well as other building materials such as timber and concrete pipes/slabs (Plates 17 to 22).

Plate 11

Plate 12

Plate 13

Plate 14

Plate 15

Plate 16

There are informal vehicle tracks traversing the site (Plates 6 to 10). There is no evidence of oil or fuel contamination from vehicles or earth moving equipment at the stockpiles or along the various tracks, nor evidence of odours which would suggest contamination on site.

A significant portion of rock & aggregate material stockpiled on the site has come from past Roads & Traffic Authority work at Sextons Hill (Banora Point) comprising various sizes of clean rock, crushed basalt rock and screenings from which there is neither evidence nor likelihood of any contamination.

In the south east corner there is evidence of herbicide poisoning of grass and weeds around stockpiles of second-hand bridge timbers, sheet piling and precast concrete units (Refer Plates 17 to 22). There are also several new CCA treated bridge girders that have been temporarily stored on site. The potential for leaching of significant or harmful quantities of treatment compounds from these sources is considered low.

Plate 17

Plate 18

Plate 19

Plate 20

Plate 21

Plate 22

The western most part of the site is the lowest section of site and is the least disturbed part of the site. It is characterised by wet ground conditions and swamp-sedge land vegetation. There is no evidence of contamination, waste or fill material in this area.

A small excavator was used to excavate a series of test pits to a depth of 1.2 metres at various locations in the eastern section of the site. The test holes revealed apparently inert materials consisting of the in-situ soils or various imported stockpiled materials. No odours which might indicate contamination were detected in any of the excavations. The materials appeared to be stable, with the exception of sparse vegetative matter and the occasional plastic bottle or other such debris as might be recovered from roadside maintenance or drainage works, believed to be the source of some of the stored materials.

Samples were taken from these test pits and tested for a range of environmental indicators by the Southern Cross University Environmental laboratory. Results of those tests are provided in Appendix C. These did not indicate any significant contamination.

Following interviews with Byron Shire Council staff which suggested the imported stockpile at the centre of the eastern part of the site contained poor quality material unsuitable for select fill (Appendix F - Paul Green and Alec Dechiera), further exploratory test pits were excavated to greater depth (approx 2.5 metres) to gain a better knowledge of the material in that area (Appendix C – Australian Soils & Concrete Testing P/L).

These deeper test holes confirmed anecdotal evidence, revealing sandy clay soils of poor and uncontrolled quality. Vegetative matter, tree stumps, steel debris, bottles, cans and other inert refuse in sparse quantities (Appendix C – Australian Soils & Concrete Testing P/L) was uncovered. There were no excessive odours detected in any of these additional excavations.

The full extent of this poor quality material is unknown. The interviewees (Appendix F - Paul Green and Alec Dechiera), indicate it is limited to the centre of the stockpile. Although these reports, visual inspection of the surface and earlier test pits indicated otherwise, for the purposes of this preliminary assessment it has been assumed that all of the approximately 14,500 cubic metres contained in stockpiles marked SP11, SP12 and SP13 (Appendix B) is potentially of this poorer quality. Soil profiles were logged of test pits excavated in this material and samples were taken and tested (Appendix C - Australian Soil & Concrete Testing) to determine the potential for recovery of better quality soils and gravels.

QUALITY OF SURFACE WATER

Soil Landscape mapping (Morand, 1994) indicates that the site is within a landscape of aeolian sand deposits with often waterlogged soils of low water holding capacity with localised salinity and permanently high water table, often within 100 – 200 cm of the surface and higher in poorly drained areas. The flat nature of the subject site and the absence of formalised surface drainage patterns results in inundation of the lower western parts of the site on a regular / almost continuous basis. The presence of an imported clay layer over much of the site further inhibits site drainage, with standing water remaining for some time after heavy rain in lower areas. The disturbed nature of the site and the variability of the stockpiles materials, much of which is clay, creates opportunities for pockets of perched water. Evidence of these site characteristics can be seen in the log records of excavated test holes which revealed relatively dry subsoil to considerable depth beneath the gravel working pad at the eastern part of the site yet very wet conditions in other excavations within the larger stockpile (Appendix B - SP11, SP12 & SP13). These conditions existed at the time of this investigation, despite an extended period of prior rainfall and a proceeding wet winter period within the catchment.

At the time of inspection, surface water on site was generally confined to swampy low lying areas in the western sections where an existing heavily over-grown open drain drains towards the south. Paper bark trees have grown back near the drain edges amongst dense clumps of weeds. There is no visual evidence of water quality degradation or the presence of contamination on site. Neither is there evidence of contaminant migration pathways of concern via waterways, drains or service conduits, to or from the site. A separate smaller drain wholly contained within the western section of the site, drains in a south west direction. A water quality “grab sample’ was obtained from the western drain and from another smaller internal drain located adjacent the central southern boundary of the land, to ascertain general site water quality. The results of tests conducted are provided in Appendix C and show no readings of concern.

FLOOD POTENTIAL

Council GIS system depicts areas of potential flooding adjacent the site (Appendix H). This shows flood level of around RL4.0 AHD. All but a small area on the south west of the land is above that level, as depicted by the flood map.

Anecdotal evidence suggests that these lower lying areas of the site experience minor localised flooding during rainfall events due to the lack of formalised drainage to allow surface water to escape. Enquiries by the project surveyors (Wade Surveyors) of occupants of adjoining premises suggest inundation up to approximately RL 4.44m AHD may occur.

There is low potential for contaminant migration pathways of concern to or from the site via overland flooding. Given the relatively flat topography flood velocities are expected to be low and minimal migration of sediments to or from the site is expected.

LOCAL SENSITIVE ENVIRONMENT

The western part of the site contains good condition Swamp sclerophyll forest EEC with a moderate diversity of heath species in the understory, with low abundance of exotic species[6]. Areas bordering the site to the west contain high quality Swamp sclerophyll Forest EEC as well as habitat for the Wallum froglet which was heard calling from vegetation to the immediate north of the site.

The remaining areas of vegetation within the site comprise mostly exotic species along stockpiles and disturbed areas of the site or are disturbed native vegetation considered to be of lesser conservation value.

The Subject site does not occur within or adjacent to any areas of SEPP 14 Coastal wetlands or SEPP 26 Littoral Rainforests. (refer Plate 2).

Assessments of significance (7 part tests) by Blackwood Ecological Services shows the proposed development is unlikely to result in a significant impact on any Threatened (TSC Act 1995) species, population or ecological community.

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[6] Blackwood Ecological Services, Ecological Assessment, July 2013

GEOLOGY AND HYDROGEOLOGY

GEOLOGY

Soil Landscape mapping for the area (Morand, 1994) indicates that the site is within the Tyagarah soil landscape which is characterised by aeolian (i.e. wind-blown) sand deposits, generally forming low lying level to gently undulating plains. Within this soil landscape, water tables are characteristically within 100 – 200 cm of the surface, higher in poorly drained areas. The soil landscape comprises deep (>150 cm), well drained Podzols and Acid Peats near barrier systems. It is also characterised by very strongly acid, permeable, often waterlogged soils of low fertility, low water holding capacity with localised salinity, permanently high water tables and moderate wind erosion hazard (Morand, 2004).

The subject site is flat and low-lying and highly modified, with a history of clearing and modification for agricultural activities.

Site stratigraphy may be divided into five categories:

(i) Natural condition, primarily low lying wet areas located to the rear/west of the site;

(ii) Natural condition stripped of topsoil but now revegetated with a mix of exotic & native species;

(iii) Natural condition stripped of topsoil and clay capped for improved vehicular access;

(iv) Natural condition stripped of topsoil, clay capped & filled with various materials to a depth of 2m plus.

(v) Natural condition stripped of topsoil, clay capped & filled with materials of better construction quality and capped with gravel to provide a hard-stand working area for handling of construction materials

Initial visual assessment and examination of the soil profile via seventeen small test pits excavated using a small 1 tonne excavator on 11 July 2013 revealed a variety of imported materials ranging from imported and stockpiled rock, gravels, road base, sands, topsoils, mulch and clay materials, consistent with evidence provided in interviews with various Council staff (Appendix F). There was evidence of broken pieces of concrete, plastic bottles, cans and other waste materials in some areas, as might be expected, given the origins of some of the material, reportedly having come from drain clearing, road shoulder maintenance and street sweeping operations.

Yet the quality of material initially uncovered suggested a potential for reuse on site as landfill capping material or as a low quality fill.

Anecdotal evidence (Appendix F - Paul Green) that topsoils were stripped and removed from a substantial part of the site by Byron Shire Council in the 1980's and replaced by imported clay materials from Pacific Vista Estate to provide a blinding layer over the basement

Aeolian sands are supported by site inspection revealing topsoils across large areas of the site similar to the Pacific Vista clays. (Plates 3 top 10).

As described elsewhere in this report, more extensive excavations on 5 August 2013 of the larger stockpile in the centre of the site with a larger machine revealed a poor quality material, entirely unsuitable as fill and containing tree stumps, branches, leaf and other vegetative matter, concrete pieces, cans and bottles, Bore logs of these excavations are provided in Appendix C.

HYDROLOGY

There are no wells on the site. Further to the west and the south west there are a number of piezometers which are monitored regularly by Council in association with effluent discharge from the Byron Sewerage wetlands. These records generally confirm reports by Morand (1994) that groundwater is typically shallow, often less than 600mm and can rise to the surface on a regular basis.

Extensive monitoring and modelling of the groundwater in the local area has been undertaken by others in relation to the augmentation of the West Byron STP and construction of the adjoining Regional Sports Fields. Full details of the Council groundwater records in the area have not been reviewed as part of this investigation, however the key findings from the various studies and investigations associated with the West Byron Sewerage Treatment plant were:

- The Belongil Creek catchment has shallow groundwater in an uncontrolled aquifer, as evidenced by the occurrence of numerous swamps and wetlands. Historically, draining of land in the western and southern parts of the catchment has involved cutting surface drains, causing shallow groundwater to discharge to Belongil Creek.
- There is a localised rise in groundwater in the vicinity of West Byron STP, in response to infiltration of effluent along surface flow paths. This localised rise is wholly contained within the West Byron STP site and does not currently affect adjoining properties.
- Monitoring of the groundwater has indicated that there is a shallow surface zone, which is responsive to changes such as increased rainfall and tidal effects. Groundwater discharges from this shallow zone flow into surface water drains as they move south-west away from the plant.
- Monitoring has also indicated that effluent from the plant does not penetrate the deeper groundwater zones and does not affect the quality of groundwater even at short distances from the plant.
- Modelling of groundwater flow into the deeper zones has shown that increases in rainfall do not result in significant changes in groundwater flow rates.
- Groundwater modelling indicates that, for the base case, at the time of transfer of South Byron STP, and at the ultimate case in 2025, some localised saturation of ground occurs within the West Byron STP site in the vicinity of the constructed wetland and Cell H. No impacts are predicted for adjacent properties as the drainage

system intercepts the shallow groundwater flows and transfers these flows through surface drainage.

- Existing use of groundwater resources in the surrounding region is limited due to variable groundwater quality and the high rainfall experienced. Monitoring of groundwater quality indicates that the existing effluent from West Byron STP is not adversely affecting groundwater quality due to rapid attenuation in the vicinity of the STP site. The augmented plant would provide an improved treatment standard in terms of nutrients and disinfection and therefore is likely to have a neutral or marginally beneficial effect on the regional groundwater quality.

ACID SULFATE POTENTIAL

Council's constraints map (Appendix K) shows the subject site to be within an area constrained by Acid Sulfate Soils. Acid sulphate soils is the common name given to naturally occurring soil and sediment containing iron sulfides. When these naturally occurring soils are disturbed and exposed to air, oxidation occurs, ultimately producing sulphuric acid.

The site falls within an area described as Class 3, meaning development consent is required for any works beyond 1 metre below the natural ground surface or for works by which the watertable is likely to be lowered beyond 1 metre below the natural ground surface.

An Acid Sulfate Soil Investigation on the adjacent Byron Regional Sports & Cultural Complex site, found no Actual Acid Sulfate Soils (AASS), but found Potential Acid Sulfate Soils (PASS), most noticeably in the north-eastern part of that area. Elsewhere[7] investigations have previously been carried out in relation to acid sulfate soils in this area, principally in association with the West Byron Effluent Reuse proposals. The assessments showed that pyrite (iron sulphide) is distributed randomly throughout the peat soils of the area (Bolton, 2001).

Earlier stripping of topsoils from the subject site and their replacement with imported clay soils in the 1980's may have uncovered some of these pyrites and resulted in oxidation of AASS, however, as this action appears to have effectively removed the majority of topsoils from the site or capped the remaining with a clay material, the potential for acid sulphate impacts has largely been removed.

Even so, a precautionary approach should be adopted in handling of stockpiles on site, particularly those containing a mix of local peaty sands. Management of the excavation of the peat material, and management of the construction of the development, will need to be guided by a detailed Acid Sulfate Soil Management Plan, to be development in accordance with ASSMAC requirements. Individual tests should be conducted on suspect material uncovered and appropriate treatment by the addition of lime, initiated.

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[7] Bolton 2001

CONCEPTUAL SITE MODEL

A conceptual site model has been developed based on the information in the preceding sections.

This involved a preliminary assessment of the possibility of site contamination. The assessment was carried out in a series of stages similar to those outlined in the *NEPM Assessment of Site Contamination (1999)*. Each stage builds on the information and assessment of the previous stages to build up a conceptual model of the site and its likely contamination status. The stages comprise:

- Review and assessment of historical documentation;
- Review and assessment of information provided through interviews;
- Visual site inspection;
- Identification of possible contamination sources and contaminants;
- Desktop assessment of the likely presence of each type of contaminant; and
- Targeted sampling at locations where contaminants would most likely exist.

HISTORICAL INFORMATION

A desktop review of existing data and site inspections was undertaken.

The initial review provided no reason to suspect contamination on site, namely:

- Current and previous land zonings provide no reason to suspect contamination to a level which would prohibit development and use of the land for industrial purposes;
- There are no clean-up notices, prevention notices, prohibition notices or other notices issued under POEO Act with respect to the site;
- No restrictions have been placed on the use of the land;
- Council has no formal records that demonstrate that the land is associated with complaints about pollution or illegal dumping of wastes;
- There are no known contamination impacts on land immediately adjacent to the site which provide reason to suspect contamination has entered the site;

However, further anecdotal information indicated the presence of contamination may have been possible:

- Interviews revealed stockpiles on site contained quantities of vegetative matter and other extraneous matter, such as bottles and cans, rocks and pieces of concrete and the like, such as might be expected to be recovered from Council maintenance works;

- Site inspection revealed isolated stacks of building materials such as timber, CCA treated bridge girders, steel and concrete pipes and other concrete products;
- Interviews and aerial photographs revealed some landuses (extractive industry – stockpiling of mineral sand mining material) described in Table 1 of *Managing Land Contamination Planning Guidelines SEPP 55–Remediation of Land* may have occurred at or near the site (DUAP EPA 1998);
- Interviews revealed stockpiles of street sweepings on site possibly contain small quantities of asbestos from brake linings and lead dust from vehicle exhausts;
- Interviews revealed the possibility of unidentified illegal dumping of materials on site.

POSSIBLE CONTAMINANT SOURCES

The review of existing data and site inspections resulted in compilation of a profile of possible contaminant sources. The review found it unlikely that contaminants, as defined under the Contaminated Land Management Act (CLM Act), are present on site in significant quantities. Possible contaminant sources, most likely location and likely presence are identified in the following table.

Under the Contaminated Land Management Act, Contamination of land means *"the presence in, on or under the land of a substance at a concentration above the concentration at which the substance is normally present in, on or under (respectively) land in the same locality, being a presence that presents a risk of harm to human health or any other aspect of the environment."*

Possible Contaminant	Most likely Location	Considered a CLM Act Contaminant?	Likely to be present
Street litter (bottles & cans etc) collected in routine street road shoulder and drains maintenance	Stockpiles in hardstand area to centre and east of site.	No	Yes
Other litter and street sweepings gathered by Council's street sweeper	Stockpiles in hardstand area to centre and east of site.	No	Yes
Vegetation and seed material excavated from drains and roadsides	Stockpiles in hardstand area to centre and east of site.	No	Yes
Possible petrochemical residues and minor asbestos particles from brake linings of road vehicles from street sweepings	Sediment of stockpiles in hardstand area to centre and east of site.	Depends on concentrations. Possible chemicals of concern petrochemical residues and minor asbestos particles.	Unlikely in significant amounts or concentrations
Possible disposal of sands derived from past sand mining activities with elevated radiation levels	Underlying sandy sediments anywhere on site.	Yes. Possible elevated radiation concern.	Unlikely at significant levels
Possible pesticide residues in material excavated from drains and roadsides	Sediment of stockpiles in hardstand area to centre and east of site.	Depends on concentrations. Possible chemicals of concern pesticide residues.	Unlikely in significant amounts or concentrations
Potential for unidentified illegal dumping of materials on the site	Stockpiles in hardstand area to centre and east of site. Adjacent to entrance gate.	Concerns are high concentrations of asbestos, pesticides, hydrocarbons, heavy metals.	Unlikely in significant amounts or concentrations

TARGETED FURTHER INVESTIGATIONS

The results of this preliminary site assessment suggest that contaminants are not present on site in significant quantities or concentrations, if at all. However, the results are not conclusive, and so targeted further site investigations were undertaken in locations and mediums most likely to contain contaminants.

This approach is supported by NEPM (1999) which suggests limited sampling may be included in a preliminary site assessment, and that it is legitimate to confine further investigations to areas where potentially contaminating activities have occurred and create a site-history-based sampling plan targeting contaminants and locations based on past land use.

RATIONALE FOR SAMPLING PROGRAM

Sampling patterns for testing were adopted as follows:

1. Radiation levels: Radiation grid survey by Southern Cross University (Appendix C) confirmed recorded radiation levels are equivalent to normal background levels expected in similar environments.
2. Soils and gravel stockpiles
    a. Individual stockpiles of basalt rock and crushed aggregates were not tested as these were visually identified as quality and well sorted materials and unlikely to contain contaminants as defined by the Act;
    b. Topsoil stockpiles were not tested as these were visually identified as quality and well sorted materials and unlikely to contain contaminants as defined by the Act;
    c. Compost materials were not tested as these were visually identified as recently mulched clean green waste materials and unlikely to contain contaminants as defined by the Act;
3. The uncontrolled fill stockpiles: Seventeen randomly located test pits were excavated to a depth of up to 1.5m to initially determine the typical characteristics of the materials contained there-in. These were accompanied by visual assessment of the exposed surface materials and laboratory testing for a range of environmental parameters (Appendix C- Southern Cross University) of samples taken from the test pits. Following interviews with Council employees, ten (10) more targeted test pits were excavated to a depth of in excess of 3m in search of the poorer quality materials said to be located near the centre of the larger stockpiles. The location of these pits are provided in Appendix C. Samples of these materials were collected and assessed for their suitability as select fill. Broad spectrum environmental testing conducted on soil samples taken from test pits on site do not exhibit any recordings outside acceptable ranges for the following indicators:

   Silver; Arsenic; Lead; Cadmium; Chromium; Copper; Manganese; Nickel; Selenium; Zinc; Mercury; Iron; Aluminium; DDT; Chlordane; Heptachlor; Aldrin + Dieldrin; Other

Organochlorine Pesticides; Demeton; Other Organophosphate Pesticides; PCB's, BTEX; Benzene; Toluene; Ethylbenzene; Total m+p-Xylenes; o-Xlylene; Xylenes (ortho.meta & para); Total BTEX and total recoverable hydrocarbons viz: C6-C9 (Volatile) Fraction; C10-C14 Fraction; C15-C28 Fraction; C29-C36 Fraction; >C10-C16 Fraction; >C10-C16 less Naphthalene; >C16-C34 Fraction; >C34-C40 Fraction.

Elevated Cr and Mn are noted but are typically elevated in volcanic soils (Lancaster SCU 2006) but are not considered significant in this instance. Refer SCU report (Appendix C).

4. Water samples were collected at the downstream extremities of the site and in an open drain leading from the adjoining industrial estate and tested for a range of environmental parameters. Locations were selected on the basis that these would likely flag any elevated levels of contaminants entering the site from external industrial sources or leaving the site via the surface drainage system.

CONCEPTUAL SITE MODEL

To determine whether further detailed assessment is required, NEPM (1999) suggests the use of hypothesis testing to attempt to disprove a baseline condition.

The baseline or “null” hypothesis proposed for this study was as follows:

“the subject site is not contaminated under the CLM Act is false”

The burden of proof is placed on rejecting this baseline condition because the test hypothesis structure maintains the baseline condition as being true until overwhelming evidence is presented to indicate otherwise.

Based on the results of the preceding sections there is insufficient evidence to support this hypothesis.

Each stage of this assessment has shown the site is unlikely to contain contamination as defined under the *Contaminated Lands Management Act*.

The conceptual site model demonstrates that the site does not contain contamination as defined under the *Contaminated Lands Management Act*.

The conceptual site model is summarised in the table below.

Possible Contaminant	Conceptual Site Model Hypothesis	Possible Source	Probable extent	Risk	Comment	Further investigation	Conclusion	Mitigation on this site
Elevated radiation levels	Elevated radiation levels present.	Past Sandmining activities or naturally occurring	Historical evidence suggests sand not deposited on this site, topsoil subsequently removed, and area covered with clay.	low	Visual site evidence confirms topsoils removed or covered with clay	Nil.	Grid checks for elevated radiation levels. SCU radiation survey confirms background levels of radiation only. There is no evidence to suggest the site has been impacted by mineral sand mining or contains elevated radiation levels.	Monitor earthworks,. Develop prior to works commencing, suitable response in the event of significant discovery of these materials.
Asbestos	Minor amounts of asbestos brake sweepings present within imported materials.	Brake linings from street sweepings and possible broken water pipe or other litter	Likely to be insignificant quantities, and likely to be contained within imported soil and material from maintenance cleaning.	low	Unlikely to be able to isolate or identify asbestos sweepings due to small volumes and particle size within material.	Nil.	Site not likely to be contaminated by asbestos, but may contain isolated larger pieces of asbestos pipe or similar.	Eliminate dust generation. Maintain exported loads damp as precaution and dispose of at landfill. Monitor earthworks, excavation and loading. Develop prior to works commencing, suitable response in the event of significant discovery of these materials.
Lead and petroleum products, and	Elevated levels of hydrocarbons and pesticides	Site Machinery Fuel, Oils and Grease	No evidence of contamination or any history of storage on site. If	low	Visual site inspection has shown no evidence of contamination, nor have	Nil.	Minor presence detected	Monitor earthworks, excavation and loading. Develop prior to works commencing, suitable

Possible Contaminant	Conceptual Site Model Hypothesis	Possible Source	Probable extent	Risk	Comment	Further investigation	Conclusion	Mitigation on this site
pesticides	present.		present, likely to be localised and minor from isolated point sources (eg leaking / refuelling plant working intermittently on site).		odours been detected.			response in the event of significant discovery of these materials.
	Elevated levels of lead present.	Street Sweepings	Historical evidence suggests street sweepings present in stockpile. Given rural roads source, unlikely to contain signficant concentrations of lead.	low	Unlikely to be able to isolate or identify lead content in sweepings due to small volumes and particle size within material.	Nil	All 10 samples returned results within expected background levels, and less than the limits set in the NSW EPA Contaminated Sites - Guidelines for the NSW Site Auditors Scheme (2006) for "Residential development with gardens and accessible soil including children's' daycare centres, preschools, primary schools, town houses or villas".	Monitor earthworks, excavation and loading. Develop prior to works commencing, suitable methodology for response in the event of significant discovery of these materials. Test for presence of lead.
	Elevated levels of lead or pesticides, litter and refuse present.	Drainage and Road Maintenance	Historical evidence suggests material from drainage maintenance present in stockpile. Limited	low	Visual evidence of litter and inert refuse. Unlikely to be able to isolate or identify lead or pesticide content in material due to small volumes and	Nil.	Pesticides: no concentrations above detection limits. Lead: refer street sweeping above.	Monitor earthworks, excavation and loading. Develop prior to works commencing, suitable methodology for response in the event of significant

Possible Contaminant	Conceptual Site Model Hypothesis	Possible Source	Probable extent	Risk	Comment	Further investigation	Conclusion	Mitigation on this site
			contaminants to drains expected (litter, road runoff, light industry, agriculture). Litter and inert refuse expected. Possibility of lead and pesticides, however unlikely to be at significant concentrations.		particle size within material.		**Sparse refuse** and litter present.	discovery of these materials.
Vegetative Material and soil mix	Significant quantities of vegetative matter present..	Drainage and Road maintenance	Historical evidence suggests material from drainage and road maintenance present in stockpile. Limited vegetative material within mixed soils and gravels.	low	Unlikely to contain contamination. However, material has poor engineering properties which need to be addressed for development.	Nil	Vegetative material unlikely to significantly contaminate but renders site fill materials unsuitable as select fill.	Monitor earthworks, excavation and loading. Develop prior to works commencing, suitable methodology for response in the event of significant discovery of these materials.
	Quantities of these materials evident in existing stockpiles.	Mulching & composting	Historical evidence suggests mulching and composting material present in stockpile. Limited vegetative material	low	Unlikely to contain contamination. However, material has poor engineering properties which need to be addressed for development.	Nil	Vegetative material should be identified and stockpiles removed from site.	Monitor excavation, loading and removal from site to appropriate location. Develop prior to works commencing, suitable

Possible Contaminant	Conceptual Site Model Hypothesis	Possible Source	Probable extent	Risk	Comment	Further investigation	Conclusion	Mitigation on this site
			within mixed soils and gravels.					methodology.
General (litter, bottles, cans, plastics and steel)	Materials present on site.	Drainage and Road maintenance, and Street Sweeping	Historical evidence suggests material from drainage / road maintenance and street sweeping present in stockpile. Limited litter and inert refuse within mixed soils and gravels.	low	Unlikely to contain contamination. However, material has poor engineering properties which need to be addressed for development.	Nil	Litter and inert refuse material unlikely to contaminate, but should be collected and removed from site to a suitable location.	Sort and remove from site. Dispose of to landfill and/or recycle where practical.

CONCLUSIONS AND RECOMMENDATIONS

This Preliminary SEPP55 Assessment Under SEPP55 concludes through a staged site assessment approach and conceptual site model based on the information gathered, that the subject site does not contain contamination as defined under the *Contaminated Lands Management Act*. As such it is considered suitable for the proposed use of an industrial estate development.

The sources of information on which this assessment has been based are many and varied. The integrity of the gathered data is arguably confirmed by its consistency with information supplied by resident interviews, formal historical records, site investigation, visual inspection, test pits and targeted sampling and chemical testing. Each assessment stage has been built on the information previously gathered including the site's characteristics, history, and preliminary targeted site investigations.

Engineering consideration of the most appropriate way to deal with fill materials stored on site is beyond the scope of this report and is the subject of separate report[8]. It is understood that to improve the engineering properties of these materials it is proposed to sort, grade and process these existing stockpiles to remove extraneous refuse and litter and vegetative matter, followed by a blending process to yield a select fill suitable for reuse.

It is considered that refining and processing of these materials in this manner would provide Council with greater certainty in discharging its responsibilities with respect to the Act if/when approving the future development of land for industrial purposes.

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[8] Site Cleanup & Restoration Lot 2 Bayshore Drive, Byron Bay - BMack January, 2014.

APPENDIX A: SITE DP PLAN

SIGNATURES, SEALS AND STATEMENTS of intention to dedicate public roads or to create public reserves, drainage reserves, easements, restrictions on the use of land or positive covenants.

Ian B Kingston
IAN B. KINGSTON
MAYOR 22 JULY 1999

Jennifer Coman
Jenny Coman
Councillor 22 July, 1999

Crown Lands Office Approval

PLAN APPROVED
Authorised Officer
Land District
Paper No.
Field Book *pages*

Council Clerk's Certificate

I hereby certify that-
(a) the requirements of the Local Government Act, 1919 (other than the requirements for the registration of plans), and
~~*(b) the requirements of Part 3 Division 2 of the •Water Board Act 1987 and •Water Supply Authorities Act 1987*~~

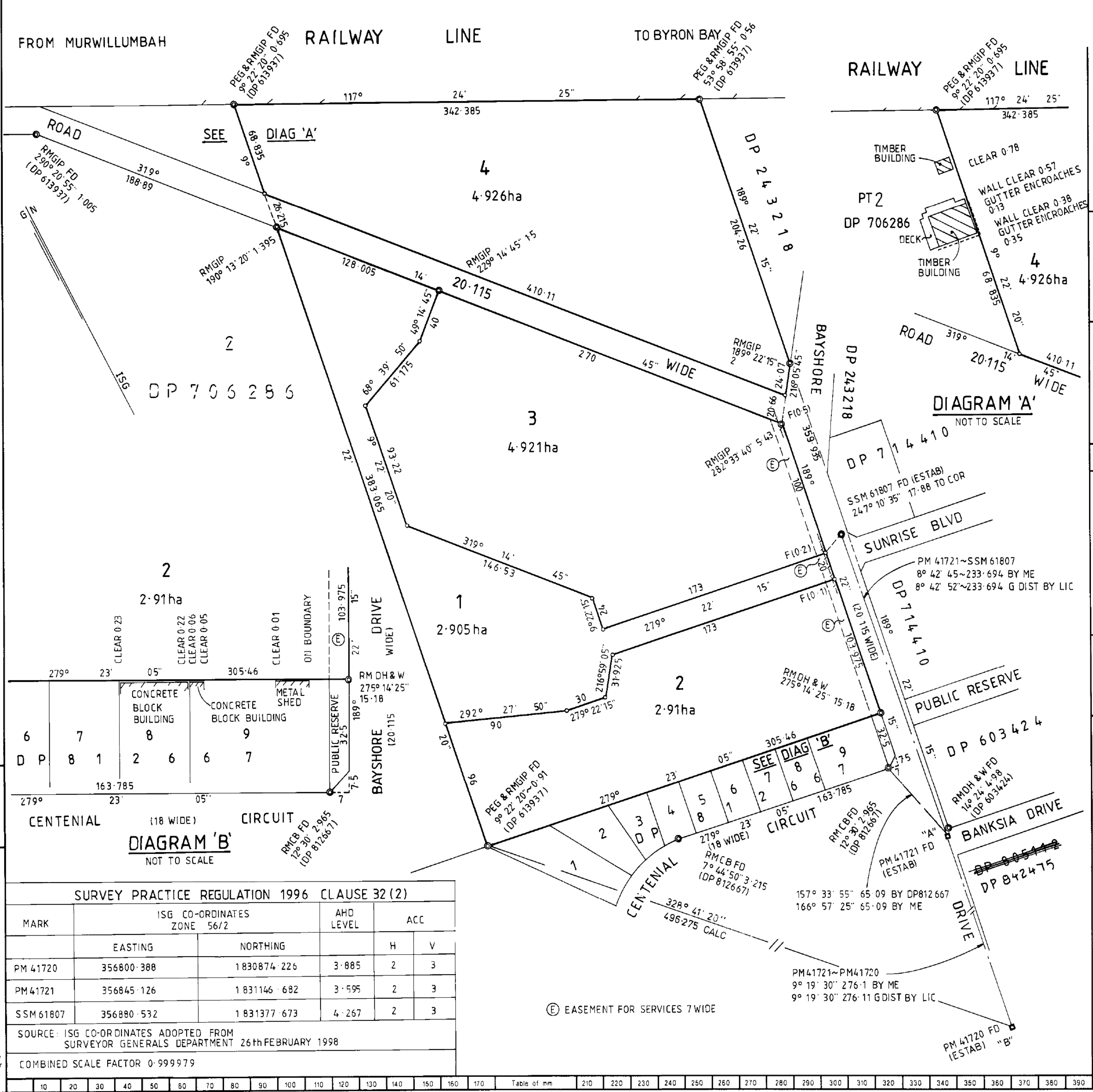
have been complied with by the applicant in relation to the proposed
"SUBDIVISION"
(insert "new road", "subdivision" or "consolidated lot") set out herein

Subdivision No. 76/98
Date 22-10-98
(Signature)
Council Clerk
Council File No. 1089970 x 97/0171

•This part of certificate to be deleted where the application is only for a consolidated lot or the opening of a new road or where the land to be subdivided is wholly outside the areas of operations of the Metropolitan Water Sewerage and Drainage Board and the Hunter District Water Board.
•Delete if inapplicable

SURVEYOR'S REFERENCE: 8135 MPD

Plan Drawing only to appear in this space



SURVEY PRACTICE REGULATION 1996 CLAUSE 32(2)

MARK	ISG CO-ORDINATES ZONE 56/2		AHD LEVEL	ACC	
	EASTING	NORTHING		H	V
PM 41720	356800·388	1830874·226	3·885	2	3
PM 41721	356845·126	1831146·682	3·595	2	3
SSM 61807	356880·532	1831377·673	4·267	2	3

SOURCE: ISG CO-ORDINATES ADOPTED FROM SURVEYOR GENERALS DEPARTMENT 26th FEBRUARY 1998

COMBINED SCALE FACTOR 0·999979

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

WARNING:CREASING OR FOLDING WILL LEAD TO REJECTION

DP1004514

Registered: 5·8·1999

C.A. Nö 76/98 OF 22·10·1998

Title System: TORRENS

Purpose: SUBDIVISION

Ref. Map: X5430 - 7#

Last Plan: DP 812667

PLAN
OF SUBDIVISION OF
LOT 25 DP 812667

Lengths are in metres. Reduction Ratio 1: 2000

LGA: BYRON

~~Suburb~~/Locality: BYRON BAY

Parish: BYRON

County: ROUS

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

I, SCOTT ANTHONY THOMPSON
of CANTYS PO BOX 157 BYRON BAY 2481

a surveyor registered under the Surveyors Act 1929, hereby certify that the survey represented in this plan is accurate, has been made in accordance with the Surveyors (Practice) Regulation 1996 and was completed on 26·2·1998
The survey relates to LOTS 1-4 INCLUSIVE

(here specify the land actually surveyed, or specify any land shown in the plan that is not the subject of the survey)
Datum Line. 'A' - 'B'
Zone Suburban/~~Country~~ *(Signature)* S.T.
Surveyor registered under the Surveyors Act 1929

Plans used in preparation of survey / ~~compilation~~
DP 812667, DP 714410, DP 613937,
DP 603424, DP 706286

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

IT IS INTENDED
PURSUANT TO SECTION 88B OF THE
CONVEYANCING ACT 1919 - 1964
TO CREATE.

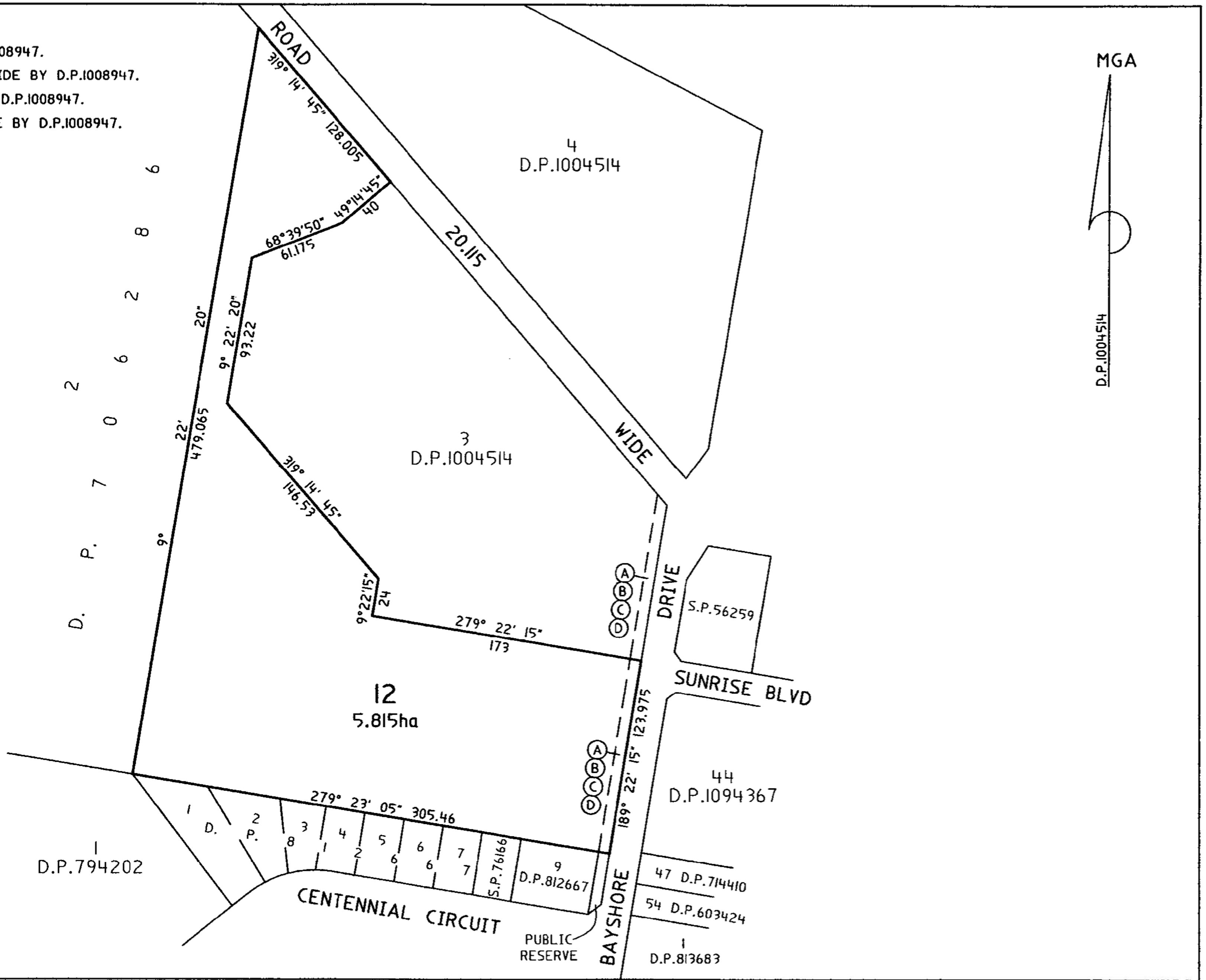
1. EASEMENT FOR SERVICES 7 WIDE

PLAN FORM 1 (A3)

WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

Sheet 1 of 1 sheets

Ⓐ EASEMENT FOR SERVICES 7 WIDE BY D.P.1008947.
Ⓑ EASEMENT FOR DRAINAGE OF SEWAGE 7 WIDE BY D.P.1008947.
Ⓒ EASEMENT FOR WATER SUPPLY 7 WIDE BY D.P.1008947.
Ⓓ EASEMENT FOR SEWER RISING MAIN 7 WIDE BY D.P.1008947.



Surveyor: SCOTT ANTHONY THOMPSON
Date of Survey: 23RD JULY 2013
Surveyor's Ref: 2722a CHECKLIST

PLAN OF
CONSOLIDATION OF
LOTS 1 & 2 D.P.1004514

LGA: BYRON
Locality: BYRON BAY
Subdivision No: -
Lengths are in metres. Reduction Ratio 1:2500

Registered
25.9.2013

DP1189646 P

10 20 30 40 50 Table of mm 80 90 100 110 120 130 140

PLAN FORM 6 (2012) **WARNING: Creasing or folding will lead to rejection**

DEPOSITED PLAN ADMINISTRATION SHEET

Sheet 1 of 2 sheet(s)

Office Use Only

Registered: 25.9.2013

Title System: TORRENS

Purpose: CONSOLIDATION

PLAN OF
CONSOLIDATION OF
LOTS 1 & 2 D.P.1004514

Crown Lands NSW/Western Lands Office Approval

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

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

Subdivision Certificate

I, ...
*Authorised Person/*General Manager/*Accredited Officer, certify that the provisions of s.109J of the *Environmental Planning and Assessment Act 1979* have been satisfied in relation to the proposed subdivision, new road or reserve set out herein.

Signature: ....
Accreditation number: ....
Consent Authority: ....
Date of endorsement: ....
Subdivision Certificate number: ....
File number: ....

*Strike through if inapplicable

Statements of intention to dedicate public roads, public reserves and drainage reserves.

Signatures, Seals and Section 88B Statements should appear on PLAN FORM 6A

Use Only

DP1189646 S

LGA: BYRON
Locality: BYRON BAY
Parish: BYRON
County: ROUS

Survey Certificate

I, SCOTT ANTHONY THOMPSON
of CANTYS SURVEYORS P.O.BOX 509 MULLUMBIMBY 2482
a surveyor registered under the Surveying and Spatial Information Act, 2002, certify that:

~~*(a) The land shown in the plan was surveyed in accordance with the *Surveying and Spatial Information Regulation 2012*, is accurate and the survey was completed on~~ ....

~~*(b) The part of the land shown in the plan (*being/*excluding^~~ .... ~~) was surveyed in accordance with the *Surveying and Spatial Information Regulation 2012*, is accurate and the survey was completed on,~~ .... ~~the part not surveyed was compiled in accordance with that Regulation.~~

*(c) The land shown in this plan was compiled in accordance with the *Surveying and Spatial Information Regulation 2012.*

Signature: .... Dated: 23/7/2013
Surveyor ID: 2096
Datum Line: ....
Type: *Urban/~~*Rural~~
The terrain is *Level-Undulating/~~*Steep-Mountainous.~~

*Strike through if inapplicable.
^Specify the land actually surveyed or specify any land shown in the plan that is not the subject of the survey.

Plans used in preparation of ~~survey~~ / compilation.
D.P.1004514, D.P.1008947, D.P.714410, D.P.812667
D.P.603424, D.P.813683, D.P.1094367, D.P.706286
D.P.794202

If space is insufficient continue on PLAN FORM 6A

Surveyor's Reference: 2722a CHECKLIST

PLAN FORM 6A(2012) **WARNING: Creasing or folding will lead to rejection**

DEPOSITED PLAN ADMINISTRATION SHEET

Sheet 2 of 2 sheet(s)

Office Use Only

Registered: 25.9.2013

e Use Only

DP1189646

PLAN OF
CONSOLIDATION OF
LOTS 1 & 2 D.P.1004514

This sheet is for the provision of the following information as required:
- A schedule of lots and addresses - See 60(c) *SSI Regulation 2012*
- Statements of intention to create and release affecting interests in accordance with section 88B *Conveyancing Act 1919*.
- Signatures and seals - see 195D *Conveyancing Act 1919*.
- Any information which cannot fit in the appropriate panel of sheet 1 of the administration sheets.

Subdivision Certificate number: ....

Date of Endorsement: ....

STREET ADDRESS OF LOT, NOT AVAILABLE.

KEN GAINGER
GENERAL MANAGER

SIMON RICHARDSON
MAYOR

THE COUNCIL OF THE SHIRE OF BYRON

If space is insufficient use additional annexure sheet.

Surveyor's Reference: 2722a CHECKLIST

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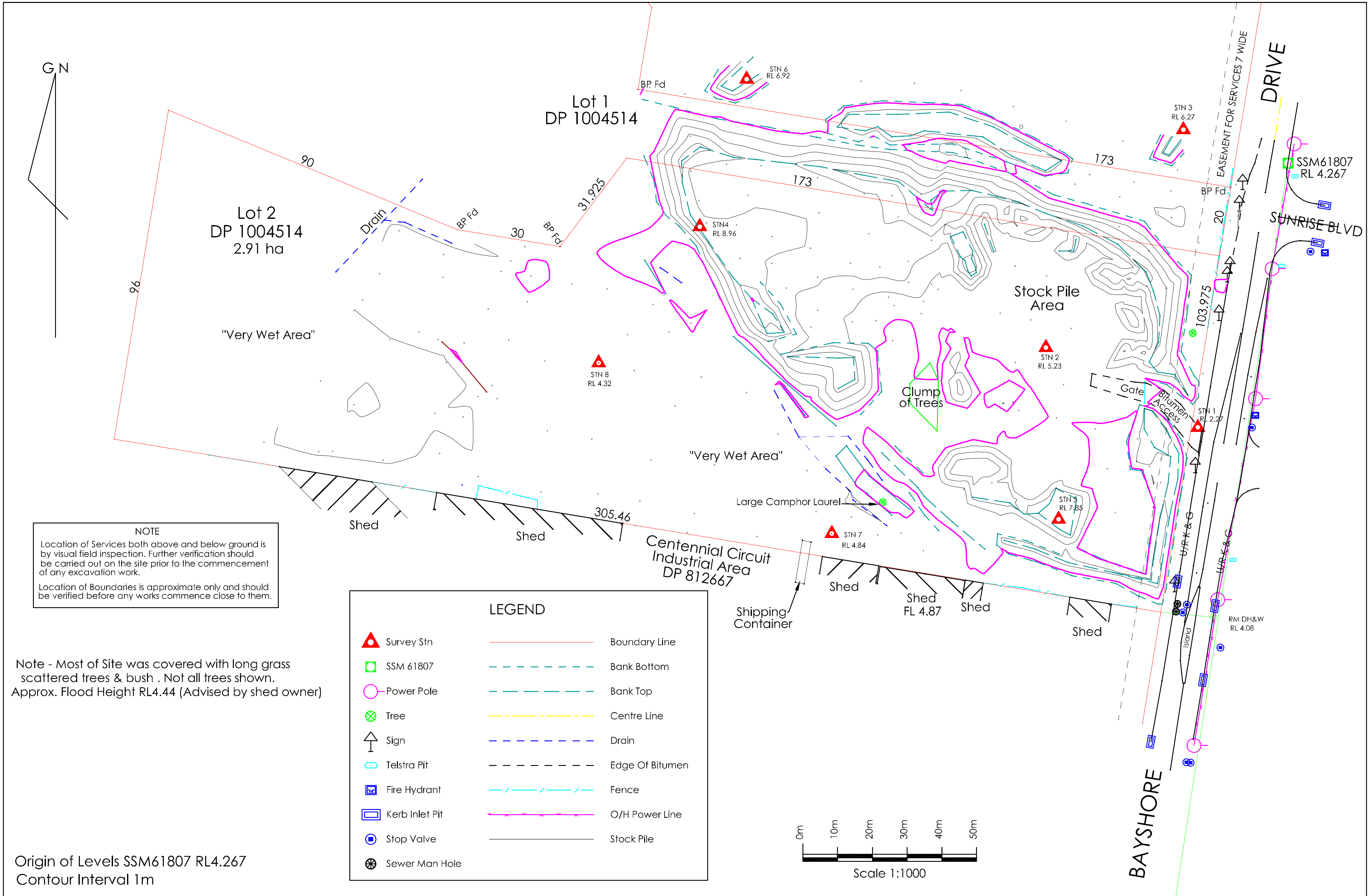
APPENDIX B: DETAILED SURVEY OF LOT 2 AND PART LOT 1 DP 1004514



NOTE

Location of Services both above and below ground is by visual field inspection. Further verification should be carried out on the site prior to the commencement of any excavation work.

Location of Boundaries is approximate only and should be verified before any works commence close to them.

Note - Most of Site was covered with long grass scattered trees & bush . Not all trees shown.
Approx. Flood Height RL4.44 (Advised by shed owner)

Origin of Levels SSM61807 RL4.267
Contour Interval 1m

LEGEND

▲	Survey Stn	——	Boundary Line
🟩	SSM 61807	– – – –	Bank Bottom
○	Power Pole	— — —	Bank Top
⊗	Tree	— · —	Centre Line
⇧	Sign	– – – –	Drain
⬭	Telstra Pit	– – – –	Edge Of Bitumen
▣	Fire Hydrant	— / —	Fence
▭	Kerb Inlet Pit	—×—	O/H Power Line
◉	Stop Valve	——	Stock Pile
⊛	Sewer Man Hole		

No	DATE	AMENDMENTS

SCALE
1:1000 @ A3

DATUM
AHD

Survey:-
19/06/12, 20/06/12,
28/06/12 & 01/7/12

Computer File :-
Mackney1811.dwg

JOB TITLE
BYRON SHIRE COUNCIL
BAYSHORE DRIVE

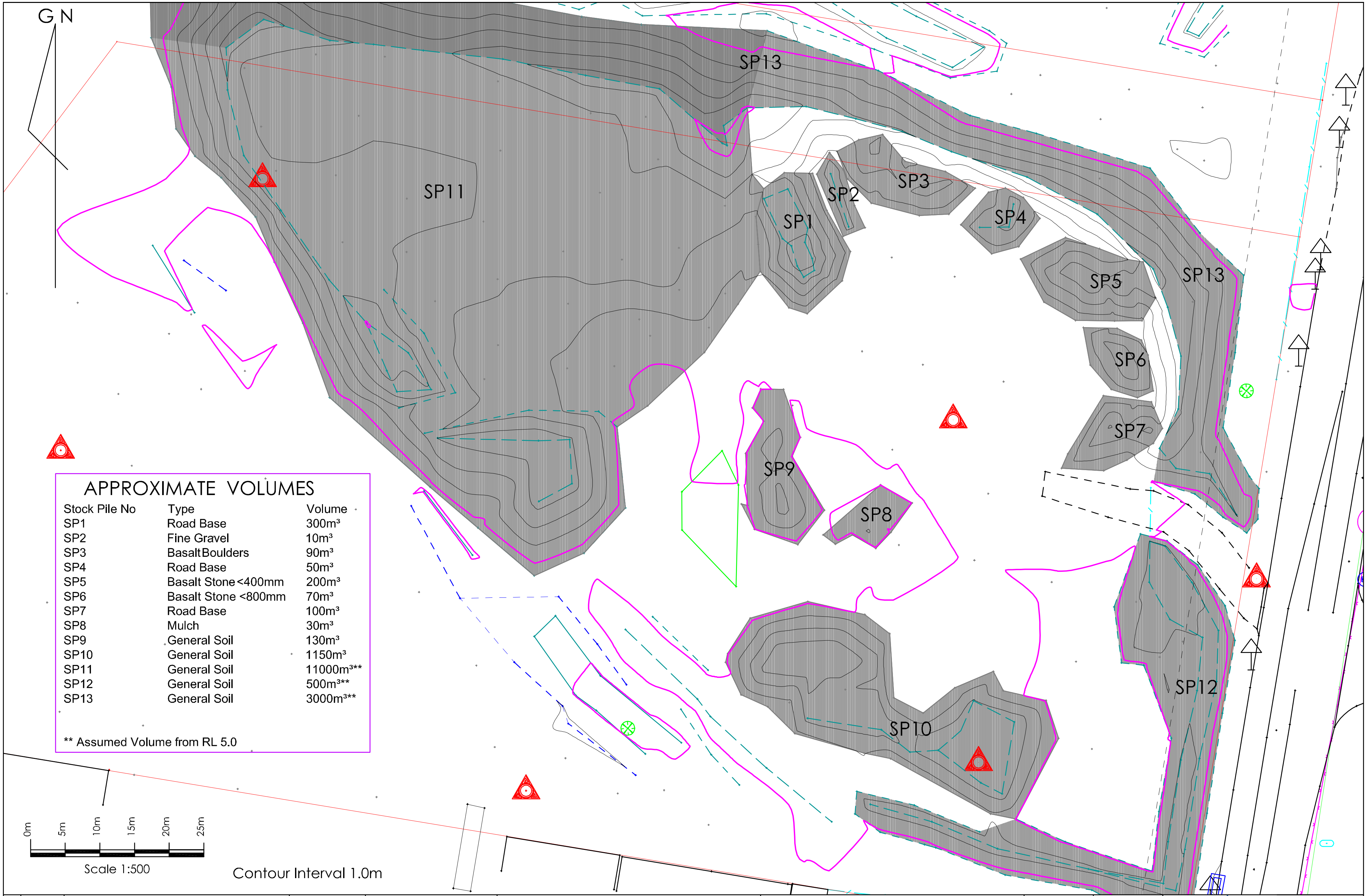
DRAWING TITLE
DETAIL SURVEY OF DEPOT SITE
LOT 2 & PART LOT 1 DP 1004514

No OF SHEETS
2

SHEET No
1

PLAN NUMBER
13/1323

WADE Engineering Surveying
Phone (02) 6621 4334
Mobile 0427 214 334
www.wade.com.au



APPROXIMATE VOLUMES

Stock Pile No	Type	Volume
SP1	Road Base	300m³
SP2	Fine Gravel	10m³
SP3	Basalt Boulders	90m³
SP4	Road Base	50m³
SP5	Basalt Stone <400mm	200m³
SP6	Basalt Stone <800mm	70m³
SP7	Road Base	100m³
SP8	Mulch	30m³
SP9	General Soil	130m³
SP10	General Soil	1150m³
SP11	General Soil	11000m³**
SP12	General Soil	500m³**
SP13	General Soil	3000m³**

** Assumed Volume from RL 5.0

No	DATE	AMENDMENTS
A	05.08.13	Stock Piles 12 & 13 Added.

SCALE
1:500 @ A3

DATUM
AHD

Survey:-
19/06/12, 20/06/12,
28/06/12 & 01/7/12

Computer File :-
Mackney1811.dwg

JOB TITLE
BYRON SHIRE COUNCIL
BAYSHORE DRIVE

DRAWING TITLE
DETAIL PLAN OF STOCK PILE AREA
LOT 2 & PART LOT 1 DP 1004514

No OF SHEETS 2
SHEET No 2
PLAN NUMBER
13/1323

WADE Engineering Surveying
Phone (02) 6621 4334
Mobile 0427 214 334
www.wade.com.au

INTENTIONALLY BLANK

APPENDIX C: LABORATORY & FIELD TEST RESULTS

Brian

From: Graham Lancaster [Graham.Lancaster@scu.edu.au]
Sent: Wednesday, 21 August 2013 6:40 AM
To: bmack@aapt.net.au
Subject: Water Sample Results attached - EAL Job No. C8001

Brian,

Waters look fairly clean with no contamination evident.

All the best

Graham

GRAHAM LANCASTER

Laboratory Manager/ Director
Environmental Analysis Laboratory (EAL)
Division of Research, Southern Cross University
Military Road, East Lismore, NSW, Australia
T: 02 6620 3678 | F: 02 6620 3957 | Mob: 0419 984 088
E: graham.lancaster@scu.edu.au | W: www.scu.edu.au/eal

CRICOS Provider: NSW 01241G, QLD 03135E, WA02621K

Southern Cross University

Environmental Analysis Laboratory

2 x WATER

C8001.

CHAIN OF COUSTODY

Environmental Analysis Laboratory

Delivery Address:

Environmental Analysis Laboratory
Southern Cross University
PO Box 157 (Military Road)
LISMORE NSW 2480

Phone: 02 6620 3678
Mobile: 0419 984 088 (Lab Manager)
Fax: 02 6620 3957
Email: eal@scu.edu.au
Website: www.scu.edu.au/eal

Submitting Client Details

Quote Id:
Job Ref: EAL@3792.
Company Name:
Contact Person: Brian Mackney
Phone:
Mobile: 04 13 679 201.
Fax:
Email:
Postal Address:

Billing Client Details

ABN:
Company Name:
Contact Person:
Phone:
Mobile:
Fax:
Email:
Postal Address:

This section will be destroyed after being processed. Only Complete CVV number if you are supplying the original hardcopy to EAL.

Payment Method:
- ☐ Purchase Order
- ☐ Cheque
- ☐ Invoice (prior approval required)
- ☐ Credit Card Mastercard / Visa No: _____/_____/_____/_____

Exp. Date: Name on Card: CVV:________

		Date	Signed
Relinquished By:	T Shepherd	8/8/13	
Preservation: None / Ice / [✓ Ice bricks] / Acidified / Filtered / Other: Esky – Fridge overnight.			
Received By:		8/8/13	
Condition on receipt: [✓ Ambient] / Cool / Frozen / Other:			

Comments:

Marketing Survey – where did you find us?
☐ Word of mouth ☐ Magazine ☐ Google search ☐ Other

Sample Analysis Request

Price List Code (e.g. SW-PACK-06)

Lab Sample No.	Sample ID	Sample Depth	Sampling Date	Your Client	Crop ID	Sample Type (e.g. water, leaf, soil)	SW-PACK-013. Enviro. monitoring	SW-SING-011. oils & grease.								
1	SP1	–	7/8/13	B. Mackney		Water	X	X								
2	SP2.	–	"	"		"	X									

EAL Project Reference:

RESULTS OF WATER ANALYSIS (Page 1 of 1)

2 samples supplied by Brian Mackney on the 8th August, 2013 - Lab. Job No. C8001

Analysis requested by Brian Mackney.

(17 Byron Creek Road, BANGALOW NSW 2479)

PARAMETER	METHODS REFERENCE	Sample 1 SP1	Sample 2 SP2
	Job No.	*C8001/1*	*C8001/2*
pH	APHA 4500-H^+-B	6.91	6.01
CONDUCTIVITY (EC) (dS/m)	APHA 2510-B	0.40	0.22
TOTAL DISSOLVED SALTS (mg/L)	calculation using EC x 680	269	150
TOTAL SUSPENDED SOLIDS (mg/L)	GFC equiv. filter - APHA 2540-D	50	5
BIOCHEMICAL OXYGEN DEMAND$_5$ (mg/L O_2)	APHA 5210-B	3.4	3.1
TOTAL OILS AND GREASE (mg/L)	APHA 5520-D (hexane extractable)	<2.0	..
TOTAL PHOSPHORUS (mg/L P)	APHA 4500 P-H	0.16	0.06
ORTHOPHOSPHATE (mg/L P)	APHA 4500 N-C	0.01	0.02
TOTAL NITROGEN (mg/L N)	APHA 4500 N-C	0.81	1.12
TOTAL KJELDAHL NITROGEN (mg/L N)	CALCULATION: TN - NOx	0.70	1.03
NITRATE (mg/L N)	APHA 4500 NO_3^--F	0.095	0.071
NITRITE (mg/L N)	APHA 4500 $NO3^-$-I	0.015	0.020
AMMONIA (mg/L N)	APHA 4500 NH_3-H	0.268	0.255

Notes:

1. 1 mg/L (milligram per litre) = 1 ppm (part per million) = 1000 μg/L (micrograms per litre)= 1000 ppb (part per billion)
2. For conductivity - 1 dS/m = 1 mS/cm = 1000 μS/cm
3. Analysis performed according to APHA, 2012, “Standard Methods for the Examination of Water & Wastewater”, 22nd Edition, except where stated otherwise.
4. Analysis conducted between sample arrival date and Report provision date

NATA
WORLD RECOGNISED ACCREDITATION
Accreditation No. 14960.
Accredited for compliance
with ISO/IEC 17025.

checked: ....
Graham Lancaster (Nata signatory)
Laboratory Manager

Environmental Analysis Laboratory, Southern Cross University,
Tel. 02 6620 3678, website: scu.edu.au/eal

Brian

From: Graham Lancaster [Graham.Lancaster@scu.edu.au]
Sent: Friday, 9 August 2013 6:19 AM
To: bmack@aapt.net.au
Subject: Soil Sample Results attached - EAL Job No. C7778

Brian,

I can see no cause for concern with the results- the Cr and Mn are typically elevated in volcanic soils – I have a short report on this if required.

The low TRH should not be a significant issue.

Thanks

Graham

GRAHAM LANCASTER

Laboratory Manager/ Director
Environmental Analysis Laboratory (EAL)
Division of Research, Southern Cross University
Military Road, East Lismore, NSW, Australia
T: 02 6620 3678 | F: 02 6620 3957 | Mob: 0419 984 088
E: graham.lancaster@scu.edu.au | W: www.scu.edu.au/eal

Southern Cross University | eal Environmental Analysis Laboratory

10 x Soil

29 July 201

CHAIN OF CUSTODY

Environmental Analysis Laboratory

Delivery Address:

Environmental Analysis Laboratory
Southern Cross University
PO Box 157 (Military Road)
LISMORE NSW 2480

Phone: 02 6620 3678
Mobile: 0419 984 088 (Lab Manager)
Fax: 02 6620 3957
Email: eal@scu.edu.au
Website: www.scu.edu.au/eal

Submitting Client Details

Quote Id:
Job Ref: Lot 2 DP 1004514
Company Name: BMack Proj Mgt Services
Contact Person: Brian Mackney
Phone: 0266871289
Mobile: 0413 679 201
Fax:
Email: bmack@aapt.net.au
Postal Address: 17 Byron Ck Rd Bangalow.

Billing Client Details

C7778

ABN:
Company Name:
Contact Person:
Phone:
Mobile: Ditto
Fax:
Email:
Postal Address:

This section will be destro [redacted] al hardcopy to EAL.

Payment Method:
☐ Purchase Order
☐ Cheque
☐ Invoice (prior app
☒ Credit Card Mas

Exp. Date: 06/14 [redacted]

		Date	Signed
Relinquished By:	B MACKNEY	29/7	
Preservation: [✓ None] / Ice / Ice bricks / Acidified / Filtered / Other:			
Received By:		29/7/13	
Condition on receipt: Ambient / [✓ Cool] / Frozen / Other:			

Comments:

Samples for SEPP55 Assessment
Lot 2 DP 1004514

Marketing Survey – where did you find us?
☐ Word of mouth ☐ Magazine ☐ Google search ☒ Other BAYSHORE DVE

Sample Analysis Request a/or

Price List Code (e.g. SW-PACK-06)

Lab Sample No.	Sample ID	Sample Depth	Sampling Date	Your Client	Crop ID	Sample Type (e.g. water, leaf, soil)	SS PACK 005	+PCB SS PACK 006	TRH/BTEX SS PACK 017							
1	7	<600	28/7	Byron Shire		Soil		*	*							
2	8	<600	28/7	Byron Shire		Soil	*									
3	9	<600	28/7	Byron Shire		Soil		*	*							
4	10	<600	28/7	Byron Shire		Soil		*	*							
5	11	<600	28/7	Byron Shire		Soil		*	*							

EAL Chain of Custody
Issue: V1.0 13/06/2013
Page 1 of 2

EAL Project Reference:

QFORM 4.2

BMACK PROJECT MGT SERVICES.

29 July 2013

CHAIN OF CUSTODY

Comments:
SAMPLES FOR SEPP55 ASSESSMENT
LOT 2 DP 1004514
BAYSHORE DVE
BYRON BAY

Marketing Survey – where did you find us?
☐ Word of mouth ☐ Magazine ☐ Google search ☐ Other

Sample Analysis Request

Price List Code (e.g. SW-PACK-06)

Lab Sample No.	Sample ID	Sample Depth	Sampling Date	Your Client	Crop ID	Sample Type (e.g. water, leaf, soil)	SS PACK 005	SS PACK 006	SS PACK 047							
6	1	<600	28/7	Byron Shire		Soil		*	*							
7	4	<600	28/7	Byron Shire		Soil	*									
8	5	<600	28/7	Byron Shire		Soil	*									
9	6	<600	28/7	Byron Shire		Soil		*	*							
10	2	<600	28/7	Byron Shire		Soil		*	*							

TOTAL of 10 Samples

29/7/13

QFORM 4.2

EAL Chain of Custody
Issue: V1.0 13/06/2013
Page 2 of 2

EAL Project Reference:
BMACK PROJECT MGT SERVICES

Report Date/Time: 29 July 2013 4:18:31PM

Sample Receipt Notification (SRN)

Project: EAL/C7778

Customer: Brian Mackney

Contact: Brian Mackney

Client Job ID: Lot 2 DP 1004514

No. of Samples: 10 x Soil

Date Received: 29 JUL 2013

Comments: Standard Request

Environmental Analysis Laboratory
Environmental Analysis Laboratory
PO Box 157
Lismore NSW 2480
ABN: 41 995 651 524
Tel: (02) 6620 3678 Fax (02) 6620 3957
Email: eal@scu.edu.au

Biller: **Brian Mackney** - Brian Mackney - 02 6687 1289

Sample Text ID	Client Sample ID	Test Request SS-PACK-005 Contaminated Site Assessment 1a	Test Request SS-PACK-006 Contaminated site assessment 1b	Test Request SS-PACK-017 Petroleum Compounds Assessment 1a
C7778/001	7	0	1	1
C7778/002	8	1	0	0
C7778/003	9	0	1	1
C7778/004	10	0	1	1
C7778/005	11	0	1	1
C7778/006	1	0	1	1
C7778/007	4	1	0	0
C7778/008	5	1	0	0
C7778/009	6	0	1	1
C7778/010	2	0	1	1
Total		3	7	7

Sample Receipt Notification (SRN)

for EAL/C7778

RESULTS OF SOIL ANALYSIS

10 soil samples supplied by Brian Mackney on the 29th July, 2013 - Lab Job No. C7778
Analysis requested by Brian Mackney. **Your Job: Lot 2 DP 1004514**
(17 Byron Creek Road, BANGALOW NSW 2479).

ANALYTE	METHOD REFERENCE	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8	Sample 9	Sample 10	*RESIDENTIAL Guideline Limit*		*Background*
		7	8	9	10	11	1	4	5	6	2	*Composite - Column 1*	*Individual - Column 1*	*Range*
	Job No.	*C7778/1*	*C7778/2*	*C7778/3*	*C7778/4*	*C7778/5*	*C7778/6*	*C7778/7*	*C7778/8*	*C7778/9*	*C7778/10*	*See note 1a*	*See note 1a*	*See note 2*
MOISTURE %	c	28	21	14	20	31	16	27	24	25	12	..	..	..
SILVER (mg/Kg DW)	*a*	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	***na***	*na*	*na*
ARSENIC (mg/Kg DW)	*a*	5	10	3	3	4	3	2	3	3	3	***<25***	*<100*	*0.2-30*
LEAD (mg/Kg DW)	*a*	21	56	30	37	36	22	14	19	50	28	***<75***	*<300*	*<2-200*
CADMIUM (mg/Kg DW)	*a*	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	***<5***	*<20*	*0.04-2.0*
CHROMIUM (mg/Kg DW)	*a*	21	18	7	42	35	9	20	14	17	8	***<25***	*<100*	*0.5-110*
COPPER (mg/Kg DW)	*a*	21	26	25	23	25	15	18	20	16	18	***<250***	*<1000*	*1-190*
MANGANESE (mg/Kg DW)	*a*	430	368	80	370	634	184	668	293	288	199	***<375***	*<1500*	*4 - 12,600*
NICKEL (mg/Kg DW)	*a*	13	11	3	16	24	7	12	10	9	6	***<150***	*<600*	*2-400*
SELENIUM (mg/Kg DW)	*a*	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	***na***	*na*	*na*
ZINC (mg/Kg DW)	*a*	73	75	118	54	114	37	61	61	56	48	***<1750***	*<7000*	*2-180*
MERCURY (mg/Kg DW)	*a*	0.06	0.06	0.03	0.10	0.07	0.02	0.05	0.04	0.09	0.02	***<3.75***	*<15*	*0.001-0.1*
IRON (% DW)	*a*	3.23	2.61	0.65	6.58	4.43	1.37	3.97	2.31	2.61	1.51	*na*	*na*	*na*
ALUMINIUM (% DW)	*a*	1.62	1.25	0.26	4.21	2.08	0.47	1.88	1.14	1.21	0.49	*na*	*na*	*na*
PESTICIDE ANALYSIS SCREEN														
DDT (mg/Kg)	*c*	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	***<50***	*<200*	*<0.2*
Chlordane (mg/kg)	*c*	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	***<12.5***	*<50*	*<0.05*
Heptachlor (mg/kg)	*c*	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	***<2.5***	*<10*	*<0.05*
Aldrin + Dieldrin (mg/kg)	*c*	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	***<2.5***	*<10*	*<0.05*
Other Organochlorine Pesticides (mg/Kg)	*c*	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**..**	..	*<0.05*
Demeton (total) (mg/kg)	*c*	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**..**	..	*<1*
Other Organophosphate Pesticides (mg/Kg)	*c*	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**..**	..	*<0.5*
PCB's (mg/Kg)	*c*	<0.1	..	<0.1	<0.1	<0.1	<0.1	..	..	<0.1	<0.1	***<2.5***	*<10*	*<0.5*
HYDROCARBON ANALYSIS RESULTS														
BTEX														
Benzene (mg/Kg)	*c*	<0.2	..	<0.2	<0.2	<0.2	<0.2	<0.2	..	<0.2	<0.2	..	..	..
Toluene (mg/Kg)	*c*	<0.5	..	<0.5	<0.5	<0.5	<0.5	<0.5	..	<0.5	<0.5	..	..	..
Ethylbenzene (mg/Kg)	*c*	<1	..	<1	<1	<1	<1	<1	..	<1	<1	..	..	..
Total m+p-Xylenes (mg/Kg)	*c*	<2	..	<2	<2	<2	<2	<2	..	<2	<2	..	..	..
o-Xylene (mg/Kg)	*c*	<1	..	<1	<1	<1	<1	<1	..	<1	<1	..	..	..
Xylenes (ortho.meta & para)	*c*	<1	..	<1	<1	<1	<1	<1	..	<1	<1			
Total BTEX (mg/Kg)	*c*	Not detected	..	Not detected	Not detected	Not detected	Not detected	Not detected	..	Not detected	Not detected	..	..	..
Total Recoverable Hydrocarbons												..	..	..
C6-C9 (Volatile) Fraction (mg/Kg)	*c*	<25	..	<25	<25	<25	<25	..	..	<25	<25	..	..	..
C10-C14 Fraction (mg/Kg)	*c*	<50	..	94	<50	<50	<50	..	..	<50	<50	..	..	..
C15-C28 Fraction (mg/Kg)	*c*	<100	..	100	<100	120	<100	..	..	120	<100	..	..	..
C29-C36 Fraction (mg/Kg)	*c*	120	..	140	<100	<100	<100	..	..	<100	<100	..	..	..
>C10-C16 Fraction (mg/Kg)	*c*	<50	..	110	<50	<50	<50	..	..	<50	<50	..	..	..
>C10-C16 less Naphthalene (mg/Kg)	*c*	<50	..	110	<50	<50	<50	..	..	<50	<50	..	..	..
>C16-C34 Fraction (mg/Kg)	*c*	160	..	200	<100	160	100	..	..	140	<100	..	..	..
>C34-C40 Fraction (mg/Kg)	*c*	<100	..	<100	<100	<100	<100	..	..	<100	<100	..	..	..

METHODS REFERENCE

a. $^{1:3}$Nitric/HCl digest - APHA 3120 ICPMS
b. $^{1:3}$Nitric/HCl digest - APHA 3120 ICPOES
c. Analysis sub-contracted - Envirolab report no. 94647

WORLD RECOGNISED
ACCREDITATION
Accreditation No. 14960.
Accredited for compliance
with ISO/IEC 17025.

NOTES

1a. Column 1 'Residential with gardens and accessible soil including childrens daycare centres, preschools, primary schools, town houses or villas' (NSW EPA 2006)
1b. Column 2 'Residential with minimal access to soil including high-rise apartments and flats' (NSW EPA 2006)
1c. Column 3 'Parks, recreational open space, playingfields including secondary schools' (NSW EPA 2006)
1d. Column 4 'Commerical and Industrial' (NSW EPA 2006)
(NSW EPA, 2006. Contaminated Sites- Guidelines for the NSW Site Auditors Scheme (2nd edition). Dept of Env and Conservation NSW, Sydney).
2. Environmental Soil Quality Guidelines, Page 40, ANZECC, 1992.

Additional NOTES

DW = Dry Weight. na = no guidelines available

Organochlorine pesticide (OC's) screen:	(HCB, alpha-BHC, gamma-BHC, Heptachlor, delta-BHC, Aldrin, Heptachlor Epoxide, gamma-Chlordane, alpha-chlordane, Endosulfan 1, pp-DDE, Dieldrin, Endrin, pp-DDD, Endosulfan 2, pp-DDT, Endrin Aldehyde, Endosulfan Sulphate, Methoxychlor)
Organophosphorus pesticide (OP's) screen:	(Diazinon, Dimethoate, Chlorpyriphos-methyl, Ronnel, Chlorpyriphos, Fenitrathion, Bromophos-ethyl, Ethion)
PCB's = Polychloriniated Biphenyls	(Arochlor 1016, 1232, 1242, 1248, 1254, 1260)

checked:...............

ASSESSMENT OF TOTAL SOIL MANGANESE AND CHROMIUM IN BASALTIC SOILS OF THE NORTH COAST, NSW

An assessment of Manganese and Chromium possible soil contamination
as required for State Environmental Planning Policy 55

PREPARED BY: GRAHAM LANCASTER
SOUTHERN CROSS UNIVERSITY A.B.N. 41 995 651 524
SCHOOL OF ENVIRONMENTAL SCIENCE AND MANAGEMENT
ENVIRONMENTAL ANALYSIS LABORATORY

Military Road, East Lismore, NSW, 2480
Ph: 02 6620 3678
Fax: 02 6620 3957
Email: glancast@scu.edu.au

FOR: NEWTON DENNY CHAPELLE
REPORT NO.: **Contamination Reports**
DATE: July, 2006

EXECUTIVE SUMMARY

The objective of the investigation is to assess typical and average soil total manganese (Mn) and chromium (Cr) concentrations in North Coast soils, NSW (ie. Grafton to the south, Kyogle to the west, Mullumbimby to the North and Ballina to the east). These soils are typically of a basaltic origin and these volcanic soils are shown to be naturally elevated in some metals.

The assessment of Mn and Cr assessment in North Coast soils has been conducted on a random 200 composite soil samples, which is equivalent to 800 individual soils. This number of soils is considered representative of North Coast soils and for the assessment of average metal concentrations.

The results of the soil analysis were compared with Column 1 of the NSW EPA (1998) '*Contaminated Sites – Guidelines for the NSW Site Auditor Scheme'*. Column 1 presented Human - Based Investigation Levels (HBIL) for developments being 'residential with gardens and accessible soil'. The guidelines are also typically modified by dividing them by the number of samples that make up the composite sample (ie. typically the guideline divided by four).

The average Mn in the 800 soils is 1800ppm Mn with a standard deviation of 1162ppm. These levels are 'naturally' well above the guideline level of 1500ppm or 375ppm Mn for composite samples (ie. 92% of the 200 composite soils analysed exceed the 375ppm guideline).

The average Cr in the 800 soils is 56ppm Cr with a standard deviation of 32ppm. These levels are 'naturally' well above the composite guideline level of 25ppm Cr (ie. 91% of the 200 composite soils analysed exceed the 25ppm guideline).

The background levels of metals analysed, obtained from ANZECC and NHMRC (1992) Table 3 "Environmental Soil Quality Guidelines" page 40, state that background levels of Mn range from 4 – 12,600ppm and total Cr from 0.5 – 110ppm. This large range for background Mn and Cr in soils further confirms the results obtained for naturally elevated Mn and Cr in North Coast soils.

All Mn and Cr analysis results in North Coast soils need to be disregarded unless an identifiable source of Mn or Cr soil contamination has been identified. The Contaminated Land Management Act 1997 clearly identifies contamination as 'above the concentration at which the substance is normally present in, on or under land in the same locality' and hence confirming that the elevated naturally occurring Mn and Cr concentrations in North Coast soils is not identified as 'contamination' and hence does not warrant further investigation or remediation.

1.0 INTRODUCTION

The Environmental Analysis Laboratory has been commissioned by Newton Denny Chapelle to undertake a investigation for Contaminated Lands in regard to soil total Mn and Cr concentrations.

The objective of the investigation is to assess typical and average soil total Mn and Cr concentrations in North Coast soils, NSW (ie. Grafton to the south, Kyogle to the west, Mullumbimby to the North and Ballina to the east). These soils are typically of a basaltic origin and these volcanic soils are shown to be naturally elevated in some metals.

The purpose of this report is to determine if north coast soils are contaminated from current or past land usage or have 'naturally' occurring Cr and Mn. To determine if a site has been contaminated, soil samples have been collected and analysed for a range of contaminants. A large number of soil composite samples from random sites were collated for this assessment. If contaminated, the results of the analysis are required to be higher than that of the relevant EPA acceptable levels. Most of the contamination reports involve residential and hence the soil analysis results are compared with the NSW EPA (1998) Columns 1 of the Table "Soil Investigation Levels for Urban Redevelopment Sites in NSW" page 30 and ANZECC and National Health and Medical Research Council (1992) Table 2 "Environmental Soil Quality Guidelines" page 40.

This investigation is Stage 1 of the *Managing Land Contamination Planning Guidelines* (DUAP and EPA, 1998). If contamination levels exceed the EPA acceptable levels, a detailed investigation is then required in accordance with DUAP and EPA (1998), being Stage 2. If the contamination levels are below the relevant acceptable levels and information gathered as part of the investigation also supports that contamination was unlikely to have occurred, Stage 1 would only be required.

2.0 METHODOLOGY

The assessment of Mn and Cr in North Coast soils has been conducted on a random 200 composite soil samples, which is equivalent to 800 individual soils. This number of soils is considered representative of North Coast soils and for the assessment of average metal concentrations.

Samples were analysed for a full range of heavy metals and the data analysed in this review is the total Mn, Cr, iron (Fe) and aluminium (Al).

2.1 Sampling Methodology

Samples were collected using a hand auger and spade, with soil being placed in plastic sample bags.

All soil samples were placed into an esky with ice bricks, and delivered to the Environmental Analysis Laboratory at Southern Cross University, Lismore. Metals analysis was conducted by the Environmental Analysis Laboratory (EAL) and quality control included blanks, duplicates and certified NIST reference soil in every batch. Analysis is conducted using a Perkin Elmer DV4300 ICPOES (Inductively Coupled Plasma Optical Emission Spectrometry) with confirmation and level analysis of all samples using a Perkin Elmer ELAN6000 ICPMS (Inductively Coupled Plasma Mass Spectrometry).

Chain of custody forms, laboratory quality assurance and laboratory quality control documentation are available on request.

3.0 BASIS FOR ASSESSMENT CRITERIA

The acceptable limits of the parameters tested are based on the NSW EPA (1998) *Contaminated Sites - Guidelines for the NSW Site Auditor Scheme*. In particular Column 1 of table "Soil Investigation Levels for Urban Redevelopment Sites in NSW" page 30. Column 1 relates to "Residential with gardens and accessible soil including children's daycare centres, preschools, primary schools, town houses or villas". The tested parameters are presented in Table 1.

Table 1: Soil Investigation Levels for Urban Redevelopment Sites in NSW: Column 1 "Residential with gardens and accessible soil including children's daycare centres, preschools, primary schools, town houses or villas" (NSW EPA 1998)

Substance	**Acceptable Limit Column 1 (mg/kg)**	**Modified Acceptable Limit Column 1 (mg/kg)** **(divided by 4 for composites of 4 samples)**
Arsenic	100	**25**
Cadmium	20	**5**
Chromium (VI)	100	**25**
Copper	1000	**250**
Manganese	1500	**375**
Nickel	600	**150**
Lead	300	**75**
Zinc	7000	**1750**
Mercury	15	**3.75**
OC's (aldrin and dieldrin)	10	**2.5**
OC's (DDT)	200	**50**

Background Levels

Metals occur naturally within soils and are a natural constituent of geological materials that erode and assist in the formation of soils. The background levels of metals analysed, obtained from ANZECC and NHMRC (1992) Table 3 "Environmental Soil Quality Guidelines" page 40, are presented in Table 2.

Table 2: Background Ranges for Potential Contaminants

Pollutant	**Background Range (mg/kg)**
Arsenic	0.2 – 30
Lead	<2 – 200
Cadmium	0.04-2
Copper	1-190
Nickel	2-400
Zinc	2-180
Manganese	4 – 12,600
Chromium	0.5 – 110 *(possible underestimate)*
Mercury	0.001-0.1

Table 3: Average Abundance of Manganese and Chromium in Basalt and other minerals

AVERAGE ABUNDANCE OF ELEMENTS IN THE EARTHS CRUST AND IN THREE COMMON ROCKS

(IN PARTS PER MILLION) (10,000ppm = 1%)

ELEMENT	CRUST	GRANITE	BASALT (Crusher Dust)	SHALE
O	464,000	485,000	441,000	495,000
Si	**282,000**	**323,000**	**230,000**	**238,000**
Al	81,000	77,000	84,000	92,000
Fe	**54,000**	**27,000**	**86,000**	**47,000**
Ca	**41,000**	**16,000**	**72,000**	**25,000**
Na	24,000	28,000	19,000	9,000
Mg	**23,000**	**4,000**	**45,000**	**14,000**
K	**21,000**	**32,000**	**8,000**	**25,000**
Ti	5,000	2,100	9,000	4,500
H	1,400	..	..	..
P	**1,100**	**700**	**1,400**	**750**
Mn	**1,000**	**500**	**1,700**	**850**
F	650	800	400	600
Ba	500	700	300	600
Sr	375	300	450	400
S	**300**	**300**	**300**	**2,500**
C	**220**	**320**	**120**	**1,000**
Zr	165	180	140	180
Cl	130	200	60	170
V	110	50	250	130
Cr	100	20	200	100
Rb	90	150	30	140
Ni	75	0.8	150	80
Zn	**70**	**50**	**100**	**90**
Ce	70	90	30	70
Cu	**50**	**12**	**100**	**50**
Y	35	40	30	35
La	35	55	10	40
Nd	30	32	20	30
Co	**22**	**3**	**48**	**20**
Li	20	30	12	60
N	**20**	**20**	**20**	**60**
Sc	20	8	35	15
Nb	20	20	20	15
Ga	18	18	18	25
Pb	12.5	20	3.5	20
B	**10**	**15**	**5**	**100**
Th	8.5	20	1.5	12
Pr	8	10	4	9
Sm	7	9	5	7
Gd	7	8	6	6
Dy	6	6.5	4	5
Er	3.5	4.5	3	3.5
Yb	3.5	4	2.5	3.5
Be	3	5	0.5	3
Cs	3	5	1	7
Hf	3	4	1.5	4
U	2.7	5	0.5	3.5
Br	2.5	0.5	0.5	5
Sn	2.5	3	2	6
Ta	2	3.5	1	2
As	1.8	1.5	2	10
Ge	1.5	1.5	1.5	1.5
Mo	**1.5**	**1.5**	**1**	**2**
Ho	1.5	2	1	1.5
Eu	1.2	1	1.5	1.4
W	1.2	1.5	0.8	1.8
Tb	1	1.5	0.8	1
Tl	0.8	1.2	0.2	1
Lu	0.6	0.7	0.5	0.6
Tm	0.5	0.6	0.5	0.6
Sb	0.2	0.2	0.2	1.5
I	0.2	0.2	0.1	1
Cd	0.15	0.1	0.2	0.3
Bi	0.15	0.2	0.1	0.2
In	0.06	0.05	0.07	0.06
Ag	0.07	0.04	0.1	0.1
Se	0.05	0.05	0.05	0.6
Hg	0.02	0.03	0.01	0.3
Au	0.003	0.002	0.004	0.003

Reference: Krauskopf, K, 1996. Introduction to Geochemistry, McGraw-Hill Internation.

4.0 RESULTS

The results from the soil testing regime are graphically represented on the following pages.
The raw data table with over 200 entries and identifiable job numbers is presented in Exhibit 1.

Figure 1- Graphical presentation of Manganese Soil Results

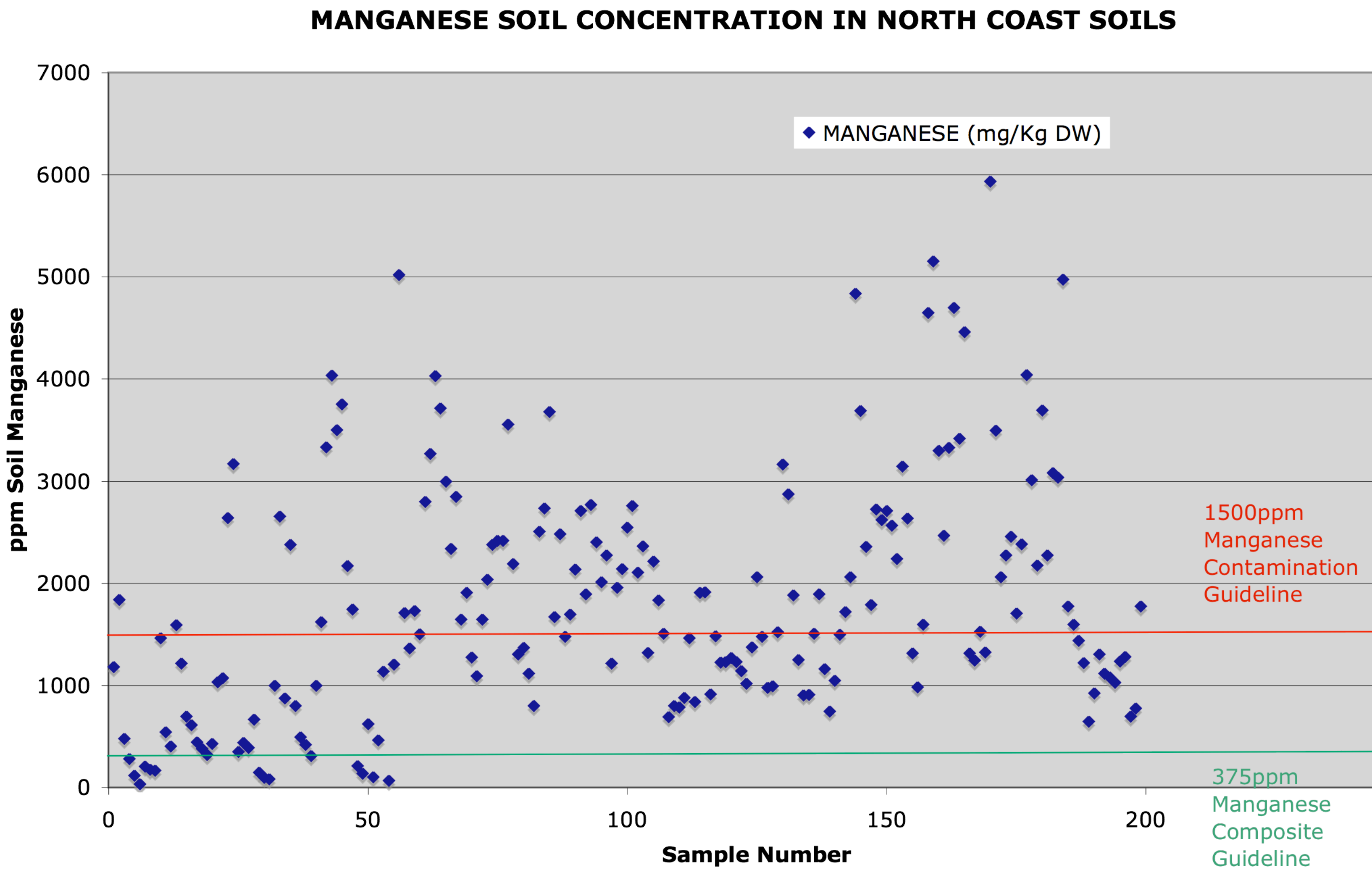


Figure 2- Graphical presentation of Chromium Soil Results

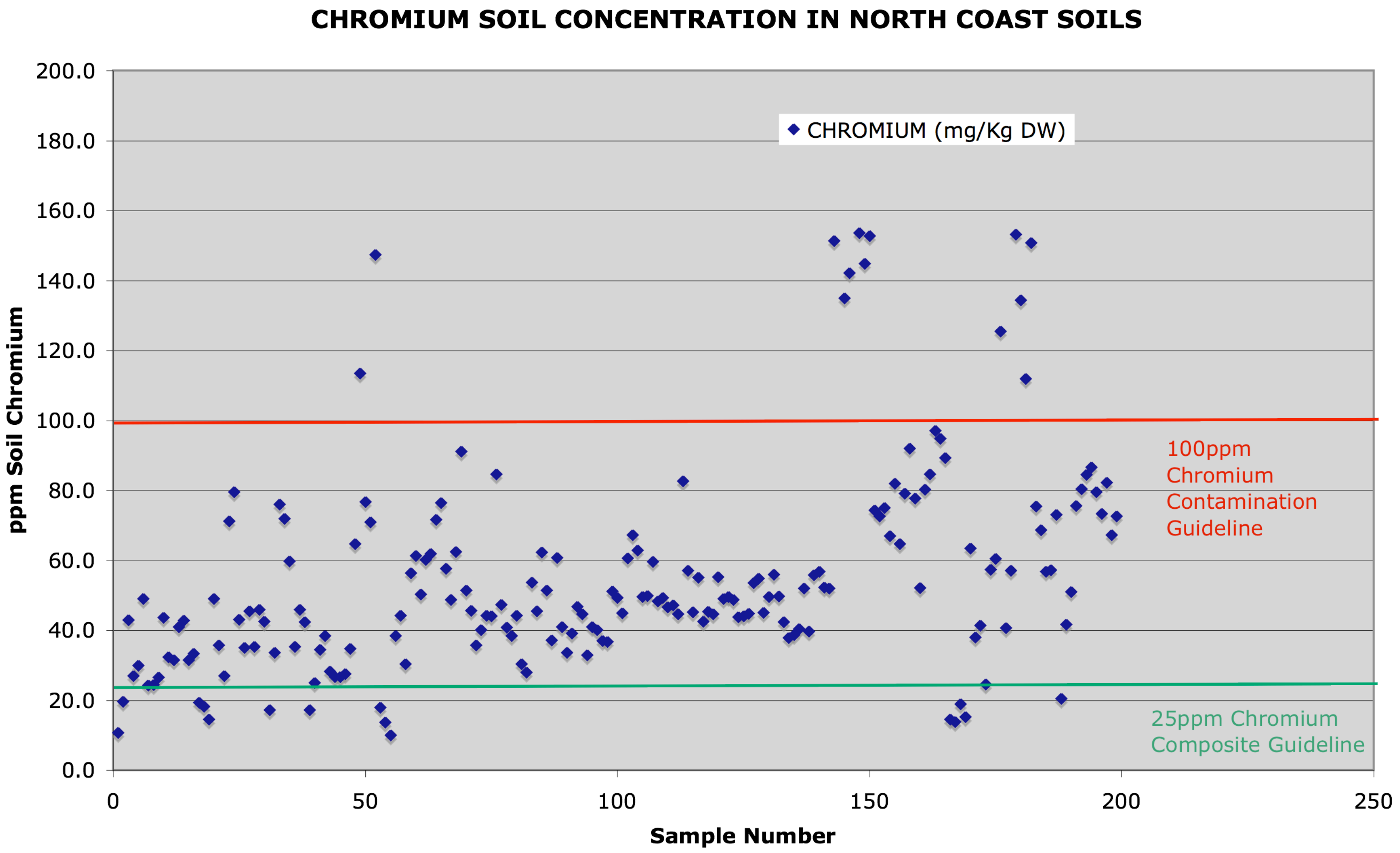


Figure 3- Relationship between Iron and Manganese in North Coast Soils

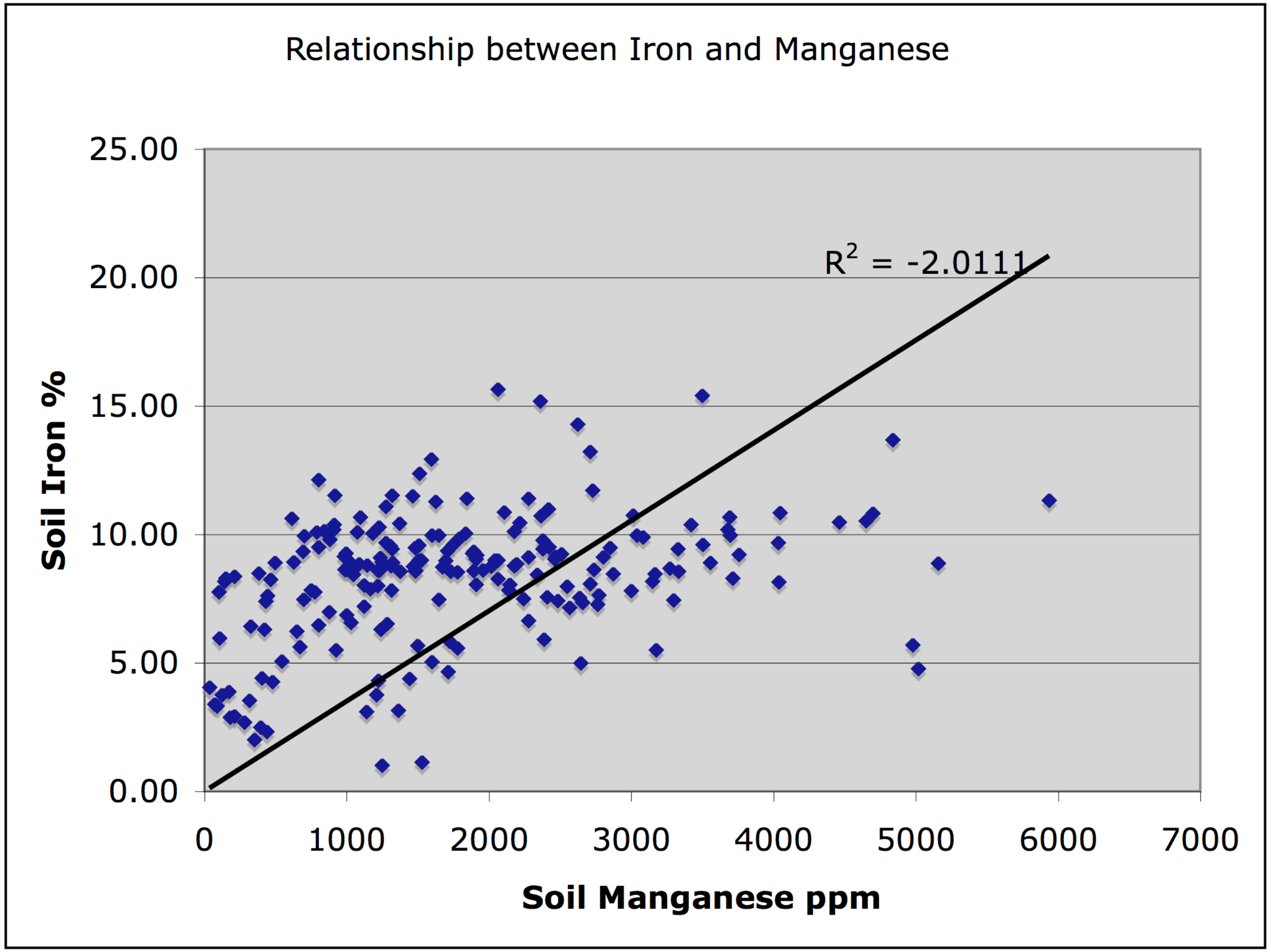
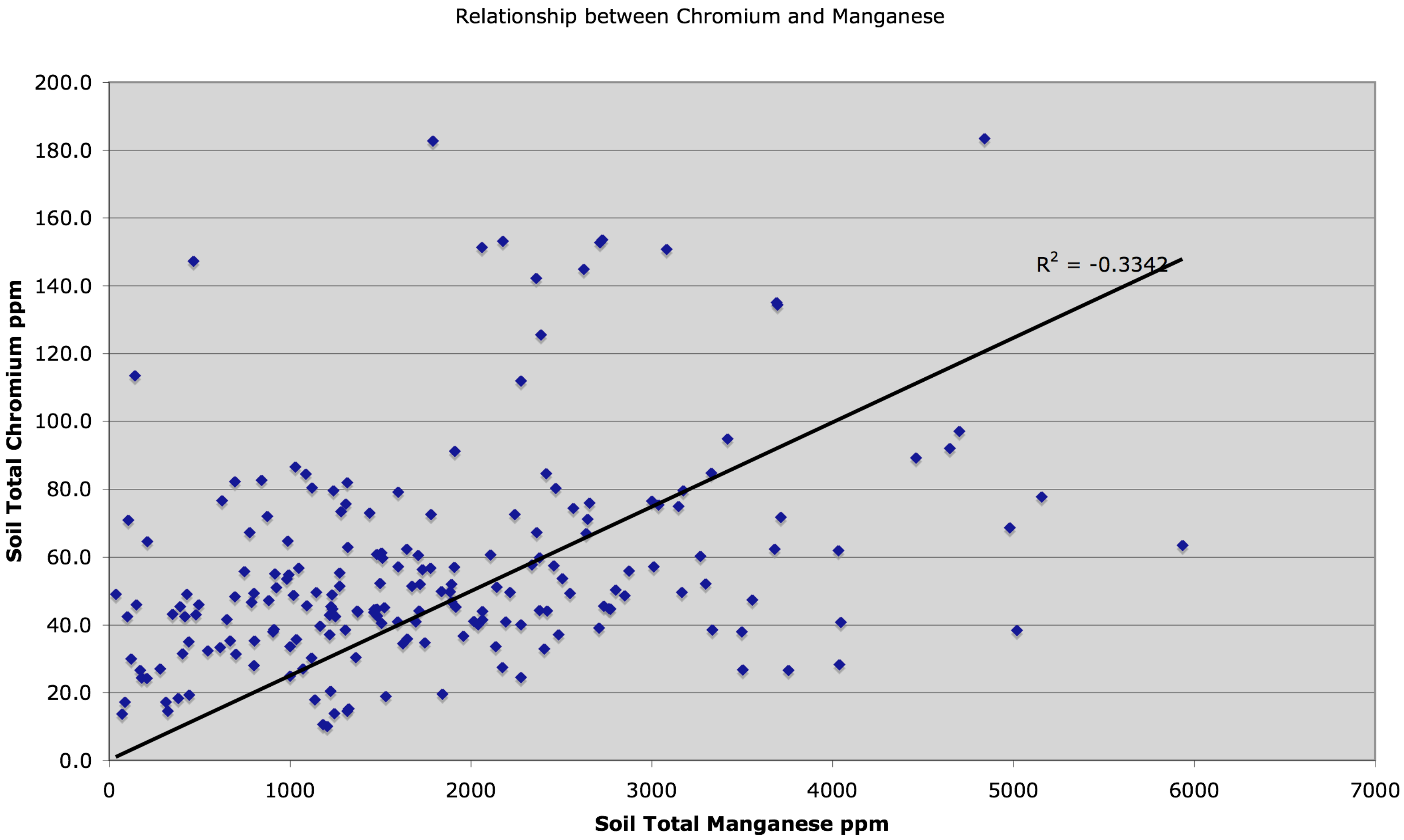


Figure 4- Relationship between Chromium and Manganese in North Coast Soils



5.0 DISCUSSION

The assessment of Mn and Cr assessment in North Coast soils has been conducted on a random 200 composite soil samples, which is equivalent to 800 individual soils. This number of soils is considered representative of North Coast and for the assessment of average metal concentrations.

The results of the soil analyses were compared with Column 1 of the NSW EPA (1998) '*Contaminated Sites – Guidelines for the NSW Site Auditor Scheme'.* Column 1 presented Human - Based Investigation Levels (HBIL) for developments being 'residential with gardens and accessible soil'. The guidelines are also typically modified by dividing them by the number of samples that make up the composite sample (ie. typically the guideline divided by four).

The average Mn in the 800 soils is 1800ppm Mn with a standard deviation of 1162ppm (refer Figure 1). These levels are 'naturally' well above the guideline level of 1500ppm or 375ppm Mn for composite samples(ie. 92% of the 200 composite soils analysed exceed the 375ppm guideline). Table 3 provides the average Mn in basalt rock at 1700ppm Mn. Basalt is the bedrock mineral for the formation of most North Coast soils. The Mn ranges from 37 to 5934ppm in the soils analysed and hence an explanation for the elevated Mn in some soils is required.

The physical features of Mn oxides and hydroxides, such as small size of crystals and large surface area has important geochemical implications. Mn^{2+} is known to replace the sites of some divalent cations (Fe^{2+}, Mg^{2+}) in silicates and oxides. Also, during weathering Mn compounds are oxidised and the released Mn oxides are reprecipitated and readily concentrated in the form of secondary Mn minerals (Alina Kabata-Pendias, 1985). Both of these processes account for the accumulation of Mn at various sites on the North Coast. Higher Mn levels are often reported in soils rich in iron and/or organic matter, which is also characteristic of North Coast soils (refer Figure 3). Mn is detected in the field by the presence of small, hard, characteristically dark-coloured nodules and identified by a vigorous effervescence with hydrogen peroxide.

The average total Cr in the 800 soils is 56ppm Cr with a standard deviation of 32ppm (refer Figure 2). These levels are 'naturally' well above the composite guideline level of 25ppm Cr (ie. 91% of the 200 composite soils analysed exceed the 25ppm guideline). The Cr ranges from 10 to 183ppm in the soils analysed. No data is available for hexavalent Cr (Cr (VI)) in North Coast soils but this valiancy of Cr is expected to show much lower concentrations than total Cr. The guidelines do relate to the Cr (VI) hence total Cr analysis is a 'worst case' scenario for contamination. Accumulation of total Cr in soils can occur with similar reasons to above but to a far lesser extent. A relationship between Mn and Cr is evident (refer to Figure 4).

The background levels of metals analysed, obtained from ANZECC and NHMRC (1992) Table 3 "Environmental Soil Quality Guidelines" page 40, state that background levels of Mn range from 4 – 12,600ppm and total Cr from 0.5 – 110ppm. This large range for background Mn and Cr in soils further confirms the results obtained for naturally elevated Mn and Cr in North Coast soils.

The Mn and Cr in North Coast soils are considered to be tightly bound to the clays and organic matter, which typically have very high cation exchange. The soils of the North Coast are typically acidic and hence lithiophorite $(Al,Li)MnO_2(OH)_2$ is the most likely Mn mineral present in the soils (Alina Kabata-Pendias, 1985). Human health impacts from total Mn and Cr have not been clearly identified and if this was considered an issue, than a very large percentage of the North Coast including all towns and residential areas would need to be assessed and investigated. Human health effects from Mn are historically from breathing airborne particles of Mn ores during mining ores such as pyrolusite, MnO_2, and causing acute respiratory disease and a severe chronic neurotoxicity ("manganism") (Crosby, 1998). Manganism also resulted from drinking water that contained 16-18ppm of dissolved Mn.

6.0 CONCLUSIONS AND RECOMMENDATIONS

The average Mn in the 800 soils is 1800ppm Mn with a standard deviation of 1162ppm. These levels are 'naturally' well above the guideline level of 1500ppm or 375ppm Mn for composite samples. The average Cr in the 800 soils is 56ppm Cr with a standard deviation of 32ppm. These levels are 'naturally' well above the composite guideline level of 25ppm Cr.

The background levels of metals analysed, obtained from ANZECC and NHMRC (1992) Table 3 "Environmental Soil Quality Guidelines" page 40, state that background levels of Mn range from 4 – 12,600ppm and total Cr from 0.5 – 110ppm. This large range for background Mn and Cr in soils further confirms the results obtained for naturally elevated Mn and Cr in North Coast soils.

All Mn and Cr analysis results in North Coast soils need to be disregarded unless an identifiable source of Mn or Cr soil contamination has been identified. The Contaminated Land Management Act 1997 clearly identifies contamination as 'above the concentration at which the substance is normally present in, on or under land in the same locality' and hence confirming that the elevated naturally occurring Mn and Cr concentrations in North Coast soils is not identified as 'contamination' and hence does not warrant further investigation or remediation.

The Mn and Cr in North Coast soils are considered to be tightly bound to the clays and organic matter which typically have very high cation exchange. Human health impacts from total Mn and Cr have not been clearly identified and if this was considered an issue, than a very large percentage of the North Coast including all towns and residential areas would need to be assessed and investigated.

7.0 REFERENCES

Alina Kabata-Pendias, (1985). *Trace Elements in Soils and Plants*. CRC Press, Florida, USA.

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Crosby, D, (1998). *Environmental Toxicology and Chemistry*. Oxford University Press, Oxford.

Commonwealth Bureau of Meteorology (2004). Averages for Major Cites and Towns [Online], Available: http://www.bom.gov.au/climate/averages/tables/cw 058009.shtml.

Council of Standards Australia (1997). *AS 4482.1-1997 Guide to the sampling and investigation of potentially contaminated soil – Non-volatile and semi-volatile compounds.* Council of Standards Australia, 50p.

Department of Urban Affairs and Planning and the Environment Protection Authority (1998). *Managing Land Contamination, Planning Guidelines SEPP 55 – Remediation of Land*.

NEPC (1999). *Schedule B (1) Guidelines on the Investigation Levels for Soil and Groundwater*. National Environmental Protection, Assessment of Site Contamination.

NSW EPA (1993) *Environmental Guidelines for Cattle Tick Dip Sites*. NSW EPA, Chatswood.

NSW EPA (1994). *Service Station Guidelines for Sensitive Landuse – Soils*

NSW EPA (1995). *Contaminated Sites – Sampling Design Guidelines.* NSW EPA, Chatswood, 35p.

NSW EPA (1997) *Guidelines for Consultants Reporting Contaminated Sites.* NSW EPA, Chatswood, 22p.

NSW EPA (1998) *Contaminated Sites – Guidelines for the NSW Site Auditor Scheme.* NSW EPA, Sydney South, 57p.

Summary of Experience and Qualifications.

The Environmental Analysis Laboratory, which is part of Southern Cross University, consists of a large range of analysts, chemists, environmental managers and scientists. The qualifications, held by the persons of the company, include:

- Doctorate of Applied Science (Environmental Management)
- Bachelor of Applied Science (Coastal Management)
- Honours in Applied Science
- Diploma in Chemistry

We have a wide range of experience and worked on a number of varied projects, which include:

- Contamination Assessment Reports for Residential, Industrial and Commercial Sites
- Acid Sulfate soil assessment and management
- Petrochemical assessment and rehabilitation
- Analysis and Rehabilitation of dipsites
- Assessment of former banana plantations
- Assessment of disposal and reuse of Biosolids
- Assessment of general agricultural and residential sites.

Southern Cross University has the following Public/ Professional Liability:

UNIMUTUAL

Agent:	ANZU MUTUAL ASSOCIATION LTD
Certificate of Entry No:	UL SCU 06

DISCLAIMER

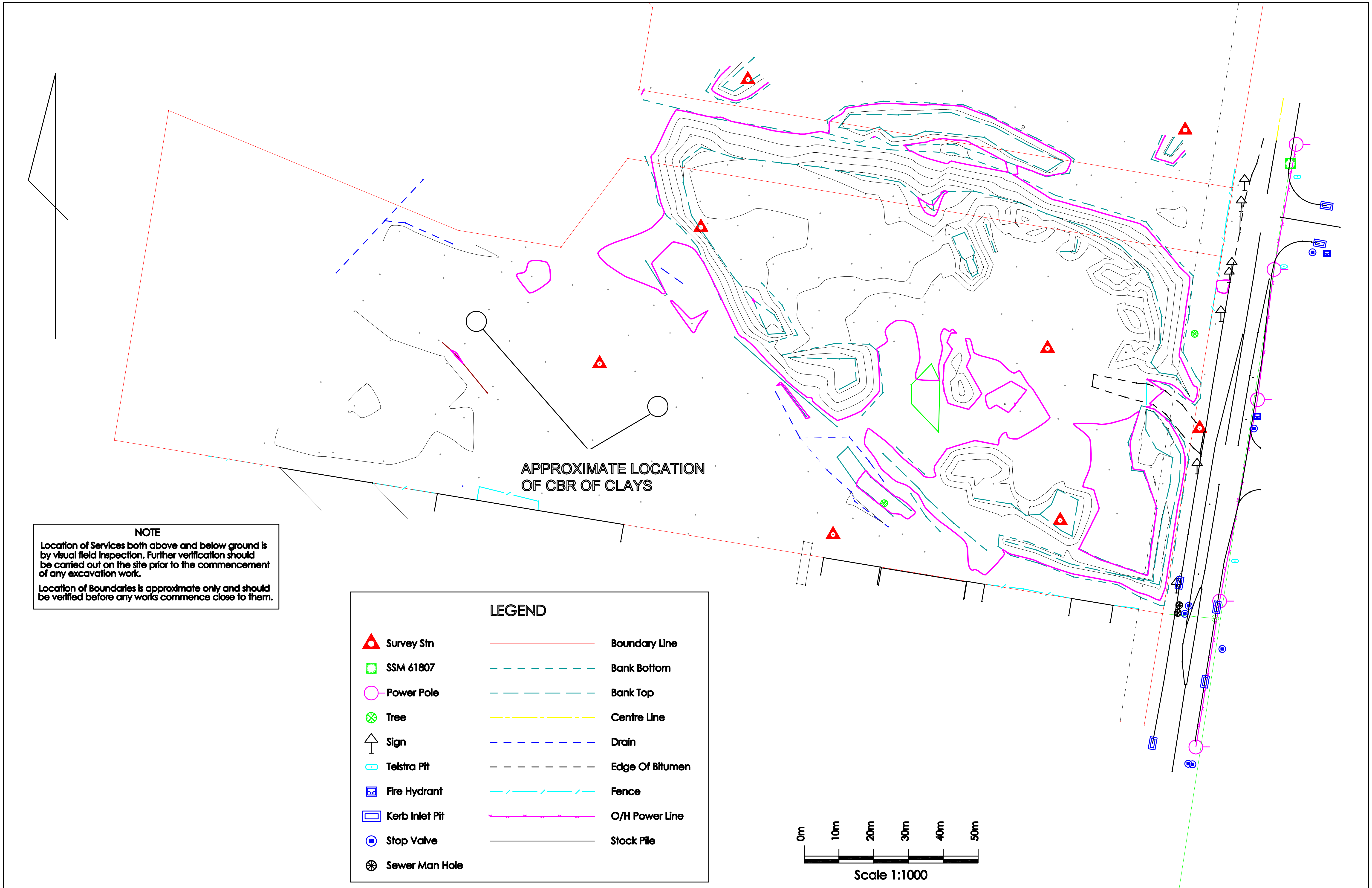
The Environmental Analysis Laboratory (EAL) as part of Southern Cross University has conducted work concerning the environmental status of the property, which is the subject of this report, and has prepared this report on the basis of that assessment.

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

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

This report is intended for the sole use of the client and only for the purpose for which it was prepared. Any representation contained in the report is made only to the client unless otherwise noted in the report. Any third party who relies on this report or on any representation contained in it does so at their own risk.

EXHIBIT 1: RAW DATA



NOTE

Location of Services both above and below ground is by visual field inspection. Further verification should be carried out on the site prior to the commencement of any excavation work.

Location of Boundaries is approximate only and should be verified before any works commence close to them.

LEGEND

▲	Survey Stn	—	Boundary Line
▢	SSM 61807	- - -	Bank Bottom
○	Power Pole	— — —	Bank Top
⊗	Tree	— · —	Centre Line
⇧	Sign	- - -	Drain
⬭	Telstra Pit	- - -	Edge Of Bitumen
▣	Fire Hydrant	—/—/—	Fence
▭	Kerb Inlet Pit	—x—x—	O/H Power Line
●	Stop Valve	—	Stock Pile
⊛	Sewer Man Hole		

No	DATE	AMENDMENTS	SCALE	Survey:-	JOB TITLE	DRAWING TITLE	No OF SHEETS	SHEET No	
			1:1000 @ A3	19/06/12, 20/06/12, 28/06/12 & 01/7/12	BYRON SHIRE COUNCIL BAYSHORE DRIVE	DETAIL SURVEY OF DEPOT SITE LOT 2 & PART LOT 1 DP 1004514	2	1	Phone (02) 6621 4334 Mobile 0427 214 334
			DATUM	Computer File :-			PLAN NUMBER		
			AHD	Mackney1811.dwg			13/1323		www.wade.com.au

AUSTRALIAN SOIL AND CONCRETE TESTING P/L A.B.N. 49 050 539 930

7/17 Southern Cross Drive, Ballina, NSW 2478. Telephone: (02) 66868 567, Fax: (02) 66868 396

ASCT Doc. W40a Rev. No. 01 – 17/4/13 BH

TEST PIT LOG

Client:	**BMack Project Management Services**	Project No:	**2043-002**
Project:	**Lot 12 Bayshore Drive, Byron Bay.**	Lab No:	**17517**

Testing Information

Test Pit Dimensions (LxW):	0.6 x 4.0m	**Excavation Method:**	Backhoe
Surface Elevation:	Existing Surface Level	**Excavation Type:**	600mm Bucket
Test Pit Location:	Proposed Building Area (see plan)		
Date Excavated:	5/8/13	**Test Pit Number:**	**1**

TEST DATA

Soil Description	Depth (m)	Graphic Symbol	Group Symbol	Consistency/ Strength	Sample
SANDY GRAVEL UNCONTROLLED FILL: brown grey, low plastic, low dry strength, fine to coarse gravel and sand, trace of clay and cobble, dense, moist.	- 0.0	▨	GW	D	*D*
SILTY SAND UNCONTROLLED FILL: black, non-plastic, low dry strength, fine sand, trace of fine to coarse gravel and organic matter, medium dense, moist.	- 0.4	▩	SM	MD	*D*
GRAVELLY SILTY CLAY FILL: pale grey mottled pale yellow brown, medium plastic, medium dry strength, fine to coarse gravel, stiff, moist.	- 0.8	☰	CL	St	*D*
SAND: grey, non-plastic, no dry strength, fine to medium sand, medium dense, moist to wet below 1.4m ***Groundwater seepage @ 1.4m***	- 1.2 - ***1.4***	▦	SP	MD	*D*
Stopped – no change.	- 1.6				

D – Disturbed Sample

Testing performed at ASCT Ballina Laboratory, NATA Accreditation No. 3229.

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Test Pit Location:	Proposed Building Area (see plan)		
Date Excavated:	5/8/13	**Test Pit Number:**	**2**

TEST DATA

Soil **Description**	**Depth (m)**	**Graphic Symbol**	**Group Symbol**	**Consistency/ Strength**	**Sample**
ORGANIC SILTY SAND UNCONTROLLED FILL: dark brown grey, low plastic, low dry strength, fine to coarse sand, some fine to coarse gravel, moist, loose.	- 0.0	▩	SM	L	
GRAVELLY SILTY CLAY UNCONTROLLED FILL: pale grey mottled pale brown yellow, medium to high plastic, medium to high dry strength, fine to coarse gravel, some fine to coarse sand, stiff, moist to very moist.	- 0.4	▥	CL/CH	St	*D*
GRAVELLY SILTY CLAY UNCONTROLLED FILL: pale yellow mottled pale red white, low to medium plastic, low to medium dry strength fine to coarse gravel, some fine sand, stiff, moist.	- 2.0	▤	CL	St	*D*
Stopped – no change.	- 2.4				

D – Disturbed Sample

AUSTRALIAN SOIL AND CONCRETE TESTING P/L A.B.N. 49 050 539 930

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TEST PIT LOG

Client:	**BMack Project Management Services**	Project No:	**2043-002**
Project:	**Lot 12 Bayshore Drive, Byron Bay.**	Lab No:	**17517**

Testing Information

Test Pit Dimensions (LxW):	0.6 x 4.0m	**Excavation Method:**	Backhoe
Surface Elevation:	Existing Surface Level	**Excavation Type:**	600mm Bucket
Test Pit Location:	Proposed Building Area (see plan)		
Date Excavated:	5/8/13	**Test Pit Number:**	**3**

TEST DATA

Soil Description	Depth (m)	Graphic Symbol	Group Symbol	Consistency/ Strength	Sample
SILTY SAND UNCONTROLLED FILL: black, non-plastic, low dry strength, fine to coarse sand, some fine to coarse gravel, trace of organic matter, loose, moist.	0.0	▨	SM	L	
CLAYEY SAND UNCONTROLLED FILL: low plastic, low dry strength, fine to coarse sand, trace of fine to coarse gravel, loose, very moist.	0.2	▩	SC	L	
ORGANIC SANDY SILTY CLAY UNCONTROLLED FILL: black, low plastic, low dry strength, fine to medium sand, significant organic matter, including fine to coarse sticks, branches, grass and roots, some inter-layering of organic silty sand, sandy silt, clayey sand, trace of rubbish, cobble and boulder, loose/soft, moist to very moist.	0.4	▒	OL	L/S	
Stopped – no change.	2.2				

Testing performed at ASCT Ballina Laboratory, NATA Accreditation No. 3229.

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TEST PIT LOG

Client:	**BMack Project Management Services**	Project No:	**2043-002**
Project:	**Lot 12 Bayshore Drive, Byron Bay.**	Lab No:	**17517**

Testing Information

Test Pit Dimensions (LxW):	0.6 x 4.0m	**Excavation Method:**	Backhoe
Surface Elevation:	Existing Surface Level	**Excavation Type:**	600mm Bucket
Test Pit Location:	Proposed Building Area (see plan)		
Date Excavated:	5/8/13	**Test Pit Number:**	**4**

TEST DATA

Soil Description	Depth (m)	Graphic Symbol	Group Symbol	Consistency/ Strength	Sample
ORGANIC SANDY SILTY CLAY UNCONTROLLED FILL: black, low plastic, low dry strength, fine to medium sand, significant organic matter, including fine to coarse sticks, branches, grass and roots, some inter-layering of organic silty sand, sandy silt, clayey sand, trace of rubbish, cobble and boulder, loose/soft, moist to very moist.	- 0.0	▨	OL	L/S	
Stopped – no change.	- 2.2				

Testing performed at ASCT Ballina Laboratory, NATA Accreditation No. 3229.

AUSTRALIAN SOIL AND CONCRETE TESTING P/L A.B.N. 49 050 539 930

7/17 Southern Cross Drive, Ballina, NSW 2478. Telephone: (02) 66868 567, Fax: (02) 66868 396

ASCT Doc. W40a Rev. No. 01 – 17/4/13 BH

TEST PIT LOG

Client:	**BMack Project Management Services**	Project No:	**2043-002**
Project:	**Lot 12 Bayshore Drive, Byron Bay.**	Lab No:	**17517**

Testing Information

Test Pit Dimensions (LxW):	0.6 x 4.0m	**Excavation Method:**	Backhoe
Surface Elevation:	Existing Surface Level	**Excavation Type:**	600mm Bucket
Test Pit Location:	Proposed Building Area (see plan)		
Date Excavated:	5/8/13	**Test Pit Number:**	**5**

TEST DATA

Soil Description	Depth (m)	Graphic Symbol	Group Symbol	Consistency/ Strength	Sample
SILTY SAND UNCONTROLLED FILL: black, low plastic, low dry strength, fine to medium sand, trace of clay, organic matter, cobble, boulder, rubble and rubbish, loose, moist.	- 0.0	▨	SM/OL	L	
Stopped – no change.	- 1.9				

AUSTRALIAN SOIL AND CONCRETE TESTING P/L A.B.N. 49 050 539 930

7/17 Southern Cross Drive, Ballina, NSW 2478. Telephone: (02) 66868 567, Fax: (02) 66868 396

ASCT Doc. W40a Rev. No. 01 – 17/4/13 BH

TEST PIT LOG

Client:	**BMack Project Management Services**	Project No:	**2043-002**
Project:	**Lot 12 Bayshore Drive, Byron Bay.**	Lab No:	**17517**

Testing Information

Test Pit Dimensions (LxW):	0.6 x 4.0m	**Excavation Method:**	Backhoe
Surface Elevation:	Existing Surface Level	**Excavation Type:**	600mm Bucket
Test Pit Location:	Proposed Building Area (see plan)		
Date Excavated:	5/8/13	**Test Pit Number:**	**6**

TEST DATA

Soil Description	**Depth (m)**	**Graphic Symbol**	**Group Symbol**	**Consistency/ Strength**	**Sample**
SILTY CLAY UNCONTROLLED FILL: brown, medium plastic, medium dry strength, some fine to medium sand and organic matter, trace of fine to coarse gravel, soft, moist.	- 0.0	▤	CL	S	
SILTY CLAY UNCONTROLLED FILL: grey to dark grey, medium plastic, medium dry strength, some organic matter, trace of rubbish, firm, moist.	- 0.3	▤	CL	F	
ORGANIC SANDY SILTY CLAY UNCONTROLLED FILL: black, low plastic, low dry strength, fine to medium sand, significant organic matter, including fine to coarse sticks, branches, grass and roots, some inter-layering of organic silty sand, sandy silt, clayey sand, trace of rubbish, cobble and boulder, loose/soft, moist to very moist.	- 0.6	░	OL	L/S	
Stopped – no change.	- 1.8				

Testing performed at ASCT Ballina Laboratory, NATA Accreditation No. 3229.

AUSTRALIAN SOIL AND CONCRETE TESTING P/L A.B.N. 49 050 539 930
7/17 Southern Cross Drive, Ballina, NSW 2478. Telephone: (02) 66868 567, Fax: (02) 66868 396

ASCT Doc. W40a Rev. No. 01 – 17/4/13 BH

TEST PIT LOG

Client:	**BMack Project Management Services**	Project No:	**2043-002**
Project:	**Lot 12 Bayshore Drive, Byron Bay.**	Lab No:	**17517**

Testing Information

Test Pit Dimensions (LxW):	0.6 x 4.0m	**Excavation Method:**	Backhoe
Surface Elevation:	Existing Surface Level	**Excavation Type:**	600mm Bucket
Test Pit Location:	Proposed Building Area (see plan)		
Date Excavated:	5/8/13	**Test Pit Number:**	**7**

TEST DATA

Soil Description	Depth (m)	Graphic Symbol	Group Symbol	Consistency/ Strength	Sample
SILTY CLAY UNCONTROLLED FILL: brown, medium plastic, medium dry strength, some fine to medium sand and organic matter, trace of fine to coarse gravel, soft, moist.	- 0.0	▤	CL	S	
ORGANIC SANDY SILTY CLAY UNCONTROLLED FILL: black, low plastic, low dry strength, fine to medium sand, significant organic matter, including fine to coarse sticks, branches, grass and roots, some inter-layering of organic silty sand, sandy silt, clayey sand, trace of rubbish, cobble and boulder, loose/soft, moist to very moist.	- 0.3	▒	OL	L/S	
Stopped – no change.	- 1.5				

Testing performed at ASCT Ballina Laboratory, NATA Accreditation No. 3229.

AUSTRALIAN SOIL AND CONCRETE TESTING P/L A.B.N. 49 050 539 930
7/17 Southern Cross Drive, Ballina, NSW 2478. Telephone: (02) 66868 567, Fax: (02) 66868 396

ASCT Doc. W40a Rev. No. 01 – 17/4/13 BH

TEST PIT LOG

Client:	**BMack Project Management Services**	Project No:	**2043-002**
Project:	**Lot 12 Bayshore Drive, Byron Bay.**	Lab No:	**2043-002**

Testing Information

Test Pit Dimensions (LxW):	0.6 x 4.0m	**Excavation Method:**	Backhoe
Surface Elevation:	Existing Surface Level	**Excavation Type:**	600mm Bucket
Test Pit Location:	Proposed Building Area (see plan)		
Date Excavated:	5/8/13	**Test Pit Number:**	**8**

TEST DATA

Soil Description	Depth (m)	Graphic Symbol	Group Symbol	Consistency/ Strength	Sample
CLAYEY SILTY SAND UNCONTROLLED FILL: dark grey brown to black, low plastic, low dry strength, fine to medium sand, some fine to coarse gravel and organic matter, trace of rubbish, loose, moist to very moist.	- 0.0	▩	SM	L	
GRAVELLY SILTY CLAY UNCONTROLLED FILL: grey to dark grey, medium to high plastic, medium to high dry strength, fine to coarse gravel, some organic matter, stiff, moist to wet.	- 0.8	▤	CL/CH	St	
Stopped – no change.	- 2.3				

Testing performed at ASCT Ballina Laboratory, NATA Accreditation No. 3229.

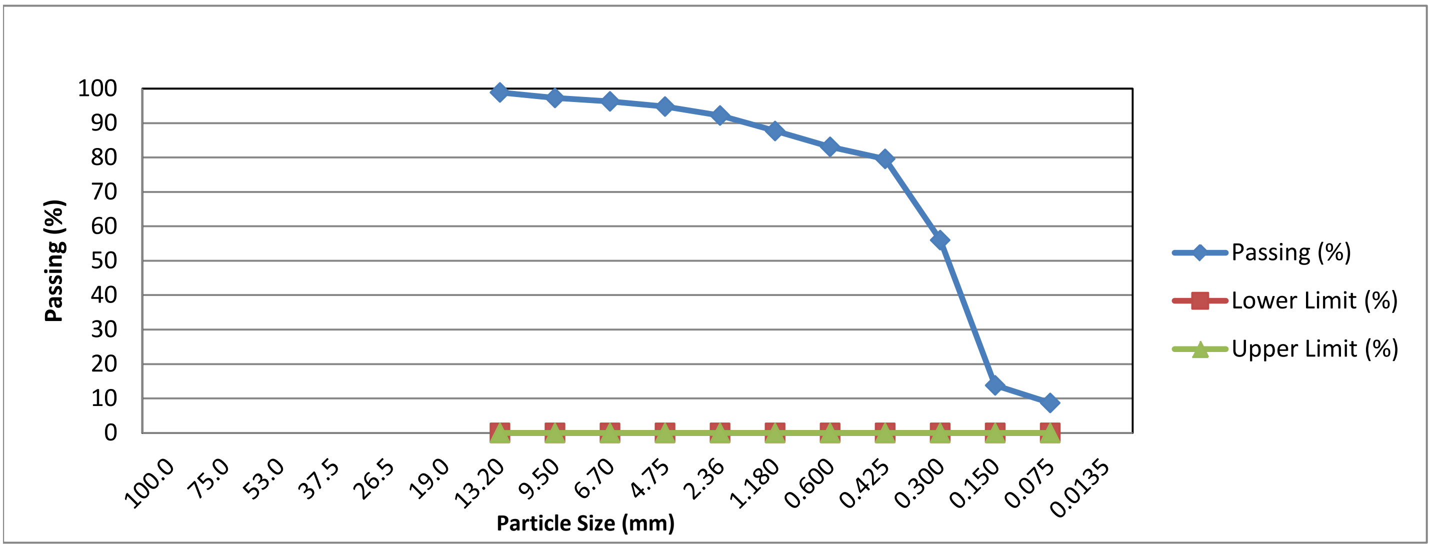
Figure 1: Aerial photo of Lot 12 Bayshore Drive, Byron Bay, showing the test pit locations excavated 5/8/13.

Particle Size Distribution Report

Client: **BMACK Project Management** Project No: **2043-002**
Project: **Bayshore Drive Byron Bay** Report No: **2043-002-001**

Lab Number:	17763-1		
Sieve Size (mm)	Passing (%)	Lower Limit (%)	Upper Limit (%)
100.0			
75.0			
53.0			
37.5			
26.5			
19.0	**100**		
13.20	**99**		
9.50	**97**		
6.70	**96**		
4.75	**95**		
2.36	**92**		
1.180	**88**		
0.600	**83**		
0.425	**80**		
0.300	**56**		
0.150	**14**		
0.075	**9**		
0.0135			
A Ratio			
B Ratio			
C Ratio			

Sampled By: ASCT
Date Sampled: 5/8/13
Sample Location: Test Pit 1
Sampling Method: AS1289.1.2.1.6.5.4
Sample Preparation: AS1289.1.1.5.7
Pretreatment: Nil
Test Methods: AS1289.3.6.1
Date Tested: 19/9/13
Sample Description: Gravelly Silty Sand: grey



NATA
ACCREDITED FOR TECHNICAL COMPETENCE

Accredited for compliance with ISO/IEC 17025. The results of the tests included in this document are traceable to Australian/national standards.

Signed: Brian Dick Date: 20/09/2013

Brian Dick
(Authorised Signatory)

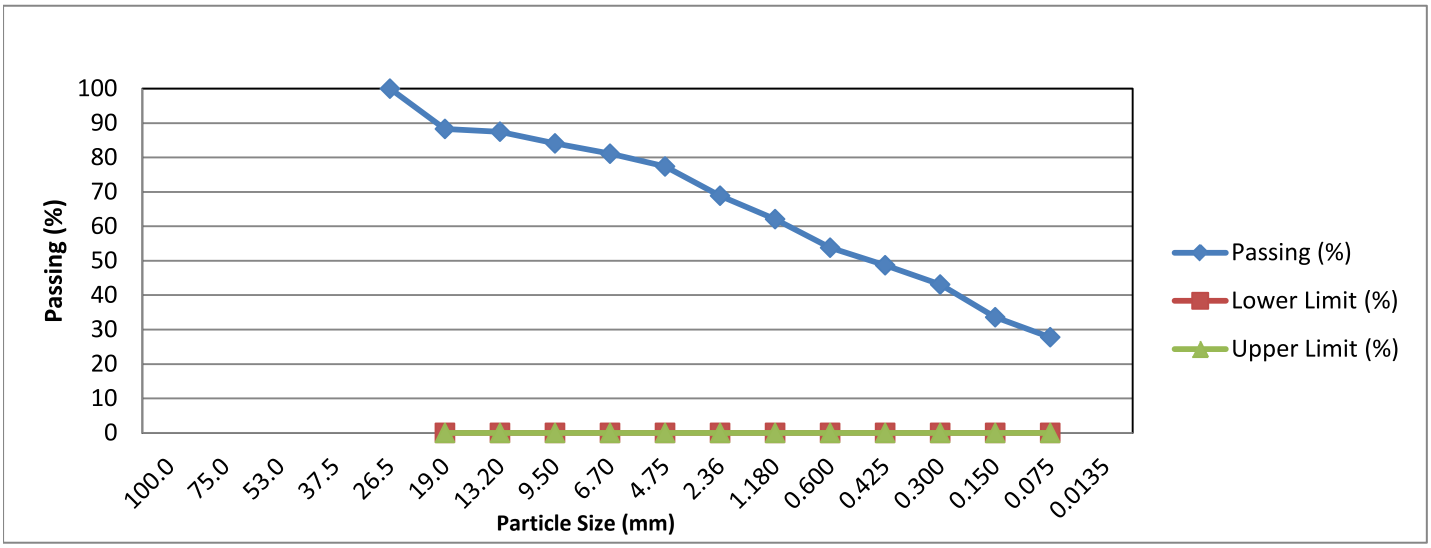
AUSTRALIAN SOIL AND CONCRETE TESTING P/L A.B.N. 49 050 539 930
Unit 7/17 Southern Cross Drive, Ballina 2478. ph (02) 6686 8567 fax: (02) 6686 8396

Particle Size Distribution Report

Client: **BMACK Project Management**
Project: **Bayshore Drive Byron Bay**
Project No: **2043-002**
Report No: **2043-002-002**

Lab Number:	17763-2		
Sieve Size (mm)	Passing (%)	Lower Limit (%)	Upper Limit (%)
100.0			
75.0			
53.0			
37.5			
26.5	**100**		
19.0	**88**		
13.20	**88**		
9.50	**84**		
6.70	**81**		
4.75	**77**		
2.36	**69**		
1.180	**62**		
0.600	**54**		
0.425	**49**		
0.300	**43**		
0.150	**34**		
0.075	**28**		
0.0135			
A Ratio			
B Ratio			
C Ratio			

Sampled By: ASCT
Date Sampled: 5/8/13
Sample Location: Test Pit 2
Sampling Method: AS1289.1.2.1.6.5.4
Sample Preparation: AS1289.1.1.5.7
Pretreatment: Nil
Test Methods: AS1289.3.6.1
Date Tested: 19/9/13
Sample Description: Gravelly Clayey Sand: pale brown grey



NATA ACCREDITED FOR TECHNICAL COMPETENCE

Accredited for compliance with ISO/IEC 17025. The results of the tests included in this document are traceable to Australian/national standards.

Signed: Brian Dick

Date: 20/09/2013

Brian Dick
(Authorised Signatory)

INTENTIONALLY BLANK

APPENDIX D: LAND TITLE INFORMATION AND HISTORY

C.P.
Conversion
Special Lse.
Restricted

No. 1959/2713

NEW SOUTH WALES
ONE POUND
TEN SHILLINGS
STAMP DUTY
SYDNEY, N.S.W.

State of New South Wales

N.S.W. DEPARTMENT OF STAMP DUTIES 10 DE 59

K 2164 34067 7.58
[LAND GRANT]

CANCELLED

REGISTER BOOK
VOL. 7807 FOL. 103

GRANT OF LAND PURCHASED BY CONDITIONAL SALE

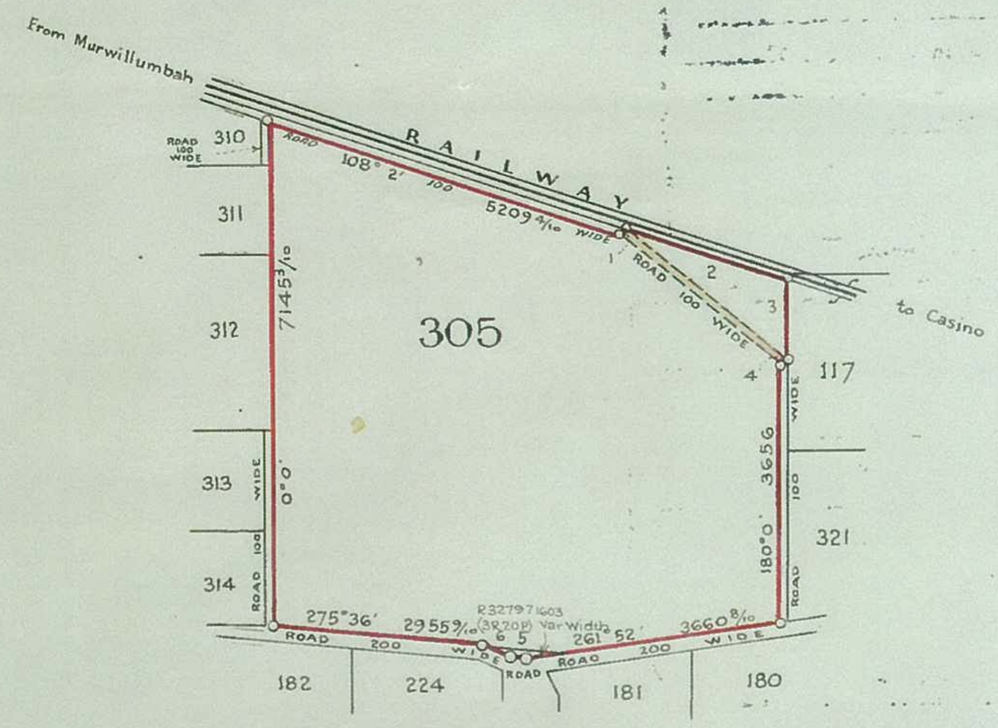
C.P. 1923/19
LISMORE

ELIZABETH the SECOND, by the Grace of God of the United Kingdom, Australia and Her other Realms and Territories Queen, Head of the Commonwealth, Defender of the Faith:—

To All to whom these Presents shall come, Greeting.—

Whereas ANDERSONS SAUSAGES PTY. LIMITED

(hereinafter called the GRANTEE) claims to be entitled to the Parcel of Land hereinafter described in virtue of a Conditional Purchase of the same applied for on the seventeenth day of September 1923 by way of conversion under the provisions of the Crown Lands Consolidation Act, 1913 as amended of a Special Lease not being a Special Lease granted over an expired Conditional Lease the holder of which had failed to apply for extension of the term and a certificate of compliance with the conditions applicable to such purchase has been issued **And Whereas** the sum of three hundred and thirty four pounds ten shillings being the purchase money payable for the said Land has been duly paid into the Office of the Treasurer of Our said State **And Whereas** all things required by law to be done to entitle the GRANTEE to a Grant of the fee simple of the said Land subject to the Reservations and Exceptions hereinafter contained have been done and performed **Now Know Ye** That for and in consideration of the said sum for and on Our behalf 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 GRANTEE and its ~~Heirs and~~ Assigns Subject to the Reservations and Exceptions hereinafter contained ALL THAT Piece or Parcel of Land in Our said State containing by admeasurement four hundred and forty six acres be the same more or less situated in the County of Rous and Parish of Byron Portion 305 as shown in plan catalogued No. R.8465-1759 in the Department of Lands excepting out of the said piece or parcel of land the road coloured brown in the plan hereon the area of which is not included in the above stated area



Reference

Line	Bearing	Distance
1	28° 57'	101 8/10
2	108° 2'	2406 7/10
3	180° 0'	1167 2/10
4	244° 56'	110 4/10
5	272° 41'	218 4/10
6	297° 32'	458 8/10

Area 446 acres.

This area does not include the area of the road coloured brown.

~Scale~
0 5 10 20 40 chains.

As per plan hereon With all the Rights and Appurtenances whatsoever thereto belonging **To Hold** unto the Grantee and its ~~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 miue 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 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 with full power for Us Our Heirs and Successors and for Our Governor as aforesaid by such person or persons as shall be by Us Them or him authorised in that behalf to make and conduct all such public ways 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

Witness Our Trusty and Well-beloved SIR ERIC WINSLOW WOODWARD, Knight Commander of Our Most Distinguished Order of Saint Michael and Saint George, Companion of Our Most Honourable Order of the Bath, Commander of Our Most Excellent Order of the British Empire, Companion of Our Distinguished Service Order, Knight of the Venerable Order of St. John of Jerusalem, Lieutenant-General on the Retired List of Our Australian Military Forces, Governor of Our State of New South Wales and its Dependencies in the Commonwealth of Australia, at Sydney in Our said State, this twenty fifth day of November in the eighth year of Our Reign and in the year of Our Lord one thousand nine hundred and fifty oioe.

J. Hughes

E W Woodward
Governor.

RECORDED and ENROLLED in the Registrar General's Office, at Sydney, in New South Wales, this fourteenth day of December 1979.

Jawatson

Registrar General.

Attention is hereby directed to the provisions of Section 272 of the Crown Lands Consolidation Act, 1913, relating to restrictions on transfer.

AV. 1/6/24 £1-10-0 BR 32663

No. H385970 MORTGAGE dated 9th December 1959 from the said Anderson Sausages Pty. Limited to The English Scottish and Australian Bank Limited

Entered 11th February 1960

Jawatson

REGISTRAR GENERAL

Anderson Meat Packing Co Pty Limited is now the registered proprietor of the land ~~within~~ described.

See TRANSFER No. L74122 dated 8th June 1967

Entered 29th July 1968

Jawatson

REGISTRAR GENERAL

MORTGAGE No. H 385970 has been discharged.

See L168466 Entered 11th September 1968

Jawatson

REGISTRAR GENERAL

F. J. Walker (Byron Bay) Pty. Ltd.

is now the registered proprietor of the land within described

See TRANSFER No. L168467 dated 6th June 1968

Entered 11th September 1968

Jawatson

REGISTRAR GENERAL

No. M.64218 MORTGAGE dated 9th November 1970 to Bank of New South Wales.

Entered 20th November 1970

Jawatson

REGISTRAR GENERAL

No. M549811 Resumption of land for Public Road Notice in Government Gazette dated 26th November 1971 Folio. 4621 whereby and by operation of the Public Roads Act of 1902 the road shown in the plan catalogued R 32797 1603 in the Department of Lands and shown as firm lines and notation (3R 20P) var width on the plan hereon was declared to be a Public Road. Limited to the surface and to a depth of 50 feet below the surface Registered 2nd February 1972.

Jawatson

REGISTRAR GENERAL.

The interest of the Council of the Shire of Byron in the addition to existing road shown on D P 613937

Entered 9/1/1981

Registrar General

Interests created pursuant to Section 88B Conveyancing Act, 1919, by the registration of Deposited Plan 612937

Registered 9-1-1981

Registrar General

NEW CERTIFICATE(S) OF TITLE ISSUING ON DP613937

NO DEALING TO BE REGISTERED WITHOUT REFERENCE TO SURVEY DRAFTING BRANCH.

This deed is cancelled as to Whole ex road

New c[illegible]s of Title have issued on 19-1-1981

for lots ~~[illegible]~~ Deposited Plan No. 613937

Lots 1 to 2 Vol 14331 Fol 24 to 25 as follows:

[illegible]ively.

REGISTRAR GE[illegible]

The residue of land in this folio comprises Road comprised in Notice of Resumption M549811

REGISTRAR GENERAL

L74122 Te

L168466 / 67 T

Resumption Gaz 26-11-71 R32797 1603

M549811 NR

CT 20/11/80

PLAN FORM 2

Plan Drawing only to appear in this space

• OFFICE USE ONLY

Signatures and seals only.

The Common Seal of F. J. WALKER (BYRON BAY) PTY. LIMITED was hereunto affixed by Order of the Board and in the presence of:

Secretary Director

Common Seal

A Mortgagee under Mortgage ... Bank of New South Wales hereby consents to the within Plan of Subdivision.
Dated at Sydney this nineteenth day of November, 1980.

Signed for and on behalf of Bank of New South Wales by ERIC VANMORRIS who is personally known to me:

For and on behalf of Bank of New South Wales

Acting Assistant Chief Security Officer.

Council Clerk's Certificate

I hereby certify that —

(a) the requirements of the Local Government Act, 1919 (other than the requirements for the registration of plans), and

*(b) ~~the requirements of section 34B of the †Metropolitan Water, Sewerage and Drainage Act, 1924, as amended. †Hunter District Water, Sewerage, and Drainage Act, 1938, as amended~~

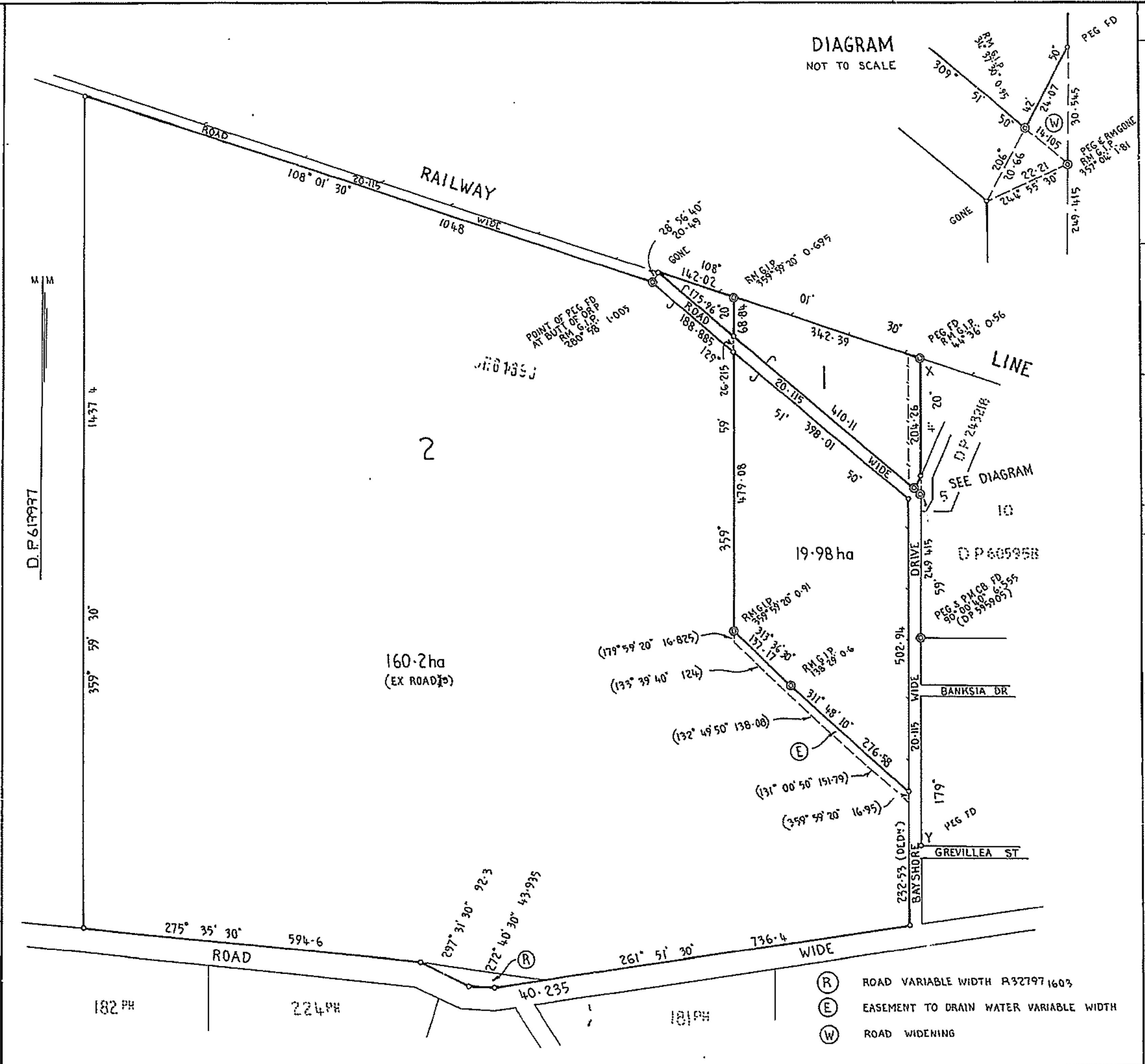
have been complied with by the applicant in relation to the proposed subdivision
(insert "new road", "subdivision" or "consolidated lot") set out herein

Subdivision No 85/80

Date 30-9-80

(Signature) Council Clerk

*This part of certificate to be deleted where the application is only for a consolidated lot or the opening of a new road or where the land to be subdivided is wholly outside the areas of operations of the Metropolitan Water Sewerage and Drainage Board and the Hunter District Water Board.
†Delete if inapplicable.



D.P 613937	
Registered:	9-1-1981 Q1
C.A.:	N°85/80 of 30·9·1980
Title System:	TORRENS
Purpose:	SUBDIVISION
Ref. Map:	X 5430-7#
Last Plan:	

PLAN
OF SUBDIVISION
OF PORTION 305

Reduction Ratio 1 : 5000
Lengths are in metres.

Mun./Shire ~~City~~	BYRON
Locality:	EWINGSDALE
Parish:	BYRON
County:	ROUS

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

I, ROBERT EDWARD CANTY of BYRON BAY a surveyor registered under the Surveyors Act, 1929, as amended, hereby certify that the survey represented in this plan as regards lot 1 only is accurate and has been made *(1) by me ~~(2) under my immediate supervision~~ in accordance with the Survey Practice Regulations, 1933, and was completed on † 25th September 1980

Signature R.E. Canty
Surveyor registered under Surveyors Act, 1929, as amended.
Datum Line of Azimuth XY
*Strike out either (1) or (2). †Insert date of survey.

Panel for use only for statements of intention to dedicate public roads or to create public reserves, drainage reserves, easements or restrictions as to user.

IT IS INTENDED

Ⓐ TO DEDICATE THE ROAD WIDENING TO THE PUBLIC

Ⓑ TO CREATE PURSUANT TO SECTION 88B OF THE CONVEYANCING ACT 1919 – 1961
   i) EASEMENT TO DRAIN WATER VARIABLE WIDTH

Y O O 2 A I A

Table of mm

WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

SURVEYOR'S REFERENCE 3293

[redacted]

I, Bruce Richard Davies, Under Secretary for Lands and Registrar General for New South Wales, certify that this negative is a photograph made as a permanent record of a document in my custody this day.

9th January, 1981

Box:52 Req:C116552 /Doc:DP 0812667 P /Rev:05-Nov-1992 /Sts:OK.OK /Prt:26-Jul-2013 13:35 /Pgs:ALL /Seq:2 of 2
Ref:lpi:sixdre /Src:W

PLAN FORM 2

SIGNATURE AND SEALS ONLY.

THE COMMON SEAL OF THE COUNCIL OF THE SHIRE OF BYRON WAS AFFIXED HERETO PURSUANT TO A RESOLUTION OF COUNCIL DATED 11 DEC. 1990.

SHIRE PRESIDENT

SHIRE CLERK

PLAN AMENDED 30-8-91

SHIRE PRESIDENT

SHIRE CLERK

Crown Lands Office Approval

PLAN APPROVED .... Authorised Officer

Land District ....

Paper No. ....

Field Book .... pages ....

Council Clerk's Certificate

I hereby certify that

(a) the requirements of the Local Government Act, 1919 (other than the requirements for the registration of plans), and

~~*(b) the requirements of section 340 of the † Metropolitan Water, Sewerage and Drainage Act, 1924, as amended. † Hunter District Water, Sewerage and Drainage Act, 1938, as amended.~~

have been complied with by the applicant in relation to the proposed "SUBDIVISION" (Insert "new road", "subdivision" or "consolidated lot") set out herein

Subdivision No. 40/91

Date 26-7-91

PLAN AMENDED 30-8-91 Barry J. Pelly 30.8.91

(Signature) Barry J. Pelly
Council Clerk

Council File No. 50529X749.1 D.89/146

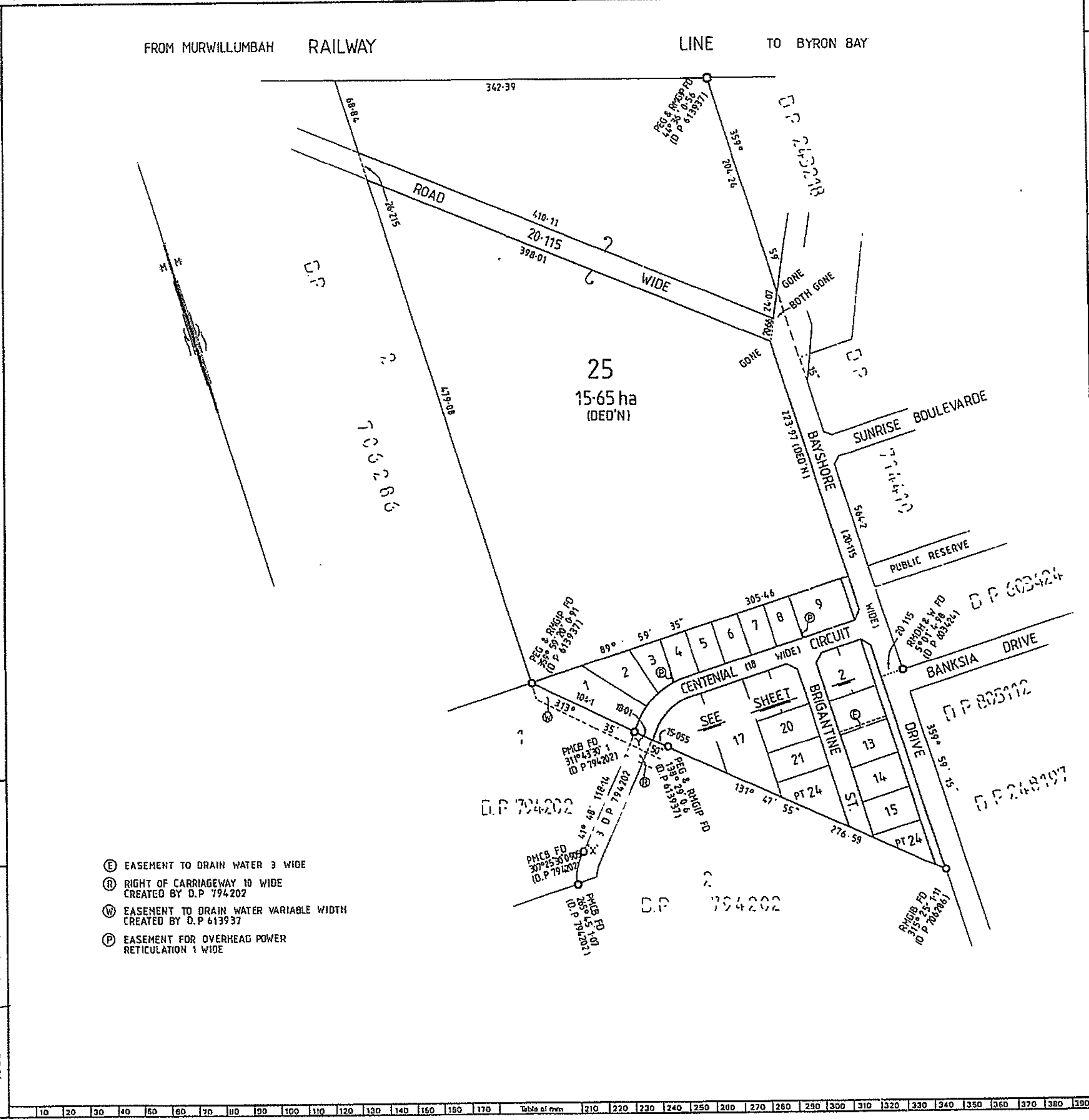
*This part of certificate to be deleted where the application is only for a consolidated lot or the opening of a new road or where the land to be subdivided is wholly outside the areas of operations of the Metropolitan Water Sewerage and Drainage Board and the Hunter District Water Board.

†Delete if inapplicable

SURVEYOR'S REFERENCE: 6140

M.P.D.

Plan Drawing only to appear in this space



Ⓔ EASEMENT TO DRAIN WATER 3 WIDE
Ⓡ RIGHT OF CARRIAGEWAY 10 WIDE CREATED BY D.P 794202
Ⓦ EASEMENT TO DRAIN WATER VARIABLE WIDTH CREATED BY D.P 613937
Ⓟ EASEMENT FOR OVERHEAD POWER RETICULATION 1 WIDE

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

WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

*OFFICE USE ONLY

DP 812667

Registered: 26.9.1991

C.A: 40/91 OF 26-7-1991

Title System: TORRENS

Purpose: SUBDIVISION

Ref. Map: X 5430-7*

Last Plan: D.P. 613937

Y 0 2 5 A 2 A

Sheet 1

CAPE 7

PLAN

OF SUBDIVISION OF
LOT 1 D P 613937

Lengths are in metres. Reduction Ratio 1:2500

Mun./Shire City: BYRON
Locality: BELONGIL
Parish: BYRON
County: ROUS

This is sheet 1 of my plan in 2 sheets.
(Delete if inapplicable)

I, ROBERT EDWARD CANTY
of PO BOX 157 BYRON BAY 2481

a surveyor registered under the Surveyors Act, 1929, as amended, hereby certify that the survey represented in this plan AS REGARDS LOTS 1 TO 24 ONLY is accurate and has been made in accordance with the Survey Practice Regulations, 1933 and any special requirements of the Department of Lands, and was completed on

16TH JANUARY 1991

Signature R.E. Canty
Surveyor registered under Surveyors Act, 1929, as amended.
Datum Line of Azimuth: X-Y
#Insert date of survey

Plans used in preparation of survey/compilation.

D P 613937 D P 794202
D P 603424 D P

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

IT IS INTENDED

TO DEDICATE

A, BRIGANTINE STREET TO THE PUBLIC AS ROAD

B, CENTENNIAL CIRCUIT TO THE PUBLIC AS ROAD

C, TO CREATE LOTS 22 & 23 AS PUBLIC RESERVE

D, TO CREATE

PURSUANT TO SECTION 88 B OF THE CONVEYANCING ACT 1919 - 1964

1, EASEMENT TO DRAIN WATER 3 WIDE

2, EASEMENT FOR OVERHEAD POWER RETICULATION 1 WIDE

AMENDMENTS AND/OR ADDITIONS MADE ON PLAN IN THE LAND TITLES OFFICE

10	20	30	40	50	60	70 Table of mm	110	120	130	140

This negative is a photograph made as a permanent record of a document in the custody of the Registrar General this day. 7th November, 1991

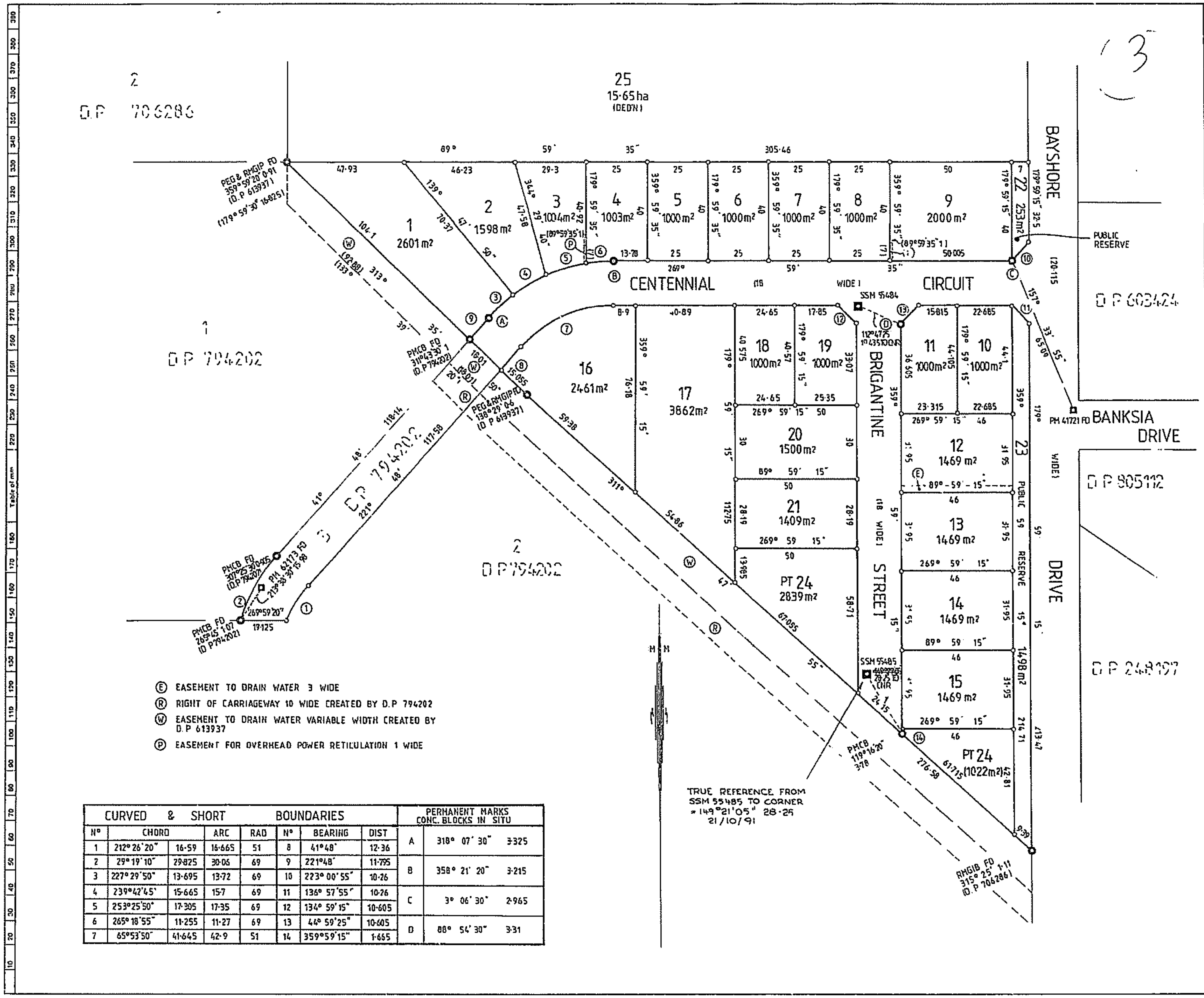
2

PLAN FORM 3

To be used in conjunction with Plan Form 2

WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

*OFFICE USE ONLY



Ⓔ EASEMENT TO DRAIN WATER 3 WIDE

Ⓡ RIGHT OF CARRIAGEWAY 10 WIDE CREATED BY D.P 794202

Ⓦ EASEMENT TO DRAIN WATER VARIABLE WIDTH CREATED BY D.P 613937

Ⓟ EASEMENT FOR OVERHEAD POWER RETICULATION 1 WIDE

CURVED & SHORT BOUNDARIES								PERMANENT MARKS CONC. BLOCKS IN SITU		
N°	CHORD		ARC	RAD	N°	BEARING	DIST			
1	212° 26' 20"	16·59	16·665	51	8	41°48'	12·36	A	318° 07' 30"	3·325
2	29° 19' 10"	29·825	30·06	69	9	221°48'	11·795			
3	227° 29' 50"	13·695	13·72	69	10	223° 00' 55"	10·26	B	358° 21' 20"	3·215
4	239°42'45"	15·665	15·7	69	11	136° 57' 55"	10·26			
5	253°25'50"	17·305	17·35	69	12	134° 59' 15"	10·605	C	3° 06' 30"	2·965
6	265° 18' 55"	11·255	11·27	69	13	44° 59' 25"	10·605			
7	65°53'50"	41·645	42·9	51	14	359°59'15"	1·665	D	88° 54' 30"	3·31

DP 812667

Registered: A 26-9-1991

This is sheet 2 of my plan in 2 sheets dated 16TH JANUARY 1991

R.E. Canty

Surveyor registered under Surveyors Act 1929

This is sheet 2 of the plan of 2 sheets covered by my Certificate No 40/91 of 26-7-91

PLAN AMENDED 30-8-91

Barry J. Kelly 30.8.91 Barry J. Kelly
Council Clerk

For use where space is insufficient in any panel on Plan Form 2

(3)

Sheet 2

PLAN AMENDED IN L T O AT SURVEYORS REQUEST 5-11-1991

Reduction Ratio 1: 1000

Plan Drawing only to appear in this space

SURVEYOR'S REFERENCE: 6140

AMENDMENTS AND/OR ADDITIONS MADE ON PLAN IN THE LAND TITLES OFFICE

10 20 30 40 50 60 70 Table of mm 110 120 130 140

This negative is a photograph made as a permanent record of a document in the custody of the Registrar General this day. 7th November, 1991

NSW GOVERNMENT Land & Property Information
A division of the Department of Finance & Services

No. B500

TITLE SEARCH

Computer Folio Certificate issued under
Section 96D of the Real Property Act 1900

COMPUTER FOLIO REFERENCE
1/613937
EDITION No. & DATE OF CURRENT CERTIFICATE OF TITLE
CANCELLED

WARNING: **** FOLIO CANCELLED ********

VOL 14331 FOL 24 IS THE CURRENT CERTIFICATE OF TITLE

LAND

LOT 1 IN DEPOSITED PLAN 613937
AT EWINGSDALE
LOCAL GOVERNMENT AREA BYRON
PARISH OF BYRON COUNTY OF ROUS
TITLE DIAGRAM DP613937

FIRST SCHEDULE

THE COUNCIL OF THE SHIRE OF BYRON (T S618149)

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 DP812667 ******** FOLIO CANCELLED ******* RESIDUE REMAINS: BEING ROAD. NEW FOLIOS HAVE BEEN CREATED FOR LOTS 1-25 INCLUSIVE IN DP812667

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

doccop2 PRINTED ON 26/7/2013 B500

FOLIO CANCELL

The Registrar General certifies that at the date and time specified above the person(s) described in the First Schedule was the registered proprietor of an estate in fee simple (or other such estate or interest set out in the Schedule) in the land described, subject to any exceptions, encumbrances, interests, and entries which appear in the Second Schedule.

* ANY ENTRIES PRECEDED BY AN ASTERISK DO NOT APPEAR ON THE CURRENT EDITION OF THE CERTIFICATE OF TITLE
WARNING: THE INFORMATION APPEARING UNDER NOTATIONS HAS NOT BEEN FORMALLY RECORDED IN THE REGISTER.

Registrar General

RP 13

STAMP DUTY

$1.00

DULY [illegible] 17 JUL 81

[redacted]

NO STAMP DUTY IS PAYABLE ON THIS INSTRUMENT

(1)

S618149 (2)

OFFICE USE ONLY

TRANSFER

REAL PROPERTY ACT, 1900

(See Instructions for Completion on back of form)

T 2 | 2 of 2 | X

$ 21

DESCRIPTION OF LAND Note (a)

Torrens Title Reference	If Part Only, Delete Whole and Give Details	Location
Vol. 7807 Fol. 103 NOW WHOLE VOL 14331 FOL 24	PART ~~WHOLE~~ being Lot 1 in D.P. 613937	at Byron Bay

TRANSFEROR Note (b)

F.J. WALKER (BYRON BAY) PTY. LIMITED

OFFICE USE ONLY N

ESTATE Note (c)

(the abovenamed TRANSFEROR) hereby acknowledges receipt of the consideration of $ 100,000.00 and transfers an estate in fee simple in the land above described to the TRANSFEREE

TRANSFEREE Note (b)

THE COUNCIL OF THE SHIRE OF BYRON of Byron Bay

OFFICE USE ONLY S.

TENANCY Note (d)

~~as joint tenants/tenants in common~~

PRIOR ENCUMBRANCES Note (e)

subject to the following PRIOR ENCUMBRANCES 1. M549811 Resumption for Public Road

2. ______ 3. ______

DATE OF TRANSFER 6/7/81

We hereby certify this dealing to be correct for the purposes of the Real Property Act, 1900.

EXECUTION Note (f)

Signed in my presence by the transferor who is personally known to me

The Common Seal of F.J. WALKER
Signature of Witness

(BYRON BAY) PTY. LIMITED was
Name of Witness (BLOCK LETTERS)

hereunto affixed by order of the
Address and occupation of Witness

Board and in the presence of:-

F.J. WALKER (BYRON BAY) PTY. LTD. Common Seal

Director

Secretary
Signature of Transferor

2/2/81

Note (f)

Signed in my presence by the transferee who is personally known to me

______
Signature of Witness

______
Name of Witness (BLOCK LETTERS)

______
Address and occupation of Witness

A.H. PALMER
Signature of Transferee's Solicitor

TO BE COMPLETED BY LODGING PARTY Notes (g) and (h)

LODGED BY

RA919

Hayes & Edgar
[illegible] STATIONERS
[illegible] IP STREET
[illegible]EY

Delivery Box Number

LOCATION OF DOCUMENTS

CT ✓ | OTHER ~~[illegible]~~ Herewith. ✓

In R.G.O. with ~~S[illegible]~~

Produced by ______

20/8/81

OFFICE USE ONLY

Extra Fee	Checked by	REGISTERED 19-8-1981
	RA8 b	Registrar General

LP

H18

TITLE SEARCH

Reference: 25/812667

WARNING: ****** **FOLIO CANCELLED** ****** **CANCELLED**

LAND

LOT 25 IN DEPOSITED PLAN 812667
AT BELONGIL
LOCAL GOVERNMENT AREA BYRON
PARISH OF BYRON COUNTY OF ROUS
TITLE DIAGRAM DP812667

FIRST SCHEDULE

THE COUNCIL OF THE SHIRE OF BYRON

SECOND SCHEDULE (2 NOTIFICATIONS)
----

1 LAND EXCLUDES MINERALS AND IS SUBJECT TO RESERVATIONS AND CONDITIONS IN FAVOUR OF THE CROWN - SEE CROWN GRANT(S)

ZZW * 2 DP1004514 ********** FOLIO CANCELLED ********** NEW FOLIOS HAVE BEEN CREATED FOR LOT(S) 1-4 INCLUSIVE IN DP1004514

NOTATIONS

NOTE: THE CERTIFICATE OF TITLE FOR THIS FOLIO OF THE REGISTER DOES NOT INCLUDE SECURITY FEATURES INCLUDED ON COMPUTERISED CERTIFICATES OF TITLE ISSUED FROM 4TH JANUARY, 2004. IT IS RECOMMENDED THAT STRINGENT PROCESSES ARE ADOPTED IN VERIFYING THE IDENTITY OF THE PERSON(S) CLAIMING A RIGHT TO DEAL WITH THE LAND COMPRISED IN THIS FOLIO.

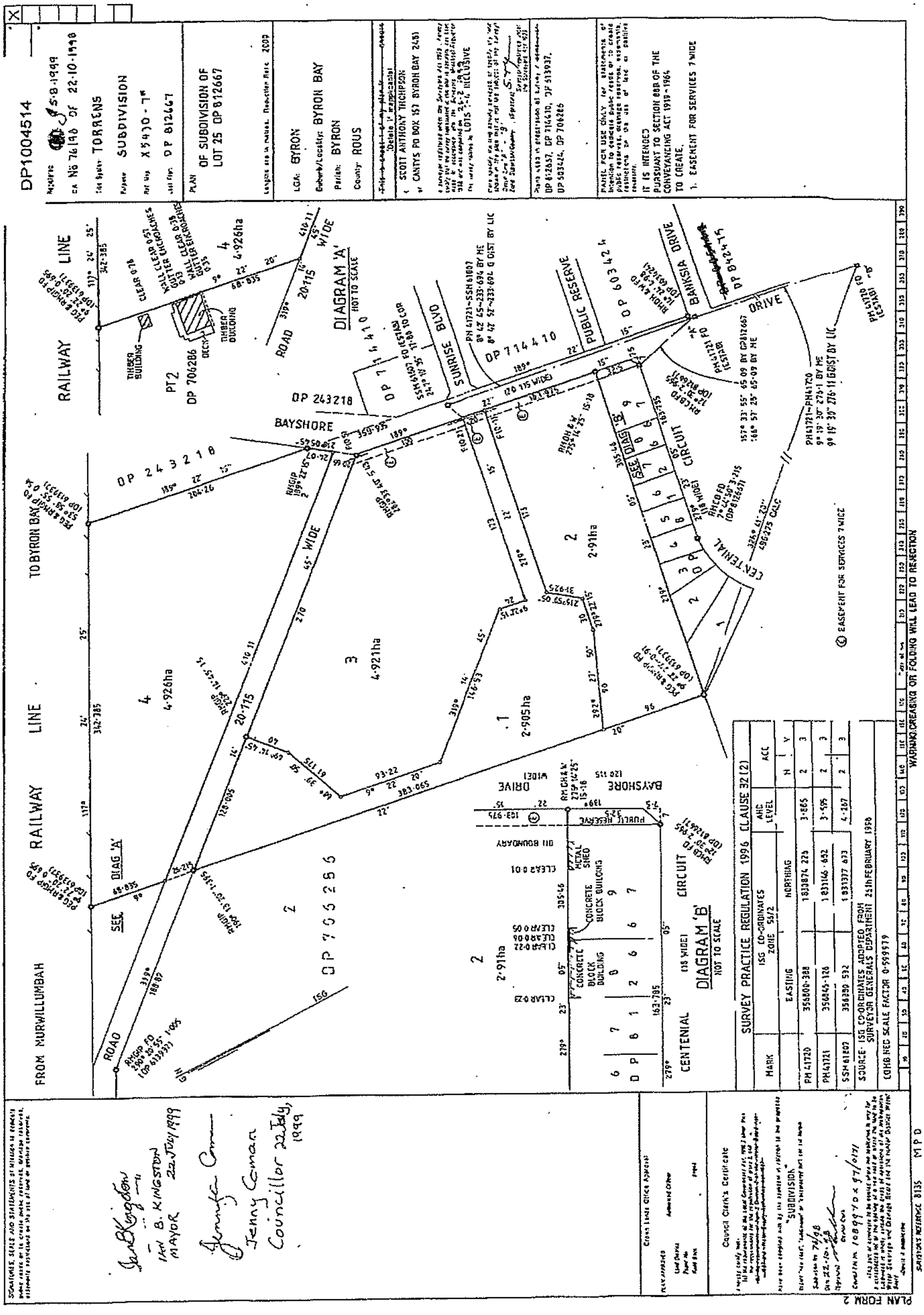
UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

FOLIO CANCELLED

1004514

Figure 1 Deposited Plan

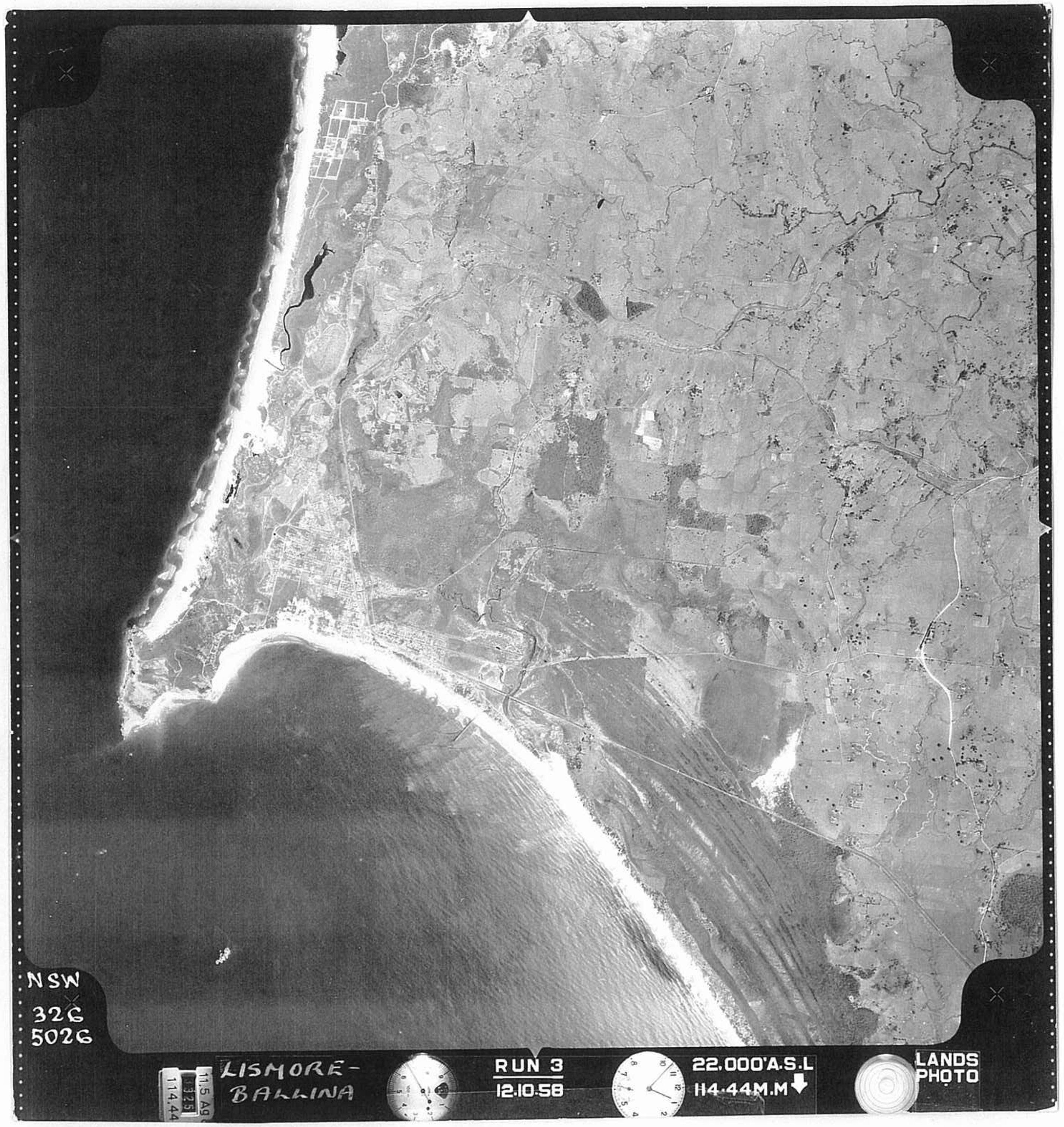


Client: byro / Document: dp 1004514 PLAN / Revision: 06-Aug-1999 / Status: OK / Printed: 09-Aug-1999 07:49 / Images: 1 / Warning: Supplied by NSW Land Titles Office for internal use by Byron Shire Council

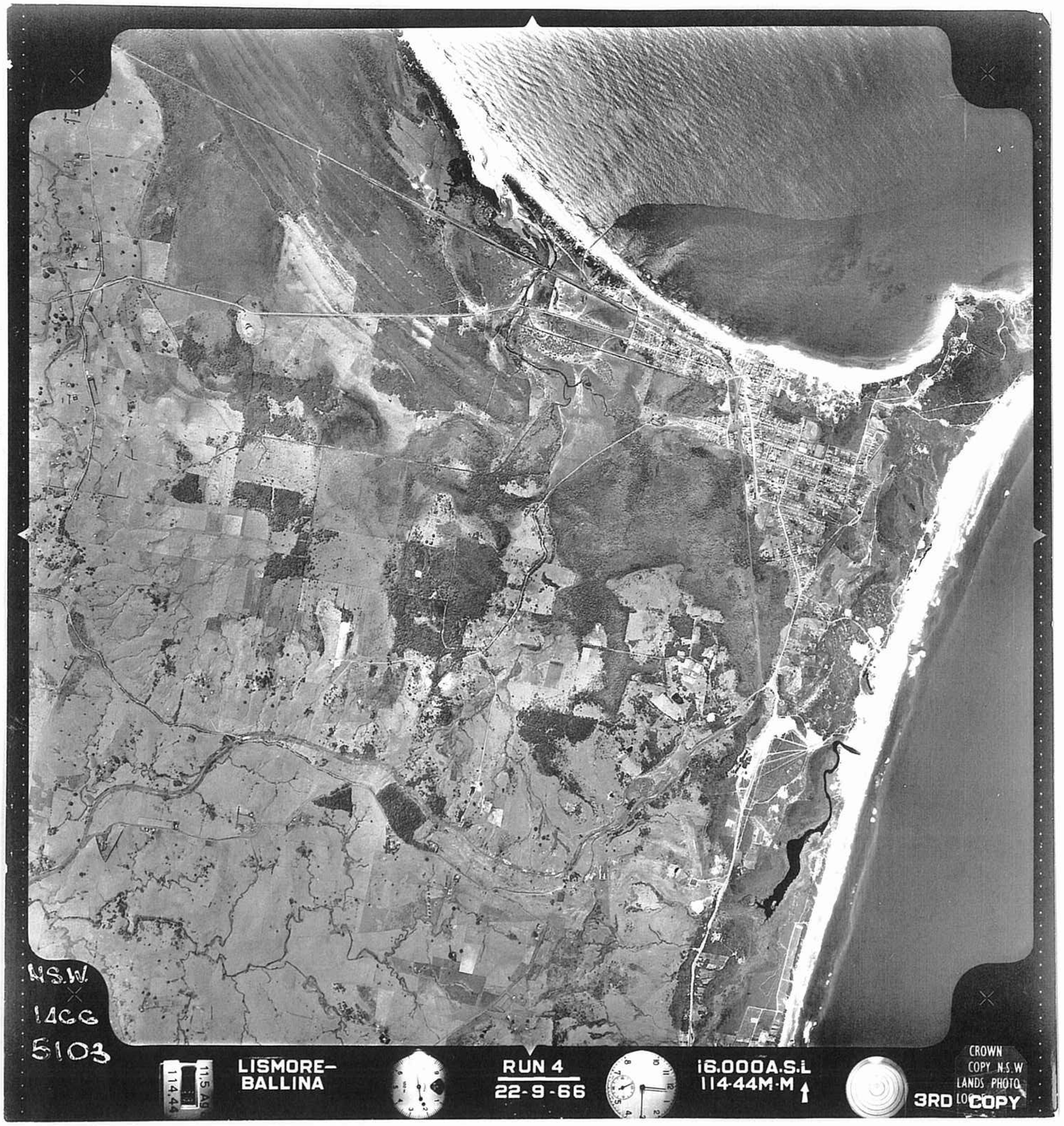
APPENDIX E: AERIAL PHOTOGRAPHY

SV4122// BYRON BAY. RUN 2. 27/5/47. 152.7mm. 15000' RESTRICTED.
428
6327 EASTMAN REGULAR SAFETY
6328 EASTMAN REGULAR SAFETY
6329

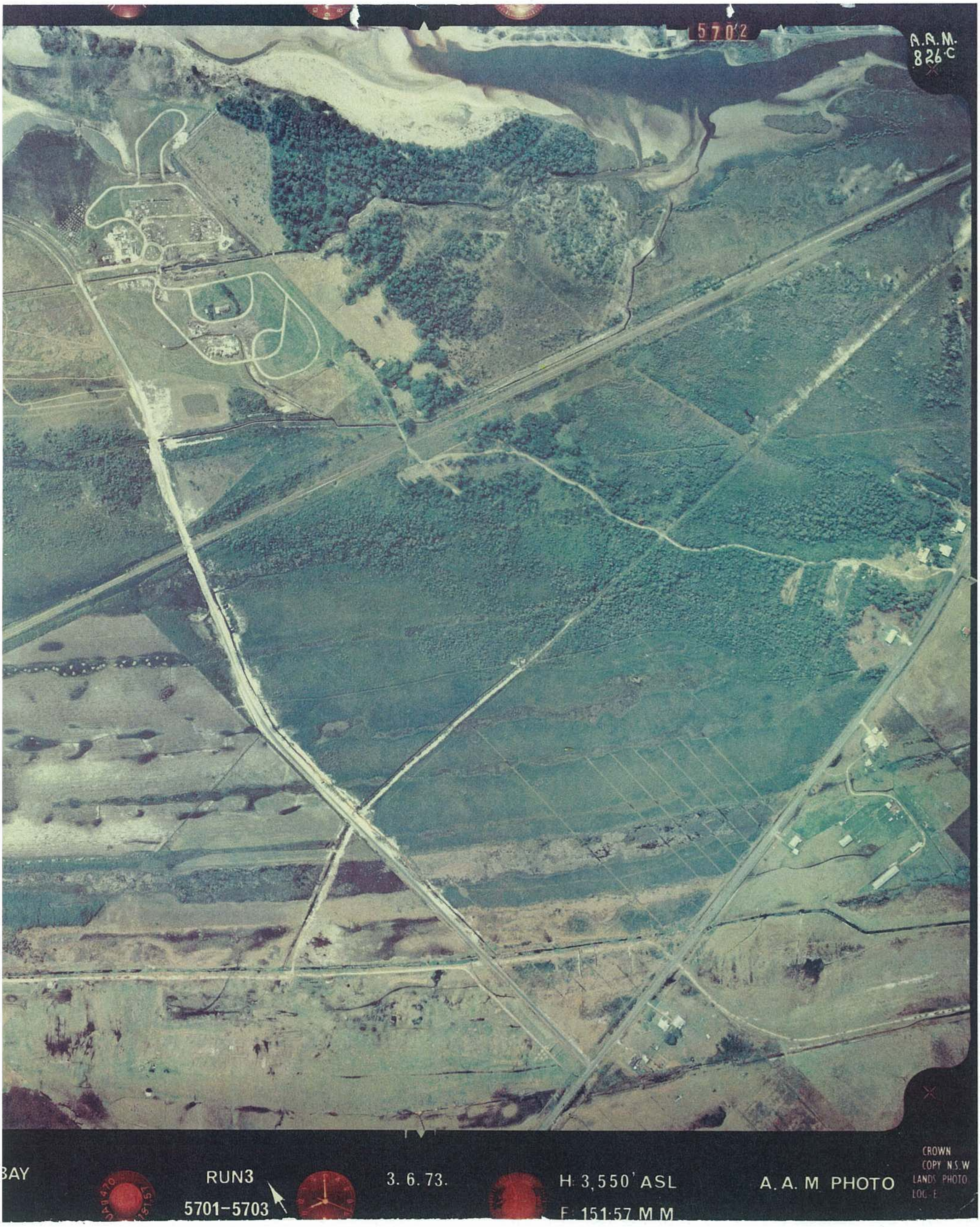
17.5/1941


NSW
326
5026
11.5 A9
1325
114.44
LISMORE-
BALLINA
RUN 3
12.10.58
22.000'A.S.L
114·44M.M
LANDS
PHOTO

17.a 10. 58


N.S.W.
1466
5103
11.5 AG
114.44
LISMORE–
BALLINA
RUN 4
22-9-66
16.000A.S.L
11444M-M
CROWN
COPY N.S.W
LANDS PHOTO
LOG
3RD COPY

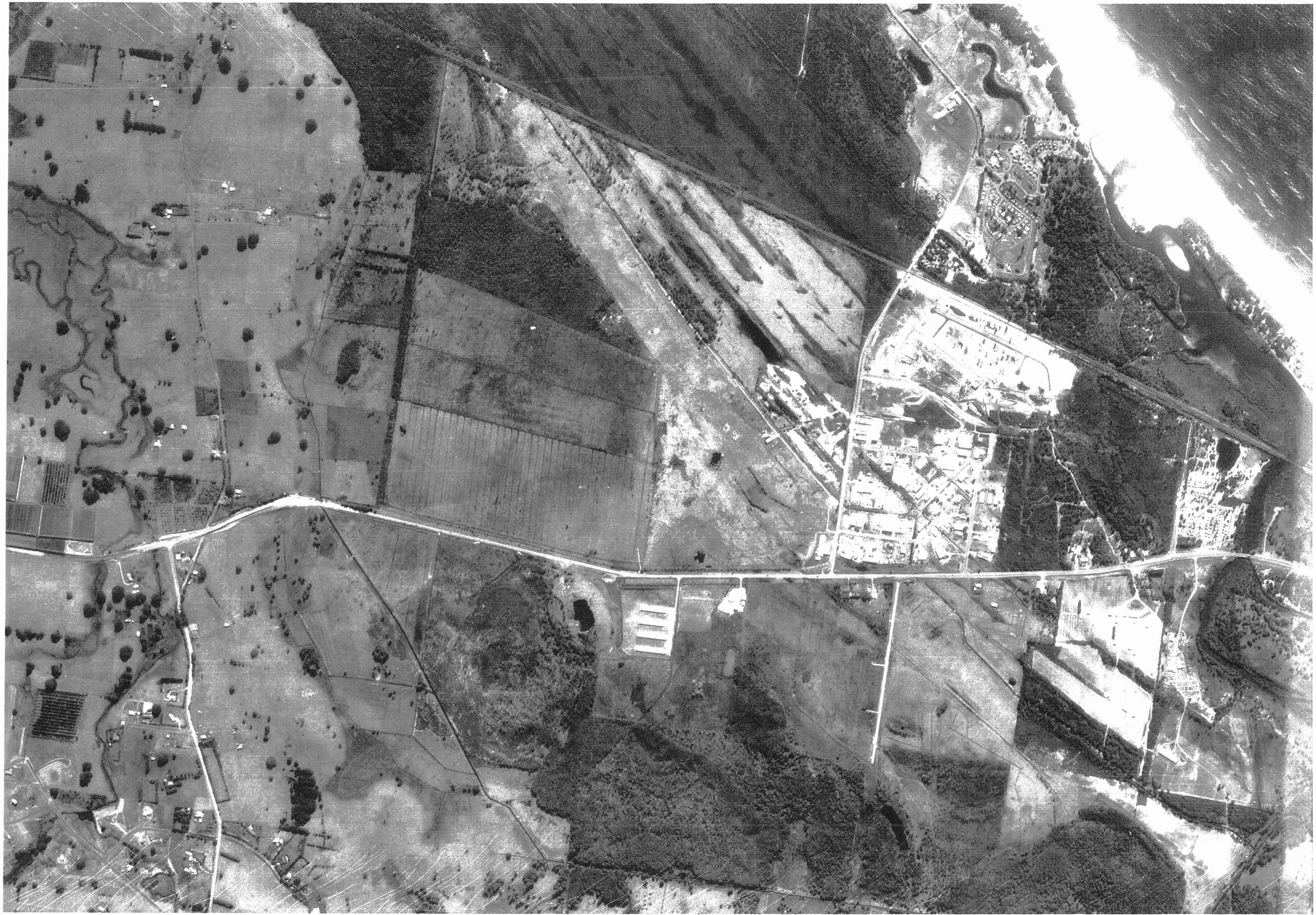
22.9-66


5702
A.A.M.
826·C
BAY
UAB470
15157
RUN3
5701-5703
3. 6. 73.
H: 3,550' ASL
F: 151·57 M M
A. A. M PHOTO
CROWN
COPY N.S.W
LANDS PHOTO
LOG·E


5703
A.A.M.
826·C
BAY
RUN3
5701-5703
3. 6. 73.
H: 3,550' ASL
F: 151·57 M.M.
A. A. M PHOTO
CROWN
COPY N.S.W
LANDS PHOTO
LOG E


UAg 1025 151.45
BALLINA
1:41 000
NSW 2771
RUN 3
3.4.79
6828m ASL
151.45mm
CROWN
COPY N.S.W
LANDS PHOTO
NSW
2771
242


NSW
3584
183
BALLINA
1:40000
NSW3584
RUN 3
1.8.87
6401 M ASL
153.10MM
UAGII 3057 153.10

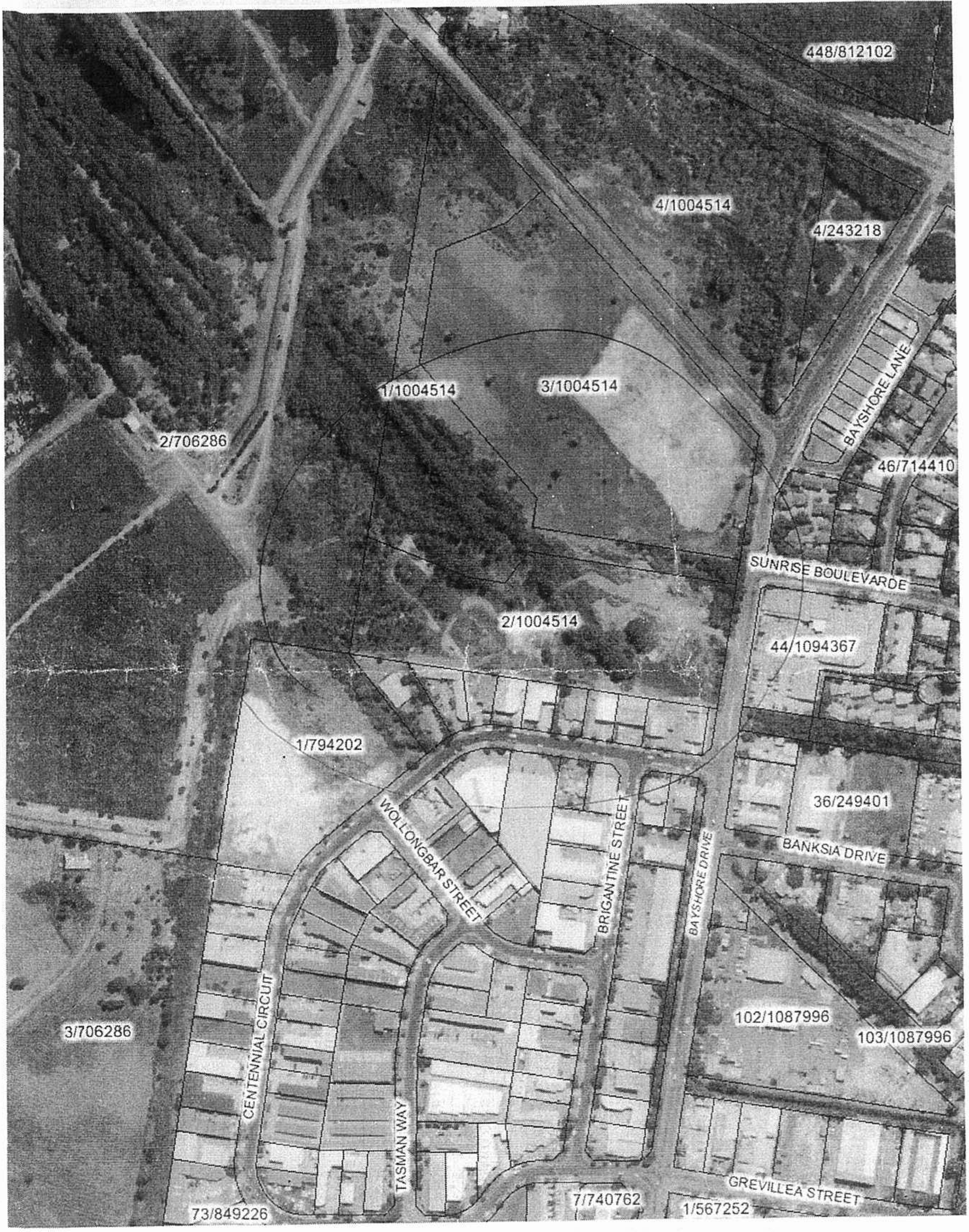


1.8.87

Study Area

Annexure 7

Lot 2 Option Report



Scale = 1:4,367

Metres 100 200

(Scale correct at A4 size)

N

14/03/2012

29/03/12

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APPENDIX F: RECORD OF INTERVIEWS

1. Chris Shevellar former Shire Clerk Byron Shire Council and resident since 1967. Council employee for 20 years to 1987.

Chris was aware that th land was formally land owned by Andersons Meatworks and F.J. Walkers asnd was used as a holding paddock for cattle for slaughter. Subsequently purchased by Council for sewerage treatment works. No detailed knowledge of previous uses.

Recommended consultation with:

- Gary MacDonald, former Shire Engineer, Byron Shire
- George Flick, long tern resident and son of former Andersons Meatworks employee.
- Ron Barnes, former meatworks employee.

2. George Flick – long term resident Quarry Lane – Local Resident Quarry Lane since 1938

George provided an extensive and lucid anecdotal history of the site beginning with it's ownership by Andersons Meatworks who operated the whaling station. He recalls that prior to that his father had spoken of a small piggery on the western side of Bayshore Drive, surmising that they may have used waste products as a feed supplement for the pigs. George believes sand mining for gold was undertaken for a short period but he understood that venture was not successful. Sand mining for rutile and other precious metals was later undertaken in the 1950's - 60's. George recalls that the extraction was located in a high sand ridge to the southwest of the subject site which ran southwest to southeast, beneath the now Ozigo Service Station and to the west of the "beekeepers house" on the southern side of Ewingsdale Road. He reported that the area mined was the highest of the swales or ridges and was the furthest sand-dune from the Ocean. The ridge extended diagonally from the intersection of Bayshore Drive towards the north west and more or less followed the a drain from a railway bridge adjacent the railway quarry at the end of Quarry Lane. He reported that the diagonal drain was constructed by the sand miners to deliver sea water to the extraction process. It ran from the end of Greys Lane under the railway bridge to Bayshore Drive and was the subject of dispute between local landowners (drainage union) and the sandminers. The effect of the drain was to introduce salt water onto the southerly draining slopes towards the Cumbebin Swamp and the lower lying parts of his land in Quarry Lane, with expected detrimental effects. The land on the seaward side of this substantially high swale drained seaward and east along the railway to the Belongil. Both the railway construction and the sand mining changed the surface water hydrology and drainage patterns such that this water now drains back towards the base of Morans Hill. He noted that the area of Lots 1 & 2, the subject of our investigations, were lower than the swale and were not mined. George was certain the site had no cattle dip as the dairy farmer who operated a farm on the now Byron Bay Beach Resort site at the end of Bayshore Drive, used to drive his cattle by road to the Quarry Lane cattle dip for dipping. George recalls the land on the eastern side of Bayshore Drive was once occupied by a Mr. Ellis who was a flying enthusiast and had constructed a landing strip on the site for landing of aircraft.

3. Jim Clark, former Accountant Walkers Meatworks 14 years – local resident since 1954.

Indicated he was familiar with the site which was part of the larger lot used by F.J. Walkers as holding paddock for meatworks cattle. Through the late 1970's and early 1980's it was used as a disposal area for disposal of paunch material (gut manure) from slaughtered cattle. Jim had no knowledge of disposal of animal carcasses on the site, although acknowledged it may have occurred on rare occasions. Unlikely to have been significant quantities as all waste material was valuable and hence rendered at the meatworks to provide meat-meal by products which were a saleable commodity. Jim had no immediate recall of the extent of sand mining, but recalls the mining followed a major sand dune which he recalls was “the shape of the existing shore line” and followed that shape parallel to the existing shoreline. Recalls seeing aerial photographs in the possession of Ian Cook which showed that shape. Sand mining went under Ozigo and continued towards the northwest along the lines of the old dunal system.

4. Gary McDonald, former Shire Engineer and Chief Town Planner Byron Shire Council late 1970 to mid 1980’s

Reports no intimate knowledge of the site. Part of former meatworks paddock and land purchased by Council as part of the sewerage treatment works site. No knowledge of historical use of the site or any potential contamination issues.

5. Bill Knobel, former Deputy Shire Engineer from mid 1970’s to 1985.

Bill was involved in the construction of the Council depot, the Byron Bay Industrial Estate and the pacific Vista Estate.

Does not recall any detailed history of the subject site. Site was part of Walkers Meatworks stock holding paddock. Acquired by Council in early 1980’s.

6. Ian Cook former Senior Assistant Engineer, Byron Shire Council 1950’s to 2002

Ian was involved in the design of the Byron Bay Industrial Estate, including the upgrading of Bayshore Drive. The subject land was owned by the F.J Walkers meatworks and used as a holding paddock for cattle and occasional disposal of animal carcasses. Ian reports no recollection of any occurrences on the site which would indicate potential site contamination. No recollection of any dip sites in the vicinity. Suggested this was unlikely as cattle brought to saleyards for slaughter would not require dipping.

Ian thought the original industrial estate on the eastern side of Bayshore Drive was built on Crown Land.

7. Brian Mackney, former Design Engineer, Strategic Planning Engineer and Engineering Services Manager, Byron Shire Council (1981-90)

Supervisor of design of Council’s Byron Industrial Estate and Pacific Vista Estate and oversighting of private industrial subdivisions west of Bayshore Drive through subdivisions engineer Mike Kingsbury. As Services Manager, oversighted the design & construction of West Byron Sewerage Treatment Plant and associated wetlands. Later (2009-12) engaged by Council as Project Coordinator for the construction of the nearby Byron Regional Regional Sport & Cultural Complex. Recalls the area to the west of Bayshore Drive was used primarily as a holding paddock by F.J. Walkers meatworks prior to the meatworks closure in the 1980’s. Has no recollection of any landuses which would suggest site contamination. Indirectly involved in extensive excavation and geotechnical investigation of surrounding properties during construction of the industrial estate, the sewerage treatment works, Sunrise beach Estate and the adjoining Byron Regional Sports Complex. Notes that some whale bones were uncovered adjacent the wetlands outlet during construction of wetlands on adjoining sewerage treatment works site. Notes historical aerial photographs show dunal swale system stretching from Bayshore Drive north across railway line to Brunswick Heads, with the reported position of the high back dunal system, following the approximate line of the southeast / northwest diagonal drain traversing the site to the south of the sewerage treatment plant.

8. Ian Pickles, Former Chief Town Planner, Byron Shire Council and later Consultant to Council in assessment of the site for subdivision

No direct knowledge of the site from Council employment, although was aware that F.J. Walkers were previous owners and that Council purchased the site which was ultimately used as sewerage treatment works site.

9. Wes Johnstone former Works Engineer Byron Shire Council

Reports no intimate knowledge of the site. Part of former meatworks paddock and land purchased by Council as part of the sewerage treatment works site. No knowledge of any potential contamination issues. Recommends Harry Wilson, former overseer be interviewed as may have some further information.

10. Harry Wilson, former BSC Ganger and Overseer and long term resident

Harry now works for Lismore City Council. He had no immediate recollection of the Pacific Vista works or matters of interest. He was able to confirm his understanding that the land was part of the original meatworks holding paddock through until being purchase by Council. Since that time the land had been used by Council as a depot for the temporary storage and handling of construction materials.

11. Col Hadwell, local resident and former Town Planner and Engineering Assistant, Byron Shire Council 1979 to 2006

Reports the site was part of former meatworks paddock. Land purchased by Council as part of the sewerage treatment works site. No knowledge of any potential contamination issues. Col travelled from Byron to Mullumbimby by train to school through 1950's and 1960's and has no recollection of the mining of the area close to the railway line. He recommends that Ian Cook be interviewed. Acknowledges comments from George Flick and suggests these would be reliable. Also recommends Ray Clark be interviewed as he worked for the sand mining company as a plant operator on sites around Byron Bay and has a thorough knowledge of the processes employed by the company.

12. Ray Clark, former Sand Mining Employee and Works Overseer, Byron Shire Council

Ray's father was a senior manager for Associated Minerals and Ray himself worked with the company in a wide range of capacities from a plant operator, truck driver and wet dredge operator for approximately ten years. He was later employed by Byron Shire Council in a number of roles including Overseer and engineering assistant.

Ray indicated he does not recall whether the subject site was ever mined. His recollection is that Cudgen RZ was the company that was mining in that location. The mining typically followed the high sand dune. A wet extraction process extracted the heavier mineral fraction, working the sand dune on a face as the dredge moved forward. The extracted material was then transported via road vehicle to the dry processing plant, located at the current Woolworths site where it was further refined, bagged and transported off site.

Working for Byron Shire Council during the late 1990's Ray advised that he worked with another Council employee Chris Johnstone, to prepare the site for sale. He reports that at the time the site was in a very untidy state, with materials deposited from road construction jobs, drainage maintenance works, although stressing that to his knowledge there was no material on site which he would consider to be "contaminated", comprising a range of sands, soils, gravels, road base and general fill material from various Council jobs. He described the site as being used to store surplus materials from various Council jobs which could not be disposed of or stored elsewhere. During the late 1990's he organised a work crew to clean up the site to render it suitable for immediate sale. Unwanted material was sorted and removed to the Myocum Landfill. Ray expressed surprise that, after the effort they went to in cleaning the site up that it wasn't then sold as planned.

13. Tony Nash, Works Manager Byron Shire Council

Tony indicated only limited knowledge of the site. He was aware that the site has been traditionally used to stored surplus construction materials over the years, but has no information on the type or quantity of materials involved. Recently materials have been received from highway construction at Banora Point. Suggested I speak to Kristian Pembroke, Works Engineer for Byron Shire Council for more details.

14. Kristian Pembroke, Works Engineer Byron Shire Council approximately 3 years.

Kristian confirmed comments provided by others indicating that the site had been used as a temporary storage of surplus construction materials, including rock, sand, road base, topsoils, lesser quality fill materials and materials excavated from the town's drainage system.

He was not aware of any materials that might constitute significant contamination, but pointed to the potential for petrochemicals and other contaminants from road sweepings and shoulder trimming, likely to have been deposited there.

Kristian had anticipated that the material may have been suitable as a landfill cover. In view of the absence of interest from the landfill to use the material for this purpose, he could not offer any alternative uses. His expectation is that the better quality materials including rock, gravel, sand, topsoil and better quality fill materials can be used on Council projects over the next twelve months. The use and/or disposal of poorer quality materials excavated from the town's drainage system is, in his view, more problematic. Experience to date has been that when wet, the material will not support vehicle loads. He conceded that it may be possible to produce a suitable blend of these poorer quality materials and imported uncrushed Myocum gravel or similar to provide a suitable blinding layer of adequate CBR across the site prior to importation of more competent fill material, believing that such an exercise was not assured of success and would require careful quality control.

15. Tony Buckley, Works Overseer Byron Shore Council

Current Council Overseer. Reports Council has deposited construction materials on the site over a long period of time. Site kept reasonably clean in recent times, with the exception of undergrowth which has been allowed to accumulate. Recommended the interviewer should talk to Council plant operators who have worked on the site over recent years, to get more details.

16. Rob King, Works Overseer Byron Shore Council

Similar comments to Tony Buckley. Materials on site have been derived from numerous construction jobs. Site is now kept locked to prevent unauthorised dumping of material on the site. Rob suggested the interviewer should interview Council plant operators who have worked on the site over the years. He believed they would provide the most reliable source of information as to what types of material were stored on the site and how the site has been managed in recent years.

17. Alex Dichiera, Plant Operator / Truck Driver Byron Shire Council

Alex is currently employed as a truck driver for Council. He has a long association with the site. He reports that materials on site have been derived from numerous construction jobs. Typically materials are brought to the site when there is nowhere else for them to be sent or used.

Over a lengthy period the stored materials have been rearranged and sorted to the extent that he believes that most unwanted refuse has been removed from the site. He and other Council personnel continue to sort the materials out when the opportunity arises, mixing topsoil, compost and other materials to form suitable blends of materials for various uses on a range of Council projects. Any unsuitable residual material is discarded at the Myocum landfill.

Alex claims that, although parts of the site are overgrown and may appear untidy, Council personnel continually sort the materials arriving, with a result that even to the extent of using a screen to screen out unwanted materials. Materials are stored in stockpiles of different types and quality of materials. Any new refuse or unsuitable material is identified and removed from the site.

He is not aware of any materials delivered to or stored on the site which would be considered to cause contamination of the site.

The site is kept locked to prevent unauthorised dumping of material.

18. Paul Green, Council Truck Driver & Plant Operator since 1981

Paul offered similar comments to Alex Dichiera. Both he and Alex have worked together with others over the years to keep the stockpiles on the site clean and free of extraneous materials that would render them unsuitable for purpose. He is not aware of any materials on site which he would describe as “contamination”, but noted the poor quality of some of the material excavated from the town’s drainage system. He expressed reservations about the quality of the material and its suitability as fill, due to the presence of vegetative matter from drain excavations. He also questioned whether, once disturbed, the larger stockpiles might be wet and of very poor quality.

Paul provided anecdotal evidence that the broader site had been originally stripped of topsoil by dozer (Council operator Les Bashforth) and filled with surplus clay material excavated during the construction of the Pacific Vista Estate during the 1980’s. The imported clays provided a blinding layer over the basement sand on the site. He could not confirm, but believes the excavated topsoil may have been transported to Pacific Vista and spread across the allotments as topsoil.

19. Wayne Bertram, Development Compliance Manager, Byron Shire Council

Wayne advised of anecdotal reports that the site had been the subject of sandmining during an earlier period, indicating he has aerial photos which might support that belief. If this is so, Wayne suggests this may have potential impacts on the site, with a risk of raised radiation levels. In more recent times there is also anecdotal evidence that the site was used as dump site by local residents.

Was it a dip site? Wayne will provide copies of the photos he has. He suggested the interviewee also look at historical aerial photos on the GIS.

Subsequent follow up revealed Council had no additional photographic records other than those already obtained.

20. Doug Leadbeater, Timber Bridge Girder supplier to Byron Council.

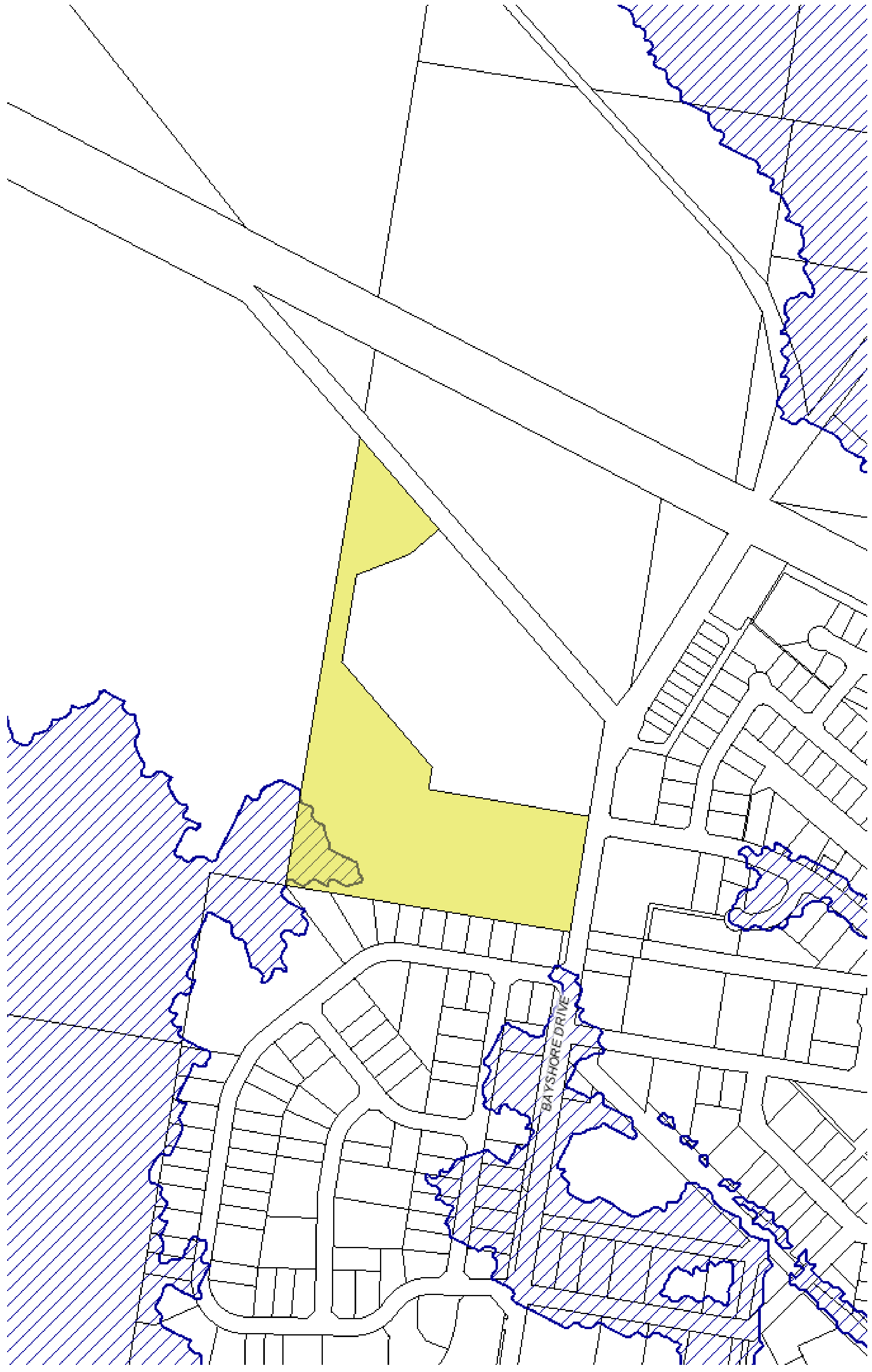
Doug confirmed that the girders supplied to Council were CCA Class 5 treated at Casino prior to delivery. Not all bridge timbers are treated for Byron Shire, but any that are green have been treated at the sawmill at Casino.

APPENDIX G: TRADE & INVESTMENT, REGIONAL INFRASTRUCTURE & SERVICES SEARCH INFORMATION


N
© 2013 Google
© 2013 Whereis® Sensis Pty Ltd
Image © 2013 DigitalGlobe
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Google earth
2006
Imagery Date: 9/6/2011
28°37'53.45" S 153°34'56.66" E elev 6 m eye alt 875 m

APPENDIX H: EXTRACTS FROM COUNCIL GIS SYSTEM

Lot 12 DP 1189646 – Flood Map



Legend

▨	Flood (1 in 100 yr)
☐	Land Parcels (-150k)

Scale = 1:6,337

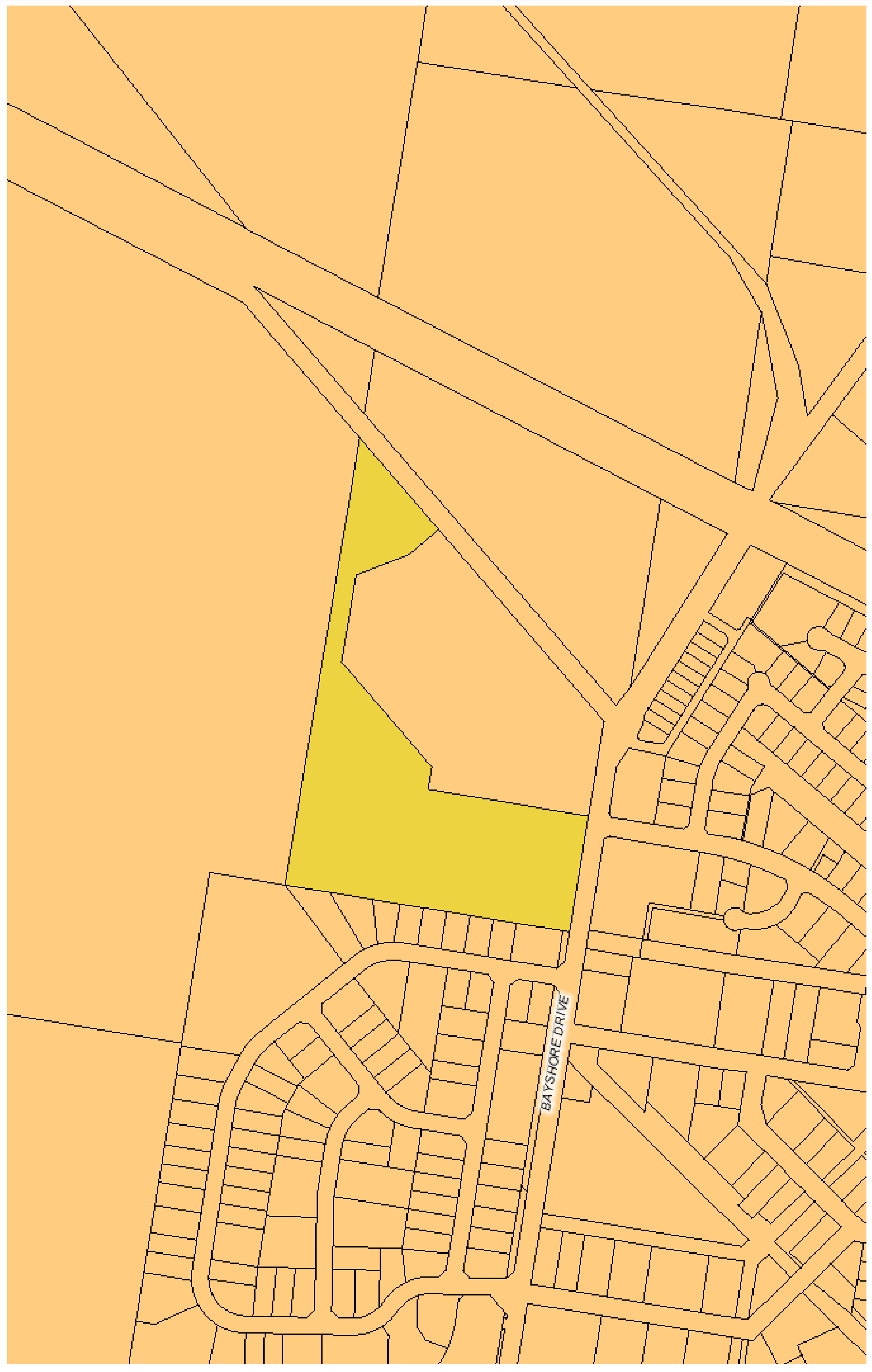
Metres 100 200 300

(Scale correct at A4 size)

N

12/06/2014

Lot 12 DP 1189646 – Acid Sulfate Soils Map



Legend

☐ Land Parcels (-150k)

Acid Sulfate Soil Class

🟦 1 - All works highly likely to have impact on ASS

🟥 2 - Works below the natural ground surface, or where the watertable is likely to be lowered, likely to have ASS impact

🟧 3 - Works more than 1 metre below the natural ground surface, or where the watertable is likely to be lowered by more than 1 metre below the natural ground surface likely to have ASS impact

🟩 4 - Works more than 2 metres below the natural ground surface, or where the watertable is likely to be lowered more than 2 metres below the natural ground surface may have ASS impact

🟪 5 - Works within 500 metres of adjacent Class 1, 2, 3 or 4, where the watertable is likely to be lowered below 1 metre AHD on the adjacent Class 1, 2, 3 or 4 land

Scale = 1:6,337

Metres 100 200 300

(Scale correct at A4 size)

12/06/2014

B Lotsearch

LOTSEARCH

LOTSEARCH ENVIRO PROFESSIONAL

Date: 19 Mar 2021 11:32:27

Reference: LS018889 EP

Address: 42 Wallum Place, Byron Bay, NSW 2481

Disclaimer:
The purpose of this report is to provide an overview of some of the site history, environmental risk and planning information available, affecting an individual address or geographical area in which the property is located. It is not a substitute for an on-site inspection or review of other available reports and records. It is not intended to be, and should not be taken to be, a rating or assessment of the desirability or market value of the property or its features.
You should obtain independent advice before you make any decision based on the information within the report.
The detailed terms applicable to use of this report are set out at the end of this report.

Dataset Listing

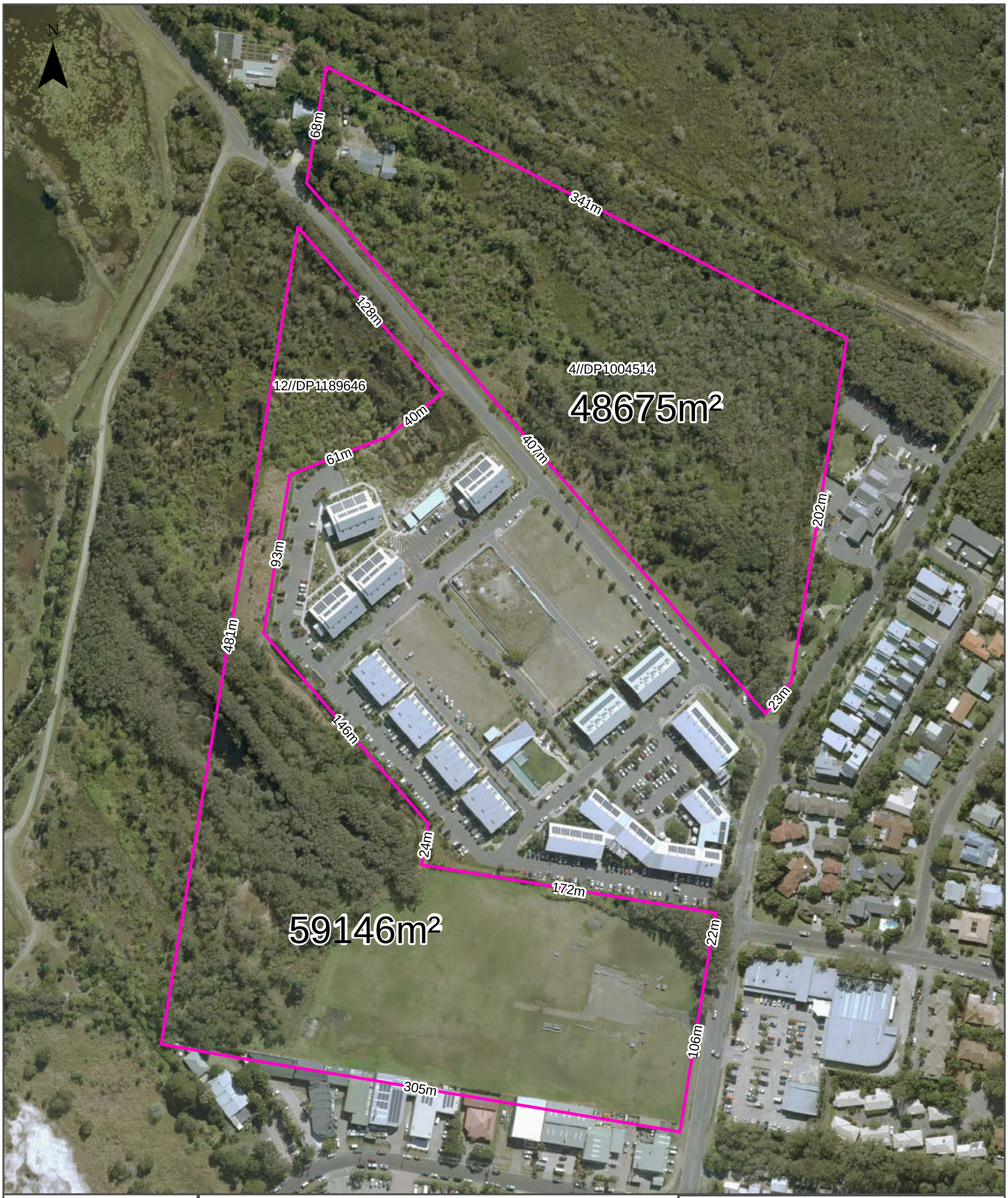
Datasets contained within this report, detailing their source and data currency:

Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	Dataset Buffer (m)	No. Features Onsite	No. Features within 100m	No. Features within Buffer
Cadastre Boundaries	NSW Department of Finance, Services & Innovation	19/02/2021	19/02/2021	Quarterly	-	-	-	-
Topographic Data	NSW Department of Finance, Services & Innovation	25/06/2019	25/06/2019	As required	-	-	-	-
List of NSW contaminated sites notified to EPA	Environment Protection Authority	11/03/2021	08/03/2021	Monthly	1000	0	0	0
Contaminated Land Records of Notice	Environment Protection Authority	04/03/2021	04/03/2021	Monthly	1000	0	0	0
Former Gasworks	Environment Protection Authority	09/03/2021	11/10/2017	Monthly	1000	0	0	0
National Waste Management Facilities Database	Geoscience Australia	11/02/2021	07/03/2017	Quarterly	1000	0	0	0
National Liquid Fuel Facilities	Geoscience Australia	15/02/2021	13/07/2012	Quarterly	1000	0	0	1
EPA PFAS Investigation Program	Environment Protection Authority	12/03/2021	23/11/2020	Monthly	2000	0	0	0
Defence PFAS Investigation & Management Program - Investigation Sites	Department of Defence	02/03/2021	02/03/2021	Monthly	2000	0	0	0
Defence PFAS Investigation & Management Program - Management Sites	Department of Defence	02/03/2021	02/03/2021	Monthly	2000	0	0	0
Airservices Australia National PFAS Management Program	Airservices Australia	01/03/2021	01/03/2021	Monthly	2000	0	0	0
Defence 3 Year Regional Contamination Investigation Program	Department of Defence	12/03/2021	12/03/2021	Monthly	2000	0	0	0
EPA Other Sites with Contamination Issues	Environment Protection Authority	02/02/2021	13/12/2018	Annually	1000	0	0	0
Licensed Activities under the POEO Act 1997	Environment Protection Authority	08/03/2021	08/03/2021	Monthly	1000	0	2	2
Delicensed POEO Activities still regulated by the EPA	Environment Protection Authority	08/03/2021	08/03/2021	Monthly	1000	0	0	1
Former POEO Licensed Activities now revoked or surrendered	Environment Protection Authority	08/03/2021	08/03/2021	Monthly	1000	1	1	6
UBD Business Directories (Premise & Intersection Matches)	Hardie Grant			Not required	150	0	0	0
UBD Business Directories (Road & Area Matches)	Hardie Grant			Not required	150	-	53	54
UBD Business Directory Dry Cleaners & Motor Garages/Service Stations (Premise & Intersection Matches)	Hardie Grant			Not required	500	0	0	0
UBD Business Directory Dry Cleaners & Motor Garages/Service Stations (Road & Area Matches)	Hardie Grant			Not required	500	-	1	1
Cattle dips of the Northern Rivers region	NSW Dept. of Primary Industries	15/02/2021	15/02/2021	Annually	1000	0	0	0
Points of Interest	NSW Department of Finance, Services & Innovation	18/02/2021	18/02/2021	Quarterly	1000	0	1	7
Tanks (Areas)	NSW Department of Customer Service - Spatial Services	16/02/2021	16/02/2021	Quarterly	1000	0	0	0
Tanks (Points)	NSW Department of Customer Service - Spatial Services	16/02/2021	16/02/2021	Quarterly	1000	0	0	0
Major Easements	NSW Department of Finance, Services & Innovation	17/02/2021	17/02/2021	Quarterly	1000	0	0	0
State Forest	Forestry Corporation of NSW	25/02/2021	14/02/2021	Annually	1000	0	0	0
NSW National Parks and Wildlife Service Reserves	NSW Office of Environment & Heritage	22/01/2021	11/12/2020	Annually	1000	0	1	2
Hydrogeology Map of Australia	Commonwealth of Australia (Geoscience Australia)	08/10/2014	17/03/2000	As required	1000	1	1	1
Temporary Water Restriction (Botany Sands Groundwater Source) Order 2018	NSW Department of Planning, Industry and Environment	26/10/2020	21/02/2018	Annually	1000	0	0	0

Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	Dataset Buffer (m)	No. Features Onsite	No. Features within 100m	No. Features within Buffer
Groundwater Boreholes	NSW Dept. of Primary Industries - Water NSW; Commonwealth of Australia (Bureau of Meteorology)	24/07/2018	23/07/2018	Annually	2000	0	2	57
Geological Units 1:250,000	NSW Department of Planning, Industry and Environment	20/08/2014		Annually	1000	1	-	3
Geological Structures 1:250,000	NSW Department of Planning, Industry and Environment	20/08/2014		Annually	1000	0	-	0
Naturally Occurring Asbestos Potential	NSW Dept. of Industry, Resources & Energy	04/12/2015	24/09/2015	Unknown	1000	0	0	0
Atlas of Australian Soils	Australian Bureau of Agriculture and Resource Economics and Sciences (ABARES)	19/05/2017	17/02/2011	As required	1000	1	1	2
Soil Landscapes of Central and Eastern NSW	NSW Department of Planning, Industry and Environment	14/10/2020	27/07/2020	Annually	1000	1	-	5
Environmental Planning Instrument Acid Sulfate Soils	NSW Department of Planning, Industry and Environment	18/03/2021	26/02/2021	Monthly	500	1	-	-
Atlas of Australian Acid Sulfate Soils	CSIRO	19/01/2017	21/02/2013	As required	1000	1	1	3
Dryland Salinity - National Assessment	National Land and Water Resources Audit	18/07/2014	12/05/2013	None planned	1000	0	0	0
Dryland Salinity Potential of Western Sydney	NSW Department of Planning, Industry and Environment	12/05/2017	01/01/2002	None planned	1000	-	-	-
Mining Subsidence Districts	NSW Department of Customer Service - Subsidence Advisory NSW	16/02/2021	16/02/2021	Quarterly	1000	0	0	0
Current Mining Titles	NSW Department of Industry	04/03/2021	04/03/2021	Monthly	1000	0	0	0
Mining Title Applications	NSW Department of Industry	04/03/2021	04/03/2021	Monthly	1000	0	0	0
Historic Mining Titles	NSW Department of Industry	04/03/2021	04/03/2021	Monthly	1000	12	12	16
Environmental Planning Instrument SEPP State Significant Precincts	NSW Department of Planning, Industry and Environment	18/03/2021	07/12/2018	Monthly	1000	0	0	0
Environmental Planning Instrument Land Zoning	NSW Department of Planning, Industry and Environment	18/03/2021	12/03/2021	Monthly	1000	4	16	35
Commonwealth Heritage List	Australian Government Department of the Agriculture, Water and the Environment	23/02/2021	20/11/2019	Quarterly	1000	0	0	0
National Heritage List	Australian Government Department of the Agriculture, Water and the Environment	23/02/2021	20/11/2019	Quarterly	1000	0	0	0
State Heritage Register - Curtilages	NSW Department of Planning, Industry and Environment	15/02/2021	30/11/2020	Quarterly	1000	0	0	0
Environmental Planning Instrument Local Heritage	NSW Department of Planning, Industry and Environment	18/03/2021	12/03/2021	Monthly	1000	0	0	0
Bush Fire Prone Land	NSW Rural Fire Service	15/03/2021	11/02/2021	Weekly	1000	2	2	3
Eastern Bushland Database (North Region)	NSW Office of Environment & Heritage	24/07/2016	01/01/1991	None planned	1000	1	1	4
Ramsar Wetlands of Australia	Australian Government Department of Agriculture, Water and the Environment	24/02/2021	19/03/2020	Annually	1000	0	0	0
Groundwater Dependent Ecosystems	Bureau of Meteorology	14/08/2017	15/05/2017	Annually	1000	1	2	4
Inflow Dependent Ecosystems Likelihood	Bureau of Meteorology	14/08/2017	15/05/2017	Unknown	1000	1	4	10
NSW BioNet Species Sightings	NSW Office of Environment & Heritage	15/03/2021	15/03/2021	Weekly	10000	-	-	-

Site Diagram

42 Wallum Place, Byron Bay, NSW 2481



Legend

🟪 Site Boundary

▭ Internal Parcel Boundaries

Total Area: $107821m^2$

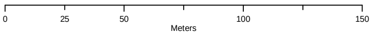
Total Perimeter: 2624m

Disclaimers:

Measurements are approximate only and may have been simplified or smaller lengths removed for readability.

Parcels that make up a small percentage of the total site area have not been labelled for increased legibility.

Scale:



Data Sources: Aerial Imagery © Aerometrex Pty Ltd

Coordinate System:
GDA 1994 MGA Zone 56

Date: 19 March 2021

Contaminated Land

42 Wallum Place, Byron Bay, NSW 2481

List of NSW contaminated sites notified to EPA

Records from the NSW EPA Contaminated Land list within the dataset buffer:

Map Id	Site	Address	Suburb	Activity	Management Class	Status	Location Confidence	Dist (m)	Direction
N/A	No records in buffer								

The values within the EPA site management class in the table above, are given more detailed explanations in the table below:

EPA site management class	Explanation
Contamination being managed via the planning process (EP&A Act)	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. The contamination of this site is managed by the consent authority under the Environmental Planning and Assessment Act 1979 (EP&A Act) planning approval process, with EPA involvement as necessary to ensure significant contamination is adequately addressed. The consent authority is typically a local council or the Department of Planning and Environment.
Contamination currently regulated under CLM Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the Contaminated Land Management Act 1997 (CLM Act). Management of the contamination is regulated by the EPA under the CLM Act. Regulatory notices are available on the EPA's Contaminated Land Public Record of Notices.
Contamination currently regulated under POEO Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. Management of the contamination is regulated under the Protection of the Environment Operations Act 1997 (POEO Act). The EPA's regulatory actions under the POEO Act are available on the POEO public register.
Contamination formerly regulated under the CLM Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation under the Contaminated Land Management Act 1997 (CLM Act). The contamination was addressed under the CLM Act.
Contamination formerly regulated under the POEO Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed under the Protection of the Environment Operations Act 1997 (POEO Act).
Contamination was addressed via the planning process (EP&A Act)	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed by the appropriate consent authority via the planning process under the Environmental Planning and Assessment Act 1979 (EP&A Act).
Ongoing maintenance required to manage residual contamination (CLM Act)	The EPA has determined that ongoing maintenance, under the Contaminated Land Management Act 1997 (CLM Act), is required to manage the residual contamination. Regulatory notices under the CLM Act are available on the EPA's Contaminated Land Public Record of Notices.
Regulation being finalised	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the Contaminated Land Management Act 1997. A regulatory approach is being finalised.
Regulation under the CLM Act not required	The EPA has completed an assessment of the contamination and decided that regulation under the Contaminated Land Management Act 1997 is not required.
Under assessment	The contamination is being assessed by the EPA to determine whether regulation is required. The EPA may require further information to complete the assessment. For example, the completion of management actions regulated under the planning process or Protection of the Environment Operations Act 1997. Alternatively, the EPA may require information via a notice issued under s77 of the Contaminated Land Management Act 1997 or issue a Preliminary Investigation Order.

NSW EPA Contaminated Land List Data Source: Environment Protection Authority

Contaminated Land

42 Wallum Place, Byron Bay, NSW 2481

Contaminated Land: Records of Notice

Record of Notices within the dataset buffer:

Map Id	Name	Address	Suburb	Notices	Area No	Location Confidence	Distance	Direction
N/A	No records in buffer							

Contaminated Land Records of Notice Data Source: Environment Protection Authority

Terms of use and disclaimer for Contaminated Land: Record of Notices, please visit
http://www.epa.nsw.gov.au/clm/clmdisclaimer.htm

Former Gasworks

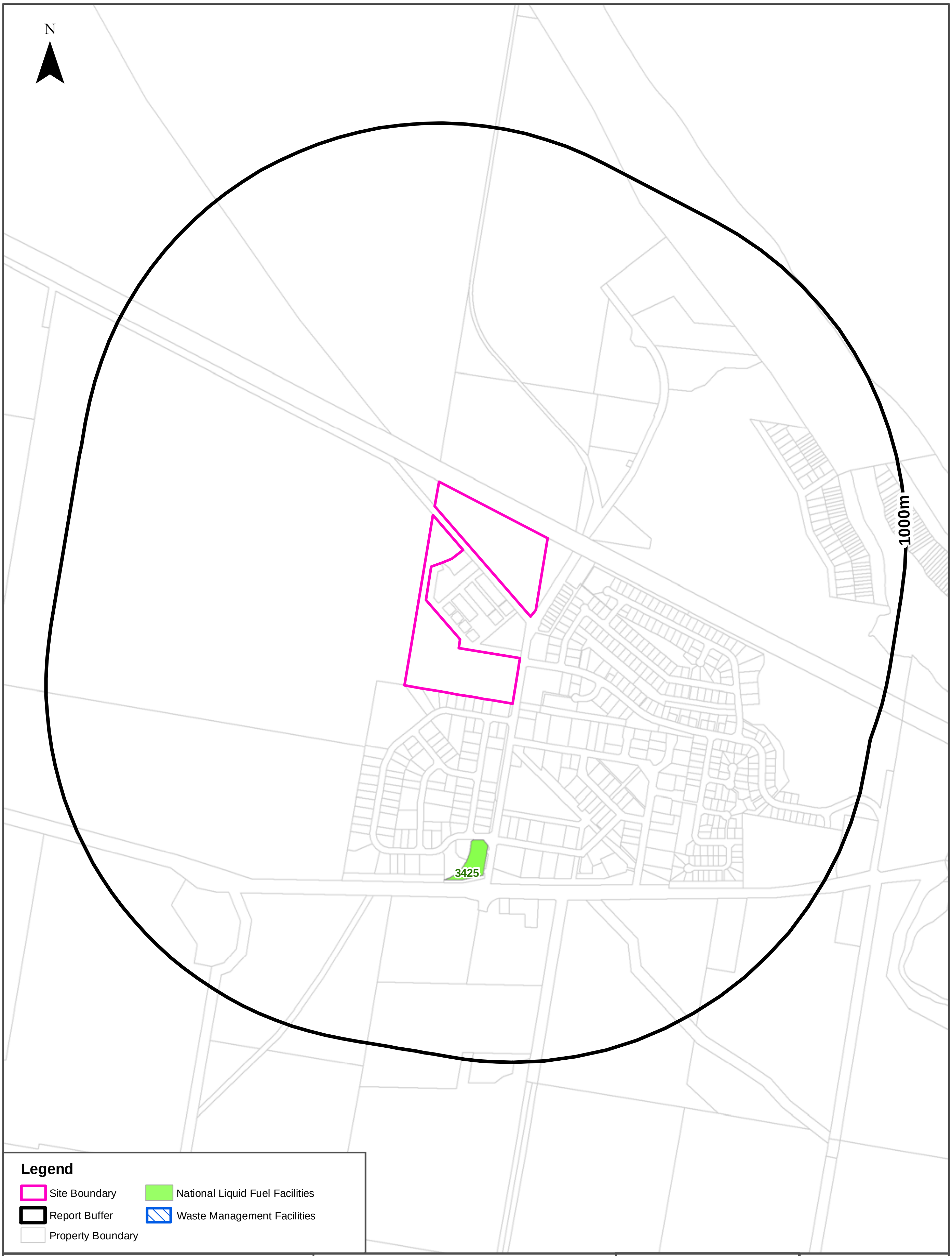
Former Gasworks within the dataset buffer:

Map Id	Location	Council	Further Info	Location Confidence	Distance	Direction
N/A	No records in buffer					

Former Gasworks Data Source: Environment Protection Authority

Waste Management & Liquid Fuel Facilities

42 Wallum Place, Byron Bay, NSW 2481



Legend

🟪 Site Boundary	🟩 National Liquid Fuel Facilities
⬛ Report Buffer	▨ Waste Management Facilities
☐ Property Boundary	

Scale:

Data Sources: Property Boundaries & Topographic Data:
© Department Finance, Services & Innovation 2021

Coordinate System:
GDA 1994 MGA Zone 56

Date: 19 March 2021

Waste Management & Liquid Fuel Facilities

42 Wallum Place, Byron Bay, NSW 2481

National Waste Management Site Database

Sites on the National Waste Management Site Database within the dataset buffer:

Site Id	Owner	Name	Address	Suburb	Class	Landfill	Reprocess	Transfer	Comments	Loc Conf	Dist (m)	Direction
N/A	No records in buffer											

Waste Management Facilities Data Source: Geoscience Australia

National Liquid Fuel Facilities

National Liquid Fuel Facilties within the dataset buffer:

Map Id	Owner	Name	Address	Suburb	Class	Operational Status	Operator	Revision Date	Loc Conf	Dist (m)	Direction
3425	BP	BP Ozigo Motor Market	Lot 11 Bayshore Drive	Byron Bay	Petrol Station	Operational		25/07/2011	Premise Match	388m	South

National Liquid Fuel Facilities Data Source: Geoscience Australia

PFAS Investigation & Management Programs

42 Wallum Place, Byron Bay, NSW 2481

EPA PFAS Investigation Program

Sites that are part of the EPA PFAS investigation program, within the dataset buffer:

Id	Site	Address	Loc Conf	Dist	Dir
N/A	No records in buffer				

EPA PFAS Investigation Program: Environment Protection Authority

Defence PFAS Investigation Program

Sites being investigated by the Department of Defence for PFAS contamination within the dataset buffer:

Map ID	Base Name	Address	Loc Conf	Dist	Dir
N/A	No records in buffer				

Defence PFAS Investigation Program Data Custodian: Department of Defence, Australian Government

Defence PFAS Management Program

Sites being managed by the Department of Defence for PFAS contamination within the dataset buffer:

Map ID	Base Name	Address	Loc Conf	Dist	Dir
N/A	No records in buffer				

Defence PFAS Management Program Data Custodian: Department of Defence, Australian Government

Airservices Australia National PFAS Management Program

Sites being investigated or managed by Airservices Australia for PFAS contamination within the dataset buffer:

Map ID	Site Name	Impacts	Loc Conf	Dist	Dir
N/A	No records in buffer				

Airservices Australia National PFAS Management Program Data Custodian: Airservices Australia

Defence Sites

42 Wallum Place, Byron Bay, NSW 2481

Defence 3 Year Regional Contamination Investigation Program

Sites which have been assessed as part of the Defence 3 Year Regional Contamination Investigation Program within the dataset buffer:

Property ID	Base Name	Address	Known Contamination	Loc Conf	Dist	Dir
N/A	No records in buffer					

Defence 3 Year Regional Contamination Investigation Program, Data Custodian: Department of Defence, Australian Government

EPA Other Sites with Contamination Issues

42 Wallum Place, Byron Bay, NSW 2481

EPA Other Sites with Contamination Issues

This dataset contains other sites identified on the EPA website as having contamination issues. This dataset currently includes:

- James Hardie asbestos manufacturing and waste disposal sites
- Radiological investigation sites in Hunter's Hill
- Pasminco Lead Abatement Strategy Area

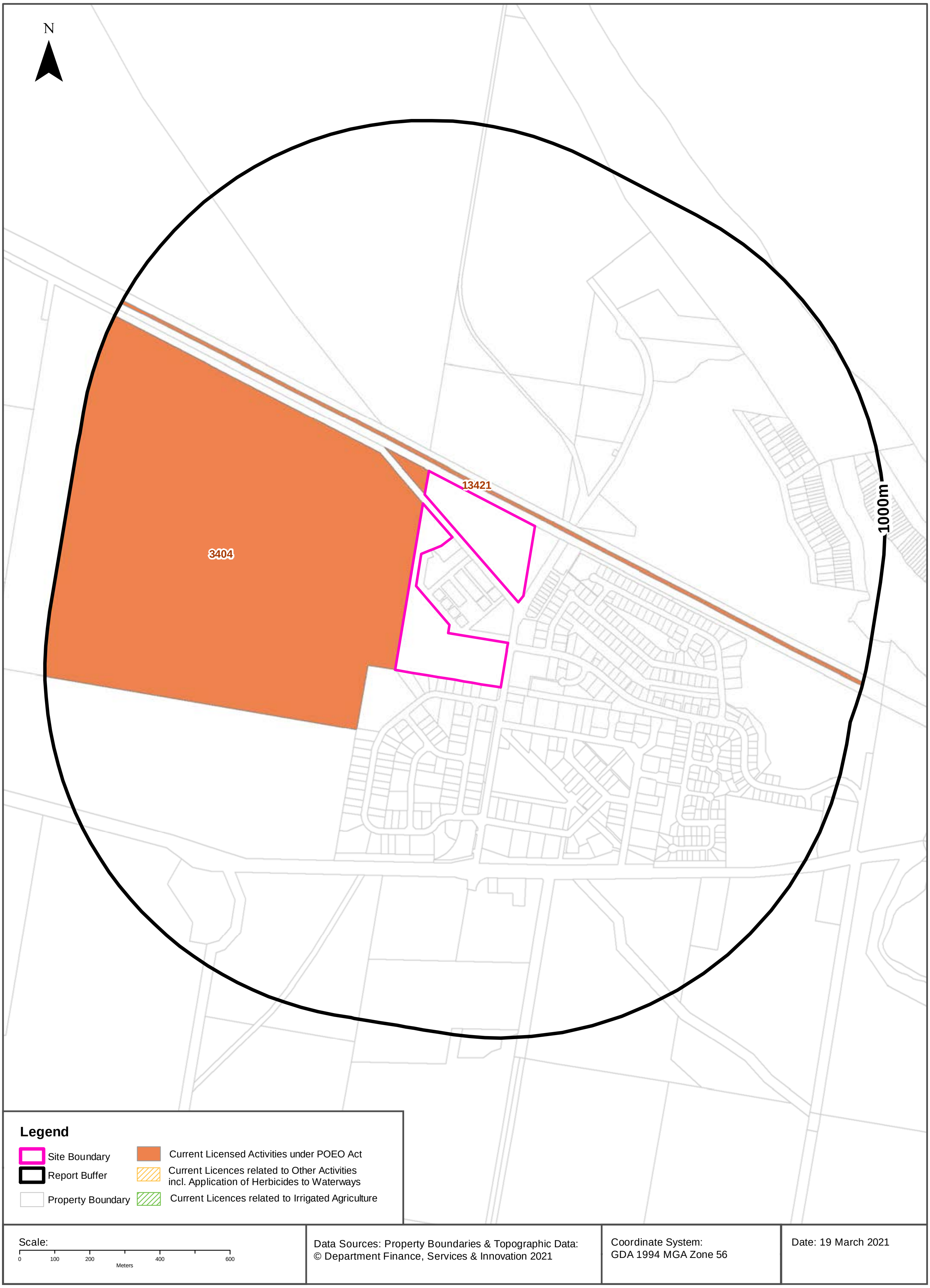
Sites within the dataset buffer:

Site Id	Site Name	Site Address	Dataset	Comments	Location Confidence	Distance	Direction
N/A	No records in buffer						

EPA Other Sites with Contamination Issues: Environment Protection Authority

Current EPA Licensed Activities

42 Wallum Place, Byron Bay, NSW 2481



Data Sources: Property Boundaries & Topographic Data:
© Department Finance, Services & Innovation 2021

Coordinate System:
GDA 1994 MGA Zone 56

Date: 19 March 2021

EPA Activities

42 Wallum Place, Byron Bay, NSW 2481

Licensed Activities under the POEO Act 1997

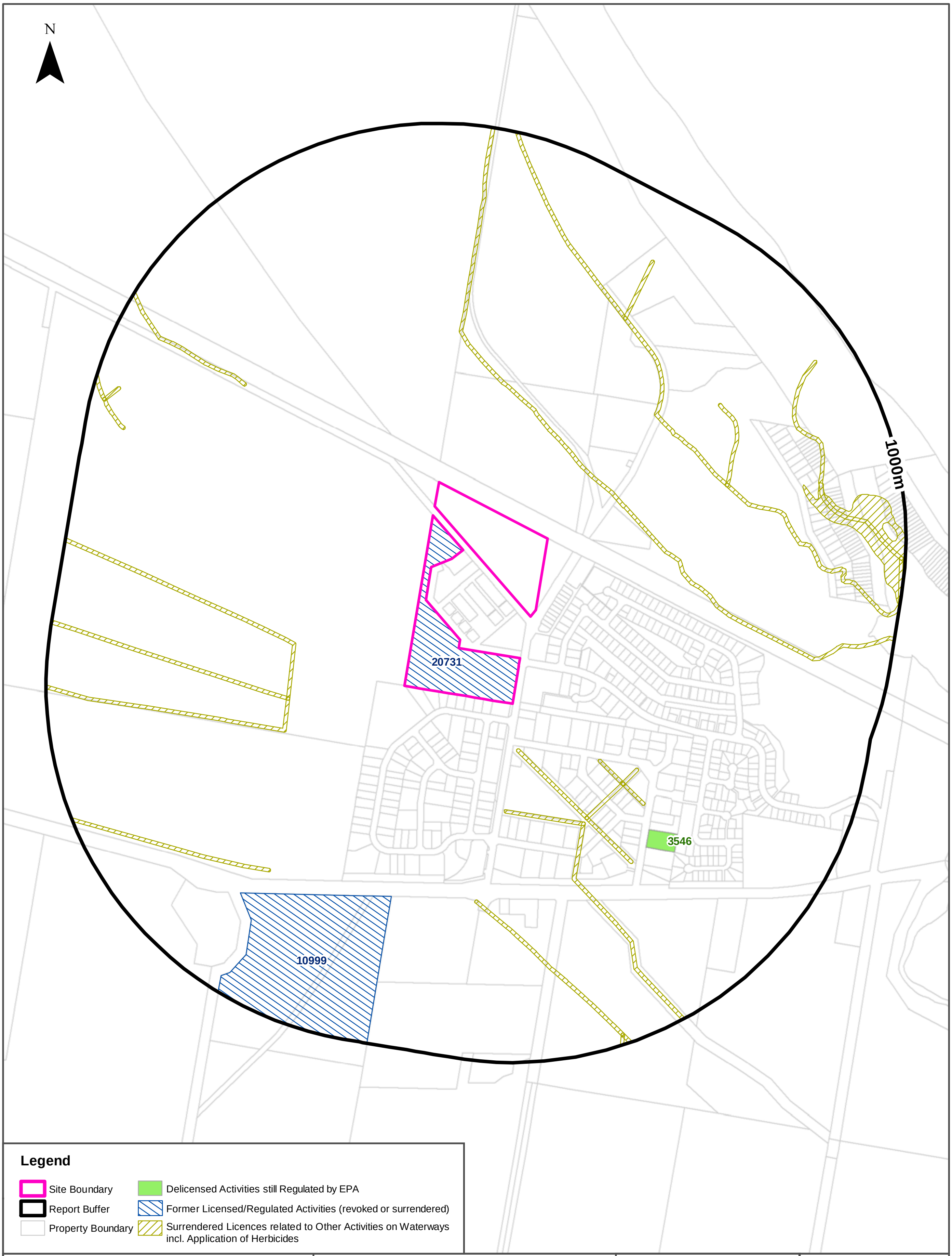
Licensed activities under the Protection of the Environment Operations Act 1997, within the dataset buffer:

EPL	Organisation	Name	Address	Suburb	Activity	Loc Conf	Distance	Direction
3404	BYRON SHIRE COUNCIL	BYRON SEWAGE TREATMENT WORKS	BAYSHORE DRIVE	BYRON BAY	Sewage treatment processing by small plants	Premise Match	0m	West
13421	JOHN HOLLAND RAIL PTY LTD		JOHN HOLLAND RAIL NETWORK, PARRAMATTA, NSW 2124		Railway systems activities	Network of Features	22m	North

POEO Licence Data Source: Environment Protection Authority

Delicensed & Former Licensed EPA Activities

42 Wallum Place, Byron Bay, NSW 2481



Legend

▭	Site Boundary	🟩	Delicensed Activities still Regulated by EPA
▭	Report Buffer	▨	Former Licensed/Regulated Activities (revoked or surrendered)
▭	Property Boundary	▨	Surrendered Licences related to Other Activities on Waterways incl. Application of Herbicides

Scale: 0 100 200 400 600 Meters

Property Boundary Data Source:
© Department Finance, Services & Innovation 2021

Coordinate System:
GDA 1994 MGA Zone 56

Date: 19 March 2021

EPA Activities

42 Wallum Place, Byron Bay, NSW 2481

Delicensed Activities still regulated by the EPA

Delicensed activities still regulated by the EPA, within the dataset buffer:

Licence No	Organisation	Name	Address	Suburb	Activity	Loc Conf	Distance	Direction
3546	HANSON CONSTRUCTION MATERIALS PTY LTD	HANSON CONSTRUCTION MATERIALS PTY LTD	LOT 41 BANKSIA DRIVE	BYRON BAY	Concrete works	Premise Match	516m	South East

Delicensed Activities Data Source: Environment Protection Authority

Former Licensed Activities under the POEO Act 1997, now revoked or surrendered

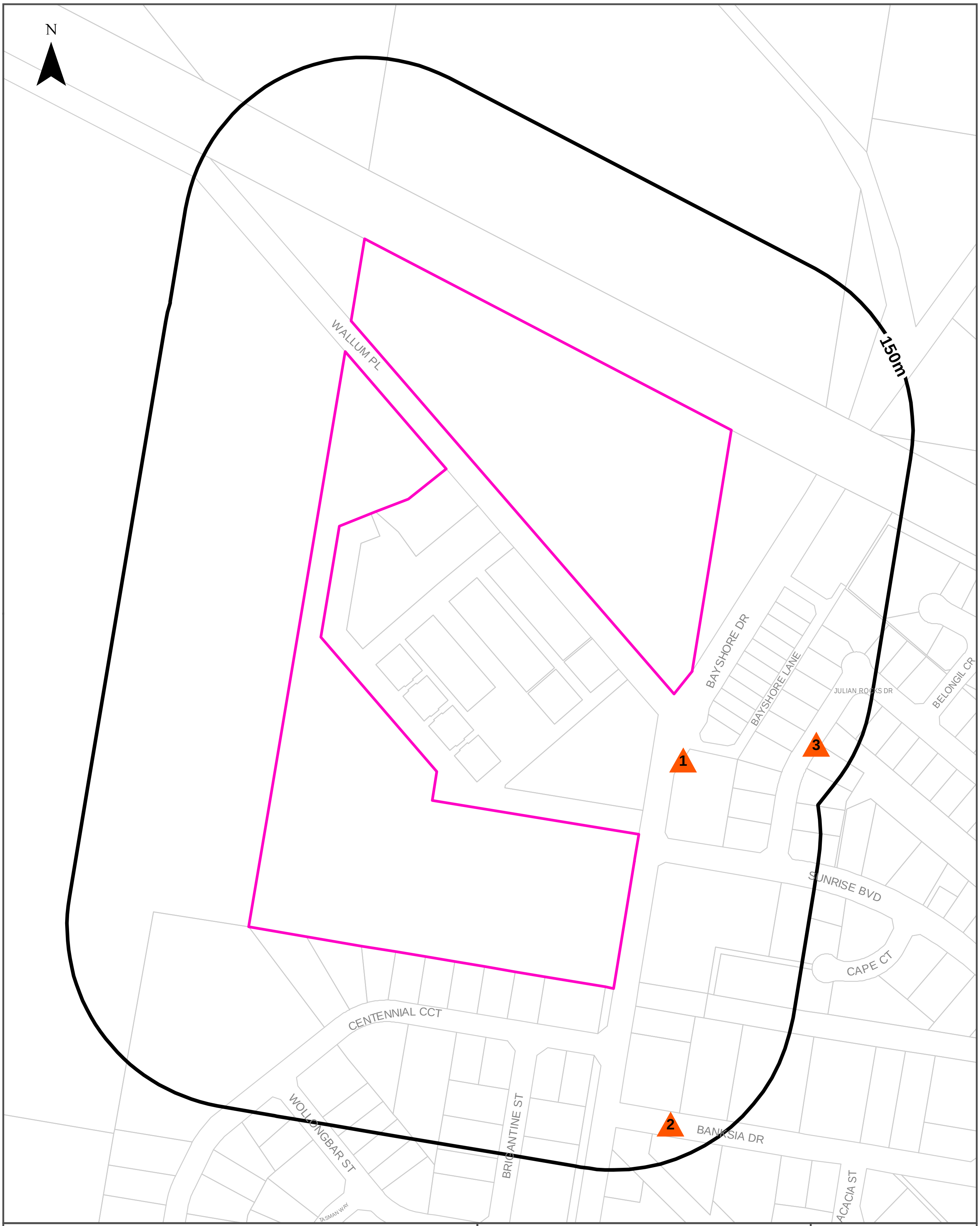
Former Licensed activities under the Protection of the Environment Operations Act 1997, now revoked or surrendered, within the dataset buffer:

Licence No	Organisation	Location	Status	Issued Date	Activity	Loc Conf	Distance	Direction
20731	BYRON SHIRE COUNCIL	, 8-12 Bayshore Drive, BYRON BAY, NSW 2481,	Surrendered	07/07/2016	Recovery of general waste	Premise Match	0m	Onsite
4292	FAR NORTH COAST COUNTY COUNCIL	COUNTY DISTRICT - LISMORE NSW 2480	Surrendered	06/09/2000	Other Activities / Non Scheduled Activity - Application of Herbicides	Network of Features	126m	-
4653	LUHRMANN ENVIRONMENT MANAGEMENT PTY LTD	WATERWAYS THROUGHOUT NSW	Surrendered	06/09/2000	Other Activities / Non Scheduled Activity - Application of Herbicides	Network of Features	126m	-
4838	Robert Orchard	Various Waterways throughout New South Wales - SYDNEY NSW 2000	Surrendered	07/09/2000	Other Activities / Non Scheduled Activity - Application of Herbicides	Network of Features	126m	-
6630	SYDNEY WEED & PEST MANAGEMENT PTY LTD	WATERWAYS THROUGHOUT NSW - PROSPECT, NSW, 2148	Surrendered	09/11/2000	Other Activities / Non Scheduled Activity - Application of Herbicides	Network of Features	126m	-
10999	INGHAMS ENTERPRISES PTY. LIMITED	BYRON BAY, 268 EWINGSDALE ROAD, EWINGSDALE	Surrendered	01/03/2005	Slaughtering or processing animals	Premise Match	585m	South West

Former Licensed Activities Data Source: Environment Protection Authority

Historical Business Directories

42 Wallum Place, Byron Bay, NSW 2481



Legend

☐ Site Boundary
☐ Buffer 150m
☐ Property Boundary
● Business directory records mapped to a specific premise
🟩 Business directory records mapped to a road intersection
▲ Business directory records mapped to a road corridor
▨ Business directory records mapped to a general area

Scale:
0 60 120 180 240
Meters

Coordinate System:
GDA 1994 MGA Zone 56

Date: 19 March 2021

Data Sources: Reproduced with permission of UBD and Hardie Grant Media Pty Ltd DD 01/08/2018
Property Boundaries © NSW Department Finance, Services & Innovation 2021

Historical Business Directories

42 Wallum Place, Byron Bay, NSW 2481

Business Directory Records 1950-1991 Premise or Road Intersection Matches

Universal Business Directory records from years 1991, 1982, 1970, 1961 & 1950, mapped to a premise or road intersection within the dataset buffer:

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Property Boundary or Road Intersection	Direction
	No records in buffer						

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Business Directory Records 1950-1991
Road or Area Matches

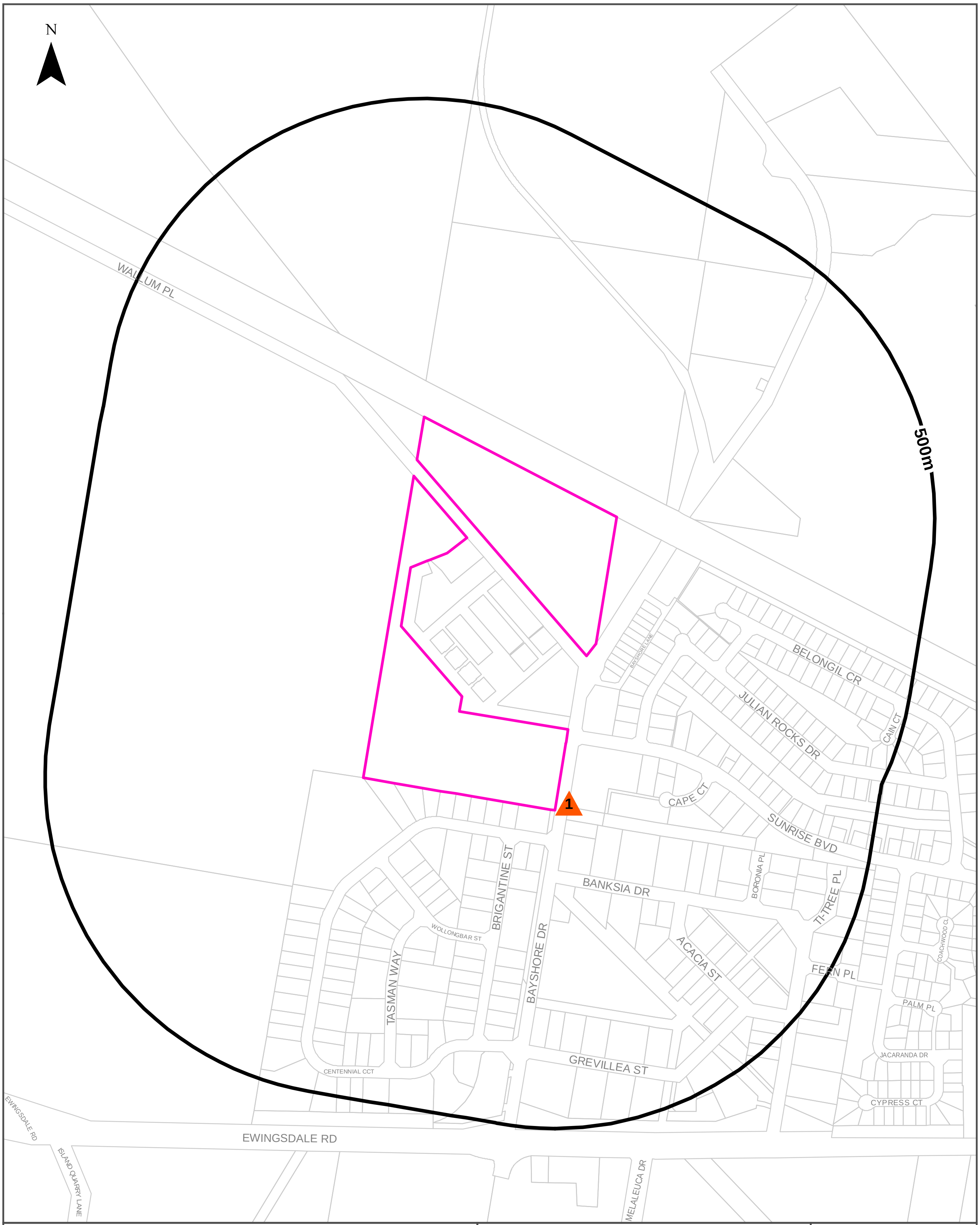
Universal Business Directory records from years 1991, 1982, 1970, 1961 & 1950, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Road Corridor or Area
1	Holiday Accommodation	Belongil Wood Resort., Bayshore Dr. Byron Bay. 2481	192351	1991	Road Match	0m
	Motor Spare Parts Dealers - Retail	Bryon Bay Auto Spares., Bayshore Dr. Byron Bay. 2481	192451	1991	Road Match	0m
	Brick Mfrs. &/Or Dists.	Byron Block Pty. Ltd., Bayshore Dr. Byron Bay. 2481	191390	1991	Road Match	0m
	Concrete Block &/Or Brick Mfrs. &/Or Dists.	Byron Block Pty. Ltd., Bayshore Dr. Byron Bay. 2481	192241	1991	Road Match	0m
	Motor Car Dealers - New &/Or Used	Ozigo Motor Market., Bayshore Dr. Byron Bay. 2481	192441	1991	Road Match	0m
	Motor Garages & Service Stations	Ozigo Motor Market., Bayshore Dr. Byron Bay. 2481	192445	1991	Road Match	0m
	Builders Supplies	Summerland Timberland., Industrial Estate. Bayshore Dr. Byron Bay. 2481	191403	1991	Road Match	0m
	Buildings - Pre-Fabricated, Portable &/Or Modular Mfrs. &/Or Dists. &/Or Erectors	Summerland Timberland., Industrial Estate. Bayshore Dr. Byron Bay. 2481	191404	1991	Road Match	0m
	Roof Trusses Mfrs. &/Or Dists.	Summerland Timberland., Industrial Estate. Bayshore Dr. Byron Bay. 2481	192534	1991	Road Match	0m
	Roofing Material Mfrs. &/Or Dists.	Summerland Timberland., Industrial Estate. Bayshore Dr. Byron Bay. 2481	192536	1991	Road Match	0m
	Timber Merchants &/Or Sawmillers	Summerland Timberland., Industrial Estate. Bayshore Dr. Byron Bay. 2481	192590	1991	Road Match	0m
	Wallboard Mfrs. &/Or Imps. &/Or Dists.	Summerland Timberland., Industrial Estate. Bayshore Dr. Byron Bay. 2481	193372	1991	Road Match	0m
	CONCRETE BLOCK &/OR BRICK MFRS, &/OR DISTS.	Byron Block Pty. Ltd., Bay Shaw Dr., Bryon Bay	86813	1982	Road Match	0m
	CAMPING GROUNDS &/OR CARAVAN PARKS.	Globetrotters Beachfront Caravan Resort, Bay Shaw Dr., Bryon Bay	86797	1982	Road Match	0m
2	Manchester Goods Mfrs. &/Or W/Salers	7Entai Futons., 1. Industrial Estate. 35 Banksia Dr. Byron Bay. 2481	192406	1991	Road Match	95m
	Window Frame Mfrs. &/Or Dists. - Aluminium	Baylite Windows & Doors., Banksia Dr. Byron Bay. 2481	193377	1991	Road Match	95m
	Auto Electricians	Byron Auto Electrical., Industrial Estate. Banksia Dr. Byron Bay. 2481	191372	1991	Road Match	95m
	Battery Sales &/Or Service	Byron Auto Electrical., Industrial Estate. Banksia Dr. Byron Bay. 2481	191382	1991	Road Match	95m
	Furniture Mfrs. &/Or W/Salers. - General	Byron Bamboo., 4. Industrial Estate. 35 Banksia Dr. Byron Bay. 2481	192296	1991	Road Match	95m
	Builders Supplies	Byron Bay Building Materials., Industrial Estate. Banksia Dr. Byron Bay. 2481	191402	1991	Road Match	95m
	Hardware - Retail	Byron Bay Building Materials., Industrial Estate. Banksia Dr. Byron Bay. 2481	192329	1991	Road Match	95m
	Paint, Enamel, Varnish &/Or Stain Mfrs. &/Or Imps. &/Or Dists.	Byron Bay Building Materials., Industrial Estate. Banksia Dr. Byron Bay. 2481	192475	1991	Road Match	95m
	Cabinet Makers	Byron Bay Joinery., Industrial Estate. Banksia Dr. Byron Bay. 2481	191412	1991	Road Match	95m
	Joinery Manufacturers &/Or Merchants	Byron Bay Joinery., Industrial Estate. Banksia Dr. Byron Bay. 2481	192389	1991	Road Match	95m
	Paint &/Or Accessories - Retail	Byron Bay Joinery., Industrial Estate. Banksia Dr. Byron Bay. 2481	192472	1991	Road Match	95m
	Plumbers Supplies	Byron Bay Joinery., Industrial Estate. Banksia Dr. Byron Bay. 2481	192488	1991	Road Match	95m
	Power Tools	Byron Bay Joinery., Industrial Estate. Banksia Dr. Byron Bay. 2481	192492	1991	Road Match	95m

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Road Corridor or Area
2	Tool Dealers - Retail	Byron Bay Joinery., Industrial Estate. Banksia Dr. Byron Bay. 2481	192591	1991	Road Match	95m
	Leadlight & Stained Glass Workers	Byron Bay Stained Glass Works., 3. Industrial Estate. 35 Banksia Dr. Byron Bay. 2481	192396	1991	Road Match	95m
	Engineers - General	Byron Steel., Industrial Estate. Banksia Dr. Byron Bay. 2481	192275	1991	Road Match	95m
	Sheet Metal Workers	Byron Steel., Industrial Estate. Banksia Dr. Byron Bay. 2481	192545	1991	Road Match	95m
	Engineers - General	Byron Steel., Industrial Estate. Banksia Drive. Byron Bay. 2481	192272	1991	Road Match	95m
	Take-Away Foods	Estate Take Aways., Industrial Estate. Banksia Dr. Byron Bay. 2481	192577	1991	Road Match	95m
	Engineers - General	Hughes. A C & J., Unit 4. Industrial Estate. Banksia Dr. Byron Bay. 2481	192276	1991	Road Match	95m
	Filter Mfrs. &/Or Dists.	Hughes. A. C & J., Unit 4. Industrial Estate. Banksia Dr. Byron Bay. 2481	192278	1991	Road Match	95m
	Welders	Hughes. A. C. & J., Unit 4. Industrial Estate. Banksia Dr. Byron Bay. 2481	193376	1991	Road Match	95m
	Clothing - Retail - Sportswear	Laddeg'S Surf Centre., Industrial Estate. Banksia Dr. Byron Bay. 2481	192235	1991	Road Match	95m
	Printers - General	Lighthouse Print., Unit 3. Lot 2. Industrial Estate. Banksia Dr. Byron Bay. 2481	192494	1991	Road Match	95m
	Printers - Lithographic	Lighthouse Print., Unit 3. Lot 2. Industrial Estate. Banksia Dr. Byron Bay. 2481	192498	1991	Road Match	95m
	Printers - Lithographic	Lighthouse Print., Unit 3. Lot 2. Industrial Estate. Banksia Drive. Byron Bay. 2481	192496	1991	Road Match	95m
	Surfboards &/Or Surfing Equipment Mfrs. &/Or Dists.	Maddog'S Surf Centre., Industrial Estate. Banksia Dr. Byron Bay. 2481	192568	1991	Road Match	95m
	Concrete - Ready Mixed	Pioneer Concrete., Industrial Estate. Banksia Dr. Byron Bay. 2481	192242	1991	Road Match	95m
	Boat, Launch &/Or Yacht Builders &/Or Designers &/Or Repairers	Project Boats., Industrial Estate. Lot 6. Banksia Drive. Byron Bay. 2481	191387	1991	Road Match	95m
	Boat, Launch &/Or Yacht Builders &/Or Designers &/Or Repairers	Project Boats., Lot 6. Industrial Estate. Banksia Dr. Byron Bay. 2481	191388	1991	Road Match	95m
	Fibreglass Repair Specialists	Project Boats., Lot 6. Industrial Estate. Banksia Dr. Byron Bay. 2481	192277	1991	Road Match	95m
	Motor Accessories - Retail	Ron Auto Electrical., Industrial Estate. Banksia Dr. Byron Bay. 2481	192438	1991	Road Match	95m
	Food Products Mfrs. &/Or Processors	Sunray Salads., Industrial Estate. Banksia Dr. Byron Bay. 2481	192287	1991	Road Match	95m
	Mattress &/Or Bedding Mfrs. &/Or Dists.	Zenlai Futons., 1. Industrial Estate. 35 Banksia Dr. Byron Bay. 2481	192411	1991	Road Match	95m
	Manchester Goods Retail	Zentai Futons., 1. Industrial Estate. 35 Banksia Dr. Byron Bay. 2481	192408	1991	Road Match	95m
	MOTOR ELECTRICIANS.	Byron Bay Joinery & Builders Supplies, Banksia Dr., Bryon Bay	86882	1982	Road Match	95m
	HARDWARE &/OR BUILDERS SUPPLIES.	Byron Bay Joinery Pty. Ltd., Banksia Dr., Bryon Bay	86851	1982	Road Match	95m
	ROOF TRUSSES MFRS. &/OR DISTS.	Byron Bay Roof Trusses & Frames Pty. Ltd., Industrial Estate, Banksia Dr., Bryon Bay	86920	1982	Road Match	95m
	ROOF TRUSSES MFRS. &/OR DISTS.	Roof Trusses & Frames Ply. Ltd. Banksia Drive, Byron Bay., Bryon Bay	86921	1982	Road Match	95m
3	Builders &/Or Building Contractors	R.T.C Homes., Julian Rocks Dr. Byron Bay. 2481	191397	1991	Road Match	105m

Dry Cleaners, Motor Garages & Service Stations

42 Wallum Place, Byron Bay, NSW 2481



Legend

▭ Site Boundary	● Business directory records mapped to a specific premise
▭ Buffer 500m	■ Business directory records mapped to a road intersection
▭ Property Boundary	▲ Business directory records mapped to a road corridor
	▨ Business directory records mapped to a general area

Scale:

0 110 220 330 440
Meters

Coordinate System:
GDA 1994 MGA Zone 56

Date: 19 March 2021

Data Sources: Reproduced with permission of UBD and Hardie Grant Media Pty Ltd DD 01/08/2018
Property Boundaries © NSW Department Finance, Services & Innovation 2021

Historical Business Directories

42 Wallum Place, Byron Bay, NSW 2481

Dry Cleaners, Motor Garages & Service Stations Premise or Road Intersection Matches

Dry Cleaners, Motor Garages & Service Stations from UBD Business Directories, mapped to a premise or road intersection, within the dataset buffer.

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Property Boundary or Road Intersection	Direction
	No records in buffer						

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Dry Cleaners, Motor Garages & Service Stations Road or Area Matches

Dry Cleaners, Motor Garages & Service Stations from UBD Business Directories, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published.

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Road Corridor or Area
1	Motor Garages & Service Stations	Ozigo Motor Market., Bayshore Dr. Byron Bay. 2481	192445	1991	Road Match	0m

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Cattle Dips

42 Wallum Place, Byron Bay, NSW 2481

Cattle Dips of the Northern Rivers Region

Cattle dip sites within the dataset buffer:

Dip Name	Road	Town	Dip Status	Licence / Lease Status	Licence / Lease Expiry Date	Distance (m)	Direction
N/A	No records in buffer						

Cattle dip site data provided by the NSW Department of Primary Industries.

Aerial Imagery 2020

42 Wallum Place, Byron Bay, NSW 2481

Legend

- 🟪 Site Boundary
- ⬛ Buffer 150m

Scale: 0 40 80 120 160 Meters	Data Sources: Aerial Imagery © Aerometrex Pty Ltd	Coordinate System: GDA 1994 MGA Zone 56	Date: 19 March 2021

Aerial Imagery 2015

42 Wallum Place, Byron Bay, NSW 2481

Scale:

Data Source Aerial Imagery: © 2021 Google Inc, used with permission. Google and the Google logo are registered trademarks of Google Inc.

Coordinate System:
GDA 1994 MGA Zone 56

Date: 18 March 2021

Aerial Imagery 2009

42 Wallum Place, Byron Bay, NSW 2481

Legend

- 🟪 Site Boundary
- ⬛ Buffer 150m

Scale:

Data Source Aerial Imagery: © 2021 Google Inc, used with permission. Google and the Google logo are registered trademarks of Google Inc.

Coordinate System:
GDA 1994 MGA Zone 56

Date: 18 March 2021

Aerial Imagery 2006

42 Wallum Place, Byron Bay, NSW 2481

Scale:

0 40 80 120 160

Meters

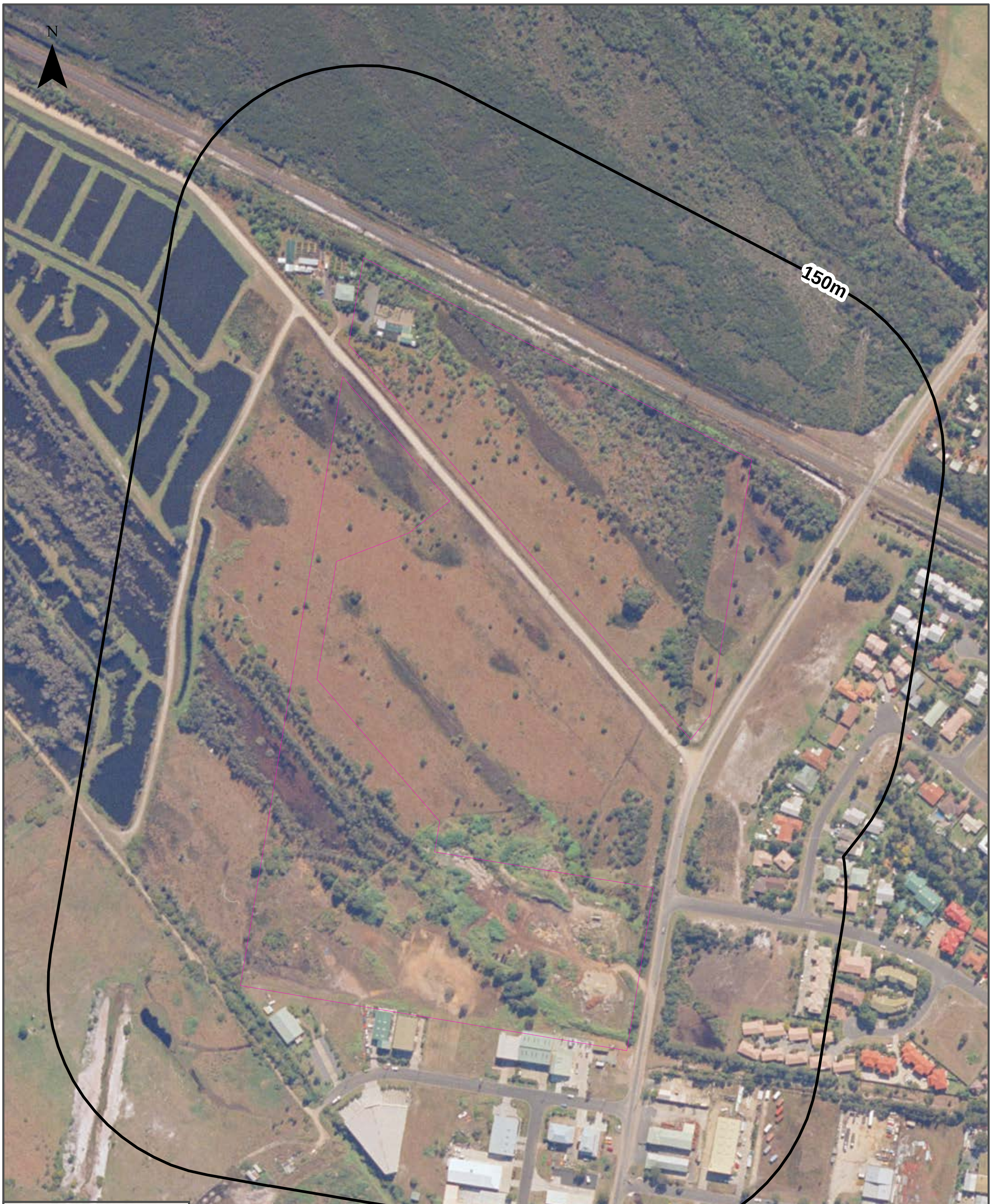
Data Source Aerial Imagery: © 2021 Google Inc, used with permission. Google and the Google logo are registered trademarks of Google Inc.

Coordinate System:
GDA 1994 MGA Zone 56

Date: 18 March 2021

Aerial Imagery 1997

42 Wallum Place, Byron Bay, NSW 2481



Legend

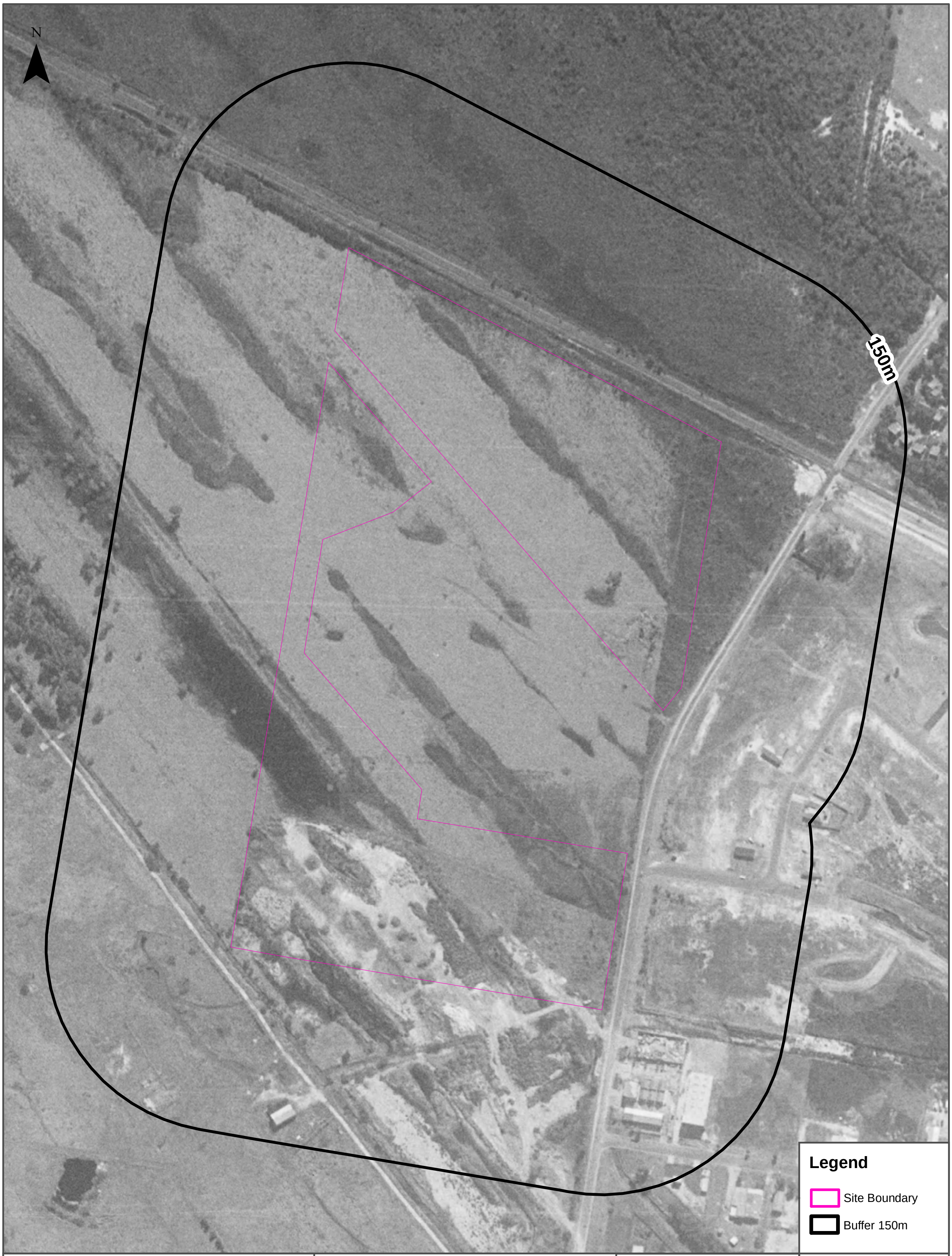
🟪 Site Boundary

⬛ Buffer 150m

Scale: 0 40 80 120 160 Meters	Data Source Aerial Imagery: © NSW Department of Customer Service	Coordinate System: GDA 1994 MGA Zone 56	Date: 18 March 2021

Aerial Imagery 1987

42 Wallum Place, Byron Bay, NSW 2481



Legend

🟪	Site Boundary
⬛	Buffer 150m

Scale: 0 40 80 120 160 Meters	Data Source Aerial Imagery: © NSW Department of Customer Service	Coordinate System: GDA 1994 MGA Zone 56	Date: 18 March 2021

Aerial Imagery 1979

42 Wallum Place, Byron Bay, NSW 2481

Legend

🟪 Site Boundary

⬛ Buffer 150m

Scale:

Data Source Aerial Imagery:
© NSW Department of Customer Service

Coordinate System:
GDA 1994 MGA Zone 56

Date: 18 March 2021

Aerial Imagery 1971

42 Wallum Place, Byron Bay, NSW 2481

Scale:
0 40 80 120 160
Meters

Data Source Aerial Imagery:
© NSW Department of Customer Service

Coordinate System:
GDA 1994 MGA Zone 56

Date: 18 March 2021

Aerial Imagery 1966

42 Wallum Place, Byron Bay, NSW 2481

Legend

🟪 Site Boundary

⬛ Buffer 150m

Scale:

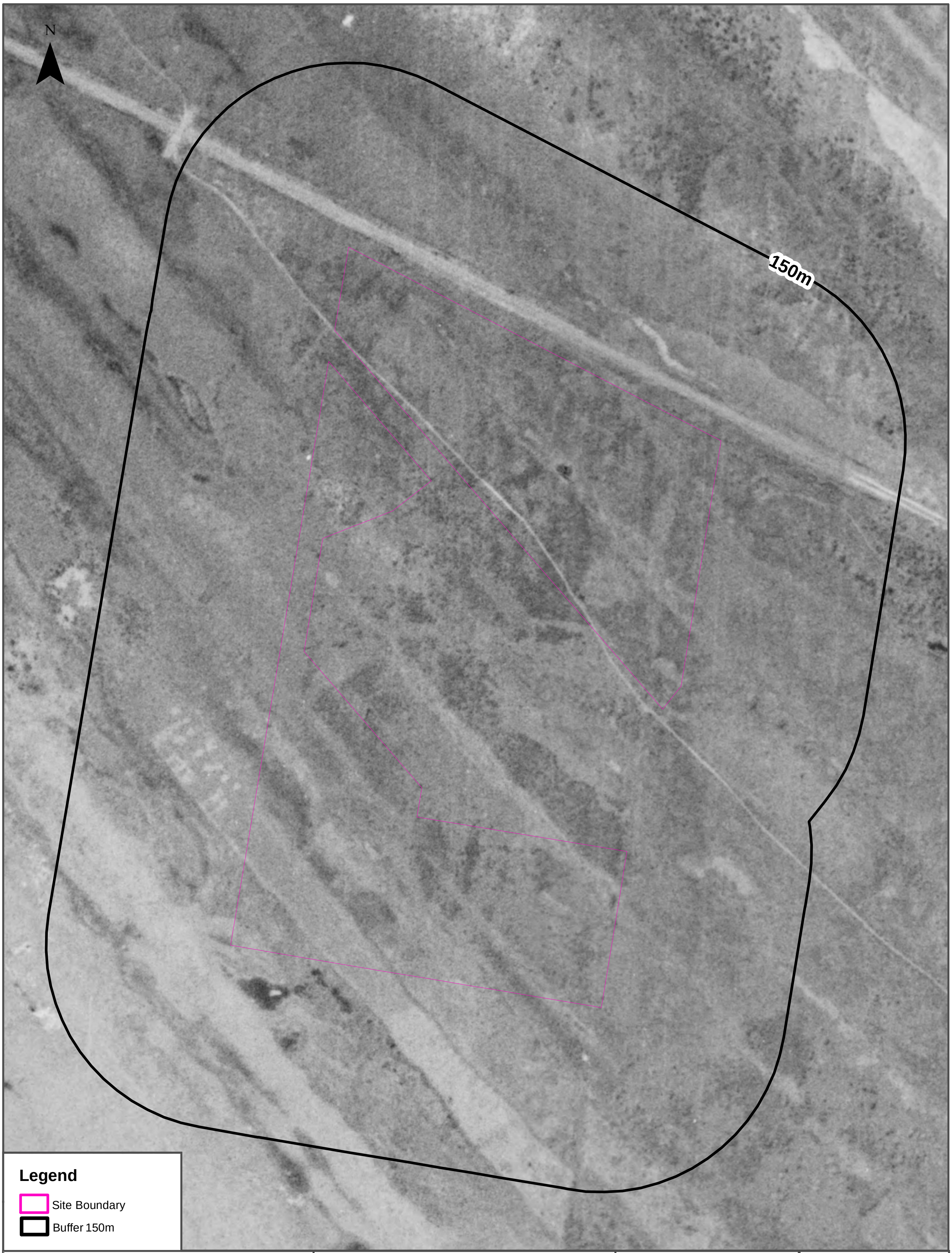
Data Source Aerial Imagery:
© NSW Department of Customer Service

Coordinate System:
GDA 1994 MGA Zone 56

Date: 18 March 2021

Aerial Imagery 1958

42 Wallum Place, Byron Bay, NSW 2481



Legend

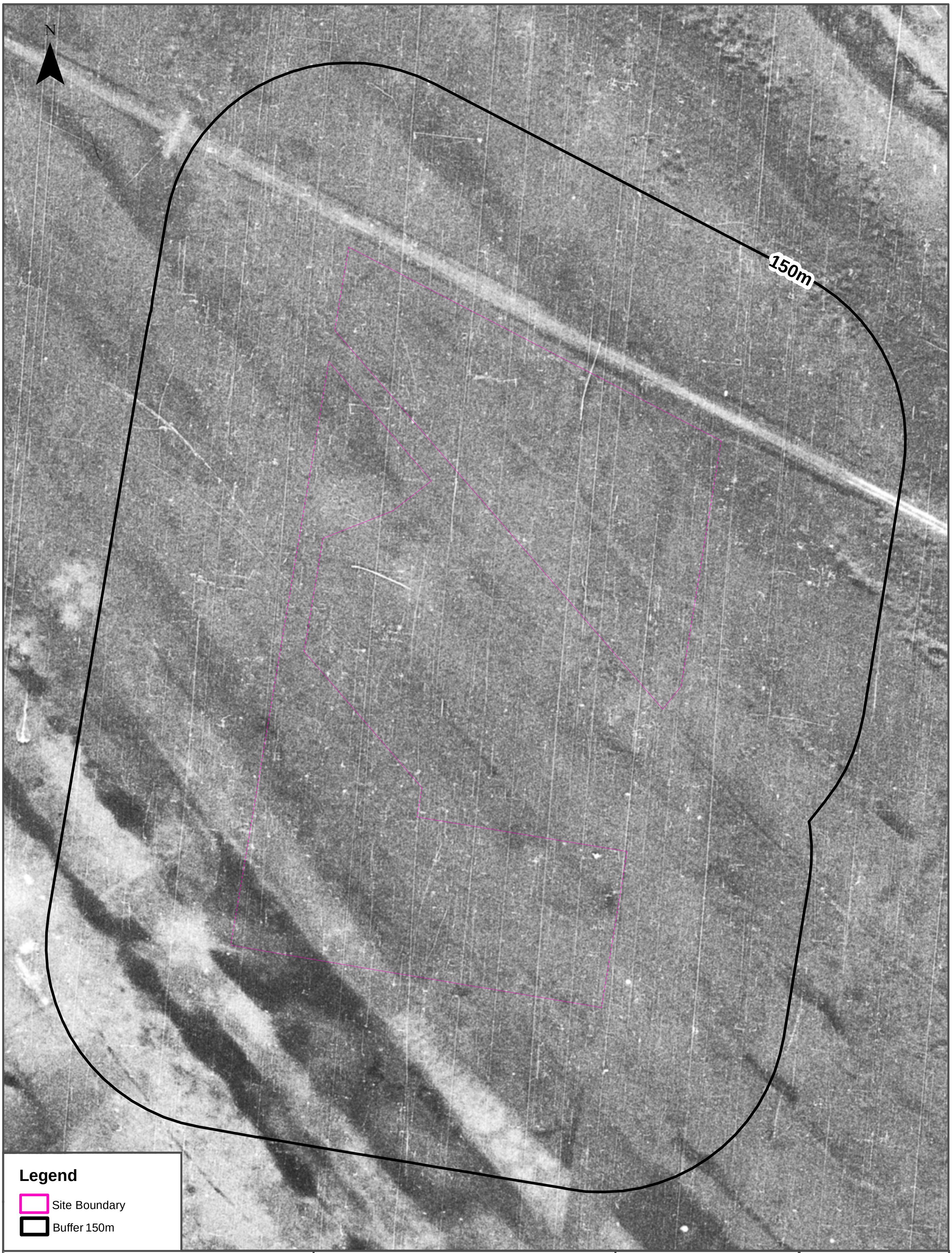
🟪 Site Boundary

⬛ Buffer 150m

Scale: 0 40 80 120 160 Meters	Data Source Aerial Imagery: © NSW Department of Customer Service	Coordinate System: GDA 1994 MGA Zone 56	Date: 18 March 2021

Aerial Imagery 1947

42 Wallum Place, Byron Bay, NSW 2481



Scale:

0 40 80 120 160
Meters

Data Source Aerial Imagery:
©2021 Geoscience Australia

Coordinate System:
GDA 1994 MGA Zone 56

Date: 18 March 2021

Topographic Map 2015

42 Wallum Place, Byron Bay, NSW 2481

Scale:
0 100 200 400 600
Meters

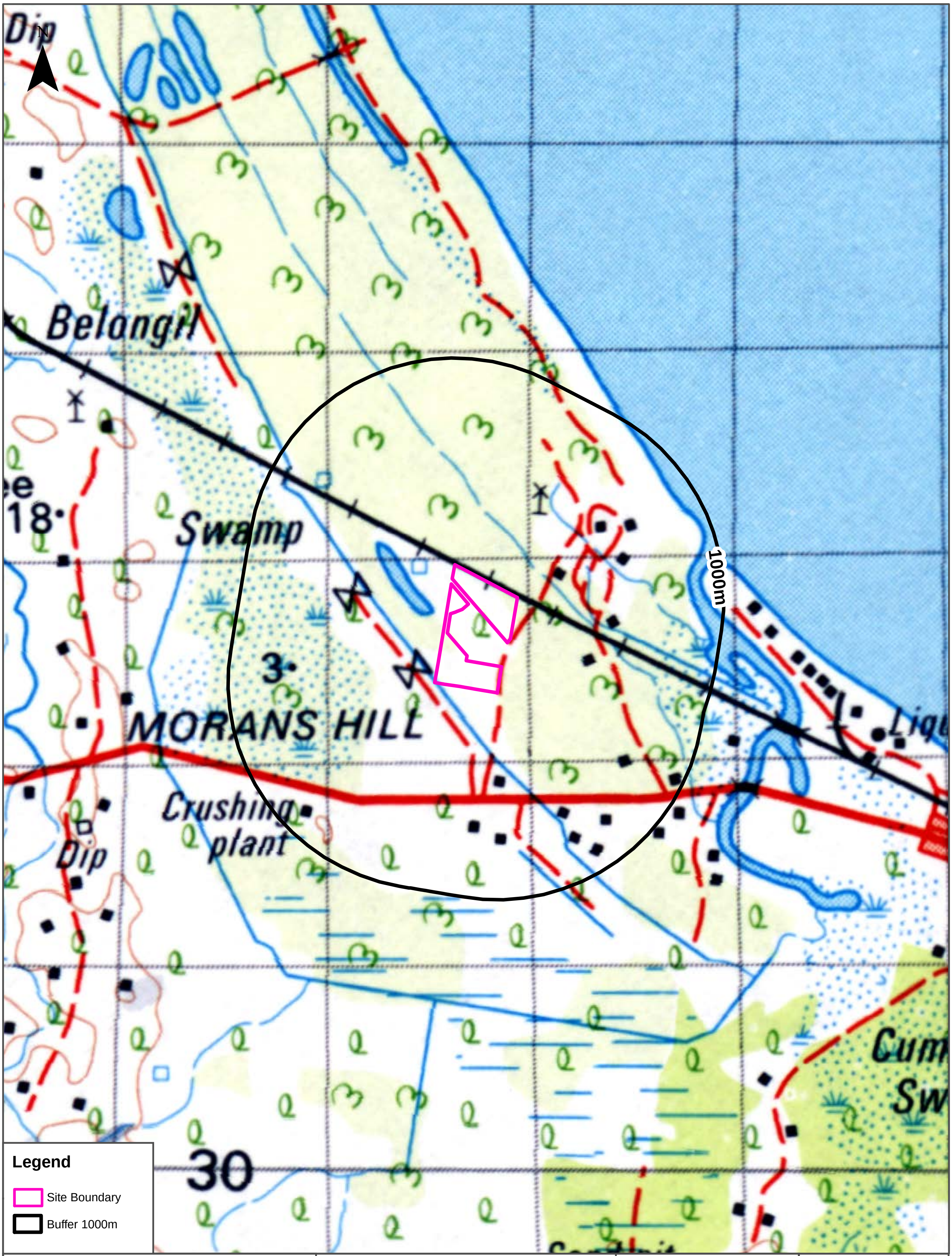
Data Sources: Topographic Map Data
© NSW Land and Property Information

Coordinate System:
GDA 1994 MGA Zone 56

Date: 19 March 2021

Historical Map 1973

42 Wallum Place, Byron Bay, NSW 2481



Legend

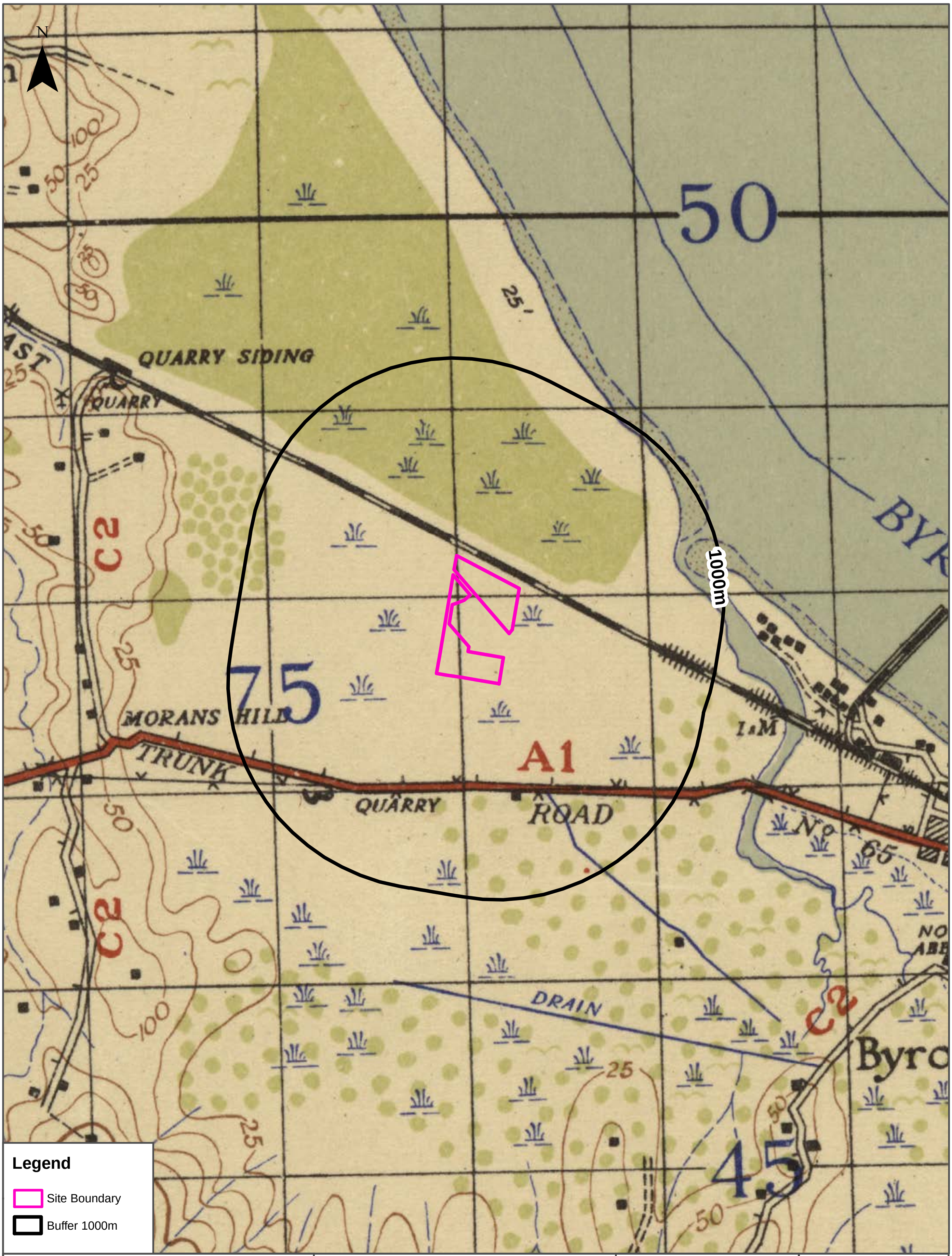
🟪 Site Boundary

⬛ Buffer 1000m

Scale: 0 200 400 800 1,200 Metres	Data Sources: NATMAP 1:100,000 Topographic Maps Geoscience Australia	Coordinate System: GDA 1994 MGA Zone 56	Date: 19 March 2021

Historical Map c.1942

42 Wallum Place, Byron Bay, NSW 2481



Legend

🟪 Site Boundary

⬛ Buffer 1000m

Scale:
0 200 400 800
Meters

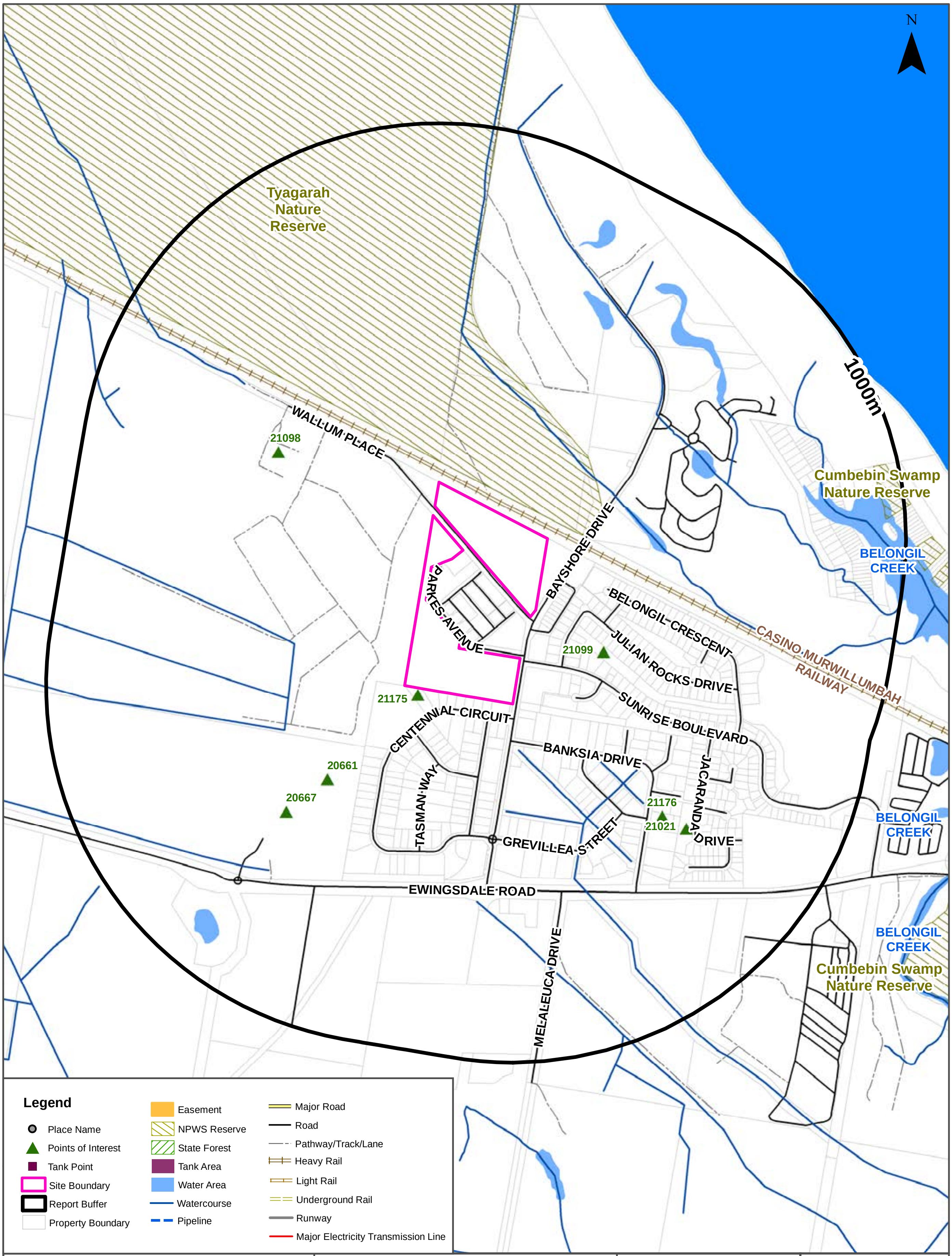
Data Sources: Australia 1:63360
Produced by Australian Section Imperial General Staff

Coordinate System:
GDA 1994 MGA Zone 56

Date: 19 March 2021

Topographic Features

42 Wallum Place, Byron Bay, NSW 2481



Scale:

Data Sources: Property Boundaries & Topographic Data:
© Department Finance, Services & Innovation 2021

Coordinate System:
GDA 1994 MGA Zone 56

Date: 19 March 2021

Topographic Features

42 Wallum Place, Byron Bay, NSW 2481

Points of Interest

What Points of Interest exist within the dataset buffer?

Map Id	Feature Type	Label	Distance	Direction
21175	Place Of Worship	EASTGATE CHRISTIAN COMMUNITY	19m	South West
21099	Park	Park	222m	East
20661	Helipad	BYRON BAY HELIPAD	339m	South West
21098	Sewage Works	Sewage Works	456m	North West
20667	Community Facility	BYRON REGIONAL SPORT AND CULTURAL COMPLEX MULTI PU	482m	South West
21176	Place Of Worship	CHRISTIAN CITY CHURCH BYRON BAY	522m	South East
21021	Park	SUNRISE PARK	596m	South East

Topographic Data Source: © Land and Property Information (2015)
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Topographic Features

42 Wallum Place, Byron Bay, NSW 2481

Tanks (Areas)

What are the Tank Areas located within the dataset buffer?
Note. The large majority of tank features provided by LPI are derived from aerial imagery & are therefore primarily above ground tanks.

Map Id	Tank Type	Status	Name	Feature Currency	Distance	Direction
	No records in buffer					

Tanks (Points)

What are the Tank Points located within the dataset buffer?
Note. The large majority of tank features provided by LPI are derived from aerial imagery & are therefore primarily above ground tanks.

Map Id	Tank Type	Status	Name	Feature Currency	Distance	Direction
	No records in buffer					

Tanks Data Source: © Land and Property Information (2015)

Major Easements

What Major Easements exist within the dataset buffer?
Note. Easements provided by LPI are not at the detail of local governments. They are limited to major easements such as Right of Carriageway, Electrical Lines (66kVa etc.), Easement to drain water & Significant subterranean pipelines (gas, water etc.).

Map Id	Easement Class	Easement Type	Easement Width	Distance	Direction
N/A	No records in buffer				

Easements Data Source: © Land and Property Information (2015)

Topographic Features

42 Wallum Place, Byron Bay, NSW 2481

State Forest

What State Forest exist within the dataset buffer?

State Forest Number	State Forest Name	Distance	Direction
N/A	No records in buffer		

State Forest Data Source: © NSW Department of Finance, Services & Innovation (2018)

National Parks and Wildlife Service Reserves

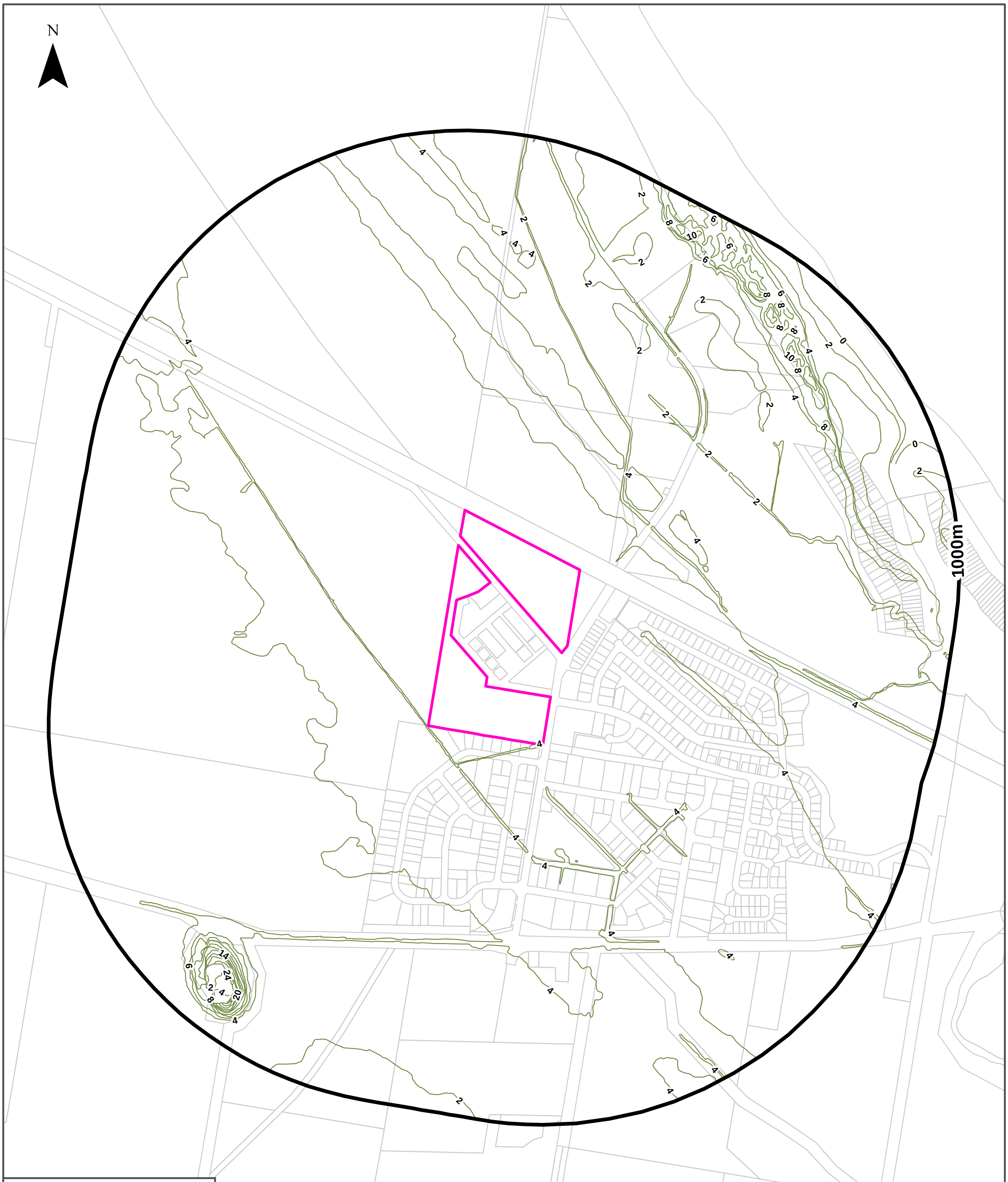
What NPWS Reserves exist within the dataset buffer?

Reserve Number	Reserve Type	Reserve Name	Gazetted Date	Distance	Direction
N0575	NATURE RESERVE	Tyagarah Nature Reserve	26/09/1986	51m	North
N0781	NATURE RESERVE	Cumbebin Swamp Nature Reserve	05/03/1999	930m	South East

NPWS Data Source: © NSW Department of Finance, Services & Innovation (2018)

Elevation Contours (m AHD)

42 Wallum Place, Byron Bay, NSW 2481



Legend

- Elevation Contour (m AHD)
- 🟪 Site Boundary
- ⬛ Report Buffer
- ☐ Property Boundary

Accuracy & Currency: This contour data can be up to 0.4 of the contour interval out in height and must therefore not be used for any design or engineering works, but only as a general guide to topography. Gaps may occur along contour lines due to vertical topography, obscured topography in the source photography such as buildings, dense vegetation or dead ground, or the fact that original buildings have been replaced in the intervening thirty years since the original contour capture.

Scale: 0 100 200 400 Meters	Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2021	Coordinate System: GDA 1994 MGA Zone 56	Date: 19 March 2021

Hydrogeology & Groundwater

42 Wallum Place, Byron Bay, NSW 2481

Hydrogeology

Description of aquifers on-site:

Description
Porous, extensive highly productive aquifers

Description of aquifers within the dataset buffer:

Description
Porous, extensive highly productive aquifers

Hydrogeology Map of Australia : Commonwealth of Australia (Geoscience Australia)

Temporary Water Restriction (Botany Sands Groundwater Source) Order 2018

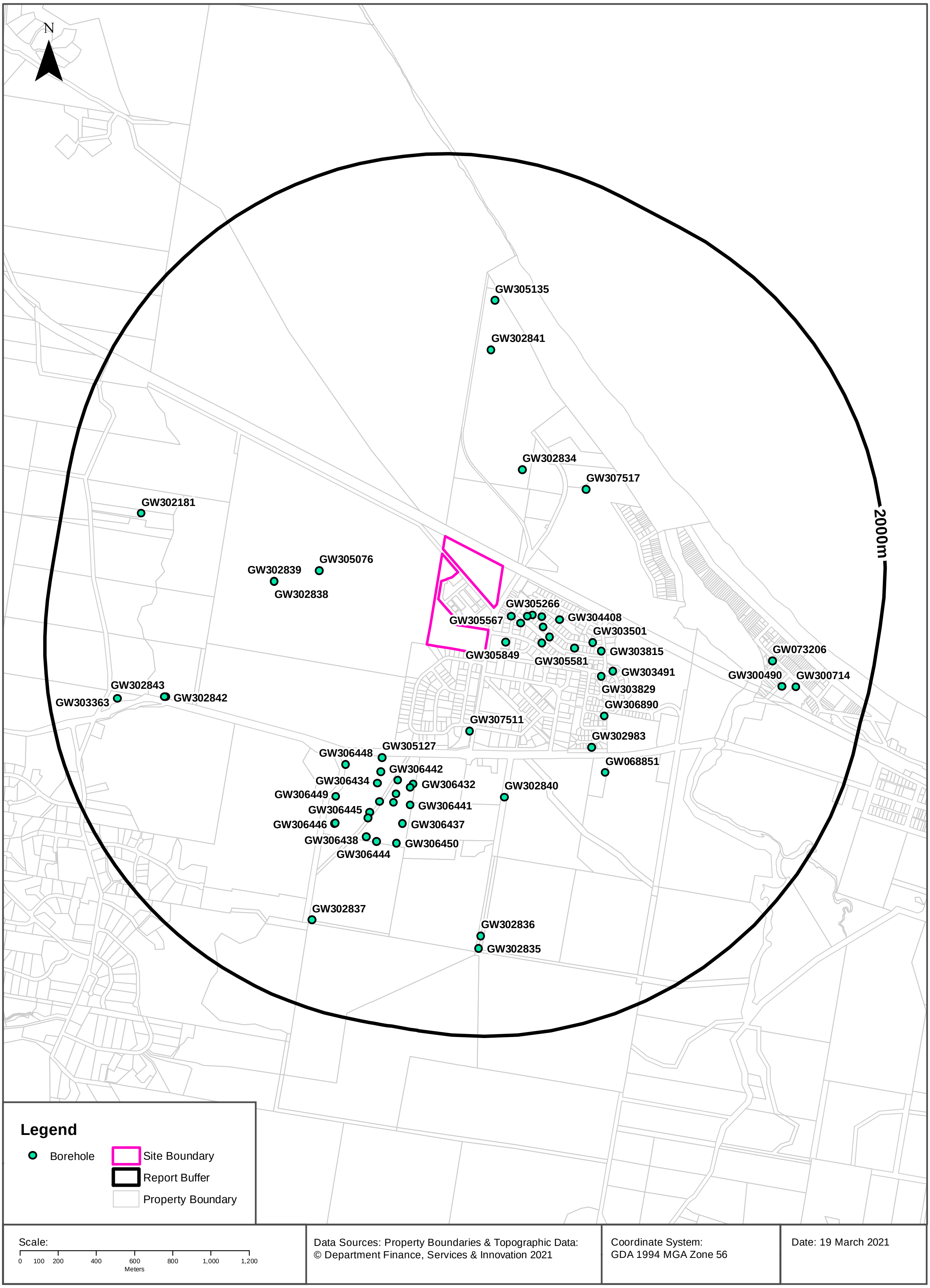
Temporary water restrictions relating to the Botany Sands aquifer within the dataset buffer:

Prohibition Area No.	Prohibition	Distance	Direction
N/A	No records in buffer		

Temporary Water Restriction (Botany Sands Groundwater Source) Order 2018 Data Source : NSW Department of Primary Industries

Groundwater Boreholes

42 Wallum Place, Byron Bay, NSW 2481



Data Sources: Property Boundaries & Topographic Data:
© Department Finance, Services & Innovation 2021

Coordinate System:
GDA 1994 MGA Zone 56

Date: 19 March 2021

Hydrogeology & Groundwater

42 Wallum Place, Byron Bay, NSW 2481

Groundwater Boreholes

Boreholes within the dataset buffer:

GW No.	Licence No	Work Type	Owner Type	Authorised Purpose	Intended Purpose	Name	Complete Date	Final Depth (m)	Drilled Depth (m)	Salinity (mg/L)	SWL (m bgl)	Yield (L/s)	Elev (AHD)	Dist	Dir
GW305849	30BL184066	Other		Dewatering (groundwater)	Dewatering (groundwater)		27/02/2006	3.00			1.00	40.000		100m	South East
GW305567	30BL180991	Spear	Private	Domestic	Domestic		16/12/2002	17.00						100m	East
GW300897	30BL177834	Bore		Domestic	Domestic		17/10/1997	11.50	11.50			0.530		161m	South East
GW072870	30BL150505	Spear	Private	Domestic	Domestic		18/09/1992	4.00	4.00	Brackish	3.00	2.000		173m	East
GW305266	30BL177952	Bore	Private	Domestic	Domestic		25/08/2005							197m	East
GW070817	30BL150498	Spear	Private	Domestic	Domestic		18/09/1992	4.00	4.00	Brackish	3.00	2.000	7.00	247m	East
GW304393	30BL182149	Bore	Private	Domestic	Domestic		22/09/2003	12.50	12.50		2.80	0.400		273m	East
GW072040	30BL176611	Spear	Private	Domestic	Domestic		20/12/1994	10.00	10.00		2.50	0.480		290m	South East
GW303762	30BL180525	Bore		Domestic	Domestic		18/12/2002	11.50	11.80		3.00	0.400		324m	South East
GW304408	30BL182192	Spear	Private	Domestic	Domestic		15/11/2003	11.90	11.90		2.00	0.400		339m	East
GW307511	30BL185808	Excavation	Private	Dewatering (groundwater)	Dewatering (groundwater)		12/10/2013	5.00	5.00			1.600		410m	South
GW305581	30BL180505	Spear	Private	Domestic	Domestic		01/07/1993	18.00						462m	South East
GW302834	30BL178984	Bore		Monitoring Bore	Monitoring Bore		14/08/2000	2.00	2.00		0.50			494m	North East
GW303501	30BL180800	Bore		Domestic	Domestic		14/01/2003	13.00	13.00		2.50	0.400		543m	East
GW307517	30BL207016	Spear	Private	Test Bore	Test Bore	Nth Byron Beach Resort	21/03/2014	5.90	5.90		1.70	2.650		592m	North East
GW303815	30BL180801	Spear	Private	Domestic	Domestic		20/03/2003	12.20	12.20		1.90	0.400		601m	East
GW305076	30BL183408	Bore	Local Govt	Dewatering (groundwater)	Dewatering (groundwater)									619m	West
GW303829	30BL181570	Spear	Private	Domestic	Domestic		26/03/2003	13.70	13.70		2.30	0.300		626m	South East
GW305127	30BL179066	Bore	Private	Monitoring Bore	Monitoring Bore		12/04/2001	3.00	3.00					637m	South West
GW303491	30BL181080	Bore		Domestic	Domestic		16/01/2003	13.00	13.00		2.40	0.500		680m	South East
GW306890	30BL183400	Spear	Private	Domestic	Domestic		22/01/2005	13.00	13.00		2.10	0.300		708m	South East
GW306442	30BL179066	Bore	Private	Monitoring Bore	Monitoring Bore		12/04/2001							708m	South West
GW306433	30BL179066	Bore	Private	Monitoring Bore	Monitoring Bore		12/04/2001							728m	South
GW306432	30BL179066	Bore	Private	Monitoring Bore	Monitoring Bore		12/04/2001							732m	South
GW302983	30BL178388	Bore		Domestic	Domestic		15/10/2001	16.00	16.00					744m	South East
GW306440	30BL179066	Bore	Private	Monitoring Bore	Monitoring Bore		12/04/2001							753m	South

GW No.	Licence No	Work Type	Owner Type	Authorised Purpose	Intended Purpose	Name	Complete Date	Final Depth (m)	Drilled Depth (m)	Salinity (mg/L)	SWL (m bgl)	Yield (L/s)	Elev (AHD)	Dist	Dir
GW306448	30BL185176	Bore	Private	Monitoring Bore	Monitoring Bore		15/12/2008	1.44	1.44		0.05			758m	South West
GW302840	30BL178983	Bore		Monitoring Bore	Monitoring Bore		01/08/2000	3.70	3.70		1.00			758m	South
GW306434	30BL179066	Bore	Private	Monitoring Bore	Monitoring Bore		12/04/2001							772m	South West
GW306436	30BL179066	Bore	Private	Monitoring Bore	Monitoring Bore		12/04/2001							800m	South
GW302839	30BL178983	Bore		Monitoring Bore	Monitoring Bore		01/08/2000	3.50	3.50		0.50			841m	West
GW302838	30BL178983	Bore		Monitoring Bore	Monitoring Bore		01/08/2000	2.50	2.50		1.00			841m	West
GW306441	30BL179066	Bore	Private	Monitoring Bore	Monitoring Bore		12/04/2001							844m	South
GW306439	30BL179066	Bore	Private	Monitoring Bore	Monitoring Bore		12/04/2001							847m	South
GW306443	30BL179066	Bore	Private	Monitoring Bore	Monitoring Bore		12/04/2001							859m	South
GW068851	30BL142051	Bore	Private	Domestic, Stock	Domestic, Stock		27/06/1991	0.00	38.50					887m	South East
GW306449	30BL185176	Bore	Private	Monitoring Bore	Monitoring Bore		15/12/2008	2.08	2.08		0.00			928m	South West
GW306445		Bore	Private		Monitoring Bore		15/12/2008	2.20	2.20		0.20			928m	South West
GW306437	30BL179066	Bore	Private	Monitoring Bore	Monitoring Bore		12/04/2001							946m	South
GW306435	30BL179066	Bore	Private	Monitoring Bore	Monitoring Bore		12/04/2001							958m	South West
GW302841	30BL178984	Bore		Monitoring Bore	Monitoring Bore		01/08/2000	2.00	2.00		0.50			1003m	North
GW306447	30BL185176	Bore	Private	Monitoring Bore	Monitoring Bore		15/12/2008	1.40	1.40		0.00			1051m	South West
GW306450	30BL185176	Bore	Private	Monitoring Bore	Monitoring Bore		15/12/2008	1.45	1.45		0.00			1051m	South
GW306446	30BL185176	Bore	Private	Monitoring Bore	Monitoring Bore		15/12/2008	0.28	0.28		0.00			1054m	South West
GW306438	30BL179066	Bore	Private	Monitoring Bore	Monitoring Bore		12/04/2001							1055m	South
GW306444	30BL179066	Bore	Private	Monitoring Bore	Monitoring Bore		12/04/2001							1064m	South
GW305135	30BL180302	Bore		Monitoring Bore	Monitoring Bore		28/08/2002	6.00	6.00		0.55			1259m	North
GW302842	30BL178983	Bore		Monitoring Bore	Monitoring Bore		07/09/2000	3.50	3.50		1.33			1395m	West
GW302843	30BL178983	Bore		Monitoring Bore	Monitoring Bore		06/09/2000	3.00	3.00		1.08			1401m	West
GW073206	30BL176271	Spear	Private	Domestic	Domestic		18/11/1994	4.30		360	1.50	1.400		1474m	East
GW302836	30BL178983	Bore		Monitoring Bore	Monitoring Bore		01/08/2000	2.70	2.70		1.00			1474m	South
GW302835	30BL178983	Bore		Monitoring Bore	Monitoring Bore		01/08/2000	1.70	1.70		0.50			1540m	South
GW300490	30BL177096	Bore		Commercial	Domestic		06/11/1995	7.00	7.00					1554m	East
GW302837	30BL178983	Bore		Monitoring Bore	Monitoring Bore		01/08/2000	3.00	3.00		1.00			1562m	South West
GW302181	30BL177648	Bore		Domestic	Domestic		20/03/1997	48.70	48.70			0.575		1586m	West
GW300714	30BL177636	Bore		Industrial	Industrial		31/12/1985	8.00						1626m	East
GW303363	30BL179720	Bore		Domestic	Domestic		21/06/2002	51.00	51.00					1645m	West

Borehole Data Source : NSW Department of Primary Industries - Office of Water / Water Administration Ministerial Corporation for all bores prefixed with GW. All other bores © Commonwealth of Australia (Bureau of Meteorology) 2015. Creative Commons 3.0 © Commonwealth of Australia http://creativecommons.org/licenses/by/3.0/au/deed.en

Hydrogeology & Groundwater

42 Wallum Place, Byron Bay, NSW 2481

Driller's Logs

Drill log data relevant to the boreholes within the dataset buffer:

Groundwater No	Drillers Log	Distance	Direction
GW300897	0.00m-11.50m Sand	161m	South East
GW072870	0.00m-4.00m Indurated Sand	173m	East
GW070817	0.00m-4.00m Indurated Sand	247m	East
GW304393	0.00m-2.50m SAND GREY FINE 2.50m-11.30m COFFEE ROCK BROWN MG SOFT 11.30m-12.50m FREE FLOWING SAND LT BROWN MG	273m	East
GW072040	0.00m-10.00m Sand	290m	South East
GW303762	0.00m-1.00m FILL 1.00m-3.00m SAND GREY FINE 3.00m-11.00m COFFEE ROCK BROWN MG SOFT 11.00m-11.80m FREE FLOWING SAND LT BROWN MG	324m	South East
GW304408	0.00m-2.80m SAND GREY FINE 2.80m-10.50m COFFEE ROCK BROWN MG SOFT 10.50m-11.90m FREE FLOWING SAND LT BROWN MG	339m	East
GW302834	0.00m-2.00m Quartzose Sand	494m	North East
GW303501	0.00m-1.20m sand grey mg 1.20m-4.20m sand white 4.20m-11.80m coffee rock brown mg soft 11.80m-13.00m free flowing sand	543m	East
GW307517	0.00m-0.50m Soil; sandy, loamy 0.50m-1.20m Sand; graded brown to fine white 1.20m-4.50m Sand; grey, medium/fine 4.50m-4.60m Sand; firm, indurated 4.60m-5.80m Sand; medium, grey 5.80m-5.90m Sand; firm, indurated	592m	North East
GW303815	0.00m-0.90m SAND GREY FINE 0.90m-3.30m SAND WHITE FINE 3.30m-11.30m COFFEE ROCK BROWN MG SOFT 11.30m-12.20m FREE FLOWING SAND LT BROWN MG	601m	East
GW303829	0.00m-0.50m SAND GREY FINE 0.50m-3.00m SAND WHITE FINE 3.00m-12.50m COFFEE ROCK BROWN MG SOFT 12.50m-13.70m FREE FLOWING SAND LT BROWN MG	626m	South East
GW305127	0.00m-1.00m grey sand fine 1.00m-1.35m dark brown indurated sand (coffee rock0 1.35m-3.00m dark brown sand soft	637m	South West
GW303491	0.00m-0.80m fill 0.80m-4.00m sand white fine 4.00m-12.00m coffee rock 12.00m-13.00m free flowing sand	680m	South East
GW306890	0.00m-3.00m SAND GREY FINE 3.00m-12.20m ROCK COFFEE BROWN,SOFT 12.20m-13.00m SAND FREE FLOWING LT BROWN	708m	South East
GW302983	0.00m-2.40m Sand White Sand 2.40m-10.70m Coffee Rock Dark Brown 10.70m-12.20m Coffee Rock Brown 12.20m-12.80m Coffee Rock Light Brown 12.80m-13.40m Free Flowing Sand 13.40m-16.00m Sand Yellow	744m	South East

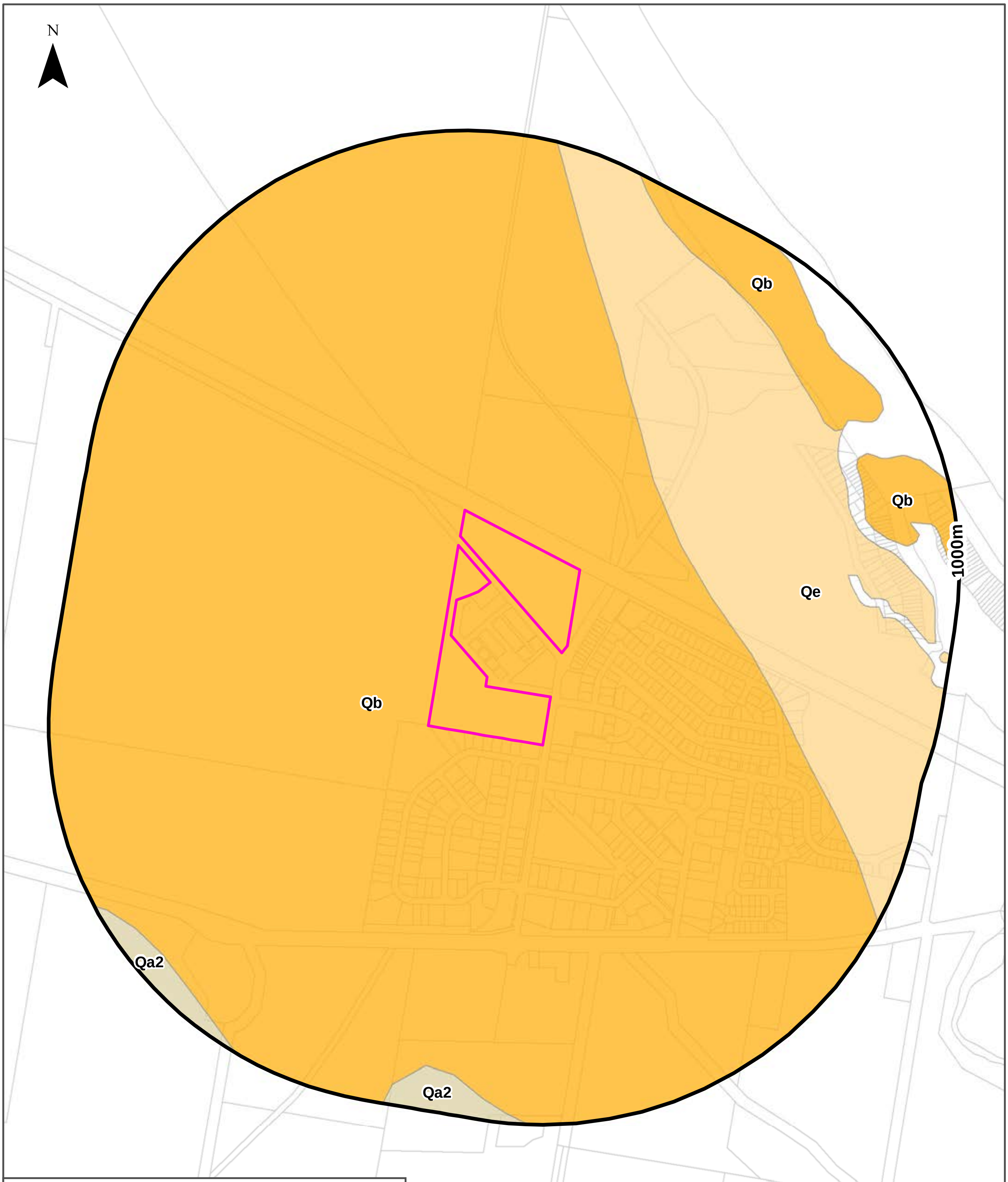
Groundwater No	Drillers Log	Distance	Direction
GW302840	0.00m-0.30m Organic Rich Sand 0.30m-3.00m Quartzose Sand 3.00m-3.70m Indurated Sand - Coffee Rock	758m	South
GW306448	0.00m-0.30m Soil, loose, peaty, saturated 0.30m-0.40m Peat. compacted, low permeability 0.40m-1.40m Sand, fine, grey, saturated, darker colour & odour with depth 1.40m-1.44m Rock, coffee rock base encountered, unable to penetrate with hand auger	758m	South West
GW302838	0.00m-0.20m Organic Rich Sand 0.20m-2.20m Quartzose Sand 2.20m-2.50m Coffee Rock - Indurated Sand	841m	West
GW302839	0.00m-0.50m Peat/Organic Silt 0.50m-3.00m Mud - Gel Like 3.00m-3.50m Quartzose Sand	841m	West
GW068851	0.00m-3.60m Sandy Soil 3.60m-12.00m Brown Clay 12.00m-13.00m Sandy Clay16.50m-20.70m Sandy Clay 20.70m-29.50m Clay & Stone 29.50m-34.00m Slippery Black Clay 34.00m-35.70m Clay With Rock Layers 35.70m-38.50m Hard Granite	887m	South East
GW306445	0.00m-2.20m Soil, sandy/silty, dark, rich, moist, very little seepage	928m	South West
GW306449	0.00m-0.35m Soil, dry, peaty 0.35m-0.45m Peat, compacted, low permeability 0.45m-2.08m Sand, fine, grey, saturated, darker colour & odour with depth. No bottom encountered	928m	South West
GW302841	0.00m-0.20m Organic Rich Sand 0.20m-2.00m Quartzose Sand	1003m	North
GW306447	0.00m-0.28m Soil, peaty, saturated, instant seepage from 0.05m 0.28m-0.40m Peat, compacted, low permeability 0.40m-1.40m Sand, fine, grey, saturated, darker colour & odour with depth 1.40m-1.40m Rock, coffee rock base encountered, unable to penetrate with hand auger	1051m	South West
GW306450	0.00m-0.10m Soil, reddish peaty organic matter 0.10m-0.45m Soil, peaty, saturated, instant seepage from 0.05m 0.45m-1.45m Sand, fine, grey, saturated, dark colour 1.45m-1.45m Rock, coffee rock base encountered, unable to penetrate with hand auger	1051m	South
GW306446	0.00m-0.28m Soil, peaty, saturated, instant seepage	1054m	South West
GW305135	0.00m-0.10m topsoil 0.10m-4.30m fine sand pale dark grey 4.30m-5.00m fine sand med brown - red 5.00m-6.00m indurated fine sand med brown - red	1259m	North
GW302842	0.00m-0.50m Soil/Road Base 0.50m-0.75m Fibric Peat 0.75m-1.80m Silty Sand 1.80m-2.00m Clayey Sand 2.00m-3.20m Sandy Mud 3.20m-3.50m Fine to course Sand	1395m	West
GW302843	0.00m-0.50m Soil/Road Base 0.50m-0.60m Organic Soil 0.60m-1.00m Fibric Peat 1.00m-2.00m Sand 2.00m-2.40m Sandy Mud 2.40m-2.85m Mud 2.85m-3.00m Fine to coarse Sand	1401m	West
GW302836	0.00m-0.50m Sand - Disturbed 0.50m-1.00m Peat (Swamp Debris) 1.00m-2.70m Quartzose Sand	1474m	South
GW302835	0.00m-0.50m Peat (Swamp Debris) 0.50m-1.70m Quartzose Sand	1540m	South
GW300490	0.00m-7.00m Sand	1554m	East
GW302837	0.00m-0.50m Organic Rich Sand 0.50m-1.00m Quartzose Sand 1.00m-2.00m Clayey Sand 2.00m-3.00m Quartzose Sand (Slightly Clayey)	1562m	South West

Groundwater No	Drillers Log	Distance	Direction
GW302181	0.00m-2.40m soil 2.40m-10.00m clay 10.00m-32.00m basalt 32.00m-36.50m white clay and hailstone 36.50m-48.70m red clay	1586m	West
GW303363	0.00m-3.00m Soil 3.00m-15.20m Clay 15.20m-24.00m Decomposed Clay 24.00m-33.50m Hailstone 33.50m-51.00m Clay	1645m	West

Drill Log Data Source: NSW Department of Primary Industries - Office of Water / Water Administration Ministerial Corp

Geology 1:250,000

42 Wallum Place, Byron Bay, NSW 2481



Legend

- 🟪 Site Boundary
- ⬛ Report Buffer
- ⬜ Property Boundary
- Fault
- Dyke
- Fold
- Marker Bed
- Trend Line
- Metamorphic Boundary
- Shear Zone
- Structure
- Thrust Fault
- Lineament

Scale:
0 100 200 400 600
Meters

Data Sources: Property Boundaries & Topographic Data:
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Coordinate System:
GDA 1994 MGA Zone 56

Date: 19 March 2021

Geology

42 Wallum Place, Byron Bay, NSW 2481

Geological Units

What are the Geological Units onsite?

Symbol	Description	Unit Name	Group	Sub Group	Age	Dom Lith	Map Sheet	Dataset
Qb	Prograded barrier beach, foredune & shoreface sands, barrier dune sand & terrestrial dunes & dune deflation areas & backbarrier - washover sand sheets & transgressive barrier deposits				Cainozoic			1:250,000

What are the Geological Units within the dataset buffer?

Symbol	Description	Unit Name	Group	Sub Group	Age	Dom Lith	Map Sheet	Dataset
Qa2	Quaternary alluvium overlying Quaternary marine & barrier sediments				Cainozoic			1:250,000
Qb	Prograded barrier beach, foredune & shoreface sands, barrier dune sand & terrestrial dunes & dune deflation areas & backbarrier - washover sand sheets & transgressive barrier deposits				Cainozoic			1:250,000
Qe	Transgressive tidal delta & channel sands & muddy sands, central basin muds, & fluvial bay-head deltas & shoreline deposits of silty sands with rare shells				Cainozoic			1:250,000

Geological Structures

What are the Geological Structures onsite?

Feature	Name	Description	Map Sheet	Dataset
No features				1:250,000

What are the Geological Structures within the dataset buffer?

Feature	Name	Description	Map Sheet	Dataset
No features				1:250,000

Geological Data Source : NSW Department of Industry, Resources & Energy

Naturally Occurring Asbestos Potential

42 Wallum Place, Byron Bay, NSW 2481

Naturally Occurring Asbestos Potential

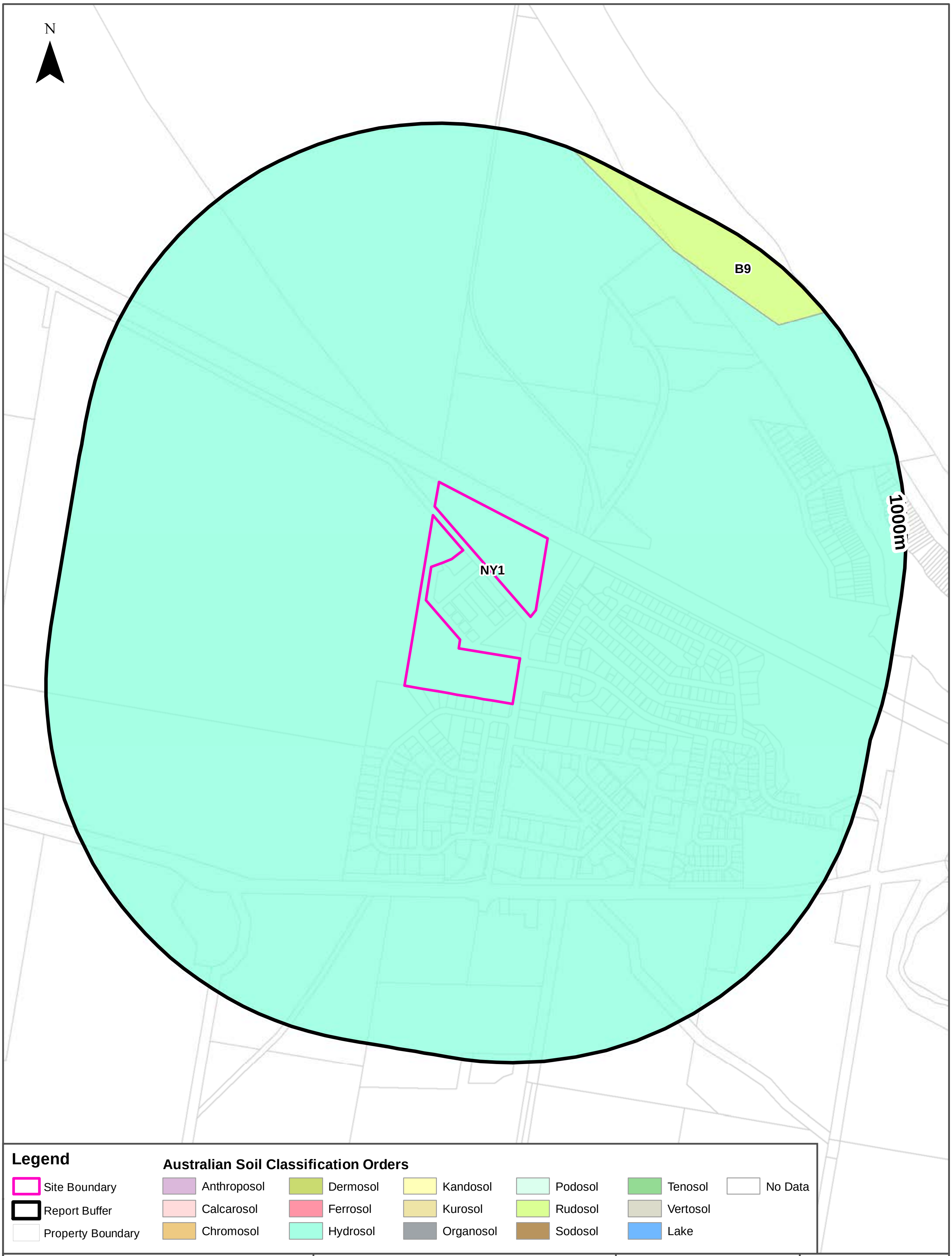
Naturally Occurring Asbestos Potential within the dataset buffer:

Potential	Sym	Strat Name	Group	Formation	Scale	Min Age	Max Age	Rock Type	Dom Lith	Description	Dist	Dir
No records in buffer												

Naturally Occurring Asbestos Potential Data Source: © State of New South Wales through NSW Department of Industry, Resources & Energy

Atlas of Australian Soils

42 Wallum Place, Byron Bay, NSW 2481



Scale:

Data Sources: Property Boundaries & Topographic Data:
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GDA 1994 MGA Zone 56

Date: 19 March 2021

Soils

42 Wallum Place, Byron Bay, NSW 2481

Atlas of Australian Soils

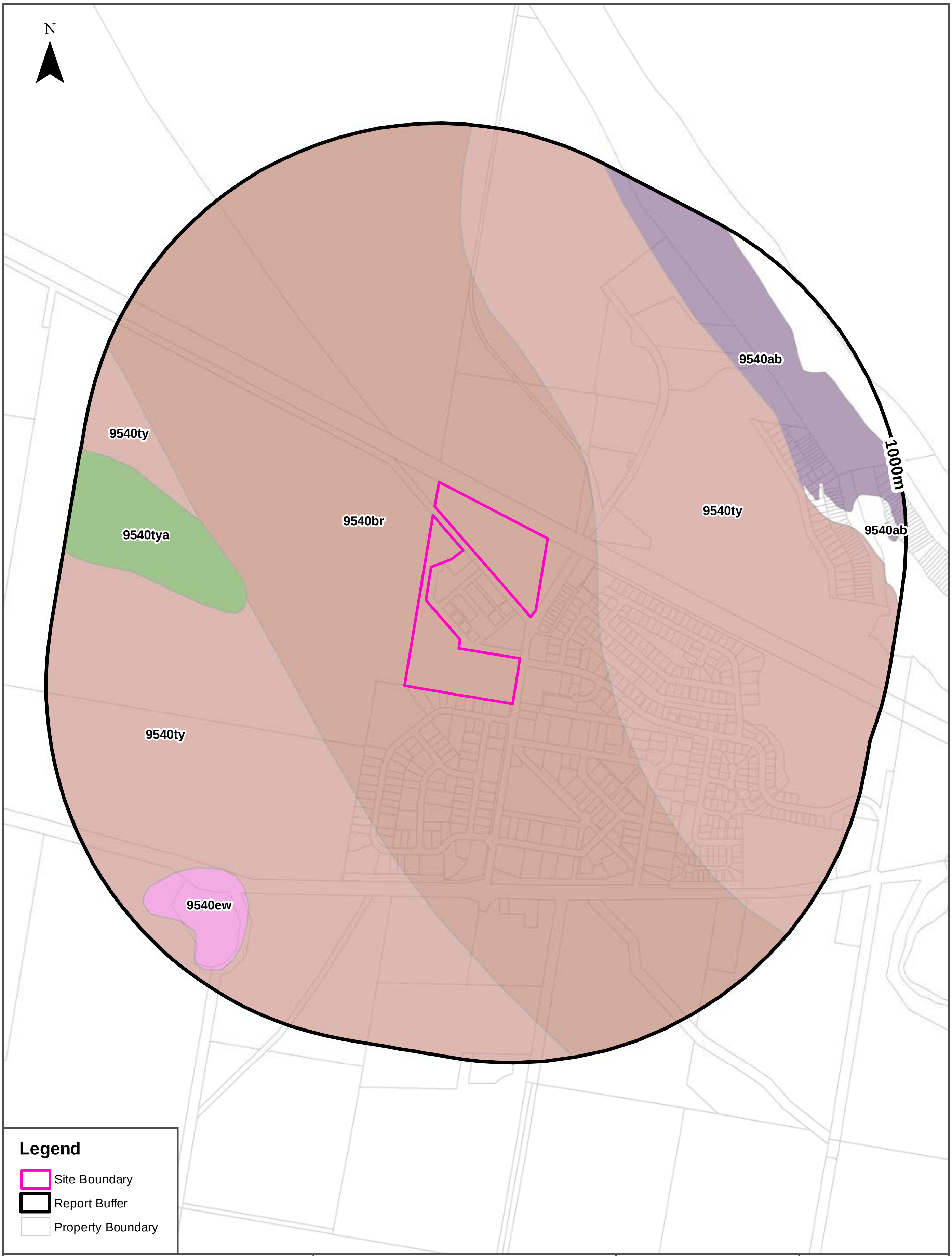
Soil mapping units and Australian Soil Classification orders within the dataset buffer:

Map Unit Code	Soil Order	Map Unit Description	Distance
NY1	Hydrosol	Coastal plains, generally low lying, poorly drained, and subject to flooding (lower and middle reaches of river flood-plains, swamps, estuarine areas, and tidal marshes): chief soils seem to be friable acidic gley soils (Dg4.11), (Dg4.41), and (Dg4.81); friable acidic yellow mottled soils (Dy5.11); leached sand soils (Uc2.2) and/or (Uc2.3); and sandy acidic yellow mottled soils (Dy5.61), (Dy5.41), and (Dy5.81) in a complex and not well-known pattern, generally as follows: (i) flat to gently sloping areas of (Dg4.11), (Dg4.41), and (Dg4.81) or (Dy5.11), and/or (Ug5.16) and (Ug5.4), with some (Dd3.11) and (Uf6.41); (ii) sandy flats and swamps of (Uc2.2), and/or (Uc2.3), and/or acid peats (0); and (iii) slightly raised sandy areas of (Dy5.61), (Dy5.41), and (Dy5.81) with (Uc2.2) and (Uc4.2). Small areas of units NY2 (Sheet 3) and B9 are included.	0m
B9	Rudosol	Present beach system of dunes and estuaries: dunes of siliceous sands (Uc1.21) backed by slopes of siliceous sands (Uc1.21) and/or leached sand soils (Uc2.2 and Uc2.3); other soils include (Dy5.81) and acid peats (0). As mapped, small areas of units NY1 and NY2 are included.	858m

Atlas of Australian Soils Data Source: CSIRO

Soil Landscapes of Central and Eastern NSW

42 Wallum Place, Byron Bay, NSW 2481



Legend

- Site Boundary
- Report Buffer
- Property Boundary

Scale:

Data Sources: Property Boundaries & Topographic Data:
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Coordinate System:
GDA 1994 MGA Zone 56

Date: 19 March 2021

Soils

42 Wallum Place, Byron Bay, NSW 2481

Soil Landscapes of Central and Eastern NSW

What are the on-site Soil Landscapes?

Soil Code	Name
9540br	Black Rock

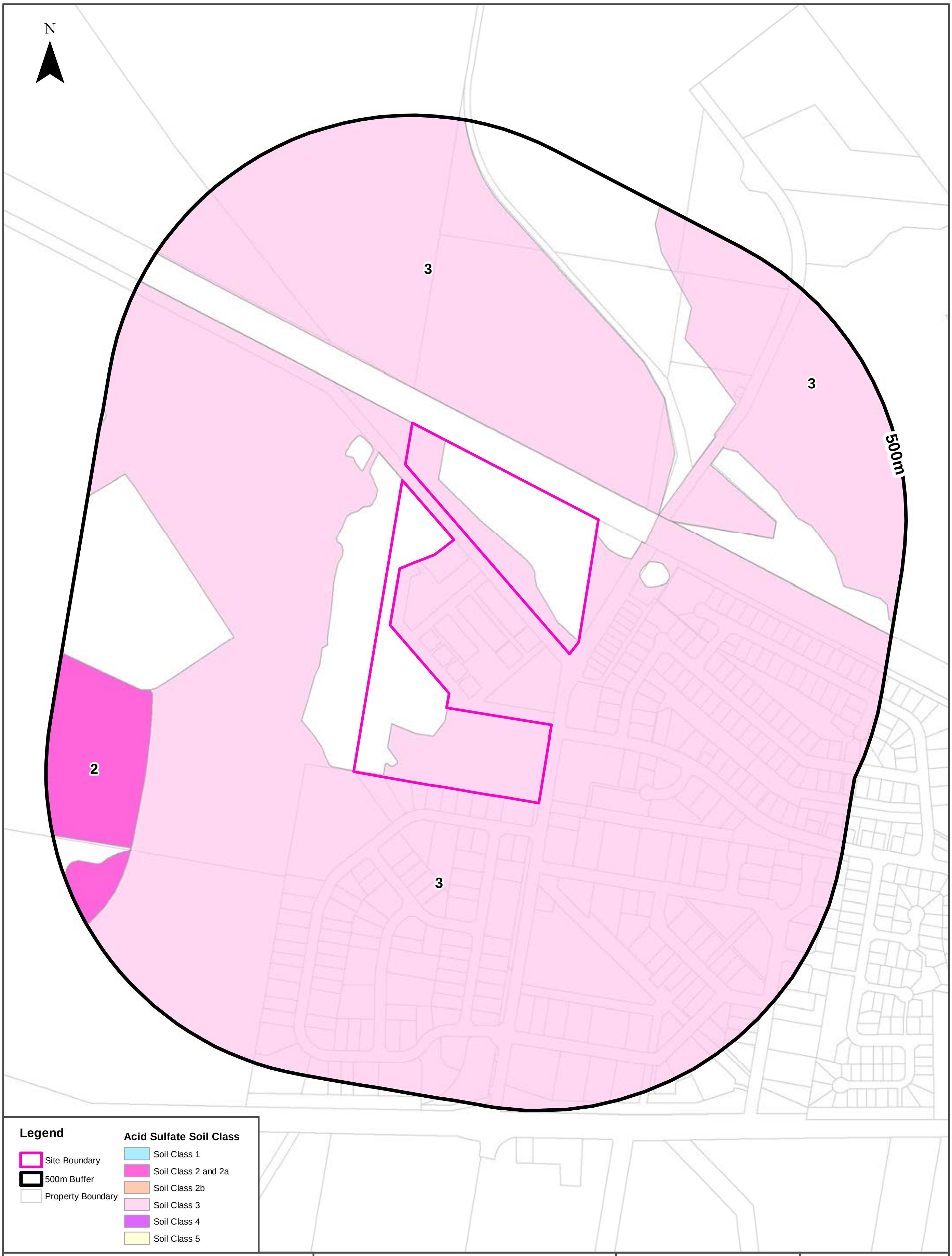
What are the Soil Landscapes within the dataset buffer?

Soil Code	Name
9540ab	Angels Beach
9540br	Black Rock
9540ew	Ewingsdale
9540ty	Tyagarah
9540tya	Tyagarah variant a

Soil Landscapes of Central and Eastern NSW: NSW Department of Planning, Industry and Environment

Acid Sulfate Soils

42 Wallum Place, Byron Bay, NSW 2481



Scale: 0 100 200 400 Meters	Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2021	Coordinate System: GDA 1994 MGA Zone 56	Date: 19 March 2021

Acid Sulfate Soils

42 Wallum Place, Byron Bay, NSW 2481

Environmental Planning Instrument - Acid Sulfate Soils

What is the on-site Acid Sulfate Soil Plan Class that presents the largest environmental risk?

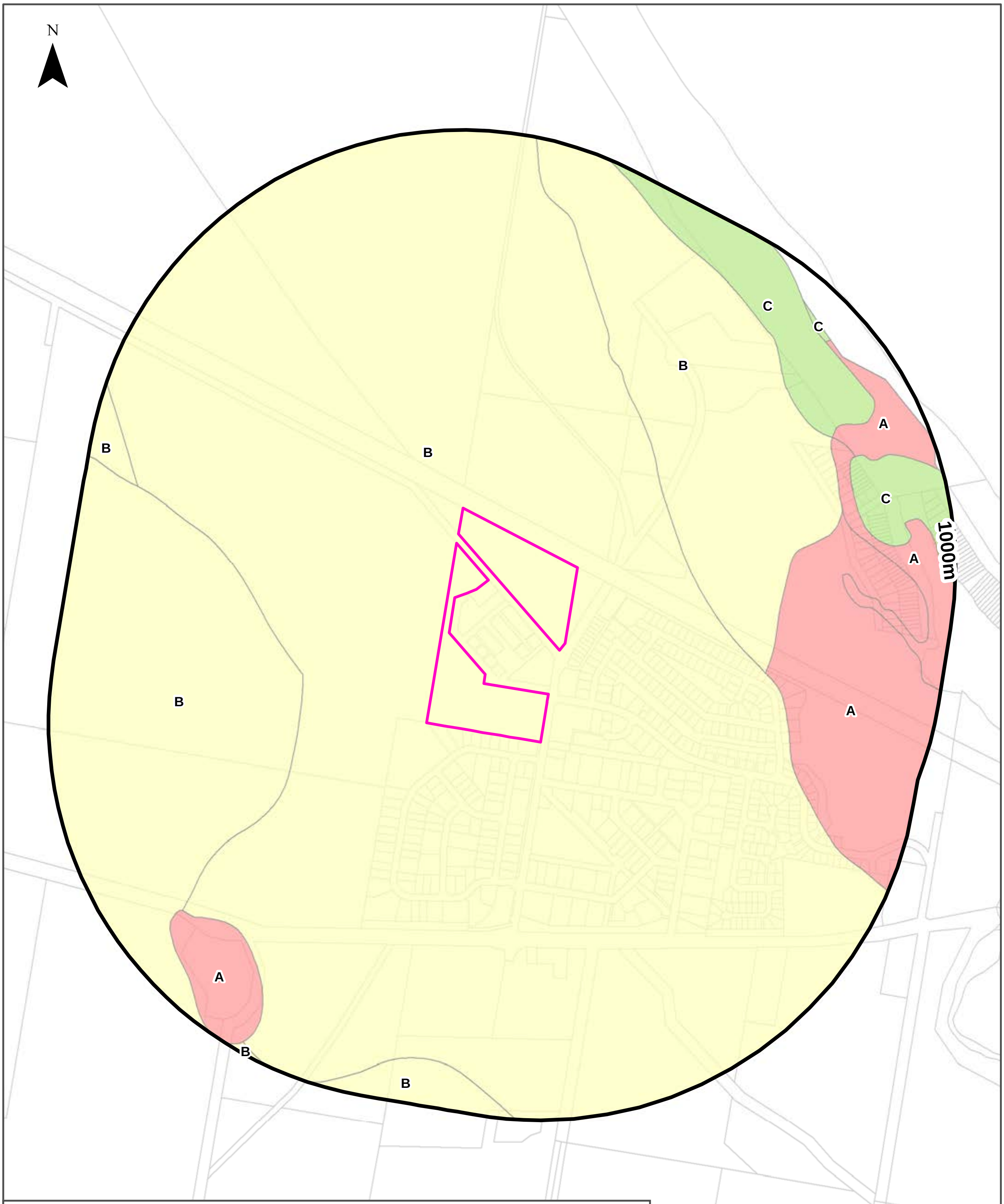
Soil Class	Description	EPI Name
3	Works more than 1 metre below natural ground surface present an environmental risk; Works by which the watertable is likely to be lowered more than 1 metre below natural ground surface, present an environmental risk	Byron Local Environmental Plan 2014

If the on-site Soil Class is 5, what other soil classes exist within 500m?

Soil Class	Description	EPI Name	Distance	Direction
N/A				

Atlas of Australian Acid Sulfate Soils

42 Wallum Place, Byron Bay, NSW 2481



Legend

▭ Site Boundary

▭ Report Buffer

▭ Property Boundary

Probability of occurrence of Acid Sulfate Soils

🟥 A. High (>70%)

🟨 B. Low (6-70%)

🟩 C. Extremely Low (1-5%)

⬜ D. No Chance (0%)

⬜ No Data

Scale:
0 100 200 400 600
Meters

Data Sources: Property Boundaries & Topographic Data:
© Department Finance, Services & Innovation 2021

Coordinate System:
GDA 1994 MGA Zone 56

Date: 19March 2021

Acid Sulfate Soils

42 Wallum Place, Byron Bay, NSW 2481

Atlas of Australian Acid Sulfate Soils

Atlas of Australian Acid Sulfate Soil categories within the dataset buffer:

Class	Description	Distance
B	Low Probability of occurrence. 6-70% chance of occurrence.	0m
A	High Probability of occurrence. >70% chance of occurrence.	534m
C	Extremely low probability of occurrence. 1-5% chance of occurrence with occurrences in small localised areas.	717m

Atlas of Australian Acid Sulfate Soils Data Source: CSIRO

Dryland Salinity

42 Wallum Place, Byron Bay, NSW 2481

Dryland Salinity - National Assessment

Is there Dryland Salinity - National Assessment data onsite?

No

Is there Dryland Salinity - National Assessment data within the dataset buffer?

No

What Dryland Salinity assessments are given?

Assessment 2000	Assessment 2020	Assessment 2050	Distance	Direction
N/A	N/A	N/A	N/A	N/A

Dryland Salinity Data Source : National Land and Water Resources Audit
The Commonwealth and all suppliers of source data used to derive the maps of "Australia, Forecast Areas Containing Land of High Hazard or Risk of Dryland Salinity from 2000 to 2050" do not warrant the accuracy or completeness of information in this product. Any person using or relying upon such information does so on the basis that the Commonwealth and data suppliers shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information. Any persons using this information do so at their own risk.
In many cases where a high risk is indicated, less than 100% of the area will have a high hazard or risk.

Dryland Salinity Potential of Western Sydney

Dryland Salinity Potential of Western Sydney within the dataset buffer?

Feature Id	Classification	Description	Distance	Direction
N/A	Outside Data Coverage			

Dryland Salinity Potential of Western Sydney Data Source : NSW Office of Environment and Heritage

Mining

42 Wallum Place, Byron Bay, NSW 2481

Mining Subsidence Districts

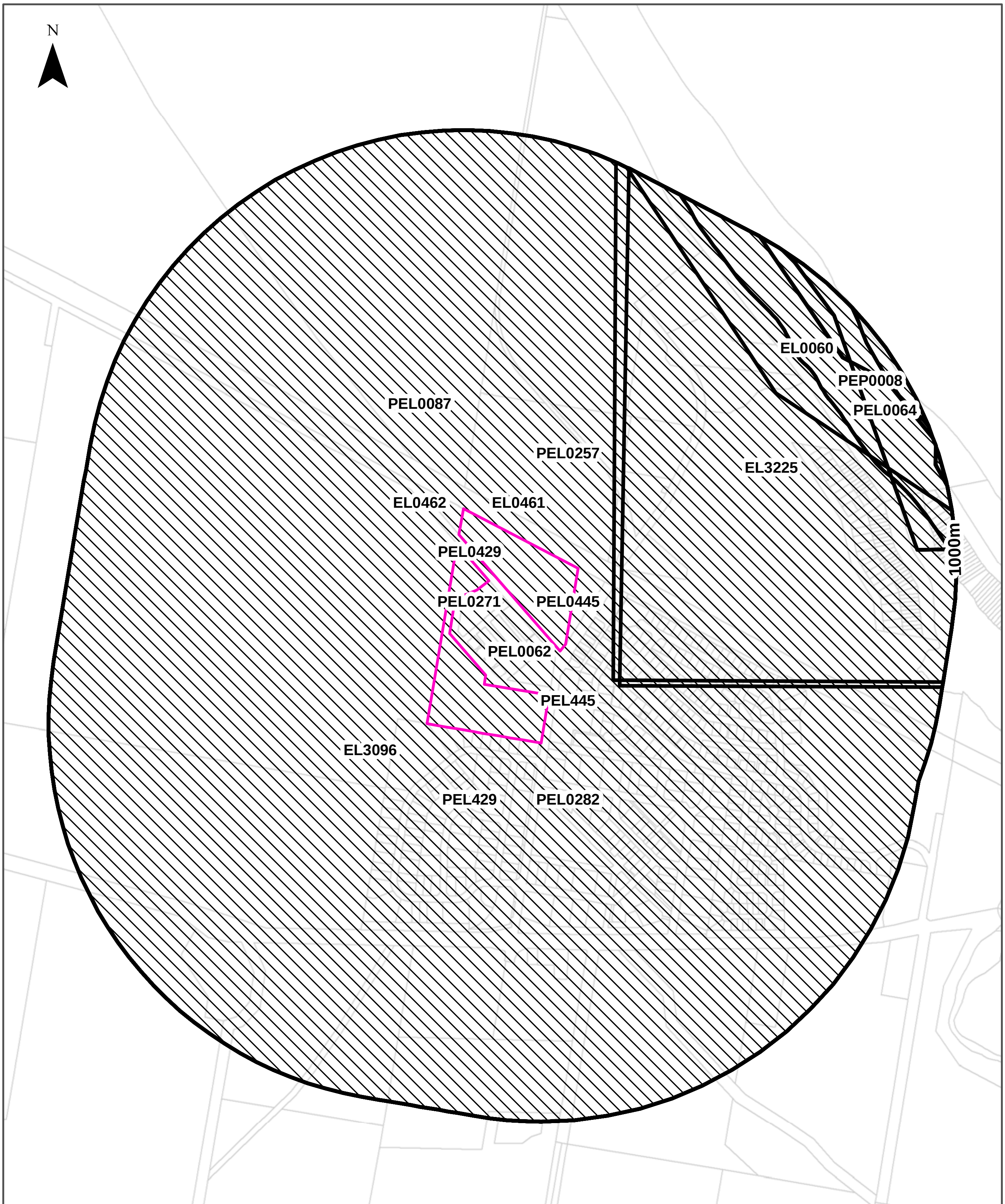
Mining Subsidence Districts within the dataset buffer:

District	Distance	Direction
There are no Mining Subsidence Districts within the report buffer		

Mining Subsidence District Data Source: © Land and Property Information (2016)

Mining & Exploration Titles

42 Wallum Place, Byron Bay, NSW 2481



Legend

▭ Site Boundary	🟥 Current Mining & Exploration Titles
▭ Report Buffer	▨ Current Mining & Exploration Title Applications
▭ Property Boundary	▨ Historical Mining & Exploration Titles

Scale: 0 100 200 400 600 Meters

Data Sources: Property Boundaries & Topographic Data:
© Department Finance, Services & Innovation 2021

Coordinate System:
GDA 1994 MGA Zone 56

Date: 19 March 2021

Mining

42 Wallum Place, Byron Bay, NSW 2481

Current Mining & Exploration Titles

Current Mining & Exploration Titles within the dataset buffer:

Title Ref	Holder	Grant Date	Expiry Date	Last Renewed	Operation	Resource	Minerals	Dist (m)	Dir'
N/A	No Records in Buffer								

Current Mining & Exploration Titles Data Source: © State of New South Wales through NSW Department of Industry

Current Mining & Exploration Title Applications

Current Mining & Exploration Title Applications within the dataset buffer:

Application Ref	Applicant	Application Date	Operation	Resource	Minerals	Dist (m)	Dir'
N/A	No Records in Buffer						

Current Mining & Exploration Title Applications Data Source: © State of New South Wales through NSW Department of Industry

Mining

42 Wallum Place, Byron Bay, NSW 2481

Historical Mining & Exploration Titles

Historical Mining & Exploration Titles within the dataset buffer:

Title Ref	Holder	Start Date	End Date	Resource	Minerals	Dist (m)	Dir'
EL0461	PLANET METALS LIMITED	01 Jun 1971	01 Dec 1972	MINERALS	Ti Fe Th Heavy mineral sands Zircon	0m	Onsite
EL0462	PLANET METALS LIMITED	01 Jun 1971	01 Dec 1972	MINERALS	Ti Fe Th Heavy mineral sands Zircon	0m	Onsite
EL3096	AUSTRALMIN PACIFIC NL	01 Jun 1988	01 Feb 1992	MINERALS	Heavy mineral sands	0m	Onsite
PEL0062	MID-EASTERN OIL			PETROLEUM	Petroleum	0m	Onsite
PEL0087	NATIONAL OIL HOLDINGS LTD, ALLIANCE OIL DEVELOPMENT AUSTRALIA NL			PETROLEUM	Petroleum	0m	Onsite
PEL0257	OIL AND MINERALS QUEST NL	3/12/1980		PETROLEUM	Petroleum	0m	Onsite
PEL0271	BASE RESOURCES LTD, EDGEWORTH MINERALS LTD	10/05/1984	9/05/1986	PETROLEUM	Petroleum	0m	Onsite
PEL0282	AGL PETROLEUM OPERATIONS PTY LTD	16/03/1992	4/11/1992	PETROLEUM	Petroleum	0m	Onsite
PEL0429	SUNOCO INC	26/10/1999	13/11/2002	PETROLEUM	Petroleum	0m	Onsite
PEL0445	DART ENERGY (BRUXNER) PTY LTD	19/04/2004	19/10/2015	PETROLEUM	Petroleum	0m	Onsite
PEL429	SUNOCO INC.			MINERALS		0m	Onsite
PEL445	DART ENERGY (BRUXNER) PTY LTD			MINERALS		0m	Onsite
EL3225	CABLE SANDS HOLDINGS PTY. LIMITED	01 Nov 1988	01 Nov 1993	MINERALS	Heavy mineral sands	116m	North East
EL0060	PLANET MINING COMPANY PTY LIMITED	01 Sep 1966	01 Sep 1969	MINERALS	Heavy mineral sands	698m	North East
PEL0064	L H SMART OIL EXPLORATION CO. LTD			PETROLEUM	Petroleum	861m	North East
PEP0008				PETROLEUM	Petroleum	861m	North East

Historical Mining & Exploration Titles Data Source: © State of New South Wales through NSW Department of Industry

State Environmental Planning Policy

42 Wallum Place, Byron Bay, NSW 2481

State Significant Precincts

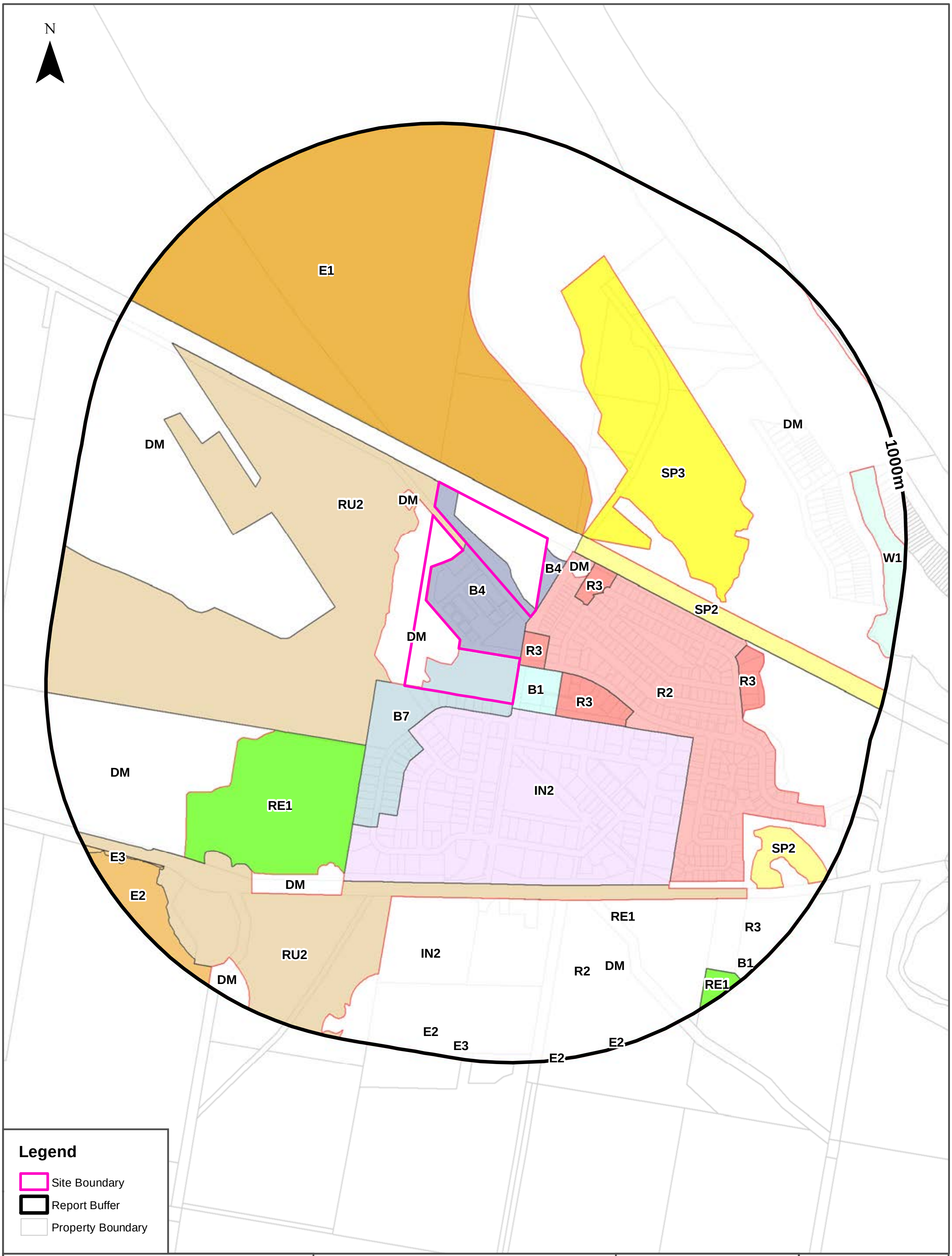
What SEPP State Significant Precincts exist within the dataset buffer?

Map Id	Precinct	EPI Name	Published Date	Commenced Date	Currency Date	Amendment	Distance	Direction
N/A	No Records in Buffer							

State Environment Planning Policy Data Source: NSW Crown Copyright - Planning & Environment

EPI Planning Zones

42 Wallum Place, Byron Bay, NSW 2481



Legend

🟪 Site Boundary

⬛ Report Buffer

⬜ Property Boundary

Scale: 0 100 200 400 600 Meters	Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2021 Planning: NSW Crown Copyright - Planning & Environment	Coordinate System: GDA 1994 MGA Zone 56	Date: 19 March 2021

Environmental Planning Instrument

42 Wallum Place, Byron Bay, NSW 2481

Land Zoning

What EPI Land Zones exist within the dataset buffer?

Zone	Description	Purpose	EPI Name	Published Date	Commenced Date	Currency Date	Amendment	Distance	Direction
DM	Deferred Matter		Byron Local Environmental Plan 2014	03/07/2020	03/07/2020	26/02/2021	Amendment No 18	0m	Onsite
DM	Deferred Matter		Byron Local Environmental Plan 2014	30/05/2014	21/07/2014	26/02/2021		0m	Onsite
B7	Business Park		Byron Local Environmental Plan 2014	30/05/2014	21/07/2014	26/02/2021		0m	Onsite
B4	Mixed Use		Byron Local Environmental Plan 2014	30/05/2014	21/07/2014	26/02/2021		0m	Onsite
B1	Neighbourhood Centre		Byron Local Environmental Plan 2014	30/05/2014	21/07/2014	26/02/2021		0m	South East
R2	Low Density Residential		Byron Local Environmental Plan 2014	30/05/2014	21/07/2014	26/02/2021		0m	South East
R3	Medium Density Residential		Byron Local Environmental Plan 2014	30/05/2014	21/07/2014	26/02/2021		0m	South East
RU2	Rural Landscape		Byron Local Environmental Plan 2014	30/05/2014	21/07/2014	26/02/2021		0m	West
IN2	Light Industrial		Byron Local Environmental Plan 2014	30/05/2014	21/07/2014	26/02/2021		12m	South
E1	National Parks and Nature Reserves		Byron Local Environmental Plan 2014	30/05/2014	21/07/2014	26/02/2021		51m	North
DM	Deferred Matter		Byron Local Environmental Plan 2014	30/05/2014	21/07/2014	26/02/2021		55m	North West
DM	Deferred Matter		Byron Local Environmental Plan 2014	30/05/2014	21/07/2014	26/02/2021		80m	East
SP2	Infrastructure	Rail Corridor	Byron Local Environmental Plan 2014	26/02/2021	26/02/2021	26/02/2021	Amendment No 25	80m	East
SP3	Tourist		Byron Local Environmental Plan 2014	30/05/2014	21/07/2014	26/02/2021		97m	North East
DM	Deferred Matter		Byron Local Environmental Plan 2014	26/02/2021	26/02/2021	26/02/2021	Amendment No 25	98m	East
R3	Medium Density Residential		Byron Local Environmental Plan 2014	30/05/2014	21/07/2014	26/02/2021		100m	East
R3	Medium Density Residential		Byron Local Environmental Plan 2014	30/05/2014	21/07/2014	26/02/2021		122m	South East
RE1	Public Recreation		Byron Local Environmental Plan 2014	30/05/2014	21/07/2014	26/02/2021		198m	South West
RU2	Rural Landscape		Byron Local Environmental Plan 2014	12/02/2021	12/02/2021	26/02/2021	Amendment No 23	503m	South
DM	Deferred Matter		Byron Local Environmental Plan 2014	30/05/2014	21/07/2014	26/02/2021		534m	South West
DM	Deferred Matter		Byron Local Environmental Plan 2014	26/02/2021	26/02/2021	26/02/2021	Amendment No 25	544m	South
R2	Low Density Residential		Byron Local Environmental Plan 1988	14/11/2014	14/11/2014	14/11/2014	State Environmental Planning Policy Amendment (West Byron Bay) 2014	544m	South
IN2	Light Industrial		Byron Local Environmental Plan 1988	14/11/2014	14/11/2014	14/11/2014	State Environmental Planning Policy Amendment (West Byron Bay) 2014	549m	South
R3	Medium Density Residential		Byron Local Environmental Plan 2014	30/05/2014	21/07/2014	26/02/2021		571m	East

Zone	Description	Purpose	EPI Name	Published Date	Commenced Date	Currency Date	Amendment	Distance	Direction
RE1	Public Recreation		Byron Local Environmental Plan 1988	14/11/2014	14/11/2014	14/11/2014	State Environmental Planning Policy Amendment (West Byron Bay) 2014	585m	South East
SP2	Infrastructure	Private college	Byron Local Environmental Plan 2014	30/05/2014	21/07/2014	26/02/2021		760m	South East
R3	Medium Density Residential		Byron Local Environmental Plan 1988	14/11/2014	14/11/2014	14/11/2014	State Environmental Planning Policy Amendment (West Byron Bay) 2014	788m	South East
E2	Environmental Conservation		Byron Local Environmental Plan 1988	14/11/2014	14/11/2014	14/11/2014	State Environmental Planning Policy Amendment (West Byron Bay) 2014	814m	South
E3	Environmental Management		Byron Local Environmental Plan 2014	12/02/2021	12/02/2021	26/02/2021	Amendment No 23	839m	South West
E2	Environmental Conservation		Byron Local Environmental Plan 2014	12/02/2021	12/02/2021	26/02/2021	Amendment No 23	843m	South West
W1	Natural Waterways		Byron Local Environmental Plan 2014	26/02/2021	26/02/2021	26/02/2021	Amendment No 25	862m	East
E3	Environmental Management		Byron Local Environmental Plan 1988	14/11/2014	14/11/2014	14/11/2014	State Environmental Planning Policy Amendment (West Byron Bay) 2014	892m	South
RE1	Public Recreation		Byron Local Environmental Plan 1988	14/11/2014	14/11/2014	14/11/2014	State Environmental Planning Policy Amendment (West Byron Bay) 2014	913m	South East
B1	Neighbourhood Centre		Byron Local Environmental Plan 1988	14/11/2014	14/11/2014	14/11/2014	State Environmental Planning Policy Amendment (West Byron Bay) 2014	940m	South East
E2	Environmental Conservation		Byron Local Environmental Plan 1988	14/11/2014	14/11/2014	14/11/2014	State Environmental Planning Policy Amendment (West Byron Bay) 2014	958m	South

Environmental Planning Instrument Data Source: NSW Crown Copyright - Planning & Environment

Heritage

42 Wallum Place, Byron Bay, NSW 2481

Commonwealth Heritage List

What are the Commonwealth Heritage List Items located within the dataset buffer?

Place Id	Name	Address	Place File No	Class	Status	Register Date	Distance	Direction
N/A	No records in buffer							

Heritage Data Source: Australian Government Department of the Environment and Energy - Heritage Branch

National Heritage List

What are the National Heritage List Items located within the dataset buffer?
Note. Please click on Place Id to activate a hyperlink to online website.

Place Id	Name	Address	Place File No	Class	Status	Register Date	Distance	Direction
N/A	No records in buffer							

Heritage Data Source: Australian Government Department of the Environment and Energy - Heritage Branch

State Heritage Register - Curtilages

What are the State Heritage Register Items located within the dataset buffer?

Map Id	Name	Address	LGA	Listing Date	Listing No	Plan No	Distance	Direction
N/A	No records in buffer							

Heritage Data Source: NSW Crown Copyright - Office of Environment & Heritage

Environmental Planning Instrument - Heritage

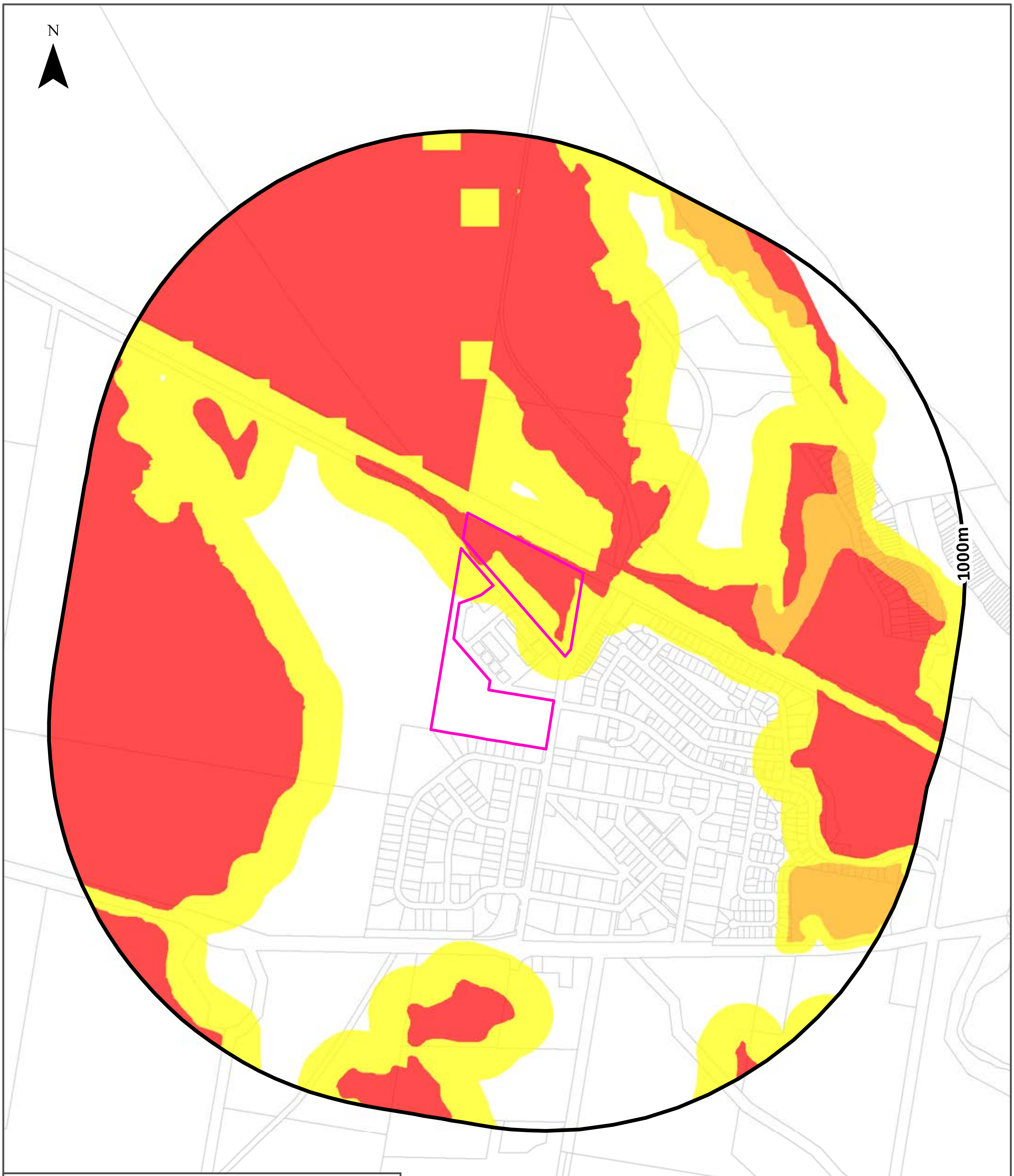
What are the EPI Heritage Items located within the dataset buffer?

Map Id	Name	Classification	Significance	EPI Name	Published Date	Commenced Date	Currency Date	Distance	Direction
N/A	No records in buffer								

Heritage Data Source: NSW Crown Copyright - Planning & Environment

Natural Hazards - Bush Fire Prone Land

42 Wallum Place, Byron Bay, NSW 2481



Legend

☐ Site Boundary

☐ Report Buffer

☐ Property Boundary

Bush Fire Prone Land Category

🟥 Vegetation Category 1

🟧 Vegetation Category 2

🟧 Vegetation Category 3

🟨 Vegetation Buffer

Scale:

0 100 200 400 600
Meters

Data Sources: Bush Fire Prone Land: © NSW Rural Fire Service 2021. Property Boundaries: © Department Finance, Services & Innovation 2021

Coordinate System:
GDA 1994 MGA Zone 56

Date: 19 March 2021

Natural Hazards

42 Wallum Place, Byron Bay, NSW 2481

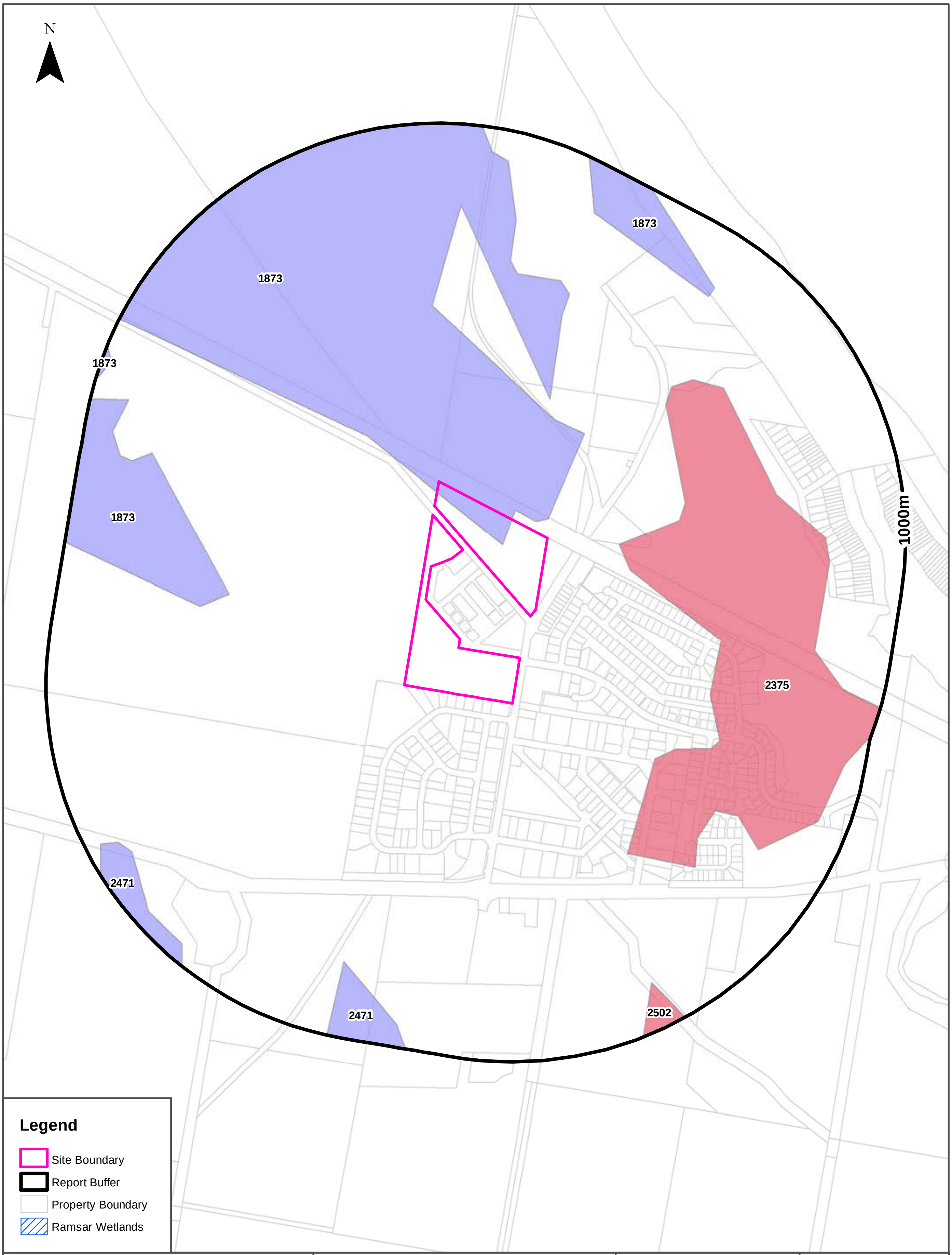
Bush Fire Prone Land

What are the nearest Bush Fire Prone Land Categories that exist within the dataset buffer?

Bush Fire Prone Land Category	Distance	Direction
Vegetation Buffer	0m	Onsite
Vegetation Category 1	0m	Onsite
Vegetation Category 2	448m	East

Ecological Constraints - Vegetation & Ramsar Wetlands

42 Wallum Place, Byron Bay, NSW 2481



Legend

🟪	Site Boundary
⬛	Report Buffer
☐	Property Boundary
▨	Ramsar Wetlands

Scale:

Data Sources: Property Boundaries & Topographic Data:
© Department Finance, Services & Innovation 2021

Coordinate System:
GDA 1994 MGA Zone 56

Date: 19 March 2021

Ecological Constraints

42 Wallum Place, Byron Bay, NSW 2481

Vegetation - Eastern Bushland Database (North Region)

What Vegetation exists within the dataset buffer?

MapId	Veg Code	Veg Desc	NVISCode	NVISDesc	Distance	Direction
1873	4	coastal complex	2	Coastal complex	0m	Onsite
2375	x	disturbed forest woodland	23	Disturbed bushland	199m	East
2471	4	coastal complex	2	Coastal complex	789m	South East
2502	x	disturbed forest woodland	23	Disturbed bushland	868m	South East

Vegetation Data Source: NSW Office of Environment and Heritage

Ramsar Wetlands

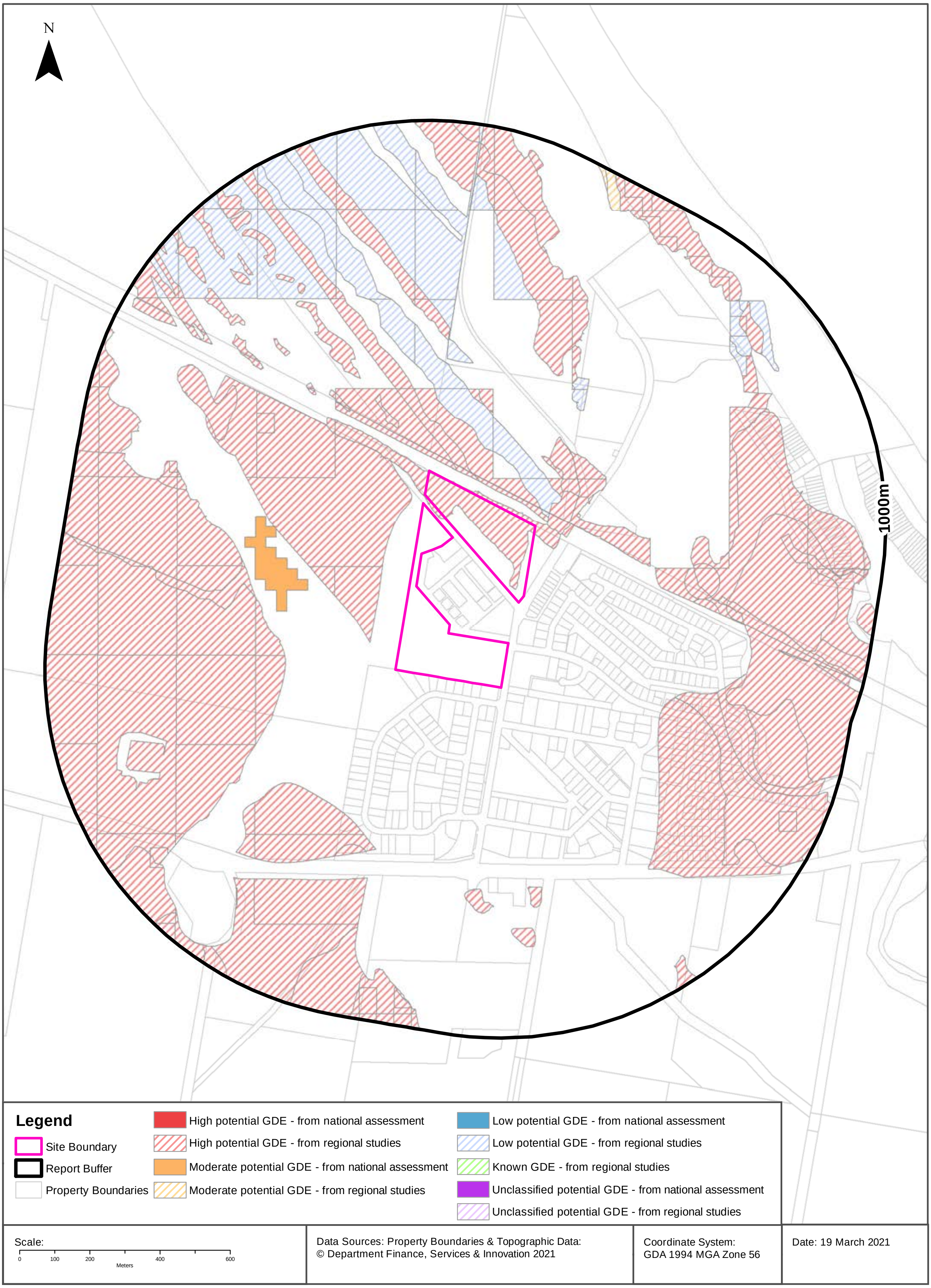
What Ramsar Wetland areas exist within the dataset buffer?

Map Id	Ramsar Name	Wetland Name	Designation Date	Source	Distance	Direction
N/A	No records in buffer					

Ramsar Wetlands Data Source: © Commonwealth of Australia - Department of Environment

Ecological Constraints - Groundwater Dependent Ecosystems Atlas

42 Wallum Place, Byron Bay, NSW 2481



Data Sources: Property Boundaries & Topographic Data:
© Department Finance, Services & Innovation 2021

Coordinate System:
GDA 1994 MGA Zone 56

Date: 19 March 2021

Ecological Constraints

42 Wallum Place, Byron Bay, NSW 2481

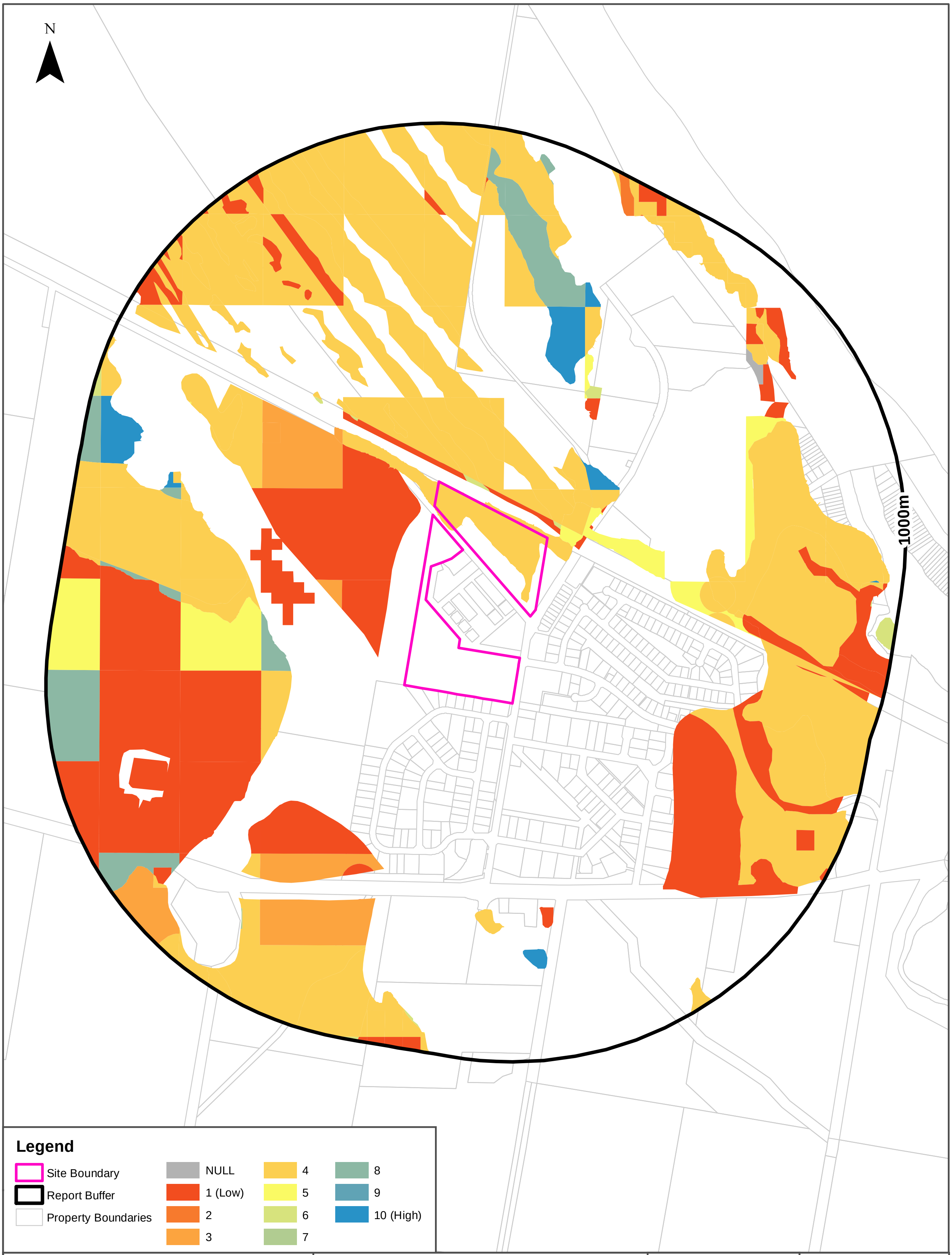
Groundwater Dependent Ecosystems Atlas

Type	GDE Potential	Geomorphology	Ecosystem Type	Aquifer Geology	Distance
Terrestrial	High potential GDE - from regional studies	Coastal lowlands on weak sedimentary rocks, with littoral and alluvial plains.	Vegetation		0m
Terrestrial	Low potential GDE - from regional studies	Plateau flank dissected into narrow strike ridges and valleys.	Vegetation		41m
Aquatic	Moderate potential GDE - from national assessment	Baslatic plateau terminating southeast in dissected volcanic pile (Mount Warning).	Wetland		283m
Terrestrial	Moderate potential GDE - from regional studies	Coastal lowlands on weak sedimentary rocks, with littoral and alluvial plains.	Vegetation		899m

Groundwater Dependent Ecosystems Atlas Data Source: The Bureau of Meteorology

Ecological Constraints - Inflow Dependent Ecosystems Likelihood

42 Wallum Place, Byron Bay, NSW 2481



Scale:

Data Sources: Property Boundaries & Topographic Data:
© Department Finance, Services & Innovation 2021

Coordinate System:
GDA 1994 MGA Zone 56

Date: 19 March 2021

Ecological Constraints

42 Wallum Place, Byron Bay, NSW 2481

Inflow Dependent Ecosystems Likelihood

Type	IDE Likelihood	Geomorphology	Ecosystem Type	Aquifer Geology	Distance
Terrestrial	4	Coastal lowlands on weak sedimentary rocks, with littoral and alluvial plains.	Vegetation		0m
Terrestrial	1	Coastal lowlands on weak sedimentary rocks, with littoral and alluvial plains.	Vegetation		28m
Terrestrial	5	Coastal lowlands on weak sedimentary rocks, with littoral and alluvial plains.	Vegetation		32m
Terrestrial	6	Baslatic plateau terminating southeast in dissected volcanic pile (Mount Warning).	Vegetation		36m
Terrestrial	10	Coastal lowlands on weak sedimentary rocks, with littoral and alluvial plains.	Vegetation		180m
Terrestrial	3	Coastal lowlands on weak sedimentary rocks, with littoral and alluvial plains.	Vegetation		206m
Aquatic	1	Baslatic plateau terminating southeast in dissected volcanic pile (Mount Warning).	Wetland		283m
Terrestrial	8	Coastal lowlands on weak sedimentary rocks, with littoral and alluvial plains.	Vegetation		318m
Terrestrial	7	Coastal lowlands on weak sedimentary rocks, with littoral and alluvial plains.	Vegetation		768m
Terrestrial	2	Coastal lowlands on weak sedimentary rocks, with littoral and alluvial plains.	Vegetation		899m

Inflow Dependent Ecosystems Likelihood Data Source: The Bureau of Meteorology

Ecological Constraints

42 Wallum Place, Byron Bay, NSW 2481

NSW BioNet Atlas

Species on the NSW BioNet Atlas that have a NSW or federal conservation status, a NSW sensitivity status, or are listed under a migratory species agreement, and are within 10km of the site?

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Animalia	Amphibia	Crinia tinnula	Wallum Froglet	Vulnerable	Not Sensitive	Not Listed	
Animalia	Amphibia	Litoria aurea	Green and Golden Bell Frog	Endangered	Not Sensitive	Vulnerable	
Animalia	Amphibia	Litoria olongburensis	Olongburra Frog	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Amphibia	Mixophyes iteratus	Giant Barred Frog	Endangered	Category 2	Endangered	
Animalia	Aves	Actitis hypoleucos	Common Sandpiper	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Amaurornis moluccana	Pale-vented Bush-hen	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Anous stolidus	Common Noddy	Not Listed	Not Sensitive	Not Listed	CAMBA;JAMBA
Animalia	Aves	Anseranas semipalmata	Magpie Goose	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Apus pacificus	Fork-tailed Swift	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Ardenna carneipes	Flesh-footed Shearwater	Vulnerable	Not Sensitive	Not Listed	ROKAMBA;JAMBA
Animalia	Aves	Ardenna pacifica	Wedge-tailed Shearwater	Not Listed	Not Sensitive	Not Listed	JAMBA
Animalia	Aves	Ardenna tenuirostris	Short-tailed Shearwater	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Arenaria interpres	Ruddy Turnstone	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Artamus cyanopterus cyanopterus	Dusky Woodswallow	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Botaurus poiciloptilus	Australasian Bittern	Endangered	Not Sensitive	Endangered	
Animalia	Aves	Burhinus grallarius	Bush Stone-curlew	Endangered	Not Sensitive	Not Listed	
Animalia	Aves	Calidris acuminata	Sharp-tailed Sandpiper	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Calidris canutus	Red Knot	Not Listed	Not Sensitive	Endangered	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Calidris ferruginea	Curlew Sandpiper	Endangered	Not Sensitive	Critically Endangered	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Calidris melanotos	Pectoral Sandpiper	Not Listed	Not Sensitive	Not Listed	ROKAMBA;JAMBA
Animalia	Aves	Calidris ruficollis	Red-necked Stint	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Calidris tenuirostris	Great Knot	Vulnerable	Not Sensitive	Critically Endangered	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Calonectris leucomelas	Streaked Shearwater	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Calyptorhynchus lathami	Glossy Black-Cockatoo	Vulnerable	Category 2	Not Listed	
Animalia	Aves	Carterornis leucotis	White-eared Monarch	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Circus assimilis	Spotted Harrier	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Cuculus optatus	Oriental Cuckoo	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA;JAMBA

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Animalia	Aves	Cyclopsitta diophthalma coxeni	Coxen's Fig-Parrot	Critically Endangered	Category 2	Endangered	
Animalia	Aves	Daphoenositta chrysoptera	Varied Sittella	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Dromaius novaehollandiae	Emu	Endangered Population	Not Sensitive	Not Listed	
Animalia	Aves	Ephippiorhynchus asiaticus	Black-necked Stork	Endangered	Not Sensitive	Not Listed	
Animalia	Aves	Esacus magnirostris	Beach Stone-curlew	Critically Endangered	Not Sensitive	Not Listed	
Animalia	Aves	Falco subniger	Black Falcon	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Fregata ariel	Lesser Frigatebird	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Gallinago hardwickii	Latham's Snipe	Not Listed	Not Sensitive	Not Listed	ROKAMBA;JAMBA
Animalia	Aves	Gelochelidon nilotica	Gull-billed Tern	Not Listed	Not Sensitive	Not Listed	CAMBA
Animalia	Aves	Glossopsitta pusilla	Little Lorikeet	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Grus rubicunda	Brolga	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Gygis alba	White Tern	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Haematopus fuliginosus	Sooty Oystercatcher	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Haematopus longirostris	Pied Oystercatcher	Endangered	Not Sensitive	Not Listed	
Animalia	Aves	Haliaeetus leucogaster	White-bellied Sea-Eagle	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Hieraaetus morphnoides	Little Eagle	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Hirundapus caudacutus	White-throated Needletail	Not Listed	Not Sensitive	Vulnerable	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Hydroprogne caspia	Caspian Tern	Not Listed	Not Sensitive	Not Listed	JAMBA
Animalia	Aves	Irediparra gallinacea	Comb-crested Jacana	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Ixobrychus flavicollis	Black Bittern	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Limosa lapponica	Bar-tailed Godwit	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Lophoictinia isura	Square-tailed Kite	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Macronectes giganteus	Southern Giant Petrel	Endangered	Not Sensitive	Endangered	
Animalia	Aves	Macronectes halli	Northern Giant-Petrel	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Aves	Melanodryas cucullata cucullata	Hooded Robin (south-eastern form)	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Ninox connivens	Barking Owl	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Ninox strenua	Powerful Owl	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Numenius madagascariensis	Eastern Curlew	Not Listed	Not Sensitive	Critically Endangered	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Numenius phaeopus	Whimbrel	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA;JAMBA
Animalia	Aves	Onychoprion fuscata	Sooty Tern	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Pandion cristatus	Eastern Osprey	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Phaethon rubricauda	Red-tailed Tropicbird	Vulnerable	Not Sensitive	Not Listed	CAMBA;JAMBA
Animalia	Aves	Pluvialis fulva	Pacific Golden Plover	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA;JAMBA

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Animalia	Aves	Pluvialis squatarola	Grey Plover	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Podargus ocellatus	Marbled Frogmouth	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Procelsterna cerulea	Grey Ternlet	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Pterodroma leucoptera leucoptera	Gould's Petrel	Vulnerable	Not Sensitive	Endangered	
Animalia	Aves	Pterodroma neglecta neglecta	Kermadec Petrel (west Pacific subspecies)	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Aves	Pterodroma nigripennis	Black-winged Petrel	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Pterodroma solandri	Providence Petrel	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Ptilinopus magnificus	Wompoo Fruit-Dove	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Ptilinopus regina	Rose-crowned Fruit-Dove	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Ptilinopus superbus	Superb Fruit-Dove	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Stagonopleura guttata	Diamond Firetail	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Stercorarius pomarinus	Pomarine Jaeger	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Sterna hirundo	Common Tern	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Sternula albifrons	Little Tern	Endangered	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Thalassarche bulleri	Buller's Albatross	Not Listed	Not Sensitive	Vulnerable	
Animalia	Aves	Thalasseus bergii	Crested Tern	Not Listed	Not Sensitive	Not Listed	JAMBA
Animalia	Aves	Thinornis rubricollis	Hooded Plover	Critically Endangered	Not Sensitive	Vulnerable	
Animalia	Aves	Todiramphus chloris	Collared Kingfisher	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Tringa brevipes	Grey-tailed Tattler	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Tringa incana	Wandering Tattler	Not Listed	Not Sensitive	Not Listed	JAMBA
Animalia	Aves	Tringa nebularia	Common Greenshank	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Tringa stagnatilis	Marsh Sandpiper	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Tyto longimembris	Eastern Grass Owl	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Tyto novaehollandiae	Masked Owl	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Tyto tenebricosa	Sooty Owl	Vulnerable	Category 3	Not Listed	
Animalia	Gastropoda	Thersites mitchellae	Mitchell's Rainforest Snail	Endangered	Not Sensitive	Critically Endangered	
Animalia	Insecta	Argynnis hyperbius	Laced Fritillary	Endangered	Not Sensitive	Critically Endangered	
Animalia	Insecta	Petalura gigantea	Giant Dragonfly	Endangered	Not Sensitive	Not Listed	
Animalia	Insecta	Petalura litorea	Coastal Petaltail	Endangered	Not Sensitive	Not Listed	
Animalia	Insecta	Phyllodes imperialis southern subspecies	Southern Pink Underwing Moth	Endangered	Not Sensitive	Endangered	
Animalia	Insecta	Synemon plana	Golden Sun Moth	Endangered	Not Sensitive	Critically Endangered	
Animalia	Mammalia	Arctocephalus pusillus doriferus	Australian Fur-seal	Vulnerable	Not Sensitive	Not Listed	

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Animalia	Mammalia	Chalinolobus nigrogriseus	Hoary Wattled Bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Dasyurus maculatus	Spotted-tailed Quoll	Vulnerable	Not Sensitive	Endangered	
Animalia	Mammalia	Dugong dugon	Dugong	Endangered	Not Sensitive	Not Listed	
Animalia	Mammalia	Eubalaena australis	Southern Right Whale	Endangered	Not Sensitive	Endangered	
Animalia	Mammalia	Megaptera novaeangliae	Humpback Whale	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Mammalia	Micronomus norfolkensis	Eastern Coastal Free-tailed Bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Miniopterus australis	Little Bent-winged Bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Miniopterus orianae oceanensis	Large Bent-winged Bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Myotis macropus	Southern Myotis	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Nyctimene robinsoni	Eastern Tube-nosed Bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Nyctophilus bifax	Eastern Long-eared Bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Nyctophilus corbeni	Corben's Long-eared Bat	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Mammalia	Petaurus norfolcensis	Squirrel Glider	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Phascolarctos cinereus	Koala	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Mammalia	Planigale maculata	Common Planigale	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Potorous tridactylus	Long-nosed Potoroo	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Mammalia	Pseudomys gracilicaudatus	Eastern Chestnut Mouse	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Mammalia	Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Scoteanax rueppellii	Greater Broad-nosed Bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Syconycteris australis	Common Blossom-bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Reptilia	Caretta caretta	Loggerhead Turtle	Endangered	Not Sensitive	Endangered	
Animalia	Reptilia	Chelonia mydas	Green Turtle	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Reptilia	Eretmochelys imbricata	Hawksbill Turtle	Not Listed	Not Sensitive	Vulnerable	
Animalia	Reptilia	Hoplocephalus stephensii	Stephens' Banded Snake	Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	Acacia bakeri	Marblewood	Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	Acalypha eremorum	Acalypha	Endangered	Not Sensitive	Not Listed	
Plantae	Flora	Acronychia littoralis	Scented Acronychia	Endangered	Not Sensitive	Endangered	
Plantae	Flora	Allocasuarina defungens	Dwarf Heath Casuarina	Endangered	Not Sensitive	Endangered	
Plantae	Flora	Allocasuarina thalassoscopica		Not Listed	Not Sensitive	Endangered	
Plantae	Flora	Archidendron hendersonii	White Lace Flower	Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	Arthraxon hispidus	Hairy Jointgrass	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Caesalpinia bonduc	Knicker Nut	Endangered	Not Sensitive	Not Listed	
Plantae	Flora	Casuarina obesa	Swamp She-oak	Endangered	Not Sensitive	Not Listed	

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Plantae	Flora	Chamaesyce psammogeton	Sand Spurge	Endangered	Not Sensitive	Not Listed	
Plantae	Flora	Corokia whiteana	Corokia	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Cryptocarya foetida	Stinking Cryptocarya	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Davidsonia jerseyana	Davidson's Plum	Endangered	Category 2	Endangered	
Plantae	Flora	Davidsonia johnsonii	Smooth Davidson's Plum	Endangered	Not Sensitive	Endangered	
Plantae	Flora	Desmodium acanthocladum	Thorny Pea	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Diospyros yandina	Shiny-leaved Ebony	Endangered	Not Sensitive	Not Listed	
Plantae	Flora	Diploglottis campbellii	Small-leaved Tamarind	Endangered	Category 2	Endangered	
Plantae	Flora	Diuris byronensis	Byron Bay Diuris	Endangered	Category 2	Not Listed	
Plantae	Flora	Drynaria rigidula	Basket Fern	Endangered	Category 3	Not Listed	
Plantae	Flora	Elaeocarpus williamsianus	Hairy Quandong	Endangered	Category 3	Endangered	
Plantae	Flora	Endiandra floydii	Crystal Creek Walnut	Endangered	Not Sensitive	Endangered	
Plantae	Flora	Endiandra hayesii	Rusty Rose Walnut	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Endiandra muelleri subsp. bracteata	Green-leaved Rose Walnut	Endangered	Not Sensitive	Not Listed	
Plantae	Flora	Floydia praealta	Ball Nut	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Fontainea australis	Southern Fontainea	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Geodorum densiflorum	Pink Nodding Orchid	Endangered	Category 2	Not Listed	
Plantae	Flora	Gossia fragrantissima	Sweet Myrtle	Endangered	Not Sensitive	Endangered	
Plantae	Flora	Grevillea hilliana	White Yiel Yiel	Endangered	Not Sensitive	Not Listed	
Plantae	Flora	Harnieria hygrophiloides		Endangered	Not Sensitive	Not Listed	
Plantae	Flora	Hicksbeachia pinnatifolia	Red Boppel Nut	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Isoglossa eranthemoides	Isoglossa	Endangered	Not Sensitive	Endangered	
Plantae	Flora	Macadamia integrifolia	Macadamia Nut	Not Listed	Not Sensitive	Vulnerable	
Plantae	Flora	Macadamia tetraphylla	Rough-shelled Bush Nut	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Macrozamia johnsonii	Johnson's Cycad	Endangered	Not Sensitive	Not Listed	
Plantae	Flora	Marsdenia longiloba	Slender Marsdenia	Endangered	Not Sensitive	Vulnerable	
Plantae	Flora	Melicope vitiflora	Coast Euodia	Endangered	Not Sensitive	Not Listed	
Plantae	Flora	Niemeyera whitei	Rusty Plum, Plum Boxwood	Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	Oberonia complanata	Yellow-flowered King of the Fairies	Endangered	Category 2	Not Listed	
Plantae	Flora	Ochrosia moorei	Southern Ochrosia	Endangered	Not Sensitive	Endangered	
Plantae	Flora	Owenia cepiodora	Onion Cedar	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Peristeranthus hillii	Brown Fairy-chain Orchid	Vulnerable	Category 2	Not Listed	
Plantae	Flora	Phaius australis	Southern Swamp Orchid	Endangered	Category 2	Endangered	
Plantae	Flora	Psilotum complanatum	Flat Fork Fern	Endangered	Category 3	Not Listed	

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Plantae	Flora	Pterostylis nigricans	Dark Greenhood	Vulnerable	Category 2	Not Listed	
Plantae	Flora	Randia moorei	Spiny Gardenia	Endangered	Not Sensitive	Endangered	
Plantae	Flora	Rhodamnia rubescens	Scrub Turpentine	Critically Endangered	Not Sensitive	Not Listed	
Plantae	Flora	Rhodomyrtus psidioides	Native Guava	Critically Endangered	Not Sensitive	Not Listed	
Plantae	Flora	Senna acclinis	Rainforest Cassia	Endangered	Not Sensitive	Not Listed	
Plantae	Flora	Syzygium hodgkinsoniae	Red Lilly Pilly	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Syzygium moorei	Durobby	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Tinospora tinosporoides	Arrow-head Vine	Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	Xylosma terrae-reginae	Queensland Xylosma	Endangered	Not Sensitive	Not Listed	

Data does not include NSW category 1 sensitive species.
NSW BioNet: © State of NSW and Office of Environment and Heritage

Location Confidences

Where Lotsearch has had to georeference features from supplied addresses, a location confidence has been assigned to the data record. This indicates a confidence to the positional accuracy of the feature. Where applicable, a code is given under the field heading “LC” or “LocConf”. These codes lookup to the following location confidences:

LC Code	Location Confidence
Premise match	Georeferenced to the site location / premise or part of site
General area or suburb match	Georeferenced with the confidence of the general/approximate area
Road match	Georeferenced to the road or rail
Road intersection	Georeferenced to the road intersection
Feature is a buffered point	Feature is a buffered point
Land adjacent to geocoded site	Land adjacent to Georeferenced Site
Network of features	Georeferenced to a network of features

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LAND REGISTRY SERVICES

Cadastral Records Enquiry Report : Lot 12 DP 1189646

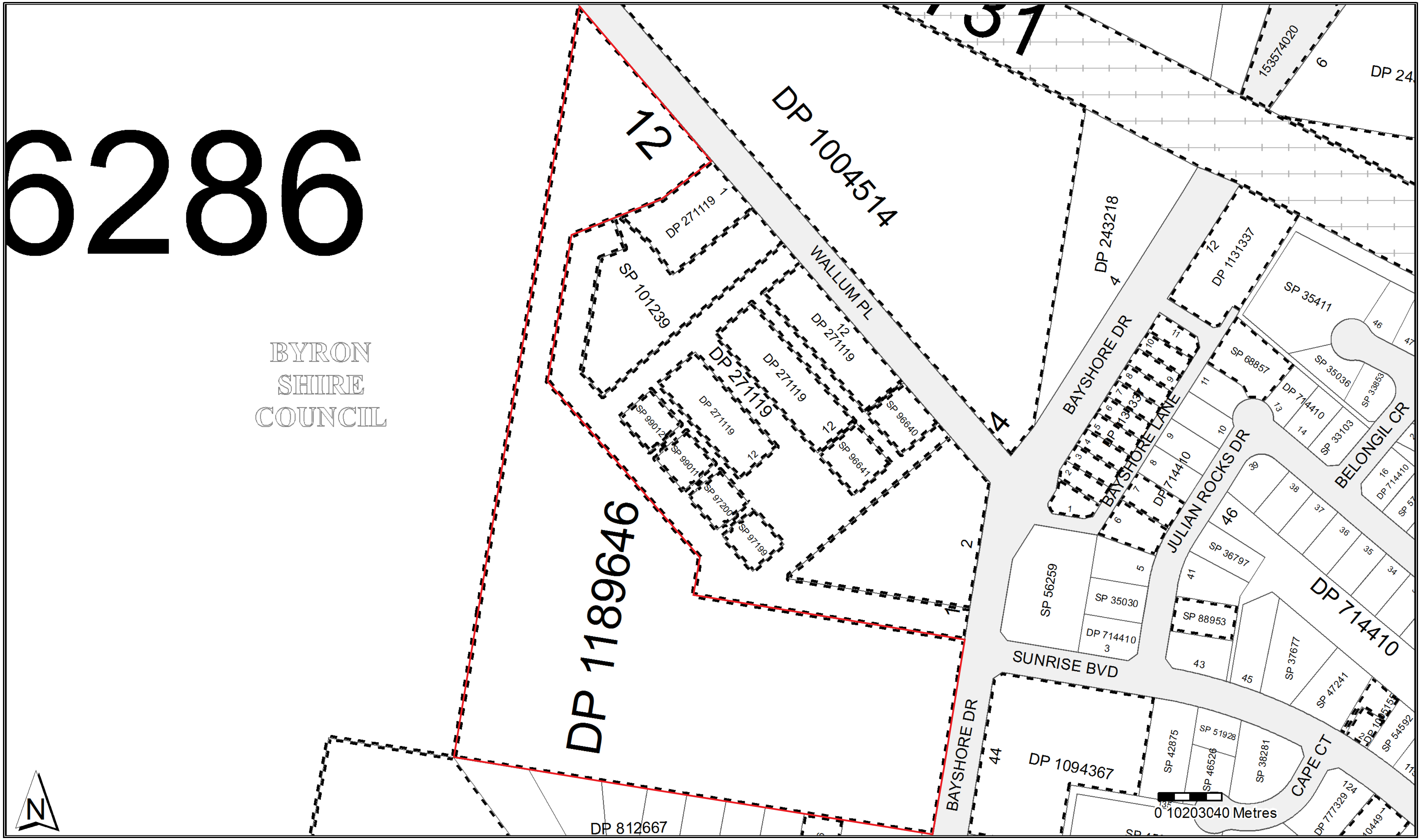
Ref : 42 Wallum Place

Locality : BYRON BAY

Parish : BYRON

LGA : BYRON

County : ROUS

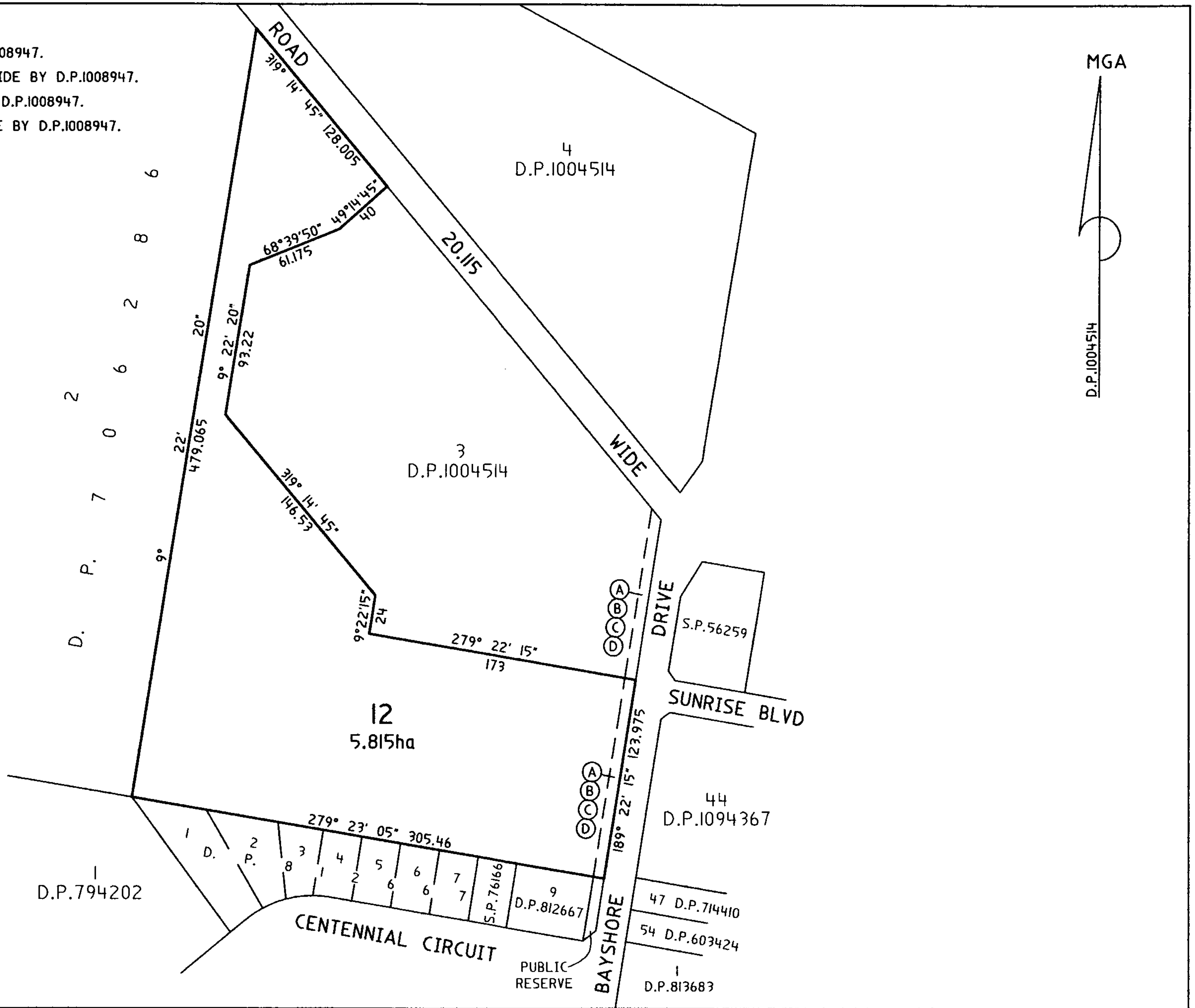


Report Generated 7:40:16 AM, 24 March, 2021

This information is provided as a searching aid only.Whilst every effort is made to ensure that current map, plan and titling information is accurately reflected, the Registrar General cannot guarantee the information provided. For ALL ACTIVITY PRIOR TO SEPTEMBER 2002 you must refer to the RGs Charting and Reference Maps

PLAN FORM 1 (A3) **WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION** Sheet 1 of 1 sheets

Ⓐ EASEMENT FOR SERVICES 7 WIDE BY D.P.1008947.
Ⓑ EASEMENT FOR DRAINAGE OF SEWAGE 7 WIDE BY D.P.1008947.
Ⓒ EASEMENT FOR WATER SUPPLY 7 WIDE BY D.P.1008947.
Ⓓ EASEMENT FOR SEWER RISING MAIN 7 WIDE BY D.P.1008947.



Surveyor: SCOTT ANTHONY THOMPSON
Date of Survey: 23RD JULY 2013
Surveyor's Ref: 2722a CHECKLIST

PLAN OF CONSOLIDATION OF LOTS 1 & 2 D.P.1004514

LGA: BYRON
Locality: BYRON BAY
Subdivision No: -
Lengths are in metres. Reduction Ratio 1:2500

Registered 25.9.2013

DP1189646 P

10 20 30 40 50 Table of mm 80 90 100 110 120 130 140

PLAN FORM 6 (2012) WARNING: Creasing or folding will lead to rejection

DEPOSITED PLAN ADMINISTRATION SHEET

Sheet 1 of 2 sheet(s)

Office Use Only

Registered: 25.9.2013

Title System: TORRENS

Purpose: CONSOLIDATION

Use Only

DP1189646 S

PLAN OF CONSOLIDATION OF LOTS 1 & 2 D.P.1004514

LGA: BYRON

Locality: BYRON BAY

Parish: BYRON

County: ROUS

Crown Lands NSW/Western Lands Office Approval

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

Signature: ....

Date: ....

File Number: ....

Office: ....

Subdivision Certificate

I, ...

*Authorised Person/*General Manager/*Accredited Officer, certify that the provisions of s.109J of the *Environmental Planning and Assessment Act 1979* have been satisfied in relation to the proposed subdivision, new road or reserve set out herein.

Signature: ....

Accreditation number: ....

Consent Authority: ....

Date of endorsement: ....

Subdivision Certificate number: ....

File number: ....

*Strike through if inapplicable

Survey Certificate

I, SCOTT ANTHONY THOMPSON

of CANTYS SURVEYORS P.O.BOX 509 MULLUMBIMBY 2482

a surveyor registered under the Surveying and Spatial Information Act, 2002, certify that:

~~*(a) The land shown in the plan was surveyed in accordance with the *Surveying and Spatial Information Regulation 2012*, is accurate and the survey was completed on ....~~

~~*(b) The part of the land shown in the plan (*being/*excluding^ ....) was surveyed in accordance with the *Surveying and Spatial Information Regulation 2012*, is accurate and the survey was completed on, ... the part not surveyed was compiled in accordance with that Regulation.~~

*(c) The land shown in this plan was compiled in accordance with the *Surveying and Spatial Information Regulation 2012.*

Signature: .... Dated: 23/7/2013

Surveyor ID: 2096

Datum Line: ....

Type: *Urban/~~*Rural~~

The terrain is *Level-Undulating/~~*Steep-Mountainous.~~

*Strike through if inapplicable.

^Specify the land actually surveyed or specify any land shown in the plan that is not the subject of the survey.

Statements of intention to dedicate public roads, public reserves and drainage reserves.

Plans used in preparation of ~~survey~~ / compilation.

D.P.1004514, D.P.1008947, D.P.714410, D.P.812667
D.P.603424, D.P.813683, D.P.1094367, D.P.706286
D.P.794202

If space is insufficient continue on PLAN FORM 6A

Signatures, Seals and Section 88B Statements should appear on PLAN FORM 6A

Surveyor's Reference: 2722a CHECKLIST

DEPOSITED PLAN ADMINISTRATION SHEET

Sheet 2 of 2 sheet(s)

Office Use Only

Registered: 25.9.2013

e Use Only

DP1189646

PLAN OF
CONSOLIDATION OF
LOTS 1 & 2 D.P.1004514

This sheet is for the provision of the following information as required:

- A schedule of lots and addresses - See 60(c) *SSI Regulation 2012*
- Statements of intention to create and release affecting interests in accordance with section 88B *Conveyancing Act 1919*.
- Signatures and seals - see 195D *Conveyancing Act 1919*.
- Any information which cannot fit in the appropriate panel of sheet 1 of the administration sheets.

Subdivision Certificate number: ....

Date of Endorsement: ....

STREET ADDRESS OF LO~~T, NOT AVAILABLE~~.

KEN GAINGER
GENERAL MANAGER

SIMON RICHARDSON
MAYOR

THE COUNCIL OF THE SHIRE OF BYRON

If space is insufficient use additional annexure sheet.

Surveyor's Reference: 2722a CHECKLIST

22.662

H.O.163.

Within Belongil Swamp Drainage Trust District

BYRON SHIRE

Papers L.B. 22. 6062

PLAN OF PORTION 305

County of Rous Parish of Byron

LAND DISTRICT OF LISMORE LAND BOARD DISTRICT OF GRAFTON

Occupation License No. Holding. Eastern Division.

Applied for under the 75th Section of the Crown Lands Consolidation Act 1913 by Oswald Joseph Byrne

Partly within V.R. 1053 South Extension Notd 28th May 1884 Revd 11-2-24. Gaz: 23-5-24.
do. do. R. 41426 for Drainage Notd 13th March 1907 Revokd 11-2-24. Gaz: 23-5-24
R 9557 for Road Purpt 31 Augt 1889. Revokd 11-2-24. Gaz:

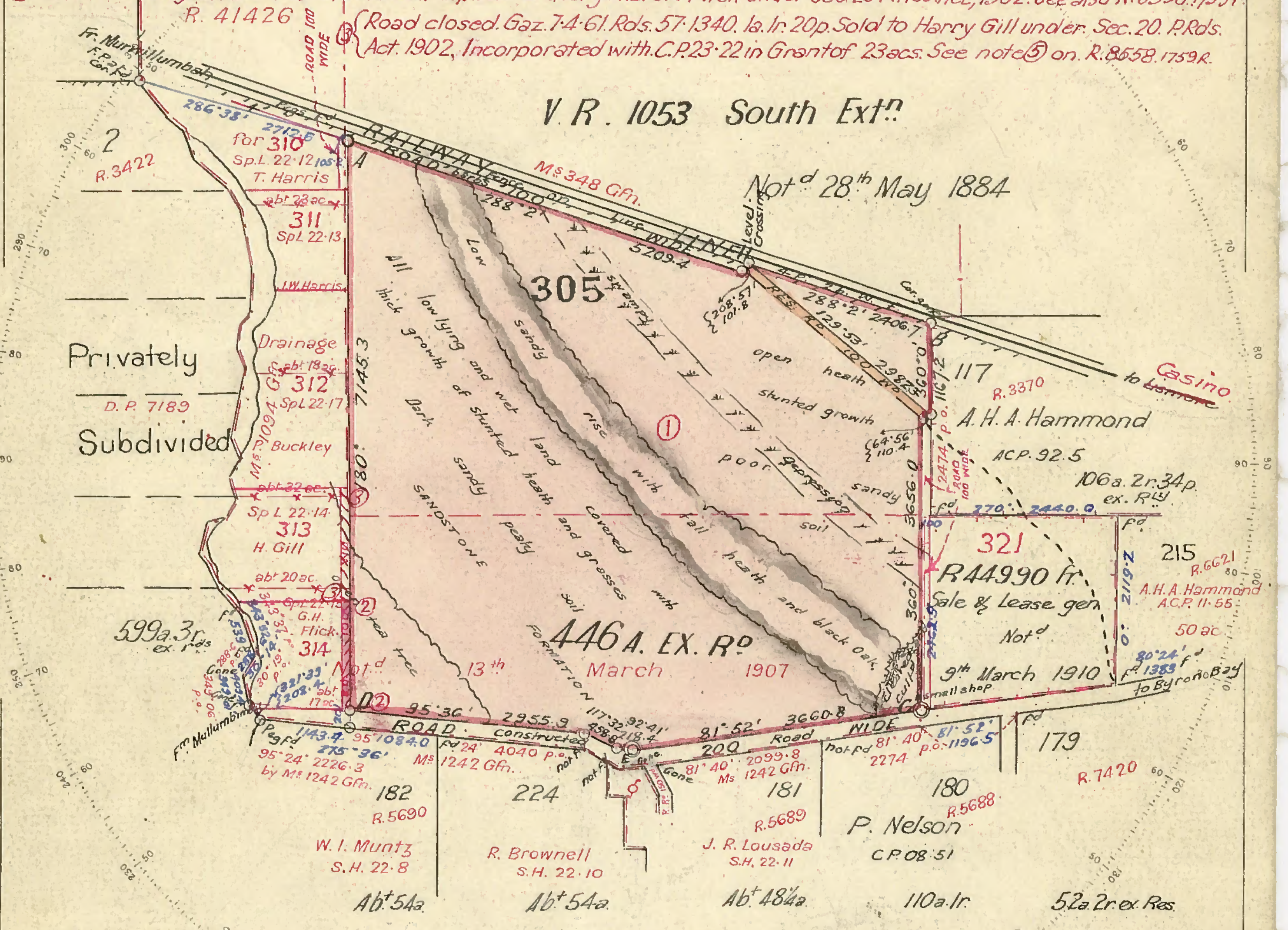
Within the Tweed & Richmond Rivers Gold Field Procld 22nd October 1887

Sp.L. 22·7 for Grazing and Agriculture from 1·8·22 to 31·12·32, Granted Gaz. 16·2·23.

① C.P. 23·19 Sept. 17th O.J. Byrne. Now Andersons Sausages Pty. Limited. Sale completed Jen. 58.3572.

② Closed road Gaz. 24·2·61. Rds. 57/1339. 1a. 1r. 37p. sold to George Harold Flick under Sec. 20 P.Rds Act, 1902. See also R. 8558.1759 r.

③ Road closed. Gaz. 7·4·61. Rds. 57·1340. 1a. 1r. 20p. Sold to Harry Gill under Sec. 20. P.Rds. Act. 1902, Incorporated with C.P.23·22 in Grant of 23acs. See note⑤ on R.8558.1759R.



Azimuth taken from Por. 215

Field Book 8317 Pages 5–8

PLAN MICROFILMED
NO ADDITIONS OR AMENDMENTS TO BE MADE

⑤ R. 9557 For Rd Purposes Notd 31·8·'89
Sp.L. 16·8 "Quarry" Byron Shire Council
Granted vide Gaz. 11·8·16. 5ac. 1r.

Reference to Corners

Corner	Bearing	From	Links	No on Tree
A	8° 51'	Tea-tree	130·4	305
B		Peg		305
C	81° 52' Peg	Metal Tube	5·0	305
D		Post		305
E	261° 52'	Metal Tube	5·0	

Reference to Traverse

Line	Bearing	Distance

I hereby certify that I in person made and on the 6th Novr 1922 completed the survey represented on this plan on which are written the bearings and lengths of the lines measured by me and I declare that the survey has been executed in accordance with the regulations published for the guidance of Licensed Surveyors and the practice of the Department of Lands.

F.G. Evans. Licensed Surveyor

Transmitted to the District Surveyor with my letter of 7th Decr 1922 No 88

Voucher No ✓ Passed Staff

Calculation Book No C194 Folio 76

Checked and Charted S.H. Whealy 3·1·23

Examined A.E. Harris 10th January 1923

Plan approved 16th Jany 1923.

Draftsman-in-Charge

Charted on Head Office Map
Fred Bidencope Jan 1923
Examined Bramley 16/2/23

Value of Improvements 24 chs. 4 pl. 2 b.w. fce.
½ V. = £6·0·0, abt 30 chs. tempy fce. (old wire) = £4·10·0;
abt 5 ac. cleared & cultd £20; Small shop - iron roof - incomplete £40.

Scale 20 Chains to an Inch.

Lithographed & Printed at the Department of Lands Sydney N.S.W. 1922.

Cat. No R. 8465-1759

standard prepared

14331024

NEW SOUTH WALES

[redacted]FICATE OF TITLE

AL PROPERTY ACT, 1900

Prior Title (Crown Grant)
Vol.7807 Fol.103

Vol. 14331 Fol. 24

EDITION ISSUED
19 1 1981

CANCELLED

(Page 1) Vol. 14331 Fol. 24

I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

SEE AUTO FOLIO

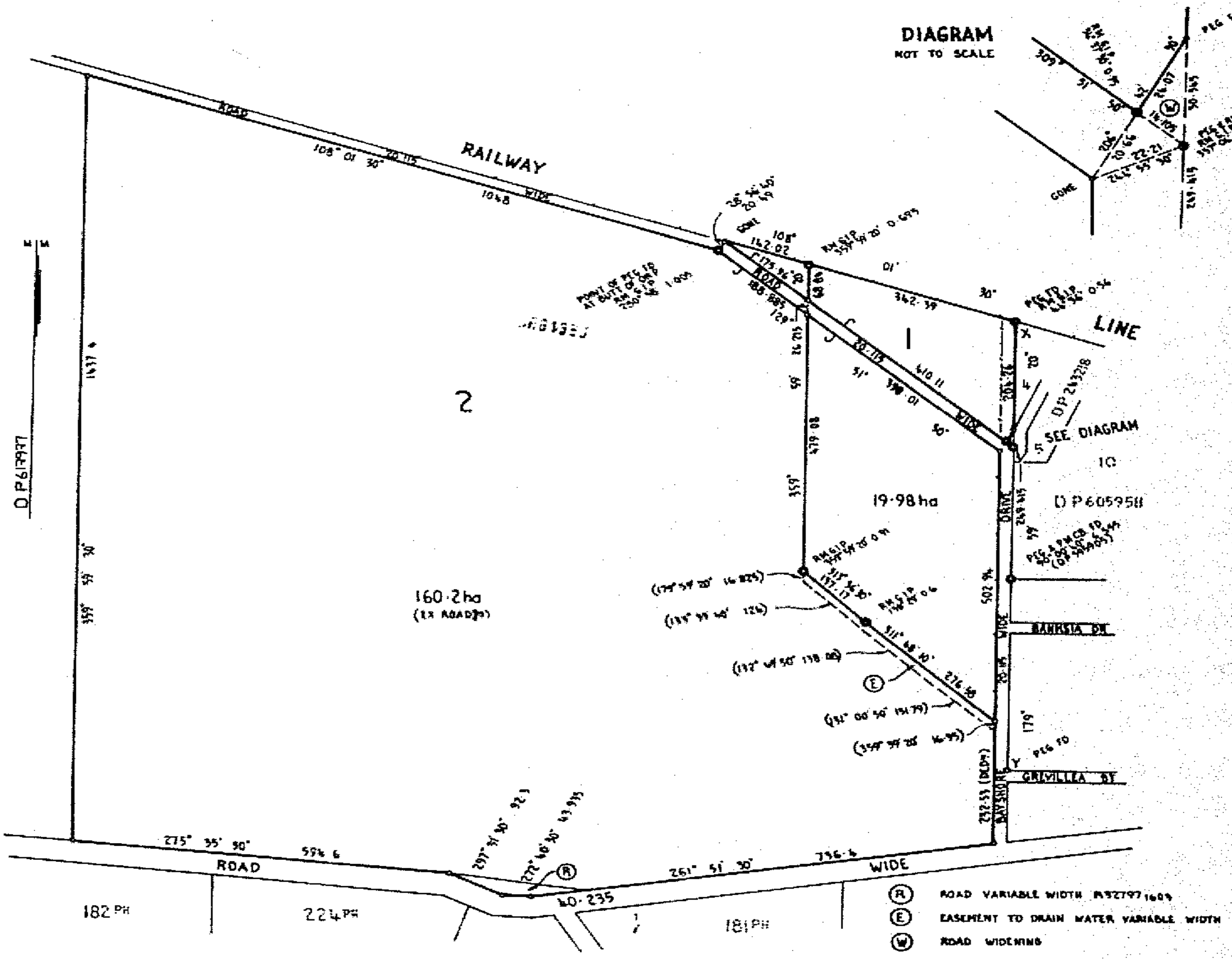
Registrar General.

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON

WARNING: THIS DOCUMENT MUST NOT BE REMOVED FROM THE REGISTRAR GENERAL'S OFFICE.

PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES



ESTATE AND LAND REFERRED TO

S

Estate in Fee Simple in Lot 1 in Deposited Plan 613937 at Ewingsdale in the Shire of Byron Parish of Byron and County of Rous. EXCEPTING THEREOUT the minerals reserved by the Crown Grant.

FIRST SCHEDULE

~~F. J. WALKER (BYRON BAY) PTY. LTD.~~

SECOND SCHEDULE

GRM

1. Reservations and conditions, if any, contained in the Crown Grant above referred to.
2. ~~Restrictions on dealings - see section 272 Crown Lands Consolidation Act, 1913 (C.P.1903/19 Lismore).~~ Cancelled S360947
3. ~~M64218 Mortgage to Bank of New South Wales.~~ Discharged S618148
4. DP613937 P Easement to drain water appurtenant to the land above described affecting the land shown so burdened in the plan hereon. EWZ

RG 2/64

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

Vol. 14331 Fol. 24

C.T. 2.7.81
S360947 W/Hattie R
~~DP611000~~
S618148 D/M
— 9 Te/R

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT		REGISTERED	Signature of Registrar General
	NATURE	NUMBER		
The Council of the Shire of Byron by Transfer S618149. Registered 19-8-1981				

SECOND SCHEDULE (continued)

INSTRUMENT		PARTICULARS	REGISTERED	Signature of Registrar General	CANCELLATION	
NATURE	NUMBER					
S360947 P	Request	Attention is directed to section 8 of the Land Aggregation Tax Management Act, 1971. Registered 19-6-1981.				

CANCELLED

SEE AUTO FOLIO

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

LAND
REGISTRY
SERVICES

Historical Title

InfoTrack

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE

24/3/2021 7:33AM

FOLIO: 1/613937

First Title(s): SEE PRIOR TITLE(S)
Prior Title(s): VOL 14331 FOL 24

Recorded	Number	Type of Instrument	C.T. Issue
28/3/1988		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
8/9/1988		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED
27/9/1991	DP812667	DEPOSITED PLAN	FOLIO CANCELLED RESIDUE REMAINS
31/7/1992	E650965	DEPARTMENTAL DEALING	FOLIO RESTORED
31/7/1992	E640216	TRANSFER RELEASING EASEMENT	
31/7/1992	E650966	DEPARTMENTAL DEALING	FOLIO CANCELLED RESIDUE REMAINS
2/4/2007	AD23587	DEPARTMENTAL DEALING	

*** END OF SEARCH ***

Historical Title

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE

24/3/2021 7:33AM

FOLIO: 25/812667

First Title(s): VOL 7807 FOL 103
Prior Title(s): 1/613937

Recorded	Number	Type of Instrument	C.T. Issue
27/9/1991	DP812667	DEPOSITED PLAN	FOLIO CREATED EDITION 1
29/7/1992	E608160	TRANSFER RELEASING EASEMENT	
2/10/1992	E801995	DEPARTMENTAL DEALING	
5/8/1999	DP1004514	DEPOSITED PLAN	FOLIO CANCELLED
2/4/2007	AD23587	DEPARTMENTAL DEALING	

*** END OF SEARCH ***

Received: 24/03/2021 07:33:24

Historical Title

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
24/3/2021 7:33AM

FOLIO: 1/1004514

First Title(s): VOL 7807 FOL 103
Prior Title(s): 25/812667

Recorded	Number	Type of Instrument	C.T. Issue
5/8/1999	DP1004514	DEPOSITED PLAN	FOLIO CREATED EDITION 1
7/1/2000	DP1008947	DEPOSITED PLAN	EDITION 2
6/10/2006	AC591433	WITHDRAWN - LEASE	
25/9/2013	DP1189646	DEPOSITED PLAN	FOLIO CANCELLED

*** END OF SEARCH ***

Received: 24/03/2021 07:33:24

Historical Title

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
24/3/2021 7:30AM

FOLIO: 2/1004514

First Title(s): VOL 7807 FOL 103
Prior Title(s): 25/812667

Recorded	Number	Type of Instrument	C.T. Issue
5/8/1999	DP1004514	DEPOSITED PLAN	FOLIO CREATED EDITION 1
7/1/2000	DP1008947	DEPOSITED PLAN	EDITION 2
18/7/2013	AH875174	APPLICATION FOR REPLACEMENT CERTIFICATE OF TITLE	EDITION 3
25/9/2013	DP1189646	DEPOSITED PLAN	FOLIO CANCELLED

*** END OF SEARCH ***

Received: 24/03/2021 07:33:23

Historical Title

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

```
                                               SEARCH DATE
                                               -----------
                                               24/3/2021 7:33AM

FOLIO: 12/1189646
------

      First Title(s): VOL 7807 FOL 103
      Prior Title(s): 1-2/1004514

Recorded    Number     Type of Instrument               C.T. Issue
--------    ------     ------------------               ----------
25/9/2013   DP1189646  DEPOSITED PLAN                   FOLIO CREATED
                                                        EDITION 1


                  ***  END OF SEARCH  ***
```

42 Wallum Place, Byron Bay PRINTED ON 24/3/2021

Title Search

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 12/1189646

SEARCH DATE	TIME	EDITION NO	DATE
24/3/2021	7:31 AM	1	25/9/2013

LAND

LOT 12 IN DEPOSITED PLAN 1189646
AT BYRON BAY
LOCAL GOVERNMENT AREA BYRON
PARISH OF BYRON   COUNTY OF ROUS
TITLE DIAGRAM DP1189646

FIRST SCHEDULE

THE COUNCIL OF THE SHIRE OF BYRON

SECOND SCHEDULE (5 NOTIFICATIONS)

1 LAND EXCLUDES MINERALS AND IS SUBJECT TO RESERVATIONS AND CONDITIONS IN FAVOUR OF THE CROWN - SEE CROWN GRANT(S)
2 DP1008947 EASEMENT FOR SERVICES 7 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
3 DP1008947 EASEMENT FOR DRAINAGE OF SEWAGE 7 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
4 DP1008947 EASEMENT FOR WATER SUPPLY 7 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
5 DP1008947 EASEMENT FOR SEWER RISING MAIN 7 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

Received: 24/03/2021 07:31:30

C Site Photos

Photo A Subject Site looking south east

Photo B Subject Site Looking South

Photo C Subject Site looking south

Photo D Subject site looking North

D PID

tim
fitzroy & associates
environmental health | environmental education | environmental auditing

Field Sample Collection

Date: 16/4/21

Staff: TF

Job Number: BSC 15/21

Location: Bayshore Drive, Byron Bay

Weather: Clear day/no rain

Purpose: ASS / [✓ CL] / OSSM / WQ / Site Inspection /Other

Sample Type: [✓ Soil] / Water / Dust / Other

Field Measurements:

ID Sample:	Time:	Depth (m):	Soil Type:	PID:	Comments:
1A + Field Dup	9.40am	0-0.1m	Dark clay	0.9	
1B		1-1.2m	Clay	0.5	
1C		1.4-1.5m	Natural	0.0	
2A		0-0.1m	Clay	0.8	
2B + Lab Dup 1		0.6-0.7m	Light Clay	0.2	
2C		1.1-1.2m	Natural	0.0	
3A + Lab Dup 2		0-0.1m	Fill clay	0.0	
3B		0.5-0.6m	Fill clay	0.0	
3C		0.8-0.9m	Fill	0.0	
4A		0-0.1m	Fill	0.8	
4B		0.5-0.6m	Fill clay	0.7	
4C		1.2-1.3m	Natural	0.9	
5A		0-0.1m	Dark clay	0.0	
5B		0.9-1m	Light clay	0.5	
5C		1.4-1.5m	Natural sand	0.3	

ID Sample:	Time:	Depth (m):	Soil Type:		Comments:
6A		0-0.1m	Clay	Battery failed*	• Battery failed on PID, unable to repair onsite
6B + Field Dup		0.5-0.6m	Light clay	Battery failed	
6C		1.2-1.3m	Natural sand	Battery failed	
7A		0-0.1m	Clay	Battery failed	
7B		0.5-0.6m	Mixed fill	Battery failed	
7C		1.2-1.3m	Natural Sand	Battery failed	
8A		0-0.1m	Dark clay	Battery failed	
8B		1-1.1m	Light clay	Battery failed	
8C		1.3-1.4m	Natural sand	Battery failed	
9A		0-0.1m	Grey clay	Battery failed	
9B		1-1.1m	Light clay	Battery failed	
9C		1.3-1.4m	Sand	Battery failed	
10A		0-0.1m	Natural black sand	Battery failed	
10B		0.3-0.4m	Black sand (fill silty)	Battery failed	
10C		1.4-1.5m	Indurated sand	Battery failed	

ID Sample:	Time:	Depth (m):	Soil Type:	PID:	Comments:
11A		0-0.1m	Clay	Battery failed	
11B		0.3-0.4m	Clay	Battery failed	
11C		1.6-1.7m	Sand	Battery failed	

201956

AES
sensing safety

Calibration and Service Report – PID

Company: TR Pty Ltd
Contact: Mark Benesovsky
Address:

Phone: 03 9896 3023
Fax: 03 9896 3099
Email: markbenesovsky@techrentals.c

Manufacturer: RAE
Instrument: PPBRAE 3000 SN: 594-905251
Model: ppbRAE 3000
Configuration: VOC
Wireless: -
Network ID: -
Unit ID: -
Details:

Serial #: 594-905251
Asset #:
Part #: 059-C116-000
Sold: 29.05.2014
Last Cal: 12.09.2019
Job #: 121510
Cal Spec:
Order #: -

Item	Test	Pass/Fail	Comments	Serial Number
Battery	NiCd, NiMH, Dry cell, LiIon	P		
Charger	Power Supply	P		
	Cradle, Travel Charger	P		
Pump	Flow	P	Cleaned, >500 mL/min	
Filter	Filter, fitting, etc	F	Dirty, replaced	
Alarms	Audible, visual, vibration	P		
Display	Operation	P		
Switches	Operation	P		
PCB	Operation	P		
Connectors	Condition	P		
Firmware	Version	P	Upgraded, 2.22	
Datalogger	Operation	P		
Monitor Housing	Condition	P		
Case	Condition / Type	P		
Sensors				
PID	Lamp	P	Cleaned	
PID	Sensor	P		
THP	Sensor	P		

Engineer's Report

Data download and PC configuration checked - Firmware upgraded to latest (Version: 2.22).
Pump assembly and Lamp cleaned. Pump Flow rate >500mL/min.
PID sensor checked if moisture sensitive - passed O.K.
New Filter fitted. Unit calibrated and serviceable.

AES
sensing safety

Calibration Certificate

Sensor	Type	Serial No.	Span Gas	Concentration	Traceability Lot #	CF	Reading	
							Zero	Span
Oxygen								
LEL								
PID	050-0000-004. 10.6EV 1/ 2 INCH LAMP	1062R132102	Isobutylene	10PPM	WO269211-10		0	10.2
Battery	059-3051-000. LI-ION BA TTERY FOR MINIRAE	159R4W0204						
Toxic 1								
Toxic 2								
Toxic 3								
Toxic 4								
Toxic 5								
Toxic 6								

Calibrated/Repaired by: DANIEL CARUSO

Date: 23.11.2020

Next Due: 23.05.2021

E Bore Logs & Groundwater Wells

GEOTECH INVESTIGATIONS PTY LTD

Unit 3/42 Machinery Drive, Tweed Heads South NSW 2486
Ph: 0755 233 979 Fax: 0755 233 981

ENGINEERING LOG – BOREHOLE PROFILE

GPS:	**N:**		**E:**	

CLIENT: TIM FITZOY & ASSOCIATES PTY LTD	**BOREHOLE I.D. :** BH 1
PROJECT: LOT 2 BAYSHORE DRIVE, BYRON BAY	**JOB No.:** GI 5765-a
EQUIPMENT TYPE: GT-10 **HOLE DIAMETER:** 110mm	**PAGE:** 1 of 1

Method	Water	Depth (m)	Graphic Log	Material Description	Consistency / Rel. Density	Sample / Test	DCP Blows / 100mm	Structure and additional observation
AD		0.5	▥	(CH) Sandy Gravelly CLAY: High plasticity, Fine to coarse sand, Trace of fine gravel, Moist, Grey mottled red and brown				FILL
		1.0	▤	(CL) Silty Sandy CLAY: Low plasticity, Fine to coarse sand, Trace of fine to medium gravel, Moist, Pale grey mottled orange				
	▼	1.5	▒	(SP) SAND: Fine sand, Trace of silt, Wet, Grey				ALLUVIUM
		2.0 2.5 3.0 3.5 4.0 4.5						

BH 1 TERMINATED AT 1.6m – LIMIT OF INVESTIGATION

METHOD	
AD	Auger Drilling
C	Casing
MS	Mud Support
NMLC	Rock Coring
RR	Rock Roller
TC	Tri Cone
WB	Wash Bore

WATER	
▼	Water Level
▶	Water Seepage

WEATHERING	
EW	Extremely
HW	Highly
DW	Distinctly
MW	Moderately
SW	Slightly
F	Fresh

CONSISTENCY / DENSITY / ROCK STRENGTH			
VS	Very Soft	D	Dense
S	Soft	VD	Very Dense
F	Firm	Fb	Friable
St	Stiff	ELw	Extremely Low
VSt	Very Stiff	VLw	Very Low
Hd	Hard	Lw	Low
VL	Very Loose	M	Medium
L	Loose	H	High
MD	Medium Dense	VH	Very High

SAMPLES / TESTS	
U( )	Undisturbed (size in mm)
D	Disturbed
BS	Bulk Sample
DCP	Dynamic Cone Penetrometer
SPT	Standard Penetrometer Test
N	Number of blows for SPT / 300mm
VS	Vane Shear
A	Acid Sulfate Sample
PP	Pocket Penetrometer (kPa)

Logged By:	DAW	**Date:**	16/04/21	**Checked By:**	AOC	**Date:**	5/5/21

Form GI 003a Issue 3

GEOTECH INVESTIGATIONS PTY LTD

Unit 3/42 Machinery Drive, Tweed Heads South NSW 2486
Ph: 0755 233 979 Fax: 0755 233 981

ENGINEERING LOG – BOREHOLE PROFILE

GPS:	**N:**		**E:**

CLIENT: TIM FITZOY & ASSOCIATES PTY LTD	**BOREHOLE I.D. :** BH 2
PROJECT: LOT 2 BAYSHORE DRIVE, BYRON BAY	**JOB No.:** GI 5765-a
EQUIPMENT TYPE: GT-10 **HOLE DIAMETER:** 110mm	**PAGE:** 1 of 1

Method	Water	Depth (m)	Graphic Log	Material Description	Consistency / Rel. Density	Sample / Test	DCP Blows / 100mm	Structure and additional observation
AD		0.5	▥	(CH) Sandy Gravelly CLAY: High plasticity, Fine to coarse sand, Trace of fine to medium gravel, Moist, Grey mottled red and brown				FILL
		1.0	▤	(CL) Silty Sandy CLAY: Low plasticity, Fine to coarse sand, Trace of fine to medium gravel, Moist, Pale grey mottled orange				
	▼		░	(SP) SAND: Fine sand, Wet, Pale grey				ALLUVIUM
		1.5	▒	(SM) Silty SAND: Fine sand, Moist, Dark grey				
		2.0 2.5 3.0 3.5 4.0 4.5						

BH 2 TERMINATED AT 1.5m – LIMIT OF INVESTIGATION

METHOD	
AD	Auger Drilling
C	Casing
MS	Mud Support
NMLC	Rock Coring
RR	Rock Roller
TC	Tri Cone
WB	Wash Bore

WATER	
▼	Water Level
►	Water Seepage

WEATHERING	
EW	Extremely
HW	Highly
DW	Distinctly
MW	Moderately
SW	Slightly
F	Fresh

CONSISTENCY / DENSITY / ROCK STRENGTH			
VS	Very Soft	D	Dense
S	Soft	VD	Very Dense
F	Firm	Fb	Friable
St	Stiff	ELw	Extremely Low
VSt	Very Stiff	VLw	Very Low
Hd	Hard	Lw	Low
VL	Very Loose	M	Medium
L	Loose	H	High
MD	Medium Dense	VH	Very High

SAMPLES / TESTS	
U( )	Undisturbed (size in mm)
D	Disturbed
BS	Bulk Sample
DCP	Dynamic Cone Penetrometer
SPT	Standard Penetrometer Test
N	Number of blows for SPT / 300mm
VS	Vane Shear
A	Acid Sulfate Sample
PP	Pocket Penetrometer (kPa)

Logged By: DAW	**Date:** 16/04/21	**Checked By:** AOC	**Date:** 5/5/21

GEOTECH INVESTIGATIONS PTY LTD

Unit 3/42 Machinery Drive, Tweed Heads South NSW 2486
Ph: 0755 233 979 Fax: 0755 233 981

ENGINEERING LOG – BOREHOLE PROFILE

GPS: **N:** **E:**

CLIENT: TIM FITZOY & ASSOCIATES PTY LTD	**BOREHOLE I.D. :** BH 3
PROJECT: LOT 2 BAYSHORE DRIVE, BYRON BAY	**JOB No.:** GI 5765-a
EQUIPMENT TYPE: GT-10 **HOLE DIAMETER:** 110mm	**PAGE:** 1 of 1

Method	Water	Depth (m)	Graphic Log	Material Description	Consistency / Rel. Density	Sample / Test	DCP Blows / 100mm	Structure and additional observation
AD			▥	(CH) Sandy Gravelly CLAY: High plasticity, Fine to coarse sand, Trace of fine gravel, Moist, Grey mottled red and brown				FILL
		0.5	▤	(CL) Silty Sandy CLAY: Low plasticity, Fine to coarse sand, Trace of fine to medium gravel, Moist, Brown mottled orange				
	▼	1.0	░	(SP) SAND: Fine sand, Trace of silt, Wet, Grey				ALLUVIUM
		1.5	▓	(SM) Silty SAND: Fine sand, Moist				
		2.0 2.5 3.0 3.5 4.0 4.5						

BH 3 TERMINATED AT 1.5m – LIMIT OF INVESTIGATION

METHOD	
AD	Auger Drilling
C	Casing
MS	Mud Support
NMLC	Rock Coring
RR	Rock Roller
TC	Tri Cone
WB	Wash Bore

WATER	
▼	Water Level
►	Water Seepage

WEATHERING	
EW	Extremely
HW	Highly
DW	Distinctly
MW	Moderately
SW	Slightly
F	Fresh

CONSISTENCY / DENSITY / ROCK STRENGTH			
VS	Very Soft	D	Dense
S	Soft	VD	Very Dense
F	Firm	Fb	Friable
St	Stiff	ELw	Extremely Low
VSt	Very Stiff	VLw	Very Low
Hd	Hard	Lw	Low
VL	Very Loose	M	Medium
L	Loose	H	High
MD	Medium Dense	VH	Very High

SAMPLES / TESTS	
U( )	Undisturbed (size in mm)
D	Disturbed
BS	Bulk Sample
DCP	Dynamic Cone Penetrometer
SPT	Standard Penetrometer Test
N	Number of blows for SPT / 300mm
VS	Vane Shear
A	Acid Sulfate Sample
PP	Pocket Penetrometer (kPa)

Logged By:	DAW	**Date:**	16/04/21	**Checked By:**	AOC	**Date:**	5/5/21

GEOTECH INVESTIGATIONS PTY LTD

Unit 3/42 Machinery Drive, Tweed Heads South NSW 2486
Ph: 0755 233 979 Fax: 0755 233 981

ENGINEERING LOG – BOREHOLE PROFILE

GPS:	**N:**		**E:**

CLIENT: TIM FITZOY & ASSOCIATES PTY LTD		**BOREHOLE I.D. :** BH 4
PROJECT: LOT 2 BAYSHORE DRIVE, BYRON BAY		**JOB No.:** GI 5765-a
EQUIPMENT TYPE: GT-10	**HOLE DIAMETER:** 110mm	**PAGE:** 1 of 1

Method	Water	Depth (m)	Graphic Log	Material Description	Consistency / Rel. Density	Sample / Test	DCP Blows / 100mm	Structure and additional observation
AD			▥	(CH) Sandy Gravelly CLAY: High plasticity, Fine to coarse sand, Moist, Grey mottled red and brown				FILL
	▼	0.5 1.0	▤	(CL) Silty Sandy CLAY: Low plasticity, Fine to coarse sand, Trace of fine to medium gravel, Moist, Brown mottled orange				
		1.5	■	(SM) Silty SAND: Fine sand, Wet, Grey				ALLUVIUM
		2.0 2.5 3.0 3.5 4.0 4.5						

BH 4 TERMINATED AT 1.5m – LIMIT OF INVESTIGATION

METHOD		WEATHERING		CONSISTENCY / DENSITY / ROCK STRENGTH				SAMPLES / TESTS	
AD	Auger Drilling	EW	Extremely	VS	Very Soft	D	Dense	U( )	Undisturbed (size in mm)
C	Casing	HW	Highly	S	Soft	VD	Very Dense	D	Disturbed
MS	Mud Support	DW	Distinctly	F	Firm	Fb	Friable	BS	Bulk Sample
NMLC	Rock Coring	MW	Moderately	St	Stiff	ELw	Extremely Low	DCP	Dynamic Cone Penetrometer
RR	Rock Roller	SW	Slightly	VSt	Very Stiff	VLw	Very Low	SPT	Standard Penetrometer Test
TC	Tri Cone	F	Fresh	Hd	Hard	Lw	Low	N	Number of blows for SPT / 300mm
WB	Wash Bore			VL	Very Loose	M	Medium	VS	Vane Shear
WATER				L	Loose	H	High	A	Acid Sulfate Sample
▼	Water Level			MD	Medium Dense	VH	Very High	PP	Pocket Penetrometer (kPa)
►	Water Seepage								

Logged By: DAW	**Date:** 16/04/21	**Checked By:** AOC	**Date:** 5/5/21

GEOTECH INVESTIGATIONS PTY LTD

Unit 3/42 Machinery Drive, Tweed Heads South NSW 2486
Ph: 0755 233 979 Fax: 0755 233 981

ENGINEERING LOG – BOREHOLE PROFILE

GPS: **N:** **E:**

CLIENT: TIM FITZOY & ASSOCIATES PTY LTD	**BOREHOLE I.D. :** BH 5
PROJECT: LOT 2 BAYSHORE DRIVE, BYRON BAY	**JOB No.:** GI 5765-a
EQUIPMENT TYPE: GT-10 **HOLE DIAMETER:** 110mm	**PAGE:** 1 of 1

Method	Water	Depth (m)	Graphic Log	Material Description	Consistency / Rel. Density	Sample / Test	DCP Blows / 100mm	Structure and additional observation
AD			▥	(CH) Sandy Gravelly CLAY: High plasticity, Fine to coarse sand, Trace of fine to medium gravel, Moist, Grey mottled red and brown				FILL
		0.5 1.0	▤	(CL) Silty Sandy CLAY: Low plasticity, Fine to coarse sand, Trace of fine to medium gravel, Moist, Pale grey mottled orange				
	▼	1.5	■	(SM) Silty SAND: Fine sand, Wet, Dark grey				ALLUVIUM
		2.0 2.5 3.0 3.5 4.0 4.5						

BH 5 TERMINATED AT 1.5m – LIMIT OF INVESTIGATION

METHOD	
AD	Auger Drilling
C	Casing
MS	Mud Support
NMLC	Rock Coring
RR	Rock Roller
TC	Tri Cone
WB	Wash Bore

WATER	
▼	Water Level
►	Water Seepage

WEATHERING	
EW	Extremely
HW	Highly
DW	Distinctly
MW	Moderately
SW	Slightly
F	Fresh

CONSISTENCY / DENSITY / ROCK STRENGTH			
VS	Very Soft	D	Dense
S	Soft	VD	Very Dense
F	Firm	Fb	Friable
St	Stiff	ELw	Extremely Low
VSt	Very Stiff	VLw	Very Low
Hd	Hard	Lw	Low
VL	Very Loose	M	Medium
L	Loose	H	High
MD	Medium Dense	VH	Very High

SAMPLES / TESTS	
U( )	Undisturbed (size in mm)
D	Disturbed
BS	Bulk Sample
DCP	Dynamic Cone Penetrometer
SPT	Standard Penetrometer Test
N	Number of blows for SPT / 300mm
VS	Vane Shear
A	Acid Sulfate Sample
PP	Pocket Penetrometer (kPa)

Logged By: DAW **Date:** 16/04/21 **Checked By:** AOC **Date:** 5/5/21

GEOTECH INVESTIGATIONS PTY LTD
Unit 3/42 Machinery Drive, Tweed Heads South NSW 2486
Ph: 0755 233 979 Fax: 0755 233 981

ENGINEERING LOG – BOREHOLE PROFILE

GPS:	**N:**		**E:**

CLIENT: TIM FITZOY & ASSOCIATES PTY LTD	**BOREHOLE I.D. :** BH 6
PROJECT: LOT 2 BAYSHORE DRIVE, BYRON BAY	**JOB No.:** GI 5765-a
EQUIPMENT TYPE: GT-10 **HOLE DIAMETER:** 110mm	**PAGE:** 1 of 1

Method	Water	Depth (m)	Graphic Log	Material Description	Consistency / Rel. Density	Sample / Test	DCP Blows / 100mm	Structure and additional observation
AD		0.5	▤	(CL) Silty Sandy CLAY: Low plasticity, Fine to coarse sand, Trace of fine to medium gravel, Moist, Brown mottled orange				FILL
		1.0	▤	(CL) Sandy CLAY: Low plasticity, Fine sand, Moist, Dark grey				ALLUVIUM
	▼	1.5	■	(SM) Silty SAND: Fine sand, Wet, Orange mottled brown				
		2.0 2.5 3.0 3.5 4.0 4.5						

BH 6 TERMINATED AT 1.5m – LIMIT OF INVESTIGATION

METHOD	
AD	Auger Drilling
C	Casing
MS	Mud Support
NMLC	Rock Coring
RR	Rock Roller
TC	Tri Cone
WB	Wash Bore

WATER	
▼	Water Level
►	Water Seepage

WEATHERING	
EW	Extremely
HW	Highly
DW	Distinctly
MW	Moderately
SW	Slightly
F	Fresh

CONSISTENCY / DENSITY / ROCK STRENGTH			
VS	Very Soft	D	Dense
S	Soft	VD	Very Dense
F	Firm	Fb	Friable
St	Stiff	ELw	Extremely Low
VSt	Very Stiff	VLw	Very Low
Hd	Hard	Lw	Low
VL	Very Loose	M	Medium
L	Loose	H	High
MD	Medium Dense	VH	Very High

SAMPLES / TESTS	
U( )	Undisturbed (size in mm)
D	Disturbed
BS	Bulk Sample
DCP	Dynamic Cone Penetrometer
SPT	Standard Penetrometer Test
N	Number of blows for SPT / 300mm
VS	Vane Shear
A	Acid Sulfate Sample
PP	Pocket Penetrometer (kPa)

Logged By: DAW	**Date:** 16/04/21	**Checked By:** AOC	**Date:** 5/5/21

GEOTECH INVESTIGATIONS PTY LTD

Unit 3/42 Machinery Drive, Tweed Heads South NSW 2486
Ph: 0755 233 979 Fax: 0755 233 981

ENGINEERING LOG – BOREHOLE PROFILE

GPS:	**N:**		**E:**		

CLIENT: TIM FITZOY & ASSOCIATES PTY LTD	**BOREHOLE I.D. :** BH 7
PROJECT: LOT 2 BAYSHORE DRIVE, BYRON BAY	**JOB No.:** GI 5765-a
EQUIPMENT TYPE: GT-10 / **HOLE DIAMETER:** 110mm	**PAGE:** 1 of 1

Method	Water	Depth (m)	Graphic Log	Material Description	Consistency / Rel. Density	Sample / Test	DCP Blows / 100mm	Structure and additional observation
AD		0.5	▥	(CH) Sandy Gravelly CLAY: High plasticity, Fine to coarse sand, Moist, Grey mottled red and brown				FILL
		1.0	▤	(CL) Silty Sandy CLAY: Low plasticity, Fine to coarse sand, Trace of fine to medium gravel, Moist, Brown mottled orange				
	▼	1.5	▒	(SP) SAND: Fine sand, Wet, Grey				ALLUVIUM
		2.0						
		2.5						
		3.0						
		3.5						
		4.0						
		4.5						

BH 7 TERMINATED AT 1.5m – LIMIT OF INVESTIGATION

METHOD		WEATHERING		CONSISTENCY / DENSITY / ROCK STRENGTH				SAMPLES / TESTS	
AD	Auger Drilling	EW	Extremely	VS	Very Soft	D	Dense	U( )	Undisturbed (size in mm)
C	Casing	HW	Highly	S	Soft	VD	Very Dense	D	Disturbed
MS	Mud Support	DW	Distinctly	F	Firm	Fb	Friable	BS	Bulk Sample
NMLC	Rock Coring	MW	Moderately	St	Stiff	ELw	Extremely Low	DCP	Dynamic Cone Penetrometer
RR	Rock Roller	SW	Slightly	VSt	Very Stiff	VLw	Very Low	SPT	Standard Penetrometer Test
TC	Tri Cone	F	Fresh	Hd	Hard	Lw	Low	N	Number of blows for SPT / 300mm
WB	Wash Bore			VL	Very Loose	M	Medium	VS	Vane Shear
WATER				L	Loose	H	High	A	Acid Sulfate Sample
▼	Water Level			MD	Medium Dense	VH	Very High	PP	Pocket Penetrometer (kPa)
►	Water Seepage								

Logged By: DAW	**Date:** 16/04/21	**Checked By:** AOC	**Date:** 5/5/21

GEOTECH INVESTIGATIONS PTY LTD

Unit 3/42 Machinery Drive, Tweed Heads South NSW 2486
Ph: 0755 233 979 Fax: 0755 233 981

ENGINEERING LOG – BOREHOLE PROFILE

GPS: **N:** **E:**

CLIENT: TIM FITZOY & ASSOCIATES PTY LTD

BOREHOLE I.D. : BH 8

PROJECT: LOT 2 BAYSHORE DRIVE, BYRON BAY

JOB No.: GI 5765-a

EQUIPMENT TYPE: GT-10

HOLE DIAMETER: 110mm

PAGE: 1 of 1

Method	Water	Depth (m)	Graphic Log	Material Description	Consistency / Rel. Density	Sample / Test	DCP Blows / 100mm	Structure and additional observation
AD			▥	(CH) Sandy Gravelly CLAY: High plasticity, Fine to coarse sand, Trace of fine to medium gravel, Moist, Grey mottled red and brown				FILL
		0.5	▤	(CL) Silty Sandy CLAY: Low plasticity, Fine to coarse sand, Trace of fine to medium gravel, Moist, Brown mottled orange				
		1.0	░	(SP) SAND: Fine sand, Trace of silt, Wet, Grey				ALLUVIUM
	▼	1.5	▓	(SM) Silty SAND: Fine sand, Wet, Dark grey				
		2.0						
		2.5						
		3.0						
		3.5						
		4.0						
		4.5						

BH 8 TERMINATED AT 1.5m – LIMIT OF INVESTIGATION

METHOD	
AD	Auger Drilling
C	Casing
MS	Mud Support
NMLC	Rock Coring
RR	Rock Roller
TC	Tri Cone
WB	Wash Bore

WATER	
▼	Water Level
▶	Water Seepage

WEATHERING	
EW	Extremely
HW	Highly
DW	Distinctly
MW	Moderately
SW	Slightly
F	Fresh

CONSISTENCY / DENSITY / ROCK STRENGTH			
VS	Very Soft	D	Dense
S	Soft	VD	Very Dense
F	Firm	Fb	Friable
St	Stiff	ELw	Extremely Low
VSt	Very Stiff	VLw	Very Low
Hd	Hard	Lw	Low
VL	Very Loose	M	Medium
L	Loose	H	High
MD	Medium Dense	VH	Very High

SAMPLES / TESTS	
U( )	Undisturbed (size in mm)
D	Disturbed
BS	Bulk Sample
DCP	Dynamic Cone Penetrometer
SPT	Standard Penetrometer Test
N	Number of blows for SPT / 300mm
VS	Vane Shear
A	Acid Sulfate Sample
PP	Pocket Penetrometer (kPa)

Logged By: DAW **Date:** 16/04/21 **Checked By:** AOC **Date:** 5/5/21

GEOTECH INVESTIGATIONS PTY LTD

Unit 3/42 Machinery Drive, Tweed Heads South NSW 2486
Ph: 0755 233 979 Fax: 0755 233 981

ENGINEERING LOG – BOREHOLE PROFILE

GPS:	**N:**		**E:**	

CLIENT: TIM FITZOY & ASSOCIATES PTY LTD		**BOREHOLE I.D. :** BH 9
PROJECT: LOT 2 BAYSHORE DRIVE, BYRON BAY		**JOB No.:** GI 5765-a
EQUIPMENT TYPE: GT-10	**HOLE DIAMETER:** 110mm	**PAGE:** 1 of 1

Method	Water	Depth (m)	Graphic Log	Material Description	Consistency / Rel. Density	Sample / Test	DCP Blows / 100mm	Structure and additional observation
AD			▥	(CH) Sandy Gravelly CLAY: High plasticity, Fine to coarse sand, Trace of fine gravel, Moist, Grey mottled red and brown				FILL
		0.5 1.0	▤	(CL) Silty Sandy CLAY: Low plasticity, Fine to coarse sand, Fine to medium gravel, Moist, Pale grey mottled orange				
	▼		░	(SP) SAND: Fine sand, Trace of silt, Wet, Grey				ALLUVIUM
		1.5 2.0	▓	(SM) Silty SAND: Fine sand, Moist, Dark grey				
		2.5 3.0 3.5 4.0 4.5						

BH 9 TERMINATED AT 2.0m – LIMIT OF INVESTIGATION

METHOD		WEATHERING		CONSISTENCY / DENSITY / ROCK STRENGTH				SAMPLES / TESTS	
AD	Auger Drilling	EW	Extremely	VS	Very Soft	D	Dense	U( )	Undisturbed (size in mm)
C	Casing	HW	Highly	S	Soft	VD	Very Dense	D	Disturbed
MS	Mud Support	DW	Distinctly	F	Firm	Fb	Friable	BS	Bulk Sample
NMLC	Rock Coring	MW	Moderately	St	Stiff	ELw	Extremely Low	DCP	Dynamic Cone Penetrometer
RR	Rock Roller	SW	Slightly	VSt	Very Stiff	VLw	Very Low	SPT	Standard Penetrometer Test
TC	Tri Cone	F	Fresh	Hd	Hard	Lw	Low	N	Number of blows for SPT / 300mm
WB	Wash Bore			VL	Very Loose	M	Medium	VS	Vane Shear
WATER				L	Loose	H	High	A	Acid Sulfate Sample
▼	Water Level			MD	Medium Dense	VH	Very High	PP	Pocket Penetrometer (kPa)
►	Water Seepage								

Logged By:	DAW	**Date:**	16/04/21	**Checked By:**	AOC	**Date:**	5/5/21

GEOTECH INVESTIGATIONS PTY LTD

Unit 3/42 Machinery Drive, Tweed Heads South NSW 2486
Ph: 0755 233 979 Fax: 0755 233 981

ENGINEERING LOG – BOREHOLE PROFILE

GPS:	**N:**		**E:**		
CLIENT: TIM FITZOY & ASSOCIATES PTY LTD			**BOREHOLE I.D. :** BH 10		
PROJECT: LOT 2 BAYSHORE DRIVE, BYRON BAY			**JOB No.:** GI 5765-a		
EQUIPMENT TYPE: GT-10	**HOLE DIAMETER:** 110mm		**PAGE:** 1 of 1		

Method	Water	Depth (m)	Graphic Log	Material Description	Consistency / Rel. Density	Sample / Test	DCP Blows / 100mm	Structure and additional observation
AD		0.5 1.0	▨	(SM) Silty SAND: Fine sand, Moist, Dark grey				FILL
		1.5	░	(SP) SAND: Fine sand, Moist, Grey				ALLUVIUM
	▼	2.0	▨	(SM) Silty SAND: Fine sand, Wet, Dark grey				
		2.5 3.0 3.5 4.0 4.5						

BH 10 TERMINATED AT 2.0m – LIMIT OF INVESTIGATION

METHOD	
AD	Auger Drilling
C	Casing
MS	Mud Support
NMLC	Rock Coring
RR	Rock Roller
TC	Tri Cone
WB	Wash Bore

WATER	
▼	Water Level
►	Water Seepage

WEATHERING	
EW	Extremely
HW	Highly
DW	Distinctly
MW	Moderately
SW	Slightly
F	Fresh

CONSISTENCY / DENSITY / ROCK STRENGTH			
VS	Very Soft	D	Dense
S	Soft	VD	Very Dense
F	Firm	Fb	Friable
St	Stiff	ELw	Extremely Low
VSt	Very Stiff	VLw	Very Low
Hd	Hard	Lw	Low
VL	Very Loose	M	Medium
L	Loose	H	High
MD	Medium Dense	VH	Very High

SAMPLES / TESTS	
U( )	Undisturbed (size in mm)
D	Disturbed
BS	Bulk Sample
DCP	Dynamic Cone Penetrometer
SPT	Standard Penetrometer Test
N	Number of blows for SPT / 300mm
VS	Vane Shear
A	Acid Sulfate Sample
PP	Pocket Penetrometer (kPa)

Logged By: DAW	**Date:** 16/04/21	**Checked By:** AOC	**Date:** 5/5/21

GEOTECH INVESTIGATIONS PTY LTD

Unit 3/42 Machinery Drive, Tweed Heads South NSW 2486
Ph: 0755 233 979 Fax: 0755 233 981

ENGINEERING LOG – BOREHOLE PROFILE

GPS:	N:		E:	

CLIENT: TIM FITZOY & ASSOCIATES PTY LTD	**BOREHOLE I.D. :** BH 11
PROJECT: LOT 2 BAYSHORE DRIVE, BYRON BAY	**JOB No.:** GI 5765-a
EQUIPMENT TYPE: GT-10 **HOLE DIAMETER:** 110mm	**PAGE:** 1 of 1

Method	Water	Depth (m)	Graphic Log	Material Description	Consistency / Rel. Density	Sample / Test	DCP Blows / 100mm	Structure and additional observation
AD		0.5 1.0	▥	(CH) Sandy Gravelly CLAY: High plasticity, Fine to coarse sand and gravel, Moist, Grey mottled red and brown				FILL
	▼	1.5	▤▥▤	(CI) Silty Sandy CLAY: Medium plasticity, Fine to coarse sand, Trace of fine gravel, Moist, Pinky orange mottled pale grey				
		2.0	▒	(SP) SAND: Fine sand, Wet, Grey				ALLUVIUM
		2.5 3.0 3.5 4.0 4.5						

BH 11 TERMINATED AT 2.0m – LIMIT OF INVESTIGATION

METHOD	
AD	Auger Drilling
C	Casing
MS	Mud Support
NMLC	Rock Coring
RR	Rock Roller
TC	Tri Cone
WB	Wash Bore

WATER	
▼	Water Level
▶	Water Seepage

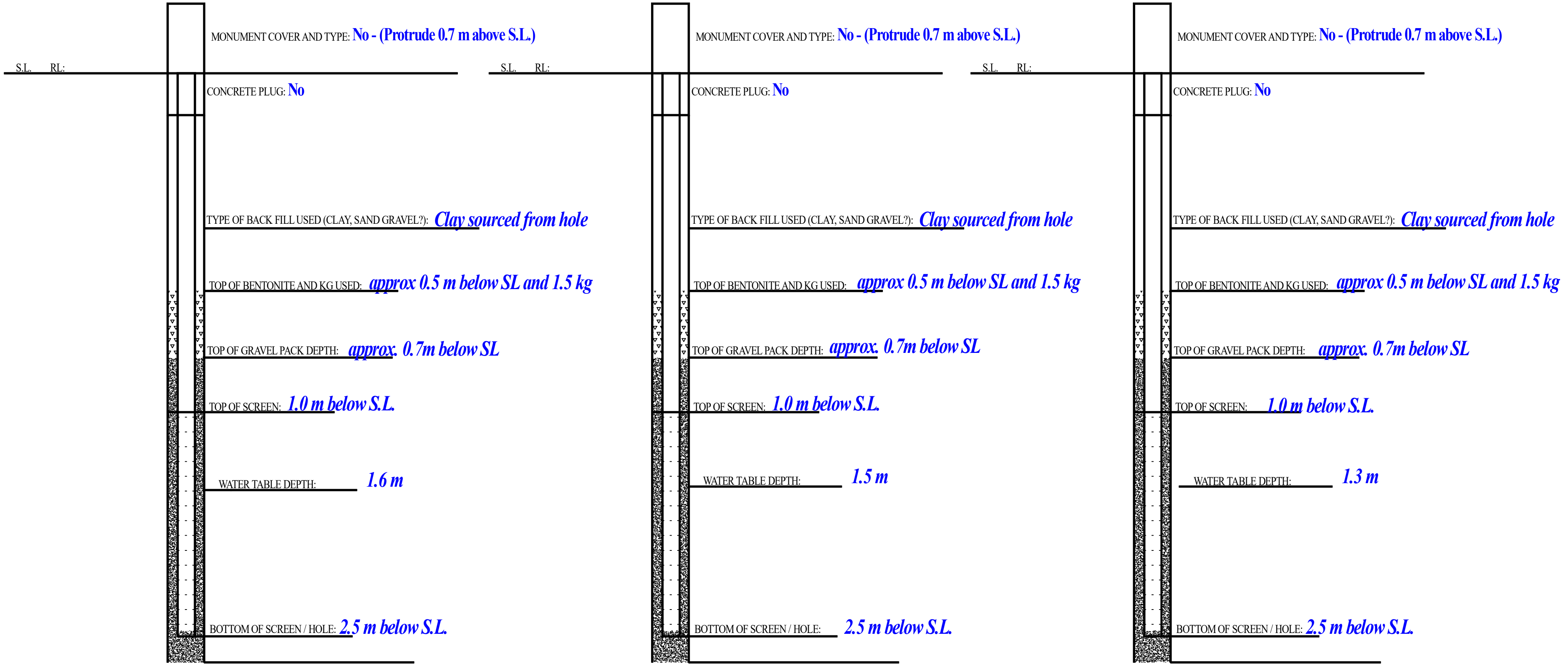
WEATHERING	
EW	Extremely
HW	Highly
DW	Distinctly
MW	Moderately
SW	Slightly
F	Fresh

CONSISTENCY / DENSITY / ROCK STRENGTH			
VS	Very Soft	D	Dense
S	Soft	VD	Very Dense
F	Firm	Fb	Friable
St	Stiff	ELw	Extremely Low
VSt	Very Stiff	VLw	Very Low
Hd	Hard	Lw	Low
VL	Very Loose	M	Medium
L	Loose	H	High
MD	Medium Dense	VH	Very High

SAMPLES / TESTS	
U( )	Undisturbed (size in mm)
D	Disturbed
BS	Bulk Sample
DCP	Dynamic Cone Penetrometer
SPT	Standard Penetrometer Test
N	Number of blows for SPT / 300mm
VS	Vane Shear
A	Acid Sulfate Sample
PP	Pocket Penetrometer (kPa)

Logged By: DAW	**Date:** 16/04/21	**Checked By:** AOC	**Date:** 5/5/21

Form GI 003a Issue 3



MONUMENT COVER AND TYPE: No - (Protrude 0.7 m above S.L.)
CONCRETE PLUG: No
TYPE OF BACK FILL USED (CLAY, SAND GRAVEL?): *Clay sourced from hole*
TOP OF BENTONITE AND KG USED: *approx 0.5 m below SL and 1.5 kg*
TOP OF GRAVEL PACK DEPTH: *approx. 0.7m below SL*
TOP OF SCREEN: *1.0 m below S.L.*
WATER TABLE DEPTH: *1.6 m*
BOTTOM OF SCREEN / HOLE: *2.5 m below S.L.*

BH 1

MONUMENT COVER AND TYPE: No - (Protrude 0.7 m above S.L.)
CONCRETE PLUG: No
TYPE OF BACK FILL USED (CLAY, SAND GRAVEL?): *Clay sourced from hole*
TOP OF BENTONITE AND KG USED: *approx 0.5 m below SL and 1.5 kg*
TOP OF GRAVEL PACK DEPTH: *approx. 0.7m below SL*
TOP OF SCREEN: *1.0 m below S.L.*
WATER TABLE DEPTH: *1.5 m*
BOTTOM OF SCREEN / HOLE: *2.5 m below S.L.*

BH 5

MONUMENT COVER AND TYPE: No - (Protrude 0.7 m above S.L.)
CONCRETE PLUG: No
TYPE OF BACK FILL USED (CLAY, SAND GRAVEL?): *Clay sourced from hole*
TOP OF BENTONITE AND KG USED: *approx 0.5 m below SL and 1.5 kg*
TOP OF GRAVEL PACK DEPTH: *approx. 0.7m below SL*
TOP OF SCREEN: *1.0 m below S.L.*
WATER TABLE DEPTH: *1.3 m*
BOTTOM OF SCREEN / HOLE: *2.5 m below S.L.*

BH 9

GeoTech INVESTIGATIONS PTY LTD

Unit 3 / 42 Machinery Drive
PO Box 6885
Tweed Heads South NSW 2486
PH: 0755 233 979
FAX: 0755 233 981
EMAIL: admin@geotechinvestigations.com
WEB: www.geotechinvestigations.com

CLIENT:
TIM FITZROY & ASSOCIATES PTY LTD

PROJECT:
LOT 2 BAYSHORE DRIVE
BYRON BAY

DRAWING REF:
GWMW Log

LEGEND

S.L. - Surface Level

DATE:
16.04.2021
OUR REF / JOB No.:
GI 5765-A

DRAWN BY:
AOC

Drawing not to scale.
Printed dimensions only.

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Ground Water Sampling Sheet

Job Name:	Well No: GW1
Job Number:	Well Type: ☒ Monitor ☐ Extractor ☐ Other
Recorded By: GC	Well Material: ☒ PVC ☐ SS ☐ Other
Date: 22/4/21	Sample by: GC

PURGING

PURGE VOLUME	PURGE METHOD
Well Diameter (D in mm): ☒ 50 ☐ 100 ☐ Other	☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Total Depth of Well (TD in m BTOC): 3.040	☐ Pump – Type: ☐ Submersible ☒ Peristaltic ☐ Other
Water Level Depth WL in m BTOC): 1.430	**PUMP INTAKE SETTING**
Number of well volumes to be purged (# VOLS) ☐ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other	Depth (m BTOC) Screen Interval (m BTOC) – Top : Bottom:

PURGE TIME

PURGE TIME 65 min PURGE RATE 4.04 ACTUAL PURGE VOLUME

0.530 m stick-up

Start: 10:45 Stop: 11:50 Elapsed: Initial: Final:

FIELD PARAMETER MEASUREMENTS

Min since purge began	Volume Purged (L)	pH	Cond. (mS/cm)	Temp (°C)	DO (mg/L)	Redox (mV)	SWL (mBTOC)	Other (e.g. observations)	
5	0.7	6.01	0.593	22.13	5.71	124	1.451		
10	1.4	5.91	0.581	22.95	2.07	104	1.493		
15	2.1	5.89	0.574	23.51	1.43	100	1.510		
20	2.8	5.83	0.570	23.61	0.59	101	1.520		
	*	Sampled *							

Observations during purging (well condition, turbidity, colour, odour, sheen):

Slightly turbid, slightly brown. No odour and/or sheen

Discharge water disposal: ☐ Drums ☐ Sanitary sewer ☐ Storm sewer ☒ Surface ☒ Other

SAMPLING

SAMPLING METHOD ☒ Same as purge method

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other ☐ Pump – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

SAMPLE DISTRIBUTION Sample Name:

Bottles:	Vol/Cont.	Analysis	Preservatives	Lab	Comments
1	ml Amber		unpreserved		
3	ml plastic		HNO_3		field filtered? (Y) / N
2	ml VOA vials		HCl		

QUALITY CONTROL SAMPLES

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No

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Ground Water Sampling Sheet

Job Name:	Well No: GW2
Job Number:	Well Type: ☒ Monitor ☐ Extractor ☐ Other
Recorded By: GC	Well Material: ☒ PVC ☐ SS ☐ Other
Date: 22/4/21	Sample by: GC

PURGING

PURGE VOLUME	PURGE METHOD
Well Diameter (D in mm): ☐ 50 ☐ 100 ☐ Other	☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Total Depth of Well (TD in m BTOC): 3.0506	☐ Pump – Type: ☐ Submersible ☒ Peristaltic ☐ Other
Water Level Depth WL in m BTOC): 1.400	**PUMP INTAKE SETTING**
Number of well volumes to be purged (# VOLS) ☐ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other	Depth (m BTOC) Screen Interval (m BTOC) – Top : Bottom:

PURGE TIME

PURGE TIME________ PURGE RATE 4.04 ACTUAL PURGE VOLUME________

0.540 Stick-up

Start: Stop: Elapsed: Initial: Final:

FIELD PARAMETER MEASUREMENTS

Min since purge began	Volume Purged (L)	pH	Cond. (mS/cm)	Temp (°C)	DO (mg/L)	Redox (mV)	SWL (mBTOC)	Other (e.g. observations)	
5	0.7	5.10	1.68	23.48	1.49	106	1.432		
10	1.4	5.03	1.70	23.32	1.35	96			
15	2.1	5.01	1.71	23.23	1.08	89	1.451		
	*		Sampled	*					

Observations during purging (well condition, turbidity, colour, odour, sheen):

Brown, Strong Sulforic odour, no sheen.

Discharge water disposal: ☐ Drums ☐ Sanitary sewer ☐ Storm sewer ☒ Surface ☒ Other

SAMPLING

SAMPLING METHOD

☒ Same as purge method

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Pump – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

SAMPLE DISTRIBUTION

Sample Name:

Bottles:	Vol/Cont.	Analysis	Preservatives	Lab	Comments
1	ml Amber		unpreserved		
3	ml plastic		HNO_3		field filtered? (Y) / N
2	ml VOA vials		HCl		

QUALITY CONTROL SAMPLES

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No

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Ground Water Sampling Sheet

Job Name:	Well No: GW3
Job Number:	Well Type: ☒ Monitor ☐ Extractor ☐ Other
Recorded By: GC	Well Material: ☒ PVC ☐ SS ☐ Other
Date: 22/4/21	Sample by: GC

PURGING

PURGE VOLUME	PURGE METHOD
Well Diameter (D in mm): ☐ 50 ☐ 100 ☐ Other	☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Total Depth of Well (TD in m BTOC): 2.630	☐ Pump – Type: ☐ Submersible ☒ Peristaltic ☐ Other
Water Level Depth WL in m BTOC): 1.070	**PUMP INTAKE SETTING**
Number of well volumes to be purged (# VOLS)	Depth (m BTOC)
☐ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other	Screen Interval (m BTOC) – Top : Bottom:

PURGE TIME

PURGE TIME________ PURGE RATE 4.04 ACTUAL PURGE VOLUME________

[0.525 m Stick-up]

Start: Stop: Elapsed: Initial: Final:

FIELD PARAMETER MEASUREMENTS

Min since purge began	Volume Purged (L)	pH	Cond. (mS/cm)	Temp (°C)	DO (mg/L)	Redox (mV)	SWL (mBTOC)	Other (e.g. observations)	
5	0.7	5.71	0.266	22.58	1.79	74	1.101		
10	1.4	5.63	0.240	22.51	0.91	77			
15	2.1	5.60	0.231	22.53	0.83	79	1.153		
		*	Sampled						

Observations during purging (well condition, turbidity, colour, odour, sheen):

Slightly brown, no odour and/or sheen

Discharge water disposal: ☐ Drums ☐ Sanitary sewer ☐ Storm sewer ☑ Surface ☒ Other

SAMPLING

SAMPLING METHOD ☒ Same as purge method

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other ☐ Pump – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

SAMPLE DISTRIBUTION Sample Name:

Bottles:	Vol/Cont.	Analysis	Preservatives	Lab	Comments
1	ml Amber		unpreserved		
3	ml plastic		HNO_3		field filtered? (Y) / N
2	ml VOA vials		HCl		

QUALITY CONTROL SAMPLES

Duplicate Samples			Blank Samples			Other Samples	
Original No	Duplicate No		Type	Sample No		Type	Sample No

Equipment Calibration Report

Horiba Water Quality Meter U-5000G – Serial No. UOF5YK53

pH	☑ pH 4.01	Actual: 4.05
Conductivity	☑ 4.49 mS/cm	Actual: 4.53
Turbidity	☑ 0 NTU	Actual: 0.0
Dissolved oxygen	☑ 8.92 mg/L	Actual: 8.84

Temperature, (i.e. Room temperature): 21.53

Calibrated by: Glen Chisnall

Date tested: 22/04/21

Job Reference: TFA

Notes:

F Data Usability Assessment and Quality Assurance

Data Usability Summary Assessment

All site work was completed in accordance with standard *TFA sampling protocols*, including a quality assurance/quality control (QA/QC) programme and standard operating procedures.

A data usability assessment was performed for the soil data collected by TFA, as summarised in the following tables:

- Table E.1, field QC samples summary,
- Table E.2, summary of field QA/QC, and
- Table E.3, summary of laboratory QA/QC.

Table I.1: Field quality control samples summary

	Total samples	Field duplicates	Inter-lab duplicates	Trip Spike	Trip blank
Soil					
Heavy metals[1]	22	2	1	1	1
BTEXN & TRHs	22	2	1	1	1
PAHs	22	2	1	1	1
OCs	22	2	1	1	1
Asbestos	21	1	1	1	1
Groundwater					
Heavy metals[2]	3	1	1	1	
BTEXN & TRHs	3	1	1	1	

Notes:

1. Arsenic, lead, cadmium, chromium, copper, nickel, zinc, mercury, beryllium, boron, cobalt.
2. Silver, aluminium, arsenic, cadmium, chromium, copper, iron, manganese, nickel, lead, selenium, zinc, mercury.

Table I.2: Summary of field QA/QC

Parameter	Complies	Comments[1]
Precision		
Standard operating procedures (SOPs) appropriate and complied with	Yes	All sampling was conducted under standard TFA operating procedures.
Field duplicates	Yes	≥ 5%. RPD[2] criteria < 30% – 50%.
Inter-laboratory duplicates	Yes	≥ 5%. RPD[2] criteria < 30% – 50%.
Accuracy		
Matrix spikes samples appropriate	Yes	≥ 1/media type.
Representativeness		
Sample collection - preservation	Yes	All samples were collected directly into laboratory supplied jars with no headspace. All samples were placed immediately into eskies containing ice.
Sample collection - sample splitting	Yes	Duplicate samples were split in the field by filling each jar collectively (i.e. co-collected). These samples were not submitted for analysis however.
Field equipment calibrated	N/A	No field equipment that required calibration was used.
Decontamination procedures	Yes	Soil samples were collected using a shovel and gloved hand, which was washed with Decon 90 between locations.
Rinsate samples	N/A	Required ≥ 1/field batch, < LORs. No rinsate samples were collected.
Trip blanks	No	≥ 1/field batch (volatiles), < LORs. No volatile compounds were potential contaminants of concern.
Trip spikes	No	≥ 1/field batch (volatiles), 70 - 130%, (recovery) or ≤ 30 - 50% (RPDs). No volatile compounds were potential contaminants of concern.
Comparability		
Consistent sampling staff	Yes	field work was conducted by Tim Fitzroy of TFA and Glen Chiswell Cavvanba.
Consistent weather/field conditions	Yes	No extreme weather conditions occurred during or before/after the investigation.
Completeness		
Sample logs and field data	Yes	-
Chain of Custody	Yes	Refer to Appendix F

Notes:

1. For QC samples, specified frequency and acceptance criteria shown.
2. RPD = relative percentage difference.

Table I.3: Summary of laboratory QA/QC

Parameter	Complies	Comments[1]
Precision		
Laboratory duplicates	Yes	≥ 10%, laboratory specified. All laboratory duplicates were within the laboratory specified global acceptance criteria.

Accuracy		
Surrogate spikes	Yes	Organics by GC, 70% - 130%. All surrogates were within the laboratory specified global acceptance criteria.
Matrix spikes analysis appropriate	Yes	≥ 70% - 130%.
Laboratory control samples (LCSs)	Yes	≥ 1/lab batch, 70% - 130%.
Certified reference material (CRM)	N/A	-
Representativeness		
Sample condition	Yes	
Holding times	Yes	
Laboratory blanks	Yes	≥ 1/lab batch, < LORs.
Comparability		
NATA accredited laboratory	Yes	EAL Laboratory Services is a NATA accredited laboratory (accreditation number 14960).
NEPM methods or similar	Yes	LORs were consistent and appropriate.
Completeness		
Sample receipt	Yes	
Laboratory reports	Yes	

Notes:

1. For QC samples, acceptance criteria shown. Acceptance criteria can vary based on analyte, statistical data and laboratory specific methods. Laboratory specified relates to detected concentrations based on LORs, e.g. result < 10 x LOR = no limit, 10 – 20 x LOR = 0 - 50%, > 20 x LOR = 0 - 20%. See laboratory reports for specific details.

Summary and Discussion

The following issues were identified with the data:

- **Precision:** The data shows no significant variability.
- **Accuracy:** The accuracy of the analysis is confirmed by surrogate, matrix spike and LCS recoveries within the acceptance criteria.
- **Representativeness:** No outliers have been reported for QC samples collected to assist in the qualification of representativeness. It should be noted that no trip spikes or blanks were analysed during the works, but no volatile compounds were PCOCs.
- **Comparability:** The data is considered to be acceptable, with consistent sampling staff and NATA accredited laboratory used and all LORs below the relevant criteria.
- **Completeness:** Laboratory and field documentation is considered to be complete.

Data Usability Background

I 1.0 Introduction

Information generated from environmental investigations requires some statement in regard to the usability of the data, and therefore quality assurance (QA) and quality control (QC) are an integral part of the analysis and interpretation of environmental data. QA/QC used in contaminated sites investigations is briefly reviewed in this section.

Quality assurance involves all of the actions, procedures, checks and decisions undertaken to ensure the representativeness and integrity of samples, and accuracy and reliability of analytical results (NEPC 1999). Quality control is the component of QA which monitors and measures the effectiveness of other procedures by the comparison of these measures to previously decided objectives.

There are various components of QA/QC which address the operation of the laboratories and the routine procedures conducted to achieve a minimum level of quality. Examples of QA components include sample control, data transfer, instrument calibration, staff training, etc. Examples of QC components include the measurement of samples to access the quality of reagents and standards, cleanliness of apparatus, accuracy and precision of methods and instruments, etc. Generally, the management of laboratory QA issues is addressed through accreditation by the National Association of Testing Authorities (NATA), or similar, and monitoring of these issues is not addressed on a project by project basis.

On a project specific basis, those involved in collecting, assessing or reviewing the relevant data should ensure the minimum level of QA is conducted. Appropriate numbers and types of QC samples should be collected and analysed, both field QC samples and laboratory QC samples. While minimum levels of QA/QC are specified in some guidelines, e.g. NSW EPA 1994, AS 4482.1-1997, NEPC 1999, the minimum level required may vary between projects, based on site and project specific aspects. This means that the minimum specified requirements may not be sufficient for a particular project. As described in the NEPM (NEPC 1999):

> *As a general rule, the level of required QC is that which adequately measures the effects of all possible influences upon sample integrity, accuracy and precision, and is capable of predicting their variation with a high degree of confidence.*

I 2.0 PARCC Parameters

Following receipt of laboratory analytical results, data validation is conducted to determine if the specified acceptance criteria have been met. This is conducted to ensure that all data, and subsequent decisions based on that data, are technically sound. Data quality is typically discussed in terms of precision, accuracy, representativeness, comparability and completeness. These are referred to as the PARCC parameters2. Field QA/QC and laboratory QC is described below within the PARCC framework.

I 2.1 Precision

I 2.1.1 Duplicates

Precision is a measure of the reproducibility of results under a given set of conditions and is assessed on the basis of agreement between a set of duplicate results obtained from duplicate analyses. The precision of a duplicate determination is measured by comparing the difference between the two samples to the average of the two samples, expressed as a relative percentage difference (RPD).

The determination is:

RPD = (P-D)/(P+D/2) x 100

P = Primary sample
D = Duplicate sample

Three types of duplicates are commonly used:

- Field duplicates are used to measure the precision of the sampling and analytical process
- Inter-laboratory duplicates are used to check on the analytical performance of the primary laboratory
- Laboratory duplicates are used to measure the precision of the analytical process.

I 2.1.2 Field Duplicates

Field duplicates (or blind replicates) are collected from the same location and submitted to the laboratory for analyses, as a primary sample. The sample nomenclature is such that the laboratory is not aware which sample is a duplicate. The RPD is calculated to determine the degree of repeatability (precision) of results obtained from the duplicate analysis. Where results are below the practical quantification limit (PQLs) or limits of reporting (LORs), i.e. non-detects, RPDs cannot be calculated. Where one result is detected, the results are considered to conform when the detected result is less than five times the PQL/LOR.

The PQL/LOR is the lowest concentration of an analyte that can be determined with acceptable precision (repeatability) and accuracy under the test conditions. The PQL/LOR is usually calculated as five times the lower limit of detection (or method detection limit). However, adjustments in PQLs/LORs may be required due to interference from high contaminant concentrations.

As environmental samples can exhibit a high degree of heterogeneity, field duplicates often exceed the acceptance criterion, particularly if the samples are co-collected, for example, because of the potential for losing volatiles during sample splitting. It is generally accepted that before results which fail the acceptance criterion are described as due to low concentrations or sample heterogeneity, the sample should be re-analysed. This may not be necessary when the analytical results are significantly less than the landuse criteria.

2.1.3 Inter-laboratory Duplicates

Inter-laboratory duplicates (or split samples) are field duplicates which are sent to second laboratory and analysed for the same analytes and, as far as possible, by the same methods. These provide a check on the analytical performance of the primary laboratory.

2.1.4 Laboratory Duplicates

Laboratory duplicates (or check samples) are field samples which are split by the laboratory and thereafter treated as separate samples. The RPD is calculated to determine the degree of repeatability (precision) of results obtained from the duplicate analysis.

USEPA (1994) specifies that for inorganics, if the results for laboratory duplicates fall outside of the recommended control limits for a particular analyte, all results for that analyte, in all associated samples of the same matrix, should be qualified as an estimated quantity. For organics, USEPA (1999) does not specify recommended actions for laboratory duplicates.

2.2 Accuracy

Accuracy is a measure of the agreement between an experimental determination and the true value of the parameter being measured. Inasmuch as the true sample concentrations are not known, the determination of accuracy is achieved through the analysis of known reference materials or assessed by the analysis of matrix spikes. Spiking of reference material into the actual sample matrix is the preferred technique because it provides a measure of the matrix effects on the analytical recovery.

Accuracy is measured in terms of percentage recovery as defined by:

$$\%R = ((SSR - SR) / SA) \times 100$$

%R = percentage recovery spike
SSR = spiked sample result
SR = sample result
SA = spike added

2.2.1 Matrix Spikes/Matrix Spike Duplicates

These are samples prepared in the laboratory by dividing a sample into two aliquots and then spiking each with identical concentrations of specific analytes. The matrix spike (MS) and matrix spike duplicate (MSD) are then analysed separately and the results compared to determine the accuracy and precision of the analytes.

2.2.2 Surrogate Spike

Surrogate spikes provide an indication of analytical accuracy. They are used only for analyses which use gas chromatography and are compounds which are similar to the organic analytes of interest in chemical composition, extraction and chromatography, but which are not normally found in field samples. Surrogates are generally spiked into all sample aliquots prior to preparation and analysis. If the surrogate spike recovery does not meet the prescribed acceptance criteria, the samples should be re-analysed.

2.2.3 Laboratory Control Samples

Laboratory control samples (quality control check samples) are laboratory prepared samples of an appropriate clean matrix (i.e. sand or distilled water) which are spiked with known concentrations of specific analytes. The laboratory control sample (LCS) is then analysed and the results are used to assess sample preparation and analytical accuracy, free of matrix effects. Certified reference material (CRM) is another form of

LCS, and involves the analysis of a known standard as part of the laboratory batch, e.g. British Columbia sediment samples for analysis of metals.

2.3 Representativeness

2.3.1 Rinsate blanks

Used to determine if sampling equipment has been adequately decontaminated to ensure that cross-contamination between samples has not occurred. The frequency for rinsate blanks is one per piece of equipment per day (AS 4482.1-1997), however it should be noted that cross-contamination will bias samples upwards, and the frequency should therefore be at the investigators discretion.

2.3.2 Trip Blanks

Used only when volatile organics are sampled to determine if transport in motor vehicles or similar has resulted in contamination of the samples. For trip blanks, a sufficient number should be analysed to allow the representativeness of the sampling to be determined. However, it should be noted that cross-contamination will bias samples upwards, and the frequency should therefore be at the investigators discretion.

2.3.3 Trip Spikes

Used only when volatile organics are sampled to attempt to quantify loss of volatiles during the analytical process. For trip spikes, a sufficient number of samples should be analysed to allow qualification of the likely loss of volatiles during the field sampling.

2.3.4 Laboratory Blanks

Laboratory blanks (or method blanks, or analysis blanks) are used to verify that contaminants are not introduced into the samples during sample preparation and analysis. The NEPM (NEPC 1999) specifies that laboratory blanks should be conducted at a frequency of “at least one per process batch”. The acceptance criterion for laboratory blanks is non-detect at the PQL/LOR.

2.4 Comparability

Comparability is a qualitative parameter designed to express the confidence with which one data set may be compared with another, including established criteria. Comparability is maintained by using consistent methods and ensuring that PQLs/LORs are below the relevant criteria.

2.5 Completeness

Quality control sample completeness is defined as the number of QC samples which should have been analysed, compared to the actual number analysed. If the appropriate number of QC samples are not analysed with each matrix or sample batch, then the data reviewer should use professional judgement to determine if the associated sample data should be qualified. Completeness also refers to the complete and correct inclusion of field/sample documentation and laboratory documentation.

2.5.1 QC Sample Frequency and Criteria

Based on EPA made or approved guidelines, the following QC samples are required for all contaminated site investigations, unless otherwise specified as part of the data quality objectives (DQOs) process review. All data to be used for validation should conform as a minimum to the requirements specified, regardless of minimum sample size.

Quality Control Sample	Frequency	Results[1]
Precision		
Field duplicates	≥ 5%	≤ 30 - 50% [2]
Inter-laboratory duplicates	≥ 5%	≤ 30 - 50% [2]
Laboratory duplicates	≥ 10%	Lab specified [3]
Accuracy		
Surrogate spikes	Organics by GC	70 – 130% [4]
Matrix spikes (MSs)	≥ 1/media type	70 - 130% [5]
Laboratory control samples (LCSs)	≥ 1/lab batch	70 - 130% [6]
Certified refence material (CRM)	LCS for metals	Lab specified [7]
Representativeness		
Rinsate samples	≥ 1/field batch	< LOR
Trip blanks	≥ 1/field batch (volatiles)	< LOR
Trip spikes	≥ 1/field batch (volatiles)	70 - 130%, ≤ 30 - 50% [8]
Laboratory blanks	≥ 1/lab batch	< LOR

Notes

1. Where results are laboratory specified, the laboratory analytical reports should be consulted for specific information.
2. Relative percentage differences (RPDs) for field duplicates from AS 4482.1 (1997).
3. RPDs for laboratory duplicates specified by the laboratory. Based on the magnitude of the results compared to the level of reporting (LOR), e.g. ALS: result < 10 x LOR = no limit, 10 – 20 x LOR = 0-50%, > 20 x LOR = 0-20%. LabMark: < 5 x LOR = 0-100%, 5 – 10 x LOR = 0-75%, > 10 x LOR = 0-50% or 0-30% for metals.
4. Surrogate recoveries specified by laboratory based on global acceptance criteria or dynamic recovery limits based on statistical evaluation of actual laboratory data.
5. MS recoveries specified by laboratory based on global acceptance criteria.
6. LCS recoveries specified by laboratory based on global acceptance criteria or dynamic recovery limits based on statistical evaluation of actual laboratory data.
7. CRM recoveries specified by laboratory based on global acceptance criteria.
8. Trip spike results are specified as either recoveries or RPDs.

3.0 References

Australian New Zealand Environment and Conservation Council (1996) Guidelines for the laboratory analysis of contaminated soils. ANZECC, Canberra, ACT.

Australian Standard AS 4482.1 (2005) Guide to the sampling and investigation of potentially contaminated soil, Part 1: Non-volatile and Semi-volatile compounds. Standards Australia, Homebush, NSW.

National Environment Protection Council (NEPC) (1999) National Environmental Protection (Assessment of Site Contamination) Measure, Schedule B(2) Guideline on Data
Collection, Sample Design and Reporting. National Environment Protection Council Service Corporation. Adelaide, SA.

National Environment Protection Council (NEPC) (1999) National Environmental Protection (Assessment of Site Contamination) Measure, Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soil. National Environment Protection Council Service Corporation. Adelaide, SA.

NSW Environment Protection Authority (1994) Contaminated Sites: Guidelines for Assessing Service Station Sites. NSW EPA, Chatswood, NSW.

NSW Environment Protection Authority (1997) Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites. NSW EPA, Chatswood, NSW.

United States Environmental Protection Agency, Contract Laboratory Program (1994) National Functional Guidelines for Inorganic Data Review. USEPA, Washington, DC.

United States Environment Protection Agency, Contract Laboratory Program (1999) National Functional Guidelines for Organic Data Review. USEPA, Washington, DC.

G Laboratory Results & COCs

RESULTS OF SOIL ANALYSIS

39 samples supplied by Tim Fitzroy & Associates Pty Ltd on 16/04/2021. Lab Job No. K5816.
Samples submitted by Tim Fitzroy. Your Job: 15/2021 BSC Lot 12 Bayshore Drive.
61 Pine Avenue EAST BALLINA NSW 2478

	Method	Sample 1	Sample 3	Sample 4	Sample 6	Sample 7	Sample 9	Sample 10	Sample 12	Sample 13	Sample 15	Sample 16
		TFA 1 A	**TFA 1 C**	**TFA 2 A**	**TFA 2 C**	**TFA 3 A**	**TFA 3 C**	**TFA 4 A**	**TFA 4 C**	**TFA 5 A**	**TFA 5 C**	**TFA 6 A**
	Job No.	*K5816/1*	*K5816/3*	*K5816/4*	*K5816/6*	*K5816/7*	*K5816/9*	*K5816/10*	*K5816/12*	*K5816/13*	*K5816/15*	*K5816/16*
MOISTURE %	subcontracted: SGS report SE 218814	14	16	14	17	23	16	23	21	21	16	13
Silver (mg/kg)	1:3 Nitric/HCl digest - APHA 3125 ICPMS	<1	<1	<1	<1	<1	<1	1	<1	<1	<1	<1
Arsenic (mg/kg)	1:3 Nitric/HCl digest - APHA 3125 ICPMS	5	<2	3	<2	7	4	2	<2	4	<2	9
Lead (mg/kg)	1:3 Nitric/HCl digest - APHA 3125 ICPMS	26	2	13	<1	18	5	7	<1	23	1	14
Cadmium (mg/kg)	1:3 Nitric/HCl digest - APHA 3125 ICPMS	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium (mg/kg)	1:3 Nitric/HCl digest - APHA 3125 ICPMS	16	3	13	<2	17	6	11	<2	20	<2	12
Copper (mg/kg)	1:3 Nitric/HCl digest - APHA 3125 ICPMS	33	2	14	<1	15	8	9	1	25	2	20
Manganese (mg/kg)	1:3 Nitric/HCl digest - APHA 3125 ICPMS	354	8	194	6	120	21	109	4	593	13	51
Nickel (mg/kg)	1:3 Nitric/HCl digest - APHA 3125 ICPMS	12	<1	8	<1	21	3	10	<1	13	<1	8
Selenium (mg/kg)	1:3 Nitric/HCl digest - APHA 3125 ICPMS	0.8	<0.5	<0.5	<0.5	<0.5	0.6	0.6	<0.5	0.7	0.8	0.7
Zinc (mg/kg)	1:3 Nitric/HCl digest - APHA 3125 ICPMS	101	3	42	1	47	15	34	2	113	4	39
Mercury (mg/kg)	1:3 Nitric/HCl digest - APHA 3125 ICPMS	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Iron (%)	1:3 Nitric/HCl digest - APHA 3125 ICPMS	2.82	0.28	1.97	0.08	2.72	0.83	1.65	0.16	3.76	0.21	2.05
Aluminium (%)	1:3 Nitric/HCl digest - APHA 3125 ICPMS	1.04	0.11	0.95	0.04	1.01	0.34	0.85	0.12	1.77	0.13	0.74
Beryllium (mg/kg)	1:3 Nitric/HCl digest - APHA 3125 ICPMS	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
Boron (mg/kg)	1:3 Nitric/HCl digest - APHA 3125 ICPMS	<2	<2	<2	<2	<2	<2	<2	3	2	<2	3
Cobalt (mg/kg)	1:3 Nitric/HCl digest - APHA 3125 ICPMS	7.9	0.2	5.0	0.1	5.2	0.7	5.7	0.1	12.9	0.4	1.4
PESTICIDE ANALYSIS SCREEN												
o,p'-DDE (mg/kg)	subcontracted: SGS report SE 218814	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan (mg/kg)	subcontracted: SGS report SE 218814	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Dieldrin (mg/kg)	subcontracted: SGS report SE 218814	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin (mg/kg)	subcontracted: SGS report SE 218814	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDD (mg/kg)	subcontracted: SGS report SE 218814	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT (mg/kg)	subcontracted: SGS report SE 218814	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan (mg/kg)	subcontracted: SGS report SE 218814	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD (mg/kg)	subcontracted: SGS report SE 218814	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT (mg/kg)	subcontracted: SGS report SE 218814	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Other Organochlorine (OC) Pesticides (mg/kg)	subcontracted: SGS report SE 218814	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
HYDROCARBON ANALYSIS RESULTS												
BTEX												
Benzene (mg/kg)	subcontracted: SGS report SE 218814	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene (mg/kg)	subcontracted: SGS report SE 218814	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene (mg/kg)	subcontracted: SGS report SE 218814	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total m/p-Xylenes (mg/kg)	subcontracted: SGS report SE 218814	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-Xylene (mg/kg)	subcontracted: SGS report SE 218814	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes (mg/kg)	subcontracted: SGS report SE 218814	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX (mg/kg)	subcontracted: SGS report SE 218814	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Total Recoverable Hydrocarbons												
C6-C10 (Volatile) Fraction (mg/kg)	subcontracted: SGS report SE 218814	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25
C10-C14 Fraction (mg/kg)	subcontracted: SGS report SE 218814	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
C15-C28 Fraction (mg/kg)	subcontracted: SGS report SE 218814	66	<45	46	<45	58	<45	<45	<45	54	<45	<45
C29-C36 Fraction (mg/kg)	subcontracted: SGS report SE 218814	70	<45	56	<45	120	46	<45	<45	62	<45	<45
C37-C40 Fraction (mg/kg)	subcontracted: SGS report SE 218814	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
>C10-C16 Fraction (mg/kg)	subcontracted: SGS report SE 218814	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25
>C10-C16 - Naphthalene (mg/kg)	subcontracted: SGS report SE 218814	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25
>C16-C34 Fraction (mg/kg)	subcontracted: SGS report SE 218814	110	<90	<90	<90	130	<90	<90	<90	97	<90	<90
>C34-C40 Fraction (mg/kg)	subcontracted: SGS report SE 218814	<120	<120	<120	<120	<120	<120	<120	<120	<120	<120	<120
C10-C36 Fraction (mg/kg)	subcontracted: SGS report SE 218814	140	<110	<110	<110	170	<110	<110	<110	120	<110	<110
Total +ve TRH (>C10-C40) (mg/kg)	subcontracted: SGS report SE 218814	<210	<210	<210	<210	<210	<210	<210	<210	<210	<210	<210
Polynuclear Aromatic Hydrocarbons (PAH)												
Naphthalene (mg/kg)	subcontracted: SGS report SE 218814	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene (mg/kg)	subcontracted: SGS report SE 218814	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene (mg/kg)	subcontracted: SGS report SE 218814	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene (mg/kg)	subcontracted: SGS report SE 218814	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1
Acenaphthene (mg/kg)	subcontracted: SGS report SE 218814	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene (mg/kg)	subcontracted: SGS report SE 218814	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene (mg/kg)	subcontracted: SGS report SE 218814	0.4	<0.1	0.2	<0.1	0.2	<0.1	<0.1	<0.1	0.5	<0.1	<0.1
Anthracene (mg/kg)	subcontracted: SGS report SE 218814	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1
Fluoranthene (mg/kg)	subcontracted: SGS report SE 218814	0.9	<0.1	0.5	<0.1	0.3	<0.1	0.1	<0.1	1.4	<0.1	<0.1
Pyrene (mg/kg)	subcontracted: SGS report SE 218814	0.9	<0.1	0.6	<0.1	0.4	<0.1	0.1	<0.1	1.4	<0.1	<0.1
Benzo(a)anthracene (mg/kg)	subcontracted: SGS report SE 218814	0.3	<0.1	0.2	<0.1	0.2	<0.1	<0.1	<0.1	0.4	<0.1	<0.1
Chrysene (mg/kg)	subcontracted: SGS report SE 218814	0.4	<0.1	0.2	<0.1	0.3	<0.1	<0.1	<0.1	0.5	<0.1	<0.1
Benzo(b&j)fluoranthene (mg/kg)	subcontracted: SGS report SE 218814	0.4	<0.1	0.3	<0.1	0.9	<0.1	<0.1	<0.1	0.5	<0.1	<0.1
Benzo(k)fluoranthene (mg/kg)	subcontracted: SGS report SE 218814	0.3	<0.1	0.2	<0.1	0.5	<0.1	<0.1	<0.1	0.5	<0.1	<0.1
Benzo(a)pyrene (mg/kg)	subcontracted: SGS report SE 218814	0.4	<0.1	0.3	<0.1	0.8	<0.1	<0.1	<0.1	0.7	<0.1	<0.1
Indeno(1,2,3-cd)pyrene (mg/kg)	subcontracted: SGS report SE 218814	0.4	<0.1	0.2	<0.1	0.9	<0.1	<0.1	<0.1	0.5	<0.1	<0.1
Dibenzo(ah)anthracene (mg/kg)	subcontracted: SGS report SE 218814	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene (mg/kg)	subcontracted: SGS report SE 218814	0.3	<0.1	0.2	<0.1	0.8	<0.1	<0.1	<0.1	0.7	<0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0 (mg/kg)	subcontracted: SGS report SE 218814	0.6	<0.2	0.4	<0.2	1.0	<0.2	<0.2	<0.2	0.9	<0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR (mg/kg)	subcontracted: SGS report SE 218814	0.7	<0.3	0.5	<0.3	1.1	<0.3	<0.3	<0.3	1.0	<0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2 (mg/kg)	subcontracted: SGS report SE 218814	0.6	<0.2	0.4	<0.2	1.1	<0.2	<0.2	<0.2	0.9	<0.2	<0.2
Total PAH (NEPM/WHO 16) (mg/kg)	subcontracted: SGS report SE 218814	4.7	<0.8	3.0	<0.8	5.1	<0.8	<0.8	<0.8	7.5	<0.8	<0.8
Speciated Phenolics (as Phenol) (mg/kg)	subcontracted: SGS report SE 218814	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Cyanide (mg/kg)	subcontracted: SGS report SE 218814	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Notes:

1. ppm = mg/Kg dried sample
2. All results as dry weight DW - samples were dried at 40oC for 24-48hrs prior to crushing and analysis.
3. Methods from Rayment and Lyons, Soil Chemical Methods - Australasia
4. Metals analysed by ICP-MS (Inductively Coupled Plasma - Mass Spectrometry)
5. In SGS Pesticide Analysis Screening the following pesticides are included:

Organochlorine pesticide (OC's) screen: (HCB, alpha-BHC, gamma-BHC, Lindane, Heptachlor, Aldrin, beta-BHC, delta-BHC, Heptachlor epoxide, op-DDE, alpha-Endosulfan, alpha-Chlordane, trans-Non pp-DDD, pp-DDT, Endosulfan sulphate, Endrin Aldehyde, Methoxychlor, Endrin Ketone, Isodrin, Mirex)

6. Analysis conducted between sample arrival date and reporting date.
7. ** NATA accreditation does not cover the performance of this service.
8. .. Denotes not requested.
9. This report is not to be reproduced except in full.
10. All services undertaken by EAL are covered by the EAL Laboratory Services Terms and Conditions (refer scu.edu.au/eal or on request).
11. Results relate only to the samples tested.
12. This report was issued on 03/05/21.

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checked: ....
Graham Lancaster
Laboratory Manager

Sample 18	Sample 19	Sample 21	Sample 22	Sample 24	Sample 25	Sample 27	Sample 28	Sample 30	Sample 31	Sample 33	Sample 34	Sample 35	Sample 36	Sample 37	Sample 38	Sample 39
TFA 6 C	**TFA 7 A**	**TFA 7 C**	**TFA 8 A**	**TFA 8 C**	**TFA 9 A**	**TFA 9 C**	**TFA 10 A**	**TFA 10 C**	**TFA 11 A**	**TFA 11 C**	**Field Dup 1A**	**Field Dup 6B**	**Lab Dup 1**	**Lab Dup 2**	**Field Blk**	**Field Dup 6C**
K5816/18	*K5816/19*	*K5816/21*	*K5816/22*	*K5816/24*	*K5816/25*	*K5816/27*	*K5816/28*	*K5816/30*	*K5816/31*	*K5816/33*	*K5816/34*	*K5816/35*	*K5816/36*	*K5816/37*	*K5816/38*	*K5816/39*
19	18	19	21	22	24	20	20	18	11	19	30	..	18	22	<1	19
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	..	..	..
<2	3	<2	3	<2	3	<2	<2	<2	4	<2	4	<2	10	..	..	..
<1	22	<1	20	3	13	<1	2	<1	16	<1	26	<1	15	..	..	..
<0.5	1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	..	..	..
<2	11	<2	25	3	10	<2	5	<2	12	2	22	<2	26	..	..	..
2	24	<1	22	5	9	1	1	<1	26	2	35	1	10	..	..	..
4	177	3	498	13	90	3	5	4	698	24	237	8	102	..	..	..
<1	8	<1	15	2	5	<1	<1	<1	28	2	15	<1	6	..	..	..
<0.5	<0.5	<0.5	0.8	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	0.9	<0.5	0.7	..	..	..
3	100	2	89	7	37	3	6	1	111	10	138	3	33	..	..	..
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	..	..	..
0.14	1.70	0.09	4.26	0.45	1.53	0.06	0.14	0.04	4.42	0.31	2.62	0.11	3.29	..	..	..
0.19	0.75	0.05	2.07	0.22	0.91	0.03	0.25	0.03	1.45	0.19	1.48	0.05	1.15	..	..	..
<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.0	<0.5	0.5	<0.5	<0.5	..	..	..
<2	<2	<2	<2	4	<2	<2	3	<2	6	<2	<2	2	<2	..	..	..
0.1	3.5	0.1	14.0	0.4	2.0	0.1	0.3	0.1	28.5	0.9	5.7	0.2	3.6	..	..	..
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	..	<0.1	<0.1	..	<0.1
<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	..	<0.2	<0.2	..	<0.2
<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	..	<0.2	<0.2	..	<0.2
<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	..	<0.2	<0.2	..	<0.2
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	..	<0.1	<0.1	..	<0.1
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	..	<0.1	<0.1	..	<0.1
<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	..	<0.2	<0.2	..	<0.2
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	..	<0.1	<0.1	..	<0.1
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	..	<0.1	<0.1	..	<0.1
Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	..	Not detected	Not detected	..	Not detected
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	..	<0.1	<0.1	<0.1	<0.1
<0.1	<0.1	0.50	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	..	<0.1	<0.1	<0.1	<0.1
<0.1	<0.1	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	..	<0.1	<0.1	<0.1	<0.1
<0.2	<0.2	0.90	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	..	<0.2	<0.2	<0.2	<0.2
<0.1	<0.1	0.40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	..	<0.1	<0.1	<0.1	<0.1
<0.3	<0.3	1.30	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	..	<0.3	<0.3	<0.3	<0.3
<0.6	<0.6	1.90	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	..	<0.6	<0.6	<0.6	<0.6
<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	..	<25	<25	<25	<25
<20	<20	22	<20	<20	<20	<20	<20	<20	<20	<20	<20	..	<20	<20	<20	<20
<45	90	60	46	<45	64	<45	<45	<45	<45	<45	89	..	<45	<45	<45	<45
<45	72	<45	56	60	75	<45	55	<45	<45	<45	100	..	<45	<45	<45	<45
<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	..	<100	<100	<100	<100
<25	<25	31	<25	<25	<25	<25	<25	<25	<25	<25	<25	..	<25	<25	<25	<25
<25	<25	31	<25	<25	<25	<25	<25	<25	<25	<25	<25	..	<25	<25	<25	<25
<90	120	<90	<90	<90	110	<90	<90	<90	<90	<90	150	..	<90	<90	<90	<90
<120	<120	<120	<120	<120	<120	<120	<120	<120	<120	<120	<120	..	<120	<120	<120	<120
<110	160	<110	<110	<110	140	<110	<110	<110	<110	<110	190	..	<110	<110	<110	<110
<210	<210	<210	<210	<210	<210	<210	<210	<210	<210	<210	<210	..	<210	<210	<210	<210
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	..	<0.1	<0.1	N.A.	<0.1
<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	..	<0.1	<0.1	N.A.	<0.1
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	..	<0.1	<0.1	N.A.	<0.1
<0.1	<0.1	<0.1	<0.1	<0.1	0.4	<0.1	<0.1	<0.1	0.1	<0.1	0.1	..	<0.1	<0.1	N.A.	<0.1
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	..	<0.1	<0.1	N.A.	<0.1
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	..	<0.1	<0.1	N.A.	<0.1
<0.1	<0.1	<0.1	0.2	<0.1	0.7	<0.1	<0.1	<0.1	0.3	<0.1	0.6	..	<0.1	<0.1	N.A.	<0.1
<0.1	<0.1	<0.1	<0.1	<0.1	0.3	<0.1	<0.1	<0.1	0.3	<0.1	0.2	..	<0.1	<0.1	N.A.	<0.1
<0.1	0.2	<0.1	0.6	<0.1	1.4	<0.1	<0.1	<0.1	0.7	<0.1	1.4	..	<0.1	0.1	N.A.	<0.1
<0.1	0.2	<0.1	0.5	<0.1	1.6	<0.1	<0.1	<0.1	0.7	<0.1	1.2	..	<0.1	0.1	N.A.	<0.1
<0.1	<0.1	<0.1	0.2	<0.1	0.5	<0.1	<0.1	<0.1	0.2	<0.1	0.4	..	<0.1	<0.1	N.A.	<0.1
<0.1	<0.1	<0.1	0.2	<0.1	0.7	<0.1	<0.1	<0.1	0.3	<0.1	0.5	..	<0.1	<0.1	N.A.	<0.1
<0.1	<0.1	<0.1	0.2	<0.1	0.5	<0.1	<0.1	<0.1	0.2	<0.1	0.4	..	<0.1	<0.1	N.A.	<0.1
<0.1	<0.1	<0.1	0.2	<0.1	0.5	<0.1	<0.1	<0.1	0.2	<0.1	0.4	..	<0.1	<0.1	N.A.	<0.1
<0.1	<0.1	<0.1	0.3	<0.1	0.8	<0.1	<0.1	<0.1	0.3	<0.1	0.5	..	<0.1	<0.1	N.A.	<0.1
<0.1	<0.1	<0.1	0.1	<0.1	0.4	<0.1	<0.1	<0.1	0.2	<0.1	0.3	..	<0.1	<0.1	N.A.	<0.1
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	..	<0.1	<0.1	N.A.	<0.1
<0.1	<0.1	<0.1	0.2	<0.1	0.6	<0.1	<0.1	<0.1	0.3	<0.1	0.4	..	<0.1	<0.1	N.A.	<0.1
<0.2	<0.2	<0.2	0.3	<0.2	1.0	<0.2	<0.2	<0.2	0.4	<0.2	0.7	..	<0.2	<0.2	N.A.	<0.2
<0.3	<0.3	<0.3	0.4	<0.3	1.1	<0.3	<0.3	<0.3	0.5	<0.3	0.8	..	<0.3	<0.3	N.A.	<0.3
<0.2	<0.2	<0.2	0.4	<0.2	1.0	<0.2	<0.2	<0.2	0.5	<0.2	0.7	..	<0.2	<0.2	N.A.	<0.2
<0.8	<0.8	<0.8	2.8	<0.8	8.4	<0.8	<0.8	<0.8	3.9	<0.8	6.5	..	<0.8	<0.8	N.A.	<0.8
<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	..	<0.5	<0.5	N.A.	<0.5
<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	..	<0.5	<0.5	N.A.	<0.5

checked: ....
Graham Lancaster
Laboratory Manager

RESULTS OF SOIL ANALYSIS

39 samples supplied by Tim Fitzroy & Associates Pty Ltd on 16/04/2021. Lab Job No. K5816.
Samples submitted by Tim Fitzroy. Your Job: 15/2021 BSC Lot 12 Bayshore Drive
61 Pine Avenue EAST BALLINA NSW 2478

Sample Identification	*EAL Job No.*	**SAMPLE DESCRIPTION[1]**	**ASBESTOS IDENTIFICATION[1]**	**ASBESTOS QUANTIFICATION[1]**	
				Approx total sample weight (g)	**Estimated Approx weight of Asbestos in soil (% w/w)**
TFA 1 A	*K5816/1*	*mixture of sandy soil, sandstones, char, organic fibres, stones and plant matter*	**No Asbestos Detected**	**486**	**<0.01**
TFA 1 B	*K5816/2*	*mixture of clayish sandy soil, stones, organic fibres, sandstones, char and plant matter*	**No Asbestos Detected**	**420**	**<0.01**
TFA 1 C	*K5816/3*	..	..	..	..
TFA 2 A	*K5816/4*	*mixture of clayish sandy soil, char, organic fibres, sandstones, stones and plant matter*	**No Asbestos Detected**	**596**	**<0.01**
TFA 2 B	*K5816/5*	*mixture of clayish sandy soil, stones, sandstones, organic fibres, char and plant matter*	**No Asbestos Detected**	**595**	**<0.01**
TFA 2 C	*K5816/6*	..	..	..	..
TFA 3 A	*K5816/7*	..	..	..	..
TFA 3 B	*K5816/8*	*mixture of clayish sandy soil, stones, sandstones, char, organic fibres and plant matter*	**No Asbestos Detected**	**575**	**<0.01**
TFA 3 C	*K5816/9*	..	..	..	..
TFA 4 A	*K5816/10*	*mixture of sandy soil, organic fibres, char, sandstones, stones and plant matter*	**No Asbestos Detected**	**576**	**<0.01**
TFA 4 B	*K5816/11*	*mixture of clayish sandy soil, stones, sandstones, organic fibres, char and plant matter*	**No Asbestos Detected**	**646**	**<0.01**
TFA 4 C	*K5816/12*	..	..	..	..
TFA 5 A	*K5816/13*	*mixture of sandy soil, sandstones, char, organic fibres, stones and plant matter*	**No Asbestos Detected**	**399**	**<0.01**
TFA 5 B	*K5816/14*	*mixture of clayish soil, stones, char, organic fibres and plant matter*	**No Asbestos Detected**	**640**	**<0.01**
TFA 5 C	*K5816/15*	..	..	..	..
TFA 6 A	*K5816/16*	*mixture of clayish sandy soil, stones, sandstones, char, organic fibres and plant matter*	**No Asbestos Detected**	**500**	**<0.01**
TFA 6 B	*K5816/17*	*mixture of clayish sandy soil, char, organic fibres, sandstones, stones and plant matter*	**No Asbestos Detected**	**503**	**<0.01**
TFA 6 C	*K5816/18*	..	..	..	..
TFA 7 A	*K5816/19*	*mixture of sandy soil, organic fibres, char, sandstones, char, stones and plant matter*	**No Asbestos Detected**	**486**	**<0.01**
TFA 7 B	*K5816/20*	*mixture of clayish sandy soil, stones, organic fibres, char, sandstones and plant matter*	**No Asbestos Detected**	**621**	**<0.01**
TFA 7 C	*K5816/21*	..	..	..	..
TFA 8 A	*K5816/22*	*mixture of clayish sandy soil, organic fibres, sandstones, wood chips, char, stones and plant matter*	**No Asbestos Detected**	**450**	**<0.01**

checked: ....
Graham Lancaster
Laboratory Manager

TFA 8 B	*K5816/23*	*mixture of clayish sandy soil, sandstones, organic fibres, char, stones and plant matter*	**No Asbestos Detected**	**599**	**<0.01**
TFA 8 C	*K5816/24*	..	..	**..**	**..**
TFA 9 A	*K5816/25*	*mixture of sandy soil, wood chips, char, sandstones, organic fibres, stones and plant matter*	**No Asbestos Detected**	**355**	**<0.01**
TFA 9 B	*K5816/26*	*mixture of clayish sandy soil, stones, sandstones, organic fibres, char and plant matter*	**No Asbestos Detected**	**601**	**<0.01**
TFA 9 C	*K5816/27*	..	..	**..**	**..**
TFA 10 A	*K5816/28*	*mixture of sandy soil, sandstones, char, organic fibres, stones and plant matter*	**No Asbestos Detected**	**650**	**<0.01**
TFA 10 B	*K5816/29*	*mixture of sandy soil, organic fibres, char, sandstones, stones and plant matter*	**No Asbestos Detected**	**536**	**<0.01**
TFA 10 C	*K5816/30*	..	..	**..**	**..**
TFA 11 A	*K5816/31*	*mixture of sandy soil, stones, organic fibres, char, sandstones and plant matter*	**No Asbestos Detected**	**395**	**<0.01**
TFA 11 B	*K5816/32*	*mixture of clayish sandy soil, stones, sandstones, organic fibres, char and plant matter*	**No Asbestos Detected**	**500**	**<0.01**
TFA 11 C	*K5816/33*	..	..	**..**	**..**
Field Dup 1A	*K5816/34*	*mixture of sandy soil, organic fibres, char, sandstones, stones and plant matter*	**No Asbestos Detected**	**438**	**<0.01**
Field Dup 6B	*K5816/35*	*mixture of clayish sandy soil, stones, organic fibres, sandstones, char and plant matter*	**No Asbestos Detected**	**616**	**<0.01**
Lab Dup 1	*K5816/36*	*mixture of clayish sandy soil, sandstones, organic fibres, char, stones and plant matter*	**No Asbestos Detected**	**522**	**<0.01**
Lab Dup 2	*K5816/37*	*mixture of sandy soil, stones, organic fibres, char, sandstones and plant matter*	**No Asbestos Detected**	**646**	**<0.01**
Trip Blank	*K5816/38*	..	..	**..**	**..**
Field Dup 6C	*K5816/39*	..	..	**..**	**..**

Notes:

1. Subcontracted - Polarized Light Microscope and dispersion staining method
2. Analysis conducted between sample arrival date and reporting date.
3. ** NATA accreditation does not cover the performance of this service.
4. .. Denotes not requested.
5. This report is not to be reproduced except in full.
6. All services undertaken by EAL are covered by the EAL Laboratory Services Terms and Conditions. These Terms and Conditions are available on the EAL website: scu.edu.au/eal, or on request.
7. Results relate only to the samples tested.
8. Subcontracting results from ASET 92764
9. This report was issued on 03/05/2021.

NATA
WORLD RECOGNISED
ACCREDITATION
Accreditation No. 14960
Accredited for compliance
with ISO/IEC 17025 - Testing

checked: ....
Graham Lancaster
Laboratory Manager

RESULTS OF WATER ANALYSIS

5 samples supplied by Tim Fitzroy & Associates Pty Ltd on 23/04/2021. Lab Job No. K6066.
Samples submitted by Tim Fitzroy. Your Job: 15/2021 BSC Lot 12 Bayshore Dr
61 Pine Avenue EAST BALLINA NSW 2478

Parameter	Methods reference	Sample 1 GW1	Sample 2 GW1 Field Dup	Sample 3 Lab Dup	Sample 4 GW2	Sample 5 GW3
	Job No.	*K6066/1*	*K6066/2*	*K6066/3*	*K6066/4*	*K6066/5*
pH	APHA 4500-H^+-B	6.04	5.99	5.99	5.27	5.88
Conductivity (EC) (dS/m)	APHA 2510-B	0.537	0.548	0.560	1.638	0.218
Total Dissolved Salts (mg/L)	** Calculation using EC x 680	365	373	381	1,114	148
Total Suspended Solids (mg/L)	GFC equiv. filter - APHA 2540-D	<1	<1	<1	<1	<1
Bicarbonate (Alkalinity) (mg/L $CaCO_3$ equivalent)	** Total Alkalinity - APHA 2320	108	111	117	34	51
Silver (mg/L)	Total Available - APHA 3125 ICPMS $^{*note\ 1\&2}$	<0.001	<0.001	<0.001	<0.001	<0.001
Aluminium (mg/L)	Total Available - APHA 3125 ICPMS $^{*note\ 1\&2}$	0.110	0.154	0.111	2.660	0.182
Arsenic (mg/L)	Total Available - APHA 3125 ICPMS $^{*note\ 1\&2}$	0.016	0.017	0.017	0.010	0.007
Cadmium (mg/L)	Total Available - APHA 3125 ICPMS $^{*note\ 1\&2}$	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium (mg/L)	Total Available - APHA 3125 ICPMS $^{*note\ 1\&2}$	0.001	0.001	0.001	0.004	0.001
Copper (mg/L)	Total Available - APHA 3125 ICPMS $^{*note\ 1\&2}$	<0.001	<0.001	<0.001	<0.001	<0.001
Iron (mg/L)	Total Available - APHA 3125 ICPMS $^{*note\ 1\&2}$	44.806	43.447	45.021	11.797	20.168
Manganese (mg/L)	Total Available - APHA 3125 ICPMS $^{*note\ 1\&2}$	0.402	0.374	0.386	0.044	3.473
Nickel (mg/L)	Total Available - APHA 3125 ICPMS $^{*note\ 1\&2}$	0.002	0.001	0.001	0.005	0.007
Lead (mg/L)	Total Available - APHA 3125 ICPMS $^{*note\ 1\&2}$	<0.001	<0.001	<0.001	0.001	<0.001
Selenium (mg/L)	Total Available - APHA 3125 ICPMS $^{*note\ 1\&2}$	0.001	<0.001	<0.001	0.001	0.001
Zinc (mg/L)	Total Available - APHA 3125 ICPMS $^{*note\ 1\&2}$	0.009	0.008	0.007	0.011	0.012
Mercury (mg/L)	Total Available - APHA 3125 ICPMS $^{*note\ 1\&2}$	0.0005	<0.0005	<0.0005	<0.0005	<0.0005
BTEX						
Benzene (µg/L or ppb)	Subcontracted: SGS report SE 219063	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene (µg/L or ppb)	Subcontracted: SGS report SE 219063	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene (µg/L or ppb)	Subcontracted: SGS report SE 219063	<0.5	<0.5	<0.5	<0.5	<0.5
m/p-Xylene (µg/L or ppb)	Subcontracted: SGS report SE 219063	<1	<1	<1	<1	<1
o-Xylene (µg/L or ppb)	Subcontracted: SGS report SE 219063	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene (µg/L or ppb)	Subcontracted: SGS report SE 219063	<0.5	<0.5	<0.5	<0.5	<0.5
Total Recoverable Hydrocarbons (TRH)						
C6-C9 Fraction (µg/L or ppb)	Subcontracted: SGS report SE 219063	<40	<40	<40	<40	<40
C10-C14 Fraction (µg/L or ppb)	Subcontracted: SGS report SE 219063	<50	<50	<50	<50	<50
C15-C28 Fraction (µg/L or ppb)	Subcontracted: SGS report SE 219063	<100	<100	<100	<100	320
C29-C36 Fraction (µg/L or ppb)	Subcontracted: SGS report SE 219063	<50	<50	<50	<50	<50
C10-C16 Fraction (µg/L or ppb)	Subcontracted: SGS report SE 219063	<60	<60	<60	<60	<60
C10-C16 less Naphthalene Fraction (µg/L or ppb)	Subcontracted: SGS report SE 219063	<60	<60	<60	<60	<60
C16-C34 Fraction (µg/L or ppb)	Subcontracted: SGS report SE 219063	<200	<200	<200	<200	350
C34-C40 Fraction (µg/L or ppb)	Subcontracted: SGS report SE 219063	<100	<100	<100	<100	<100
Sum C10-C36 Fraction (µg/L or ppb)	Subcontracted: SGS report SE 219063	<100	<100	<100	<100	320

Notes:

1. Total metals - samples digested with nitric acid; Total available (acid soluble/ extractable) metals - samples acidified with nitric acid to pH <2;
   Dissolved metals - samples filtered through 0.45µm cellulose acetate and then acidified with nitric acid prior to analysis
2. Metals and salts analysed by Inductively Coupled Plasma - Mass Spectrometry (ICP-MS).
3. 1 mg/L (milligram per litre) = 1 ppm (part per million) = 1000 µg/L (micrograms per litre) = 1000 ppb (part per billion).
4. For conductivity 1 dS/m = 1 mS/cm = 1000 µS/cm.
5. Analysis performed according to APHA (2017) 'Standard Methods for the Examination of Water & Wastewater', 23rd Edition, except where stated otherwise.
6. Analysis conducted between sample arrival date and reporting date.
7. ** NATA accreditation does not cover the performance of this service.
8. .. Denotes not requested.
9. This report is not to be reproduced except in full.
10. All services undertaken by EAL are covered by the EAL Laboratory Services Terms and Conditions (refer scu.edu.au/eal or on request).
11. Results relate only to the samples tested.
12. This report was issued on 30/04/2021.

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ACCREDITATION
Accreditation No. 14960
Accredited for compliance
with ISO/IEC 17025 - Testing

checked: ....
Graham Lancaster
Laboratory Manager

RESULTS OF WATER ANALYSIS

1 sample supplied by Tim Fitzroy & Associates Pty Ltd on 16/04/2021. Lab Job No. K5815.
Samples submitted by Tim Fitzroy. Your Job: 15/2021 BSC Lot 12 Bayshore Drive
61 Pine Avenue EAST BALLINA NSW 2478

Parameter	Methods reference	Sample 1 Rinsate Blank
	Job No.	*K5815/1*
pH	APHA 4500-H^+-B	6.36
Conductivity (EC) (dS/m)	APHA 2510-B	0.007
Total Dissolved Salts (mg/L)	** Calculation using EC x 680	5
Total Suspended Solids (mg/L)	GFC equiv. filter - APHA 2540-D	<1
Bicarbonate (Alkalinity) (mg/L $CaCO_3$ equivalent)	** Total Alkalinity - APHA 2320	5
Silver (mg/L)	Total Available - APHA 3125 ICPMS *note 1&2	<0.001
Aluminium (mg/L)	Total Available - APHA 3125 ICPMS *note 1&2	<0.005
Arsenic (mg/L)	Total Available - APHA 3125 ICPMS *note 1&2	<0.001
Cadmium (mg/L)	Total Available - APHA 3125 ICPMS *note 1&2	<0.001
Chromium (mg/L)	Total Available - APHA 3125 ICPMS *note 1&2	<0.001
Copper (mg/L)	Total Available - APHA 3125 ICPMS *note 1&2	<0.001
Iron (mg/L)	Total Available - APHA 3125 ICPMS *note 1&2	<0.005
Manganese (mg/L)	Total Available - APHA 3125 ICPMS *note 1&2	<0.001
Nickel (mg/L)	Total Available - APHA 3125 ICPMS *note 1&2	<0.001
Lead (mg/L)	Total Available - APHA 3125 ICPMS *note 1&2	<0.001
Selenium (mg/L)	Total Available - APHA 3125 ICPMS *note 1&2	<0.002
Zinc (mg/L)	Total Available - APHA 3125 ICPMS *note 1&2	0.002
Mercury (mg/L)	Total Available - APHA 3125 ICPMS *note 1&2	<0.0005
BTEX		
Benzene (μg/L or ppb)	Subcontracted: SGS report SE 218801	<1
Toluene (μg/L or ppb)	Subcontracted: SGS report SE 218801	<1
Ethylbenzene (μg/L or ppb)	Subcontracted: SGS report SE 218801	<1
m/p-Xylene (μg/L or ppb)	Subcontracted: SGS report SE 218801	<2
o-Xylene (μg/L or ppb)	Subcontracted: SGS report SE 218801	<1
Naphthalene (μg/L or ppb)	Subcontracted: SGS report SE 218801	<1
Total Recoverable Hydrocarbons (TRH)		
C6-C9 Fraction (μg/L or ppb)	Subcontracted: SGS report SE 218801	<10
C10-C14 Fraction (μg/L or ppb)	Subcontracted: SGS report SE 218801	<50
C15-C28 Fraction (μg/L or ppb)	Subcontracted: SGS report SE 218801	<100
C29-C36 Fraction (μg/L or ppb)	Subcontracted: SGS report SE 218801	<100
C10-C16 Fraction (μg/L or ppb)	Subcontracted: SGS report SE 218801	<50
C10-C16 less Naphthalene Fraction (μg/L or ppb)	Subcontracted: SGS report SE 218801	<50
C16-C34 Fraction (μg/L or ppb)	Subcontracted: SGS report SE 218801	<100
C34-C40 Fraction (μg/L or ppb)	Subcontracted: SGS report SE 218801	<100
Sum C10-C36 Fraction (μg/L or ppb)	Subcontracted: SGS report SE 218801	<50

Notes:

1. Total metals - samples digested with nitric acid; Total available (acid soluble/ extractable) metals - samples acidified with nitric acid to pH <2; Dissolved metals - samples filtered through 0.45μm cellulose acetate and then acidified with nitric acid prior to analysis
2. Metals and salts analysed by Inductively Coupled Plasma - Mass Spectrometry (ICP-MS).
3. 1 mg/L (milligram per litre) = 1 ppm (part per million) = 1000 μg/L (micrograms per litre) = 1000 ppb (part per billion).
4. For conductivity 1 dS/m = 1 mS/cm = 1000 μS/cm.
5. Analysis performed according to APHA (2017) 'Standard Methods for the Examination of Water & Wastewater', 23rd Edition, except where stated otherwise.
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11. Results relate only to the samples tested.
12. This report was issued on 30/04/2021.

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checked: ....
Graham Lancaster
Laboratory Manager

ASET

AUSTRALIAN SAFER ENVIRONMENT & TECHNOLOGY PTY LTD

Suite 710/ 90 George Street Hornsby NSW 2077 PO Box 1644 Hornsby Westfield NSW 1635

Ph: 02 9987 2183 Fax: 02 9987 2151 Email: aset@bigpond.net.au

p.1 of 2

ASET JOB NO: ASET92764/95944/1-25

Company Name & Address:

Environmental Analysis Lab
Military Road
East Lismore NSW 2480

Contact Ph:

Contact Name:

Job No:

Project Name: K5816

Email Results to:

eal@scu.edu.au

	Sample ID	Date	Matrix	Container	Sample Location	Asbestos Identification	WA NEPM Quantification					
1	K5816/ 1	20/4/21	soil	bag	–		X					
2	2						+					
3	4						+					
4	5						+					
5	8						+					
6	10						+					
7	11						+					
8	13						+					
9	14						+					
10	16						+					
11	17						+					
12	19						+					
13	20						+					
14	22						+					
15	23						+					
16	25						+					
17	26						+					
18	28						+					
19	29						+					
20	31						+					
21	K5816/ 32						+					

RECEIVED
22 APR 2021
BY:

Relinquished By:
Date & Time:
Signature:

Received By:
Date & Time: 22/4/21 4·30pm
Signature:

Turn around time				Method of Shipment
24 Hrs		3 Days		
48 Hrs		5 Days		

ASET **AUSTRALIAN SAFER ENVIRONMENT & TECHNOLOGY PTY LTD**

p.2 of 2

Suite 710/ 90 George Street Hornsby NSW 2077 PO Box 1644 Hornsby Westfield NSW 1635
Ph: 02 9987 2183 Fax: 02 9987 2151 Email: aset@bigpond.net.au

ASET JOB NO:

Company Name & Address:
Environmental Analysis Lab
Military Road
East Lismore NSW 2480

Contact Ph:

Contact Name:

Job No:

Project Name: K5816

Email Results to: eal@scu.edu.au

	Sample ID	Date	Matrix	Container	Sample Location	Asbestos Identification	WA NEPM Quantification				
22	K5816/34	20/4/21	Soil	bag			✗				
23	35						✗				
24	36						✗				
25	37						✗				

RECEIVED
22 APR 2021
BY:

Relinquished By:
Date & Time:
Signature:

Received By: Kirk
Date & Time: 22/4/21 4-30pm
Signature:

Turn around time				Method of Shipment
24 Hrs		3 Days		
48 Hrs		5 Days		

AUSTRALIAN SAFER ENVIRONMENT & TECHNOLOGY PTY LTD
ABN 36 088 095 112

Our ref : ASET92764 / 95944 / 1 - 25
Your ref : K5816
NATA Accreditation No: 14484

26 April 2021

Environmental Analysis Laboratory
Military Road
East Lismore NSW 2480

Attn: Mr Graham Lancaster

WORLD RECOGNISED
ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.

Dear Graham

Asbestos Identification
This report presents the results of twenty five samples, forwarded by Environmental Analysis Laboratory on 22 April 2021, for analysis for asbestos.

1.Introduction: Twenty five samples forwarded were examined and analysed for the presence of asbestos on 23 and 26 April 2021.

2. Methods : The samples were examined under a Stereo Microscope and selected fibres were analysed by Polarized Light Microscopy in conjunction with Dispersion Staining method **(Australian Standard AS 4964 - 2004 and Safer Environment Method 1 as the supplementary work instruction) (Qualitative Analysis only).**

The report also provides approximate weights and percentages, categories of asbestos forms appearing in the sample, such as **AF** (Asbestos Fines), **FA** (Friable Asbestos) and **ACM** (Asbestos Containing Material), also satisfying the requirements of the WA/ NEPM Guidelines).

3. Results : **Sample No. 1. ASET92764 / 95944 / 1. K5816/1.**
Approx dimensions 10.0 cm x 10.0 cm x 5.0 cm
Approximate total dry weight of soil = 486.0g.
The sample consisted of a mixture of sandy soil, sandstones, char, organic fibres, stones and plant matter.
No asbestos detected.

Ω Sample No. 2. ASET92764 / 95944 / 2. K5816/2.
Approx dimensions 10.0 cm x 10.0 cm x 4.0 cm
Approximate total dry weight of soil = 420.0g.
The sample consisted of a mixture of clayish sandy soil, stones, organic fibres, sandstones, char and plant matter.
No asbestos detected.

Sample No. 3. ASET92764 / 95944 / 3. K5816/4.
Approx dimensions 10.0 cm x 10.0 cm x 5.0 cm
Approximate total dry weight of soil = 569.0g.
The sample consisted of a mixture of clayish sandy soil, char, organic fibres, sandstones, stones and plant matter.
No asbestos detected.

SUITE 710 / 90 GEORGE STREET, HORNSBY NSW 2077 – P.O. BOX 1644 HORNSBY WESTFIELD NSW 1635
PHONE: (02) 99872183 FAX: (02)99872151 EMAIL: info@ausset.com.au WEBSITE: www.Ausset.com.au

OCCUPATIONAL HEALTH & SAFETY STUDIES • INDOOR AIR QUALITY SURVEYS • HAZARDOUS MATERIAL SURVEYS • RADIATION SURVEYS • ASBESTOS SURVEYS
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Page 1 of 5

Sample No. 4. ASET92764 / 95944 / 4. K5816/5.
Approx dimensions 10.0 cm x 10.0 cm x 5.1 cm
Approximate total dry weight of soil = 595.0g.
The sample consisted of a mixture of clayish sandy soil, stones, sandstones, organic fibres, char and plant matter.
No asbestos detected.

Sample No. 5. ASET92764 / 95944 / 5. K5816/8.
Approx dimensions 10.0 cm x 10.0 cm x 5.0 cm
Approximate total dry weight of soil = 575.0g.
The sample consisted of a mixture of clayish sandy soil, stones, sandstones, char, organic fibres and plant matter.
No asbestos detected.

Sample No. 6. ASET92764 / 95944 / 6. K5816/10.
Approx dimensions 10.0 cm x 10.0 cm x 5.0 cm
Approximate total dry weight of soil = 576.0g.
The sample consisted of a mixture of sandy soil, organic fibres, char, sandstones, stones and plant matter.
No asbestos detected.

Sample No. 7. ASET92764 / 95944 / 7. K5816/11.
Approx dimensions 10.0 cm x 10.0 cm x 5.2 cm
Approximate total dry weight of soil = 646.0g.
The sample consisted of a mixture of clayish sandy soil, stones, sandstones, organic fibres, char and plant matter.
No asbestos detected.

Ω Sample No. 8. ASET92764 / 95944 / 8. K5816/13.
Approx dimensions 10.0 cm x 10.0 cm x 3.8 cm
Approximate total dry weight of soil = 399.0g.
The sample consisted of a mixture of sandy soil, sandstones, char, organic fibres, stones and plant matter.
No asbestos detected.

Sample No. 9. ASET92764 / 95944 / 9. K5816/14.
Approx dimensions 10.0 cm x 10.0 cm x 5.3 cm
Approximate total dry weight of soil = 640.0g.
The sample consisted of a mixture of clayish soil, stones, char, organic fibres and plant matter.
No asbestos detected.

Sample No. 10. ASET92764 / 95944 / 10. K5816/16.
Approx dimensions 10.0 cm x 10.0 cm x 5.0 cm
Approximate total dry weight of soil = 500.0g.
The sample consisted of a mixture of clayish sandy soil, stones, sandstones, char, organic fibres and plant matter.
No asbestos detected.

Sample No. 11. ASET92764 / 95944 / 11. K5816/17.
Approx dimensions 10.0 cm x 10.0 cm x 5.0 cm
Approximate total dry weight of soil = 503.0g.
The sample consisted of a mixture of clayish sandy soil, char, organic fibres, sandstones, stones and plant matter.
No asbestos detected.

Sample No. 12. ASET92764 / 95944 / 12. K5816/19.
Approx dimensions 10.0 cm x 10.0 cm x 5.0 cm
Approximate total dry weight of soil = 487.0g.
The sample consisted of a mixture of sandy soil, organic fibres, char, sandstones, char, stones and plant matter.
No asbestos detected.

Sample No. 13. ASET92764 / 95944 / 13. K5816/20.
Approx dimensions 10.0 cm x 10.0 cm x 5.1 cm
Approximate total dry weight of soil = 621.0g.
The sample consisted of a mixture of clayish sandy soil, stones, organic fibres, char, sandstones and plant matter.
No asbestos detected.

Ω Sample No. 14. ASET92764 / 95944 / 14. K5816/22.
Approx dimensions 10.0 cm x 10.0 cm x 4.2 cm
Approximate total dry weight of soil = 450.0g.
The sample consisted of a mixture of clayish sandy soil, organic fibres, sandstones, wood chips, char, stones and plant matter.
No asbestos detected.

Sample No. 15. ASET92764 / 95944 / 15. K5816/23.
Approx dimensions 10.0 cm x 10.0 cm x 5.1 cm
Approximate total dry weight of soil = 599.0g.
The sample consisted of a mixture of clayish sandy soil, sandstones, organic fibres, char, stones and plant matter.
No asbestos detected.

Ω Sample No. 16. ASET92764 / 95944 / 16. K5816/25.
Approx dimensions 10.0 cm x 10.0 cm x 3.2 cm
Approximate total dry weight of soil = 355.0g.
The sample consisted of a mixture of sandy soil, wood chips, char, sandstones, organic fibres, stones and plant matter.
No asbestos detected.

Sample No. 17. ASET92764 / 95944 / 17. K5816/26.
Approx dimensions 10.0 cm x 10.0 cm x 5.1 cm
Approximate total dry weight of soil = 601.0g.
The sample consisted of a mixture of clayish sandy soil, stones, sandstones, organic fibres, char and plant matter.
No asbestos detected.

Sample No. 18. ASET92764 / 95944 / 18. K5816/28.
Approx dimensions 10.0 cm x 10.0 cm x 5.3 cm
Approximate total dry weight of soil = 650.0g.
The sample consisted of a mixture of sandy soil, sandstones, char, organic fibres, stones and plant matter.
No asbestos detected.

Sample No. 19. ASET92764 / 95944 / 19. K5816/29.
Approx dimensions 10.0 cm x 10.0 cm x 5.0 cm
Approximate total dry weight of soil = 536.0g.
The sample consisted of a mixture of sandy soil, organic fibres, char, sandstones, stones and plant matter.
No asbestos detected.

Ω Sample No. 20. ASET92764 / 95944 / 20. K5816/31.
Approx dimensions 10.0 cm x 10.0 cm x 3.6 cm
Approximate total dry weight of soil = 395.0g.
The sample consisted of a mixture of sandy soil, stones, organic fibres, char, sandstones and plant matter.
No asbestos detected.

Sample No. 21. ASET92764 / 95944 / 21. K5816/32.
Approx dimensions 10.0 cm x 10.0 cm x 5.0 cm
Approximate total dry weight of soil = 500.0g.
The sample consisted of a mixture of clayish sandy soil, stones, sandstones, organic fibres, char and plant matter.
No asbestos detected.

Ω Sample No. 22. ASET92764 / 95944 / 22. K5816/34.
Approx dimensions 10.0 cm x 10.0 cm x 4.0 cm
Approximate total dry weight of soil = 438.0g.
The sample consisted of a mixture of sandy soil, organic fibres, char, sandstones, stones and plant matter.
No asbestos detected.

Sample No. 23. ASET92764 / 95944 / 23. K5816/35.
Approx dimensions 10.0 cm x 10.0 cm x 5.1 cm
Approximate total dry weight of soil = 616.0g.
The sample consisted of a mixture of clayish sandy soil, stones, organic fibres, sandstones, char and plant matter.
No asbestos detected.

Sample No. 24. ASET92764 / 95944 / 24. K5816/36.
Approx dimensions 10.0 cm x 10.0 cm x 5.0 cm
Approximate total dry weight of soil = 522.0g.
The sample consisted of a mixture of clayish sandy soil, sandstones, organic fibres, char, stones and plant matter.
No asbestos detected.

Sample No. 25. ASET92764 / 95944 / 25. K5816/37.
Approx dimensions 10.0 cm x 10.0 cm x 5.2 cm
Approximate total dry weight of soil = 646.0g.
The sample consisted of a mixture of sandy soil, stones, organic fibres, char, sandstones and plant matter.
No asbestos detected.

Reported by,

Mahen De Silva. BSc, MSc, Grad Dip (Occ Hyg)
Occupational Hygienist / Approved Identifier.
Approved Signatory

WORLD RECOGNISED
ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.

This report is consistent with the analytical procedures and reporting recommendations in the Western Australia Guidelines for the Assessment Remediation and Management of Asbestos contaminated sites

in Western Australia and it also satisfies the requirements of the current NEPM Guidelines. NATA Accreditation does not cover the performance of this service.

Disclaimers;

The approx; weights given above can be used only as a guide. They do not represent absolute weights of each kind of asbestos, as it is impossible to extract all loose fibres from soil and other asbestos containing building material samples using this method. However above figures may be used as closest approximations to the exact values in each case. Estimation and/ or reporting of asbestos fibre weights in asbestos containing materials and soil is out of the Scope of the NATA Accreditation. NATA Accreditation only covers the qualitative part of the results reported. This weight disclaimer also covers weight / weight percentages if given.

ACM - Asbestos Containing Material - Products or materials that contain asbestos in an inert bound matrix such as cement or resin. Here taken to be sound material, even as fragments and not fitting through a 7mm X 7 mm sieve.

AF -Includes asbestos free fibres, small fibre bundles and also ACM fragments that pass through a 7mm X 7 mm sieve.

FA -Friable asbestos material such as severely weathered ACM, and asbestos in the form of loose fibrous material such as insulation products.

^ denotes loose fibres of relevant asbestos types detected in soil/dust.
*** denotes asbestos detected in ACM in bonded form.**
 # denotes friable asbestos as soft fibro plaster and/ or highly weathered ACM that will easily crumble.
λ denotes samples that have been analysed only in accordance to AS 4964 – 2004.
Ω Sample volume criteria of 500mL have not been satisfied.

The results contained in this report relate only to the sample/s submitted for testing. Australian Safer Environment & Technology accepts no responsibility for whether or not the submitted sample/s is/are representative. Results indicating "No asbestos detected" indicates a reporting limit specified in AS4964 -2004 which is 0.1g/ Kg (0.01%). Any amounts detected at assumed lower level than that would be reported, however those assumed lower levels may be treated as "No asbestos detected" as specified and recommended by A4964-2004. Trace / respirable level asbestos will be reported only when detected and trace analysis have been performed on each sample as required by AS4964-2004. When loose asbestos fibres/ fibre bundles are detected and reported that means they are larger handpicked fibres/ fibre bundles, and they do not represent respirable fibres. Dust/soil samples are always subjected to trace analysis except where the amounts involved are extremely minute and trace analysis is not possible to be carried out. When trace analysis is not performed on dust samples it will be indicated in the report that trace analysis has not been carried out due to the volume of the sample being extremely minute.

Estimation of asbestos weights involves the use of following assumptions;
Volume of each kind of Asbestos present in broken edges have been visually estimated and its been assumed that volumes remain similar throughout the binding matrix and those volumes are only approximate and not exact. Material densities have been assumed to be similar to commonly found similar materials and may not be exact.

All samples indicating "No asbestos detected" are assumed to be less than 0.001% for friable AF and FA portions detected and 0.01 % for ACM detected unless the approximate weight is given.

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS		LABORATORY DETAILS	
Contact	Graham Lancaster	Manager	Huong Crawford
Client	ENVIRONMENTAL ANALYSIS LABORATORY	Laboratory	SGS Alexandria Environmental
Address	PO BOX 157 LISMORE NSW 2480	Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	61 2 6620 3678	Telephone	+61 2 8594 0400
Facsimile	(Not specified)	Facsimile	+61 2 8594 0499
Email	Graham.Lancaster@scu.edu.au	Email	au.environmental.sydney@sgs.com
Project	**K5815**	SGS Reference	**SE218801 R0**
Order Number	**K5815**	Date Received	21 Apr 2021
Samples	1	Date Reported	28 Apr 2021

COMMENTS

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

SIGNATORIES

Ly Kim HA Organic Section Head	Teresa NGUYEN Organic Chemist

Parameter	Units	LOR	Sample Number SE218801.001 Sample Matrix Water Sample Date 20 Apr 2021 Sample Name K5815/1

VOCs in Water Method: AN433 Tested: 21/4/2021

Monocyclic Aromatic Hydrocarbons

Benzene	µg/L	0.5	<0.5
Toluene	µg/L	0.5	<0.5
Ethylbenzene	µg/L	0.5	<0.5
m/p-xylene	µg/L	1	<1
o-xylene	µg/L	0.5	<0.5

Polycyclic VOCs

Naphthalene	µg/L	0.5	<0.5

Surrogates

d4-1,2-dichloroethane (Surrogate)	%	-	100
d8-toluene (Surrogate)	%	-	100
Bromofluorobenzene (Surrogate)	%	-	102

Totals

Total Xylenes	µg/L	1.5	<1.5
Total BTEX	µg/L	3	<3

Volatile Petroleum Hydrocarbons in Water Method: AN433 Tested: 21/4/2021

TRH C6-C10	µg/L	50	<50
TRH C6-C9	µg/L	40	<40

Surrogates

d4-1,2-dichloroethane (Surrogate)	%	-	100
d8-toluene (Surrogate)	%	-	100
Bromofluorobenzene (Surrogate)	%	-	102

Parameter	Units	LOR	Sample Number SE218801.001 Sample Matrix Water Sample Date 20 Apr 2021 Sample Name K5815/1

Volatile Petroleum Hydrocarbons in Water Method: AN433 Tested: 21/4/2021 (continued)

VPH F Bands

Benzene (F0)	µg/L	0.5	<0.5
TRH C6-C10 minus BTEX (F1)	µg/L	50	<50

Low Level TRH (Total Recoverable Hydrocarbons) in Water Method: AN403 Tested: 23/4/2021

LLTRH C10-C14	µg/L	50	<50
LLTRH C15-C28	µg/L	100	<100
LLTRH C29-C36	µg/L	50	<50
TRH Sum C10-C36	µg/L	100	<100

TRH F Bands

LLTRH >C10-C16	µg/L	60	<60
LLTRH >C16-C34 (F3)	µg/L	200	<200
LLTRH >C34-C40 (F4)	µg/L	100	<100

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.

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

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
LLTRH C10-C14	LB223199	µg/L	50	<50	84%
LLTRH C15-C28	LB223199	µg/L	100	<100	101%
LLTRH C29-C36	LB223199	µg/L	50	<50	102%
TRH Sum C10-C36	LB223199	µg/L	100	<100	

TRH F Bands

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
LLTRH >C10-C16	LB223199	µg/L	60	<60	NA
LLTRH >C16-C34 (F3)	LB223199	µg/L	200	<200	NA
LLTRH >C34-C40 (F4)	LB223199	µg/L	100	<100	NA

VOCs in Water Method: ME-(AU)-[ENV]AN433

Monocyclic Aromatic Hydrocarbons

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Benzene	LB223058	µg/L	0.5	<0.5	0%	119%	109%
Toluene	LB223058	µg/L	0.5	<0.5	0%	124%	112%
Ethylbenzene	LB223058	µg/L	0.5	<0.5	0%	121%	113%
m/p-xylene	LB223058	µg/L	1	<1	0%	116%	112%
o-xylene	LB223058	µg/L	0.5	<0.5	0%	123%	112%

Polycyclic VOCs

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Naphthalene	LB223058	µg/L	0.5	<0.5	0%	NA	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
d4-1,2-dichloroethane (Surrogate)	LB223058	%	-	119%	7%	106%	98%
d8-toluene (Surrogate)	LB223058	%	-	101%	1%	103%	99%
Bromofluorobenzene (Surrogate)	LB223058	%	-	94%	7%	96%	99%

Totals

Parameter	QC Reference	Units	LOR	MB
Total Xylenes	LB223058	µg/L	1.5	<1.5
Total BTEX	LB223058	µg/L	3	<3

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
TRH C6-C10	LB223058	µg/L	50	<50	0%	88%	99%
TRH C6-C9	LB223058	µg/L	40	<40	0%	92%	99%

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
d4-1,2-dichloroethane (Surrogate)	LB223058	%	-	119%	7 - 8%	106%	98%
d8-toluene (Surrogate)	LB223058	%	-	101%	1 - 7%	103%	99%
Bromofluorobenzene (Surrogate)	LB223058	%	-	94%	7 - 11%	96%	99%

VPH F Bands

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Benzene (F0)	LB223058	µg/L	0.5		0%	NA	NA
TRH C6-C10 minus BTEX (F1)	LB223058	µg/L	50	<50	0%	79%	99%

METHOD	METHODOLOGY SUMMARY
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 not corrected for Naphthalene.
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.
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
***	Indicates that both * and ** apply.	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.

This document is issued by the Company under its General Conditions of Service accessible at www.sgs.com/en/Terms-and-Conditions.aspx. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client only. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law .

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STATEMENT OF QA/QC PERFORMANCE

SE218801 R0

CLIENT DETAILS

Contact	Graham Lancaster
Client	ENVIRONMENTAL ANALYSIS LABORATORY
Address	PO BOX 157 LISMORE NSW 2480
Telephone	61 2 6620 3678
Facsimile	(Not specified)
Email	Graham.Lancaster@scu.edu.au
Project	**K5815**
Order Number	**K5815**
Samples	1

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE218801 R0**
Date Received	21 Apr 2021
Date Reported	28 Apr 2021

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 (within the SGS Alexandria Environmental laboratory).

SAMPLE SUMMARY

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	Client	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	1 Water
Date documentation received	21/4/2021	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	17.2°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

HOLDING TIME SUMMARY

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

Low Level TRH (Total Recoverable Hydrocarbons) in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
K5815/1	SE218801.001	LB223199	20 Apr 2021	21 Apr 2021	27 Apr 2021	23 Apr 2021	02 Jun 2021	28 Apr 2021

VOCs in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
K5815/1	SE218801.001	LB223058	20 Apr 2021	21 Apr 2021	27 Apr 2021	21 Apr 2021	31 May 2021	23 Apr 2021

Volatile Petroleum Hydrocarbons in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
K5815/1	SE218801.001	LB223058	20 Apr 2021	21 Apr 2021	27 Apr 2021	21 Apr 2021	31 May 2021	23 Apr 2021

SURROGATES

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.

VOCs in Water

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	K5815/1	SE218801.001	%	40 - 130%	102
d4-1,2-dichloroethane (Surrogate)	K5815/1	SE218801.001	%	40 - 130%	100
d8-toluene (Surrogate)	K5815/1	SE218801.001	%	40 - 130%	100

Volatile Petroleum Hydrocarbons in Water

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	K5815/1	SE218801.001	%	40 - 130%	102
d4-1,2-dichloroethane (Surrogate)	K5815/1	SE218801.001	%	60 - 130%	100
d8-toluene (Surrogate)	K5815/1	SE218801.001	%	40 - 130%	100

METHOD BLANKS

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.

Low Level TRH (Total Recoverable Hydrocarbons) in Water

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

Sample Number	Parameter	Units	LOR	Result
LB223199.001	LLTRH C10-C14	µg/L	50	<50
	LLTRH C15-C28	µg/L	100	<100
	LLTRH C29-C36	µg/L	50	<50

VOCs in Water

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

Sample Number		Parameter	Units	LOR	Result
LB223058.001	Monocyclic Aromatic Hydrocarbons	Benzene	µg/L	0.5	<0.5
		Toluene	µg/L	0.5	<0.5
		Ethylbenzene	µg/L	0.5	<0.5
		m/p-xylene	µg/L	1	<1
		o-xylene	µg/L	0.5	<0.5
	Polycyclic VOCs	Naphthalene	µg/L	0.5	<0.5
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	119
		d8-toluene (Surrogate)	%	-	101
		Bromofluorobenzene (Surrogate)	%	-	94

Volatile Petroleum Hydrocarbons in Water

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

Sample Number		Parameter	Units	LOR	Result
LB223058.001		TRH C6-C9	µg/L	40	<40
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	119
		d8-toluene (Surrogate)	%	-	101
		Bromofluorobenzene (Surrogate)	%	-	94

DUPLICATES

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.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

VOCs in Water

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218801.001	LB223058.023	Monocyclic Aromatic	Benzene	μg/L	0.5	<0.5	<0.5	200	0
			Toluene	μg/L	0.5	<0.5	<0.5	162	0
			Ethylbenzene	μg/L	0.5	<0.5	<0.5	200	0
			m/p-xylene	μg/L	1	<1	<1	200	0
			o-xylene	μg/L	0.5	<0.5	<0.5	200	0
		Polycyclic	Naphthalene	μg/L	0.5	<0.5	<0.5	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	μg/L	-	10	9.4	30	7
			d8-toluene (Surrogate)	μg/L	-	10	9.9	30	1
			Bromofluorobenzene (Surrogate)	μg/L	-	10	9.5	30	7

Volatile Petroleum Hydrocarbons in Water

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218801.001	LB223058.023		TRH C6-C10	μg/L	50	<50	<50	200	0
			TRH C6-C9	μg/L	40	<40	<40	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	μg/L	-	10	9.4	30	7
			d8-toluene (Surrogate)	μg/L	-	10	9.9	30	1
			Bromofluorobenzene (Surrogate)	μg/L	-	10	9.5	30	7
		VPH F Bands	Benzene (F0)	μg/L	0.5	<0.5	<0.5	200	0
			TRH C6-C10 minus BTEX (F1)	μg/L	50	<50	<50	200	0
SE218806.009	LB223058.024		TRH C6-C10	μg/L	50	<50	<50	200	0
			TRH C6-C9	μg/L	40	<40	<40	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	μg/L	-	11	9.7	30	8
			d8-toluene (Surrogate)	μg/L	-	11	10	30	7
			Bromofluorobenzene (Surrogate)	μg/L	-	11	9.7	30	11
		VPH F Bands	Benzene (F0)	μg/L	0.5	<0.5	<0.5	200	0
			TRH C6-C10 minus BTEX (F1)	μg/L	50	<50	<50	200	0

LABORATORY CONTROL SAMPLES

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.

Low Level TRH (Total Recoverable Hydrocarbons) in Water

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB223199.002		LLTRH C10-C14	µg/L	50	1000	1200	60 - 140	84
		LLTRH C15-C28	µg/L	100	1200	1200	60 - 140	101
		LLTRH C29-C36	µg/L	50	1200	1200	60 - 140	102

VOCs in Water

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB223058.002	Monocyclic Aromatic	Benzene	µg/L	0.5	54	45.45	60 - 140	119
		Toluene	µg/L	0.5	56	45.45	60 - 140	124
		Ethylbenzene	µg/L	0.5	55	45.45	60 - 140	121
		m/p-xylene	µg/L	1	110	90.9	60 - 140	116
		o-xylene	µg/L	0.5	56	45.45	60 - 140	123
	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	11	10	60 - 140	106
		d8-toluene (Surrogate)	µg/L	-	10	10	70 - 130	103
		Bromofluorobenzene (Surrogate)	µg/L	-	9.6	10	70 - 130	96

Volatile Petroleum Hydrocarbons in Water

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB223058.002		TRH C6-C10	µg/L	50	830	946.63	60 - 140	88
		TRH C6-C9	µg/L	40	760	818.71	60 - 140	92
	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	11	10	60 - 140	106
		d8-toluene (Surrogate)	µg/L	-	10	10	70 - 130	103
		Bromofluorobenzene (Surrogate)	µg/L	-	9.6	10	70 - 130	96
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	500	639.67	60 - 140	79

MATRIX SPIKES

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.

VOCs in Water

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE218752.013	LB223058.025	Monocyclic Aromatic	Benzene	µg/L	0.5	50	<0.5	45.45	109
			Toluene	µg/L	0.5	51	<0.5	45.45	112
			Ethylbenzene	µg/L	0.5	51	<0.5	45.45	113
			m/p-xylene	µg/L	1	100	<1	90.9	112
			o-xylene	µg/L	0.5	51	<0.5	45.45	112
		Polycyclic	Naphthalene	µg/L	0.5	45	<0.5	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	9.8	10.7	-	98
			d8-toluene (Surrogate)	µg/L	-	9.9	10.7	-	99
			Bromofluorobenzene (Surrogate)	µg/L	-	9.9	10.8	-	99

Volatile Petroleum Hydrocarbons in Water

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE218752.013	LB223058.025		TRH C6-C10	µg/L	50	940	<50	946.63	99
			TRH C6-C9	µg/L	40	810	<40	818.71	99
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	9.8	10.7	-	98
			d8-toluene (Surrogate)	µg/L	-	9.9	10.7	-	99
			Bromofluorobenzene (Surrogate)	µg/L	-	9.9	10.8	-	99
		VPH F Bands	Benzene (F0)	µg/L	0.5		<0.5	-	-
			TRH C6-C10 minus BTEX (F1)	µg/L	50	630	<50	639.67	99

MATRIX SPIKE DUPLICATES

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

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.
***	Indicates that both * and ** apply.
-	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.

SAMPLE RECEIPT ADVICE

SE218801

CLIENT DETAILS

Contact	Graham Lancaster
Client	ENVIRONMENTAL ANALYSIS LABORATORY
Address	PO BOX 157 LISMORE NSW 2480
Telephone	61 2 6620 3678
Facsimile	(Not specified)
Email	Graham.Lancaster@scu.edu.au
Project	**K5815**
Order Number	**K5815**
Samples	1

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Wed 21/4/2021
Report Due	Wed 28/4/2021
SGS Reference	**SE218801**

SUBMISSION DETAILS

This is to confirm that 1 sample was received on Wednesday 21/4/2021. Results are expected to be ready by COB Wednesday 28/4/2021. Please quote SGS reference SE218801 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	Client	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	1 Water
Date documentation received	21/4/2021	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	17.2°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

Unless otherwise instructed, water and bulk samples will be held for one month from date of report, and soil samples will be held for two months.

COMMENTS

Sampling date was not provided. It is assumed to be as date samples were relinquished.

SAMPLE RECEIPT ADVICE

SE218801

CLIENT DETAILS

Client ENVIRONMENTAL ANALYSIS LABORATORY

Project K5815

SUMMARY OF ANALYSIS

No.	Sample ID	Low Level TRH (Total Recoverable	VOCs in Water	Volatile Petroleum Hydrocarbons in Water
001	K5815/1	7	11	7

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Graham Lancaster
Client	ENVIRONMENTAL ANALYSIS LABORATORY
Address	PO BOX 157 LISMORE NSW 2480
Telephone	61 2 6620 3678
Facsimile	(Not specified)
Email	Graham.Lancaster@scu.edu.au
Project	**K5816**
Order Number	**K5816**
Samples	27

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE218814 R0**
Date Received	21 Apr 2021
Date Reported	29 Apr 2021

COMMENTS

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

SIGNATORIES

Akheeqar BENIAMEEN
Chemist

Dong LIANG
Metals/Inorganics Team Leader

Ly Kim HA
Organic Section Head

Teresa NGUYEN
Organic Chemist

		Sample Number	SE218814.001	SE218814.002	SE218814.003	SE218814.004
		Sample Matrix	Soil	Soil	Soil	Soil
		Sample Date	20 Apr 2021	20 Apr 2021	20 Apr 2021	20 Apr 2021
		Sample Name	K5816/1	K5816/3	K5816/4	K5816/6
Parameter	**Units**	**LOR**				

VOC's in Soil Method: AN433 Tested: 22/4/2021

Monocyclic Aromatic Hydrocarbons

Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1

Polycyclic VOCs

Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1

Surrogates

d4-1,2-dichloroethane (Surrogate)	%	-	78	83	82	85
d8-toluene (Surrogate)	%	-	77	81	81	82
Bromofluorobenzene (Surrogate)	%	-	71	74	74	74

Totals

Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6

Volatile Petroleum Hydrocarbons in Soil Method: AN433 Tested: 22/4/2021

TRH C6-C10	mg/kg	25	<25	<25	<25	<25
TRH C6-C9	mg/kg	20	<20	<20	<20	<20

Surrogates

d4-1,2-dichloroethane (Surrogate)	%	-	78	83	82	85
d8-toluene (Surrogate)	%	-	77	81	81	82
Bromofluorobenzene (Surrogate)	%	-	71	74	74	74

VPH F Bands

Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25

		Sample Number	SE218814.001	SE218814.002	SE218814.003	SE218814.004
		Sample Matrix	Soil	Soil	Soil	Soil
		Sample Date	20 Apr 2021	20 Apr 2021	20 Apr 2021	20 Apr 2021
		Sample Name	K5816/1	K5816/3	K5816/4	K5816/6
Parameter	Units	LOR				

TRH (Total Recoverable Hydrocarbons) in Soil Method: AN403 Tested: 22/4/2021

TRH C10-C14	mg/kg	20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	**66**	<45	**46**	<45
TRH C29-C36	mg/kg	45	**70**	<45	**56**	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100
TRH C10-C36 Total	mg/kg	110	**140**	<110	<110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210	<210

TRH F Bands

TRH >C10-C16	mg/kg	25	<25	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	**110**	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120

PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 Tested: 22/4/2021

Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	**0.4**	<0.1	**0.2**	<0.1
Anthracene	mg/kg	0.1	**0.1**	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	**0.9**	<0.1	**0.5**	<0.1
Pyrene	mg/kg	0.1	**0.9**	<0.1	**0.6**	<0.1
Benzo(a)anthracene	mg/kg	0.1	**0.3**	<0.1	**0.2**	<0.1
Chrysene	mg/kg	0.1	**0.4**	<0.1	**0.2**	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	**0.4**	<0.1	**0.3**	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	**0.3**	<0.1	**0.2**	<0.1
Benzo(a)pyrene	mg/kg	0.1	**0.4**	<0.1	**0.3**	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	**0.4**	<0.1	**0.2**	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	**0.3**	<0.1	**0.2**	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	**0.6**	<0.2	**0.4**	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	**0.7**	<0.3	**0.5**	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	**0.6**	<0.2	**0.4**	<0.2
Total PAH (18)	mg/kg	0.8	**4.7**	<0.8	**3.0**	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	**4.7**	<0.8	**3.0**	<0.8

Surrogates

d5-nitrobenzene (Surrogate)	%	-	**127**	**110**	**109**	**124**
2-fluorobiphenyl (Surrogate)	%	-	**80**	**79**	**72**	**117**
d14-p-terphenyl (Surrogate)	%	-	**113**	**115**	**106**	**106**

OC Pesticides in Soil Method: AN420 Tested: 22/4/2021

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

		Sample Number	SE218814.001	SE218814.002	SE218814.003	SE218814.004
		Sample Matrix	Soil	Soil	Soil	Soil
		Sample Date	20 Apr 2021	20 Apr 2021	20 Apr 2021	20 Apr 2021
		Sample Name	K5816/1	K5816/3	K5816/4	K5816/6
Parameter	**Units**	**LOR**				

OC Pesticides in Soil Method: AN420 Tested: 22/4/2021 (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)	%	-	100	97	103	99

Speciated Phenols in Soil Method: AN420 Tested: 22/4/2021

Phenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2-methyl phenol (o-cresol)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
3/4-methyl phenol (m/p-cresol)	mg/kg	1	<1	<1	<1	<1
Total Cresol	mg/kg	1.5	<1.5	<1.5	<1.5	<1.5
2-chlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2,4-dimethylphenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2,6-dichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2,4-dichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-trichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2-nitrophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
4-nitrophenol	mg/kg	1	<1	<1	<1	<1
2,4,5-trichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2,3,4,6/2,3,5,6-tetrachlorophenol	mg/kg	1	<1	<1	<1	<1
Pentachlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2,4-dinitrophenol	mg/kg	2	<2	<2	<2	<2
4-chloro-3-methylphenol	mg/kg	2	<2	<2	<2	<2

Surrogates

2,4,6-Tribromophenol (Surrogate)	%	-	83	83	78	84
d5-phenol (Surrogate)	%	-	83	93	83	91

Total Cyanide in soil by Discrete Analyser (Aquakem) Method: AN077/AN287 Tested: 26/4/2021

Total Cyanide	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE218814.001 Soil 20 Apr 2021 K5816/1	SE218814.002 Soil 20 Apr 2021 K5816/3	SE218814.003 Soil 20 Apr 2021 K5816/4	SE218814.004 Soil 20 Apr 2021 K5816/6
Moisture Content Method: AN002 Tested: 23/4/2021							
% Moisture	%w/w	1		14.1	16.4	14.0	17.3

Parameter	Units	LOR	Sample Number: SE218814.005 Sample Matrix: Soil Sample Date: 20 Apr 2021 Sample Name: K5816/7	SE218814.006 Soil 20 Apr 2021 K5816/9	SE218814.007 Soil 20 Apr 2021 K5816/10	SE218814.008 Soil 20 Apr 2021 K5816/12
VOC's in Soil Method: AN433 Tested: 22/4/2021						
Monocyclic Aromatic Hydrocarbons						
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Polycyclic VOCs						
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Surrogates						
d4-1,2-dichloroethane (Surrogate)	%	-	79	82	92	88
d8-toluene (Surrogate)	%	-	77	80	112	87
Bromofluorobenzene (Surrogate)	%	-	71	73	103	75
Totals						
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6
Volatile Petroleum Hydrocarbons in Soil Method: AN433 Tested: 22/4/2021						
TRH C6-C10	mg/kg	25	<25	<25	<25	<25
TRH C6-C9	mg/kg	20	<20	<20	<20	<20
Surrogates						
d4-1,2-dichloroethane (Surrogate)	%	-	79	82	92	88
d8-toluene (Surrogate)	%	-	77	80	112	87
Bromofluorobenzene (Surrogate)	%	-	71	73	103	75
VPH F Bands						
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25

		Sample Number	SE218814.005	SE218814.006	SE218814.007	SE218814.008
		Sample Matrix	Soil	Soil	Soil	Soil
		Sample Date	20 Apr 2021	20 Apr 2021	20 Apr 2021	20 Apr 2021
		Sample Name	K5816/7	K5816/9	K5816/10	K5816/12
Parameter	Units	LOR				

TRH (Total Recoverable Hydrocarbons) in Soil Method: AN403 Tested: 22/4/2021

TRH C10-C14	mg/kg	20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	**58**	<45	<45	<45
TRH C29-C36	mg/kg	45	**120**	**46**	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100
TRH C10-C36 Total	mg/kg	110	**170**	<110	<110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210	<210

TRH F Bands

TRH >C10-C16	mg/kg	25	<25	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	**130**	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120

PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 Tested: 22/4/2021

Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	**0.2**	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	**0.3**	<0.1	**0.1**	<0.1
Pyrene	mg/kg	0.1	**0.4**	<0.1	**0.1**	<0.1
Benzo(a)anthracene	mg/kg	0.1	**0.2**	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.1	**0.3**	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	**0.9**	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	**0.5**	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	**0.8**	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	**0.9**	<0.1	<0.1	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	**0.8**	<0.1	<0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	**1.0**	<0.2	<0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	**1.1**	<0.3	<0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	**1.1**	<0.2	<0.2	<0.2
Total PAH (18)	mg/kg	0.8	**5.1**	<0.8	<0.8	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	**5.1**	<0.8	<0.8	<0.8

Surrogates

d5-nitrobenzene (Surrogate)	%	-	**118**	**123**	**125**	**104**
2-fluorobiphenyl (Surrogate)	%	-	**77**	**82**	**87**	**98**
d14-p-terphenyl (Surrogate)	%	-	**109**	**111**	**113**	**99**

OC Pesticides in Soil Method: AN420 Tested: 22/4/2021

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	SE218814.005 Soil 20 Apr 2021 K5816/7	SE218814.006 Soil 20 Apr 2021 K5816/9	SE218814.007 Soil 20 Apr 2021 K5816/10	SE218814.008 Soil 20 Apr 2021 K5816/12

OC Pesticides in Soil Method: AN420 Tested: 21/4/2021 (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)	%	-	102	96	102	109

Speciated Phenols in Soil Method: AN420 Tested: 22/4/2021

Phenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2-methyl phenol (o-cresol)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
3/4-methyl phenol (m/p-cresol)	mg/kg	1	<1	<1	<1	<1
Total Cresol	mg/kg	1.5	<1.5	<1.5	<1.5	<1.5
2-chlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2,4-dimethylphenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2,6-dichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2,4-dichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-trichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2-nitrophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
4-nitrophenol	mg/kg	1	<1	<1	<1	<1
2,4,5-trichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2,3,4,6/2,3,5,6-tetrachlorophenol	mg/kg	1	<1	<1	<1	<1
Pentachlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2,4-dinitrophenol	mg/kg	2	<2	<2	<2	<2
4-chloro-3-methylphenol	mg/kg	2	<2	<2	<2	<2

Surrogates

2,4,6-Tribromophenol (Surrogate)	%	-	88	81	75	90
d5-phenol (Surrogate)	%	-	83	90	88	97

Total Cyanide in soil by Discrete Analyser (Aquakem) Method: AN077/AN287 Tested: 26/4/2021

Total Cyanide	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name			
			SE218814.005 Soil 20 Apr 2021 K5816/7	SE218814.006 Soil 20 Apr 2021 K5816/9	SE218814.007 Soil 20 Apr 2021 K5816/10	SE218814.008 Soil 20 Apr 2021 K5816/12

Moisture Content Method: AN002 Tested: 23/4/2021

% Moisture	%w/w	1	22.5	15.7	22.9	21.2

Parameter	Units	LOR				
		Sample Number	SE218814.009	SE218814.010	SE218814.011	SE218814.012
		Sample Matrix	Soil	Soil	Soil	Soil
		Sample Date	20 Apr 2021	20 Apr 2021	20 Apr 2021	20 Apr 2021
		Sample Name	K5816/13	K5816/15	K5816/16	K5816/18

VOC's in Soil Method: AN433 Tested: 21/4/2021

Monocyclic Aromatic Hydrocarbons

Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1

Polycyclic VOCs

Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1

Surrogates

d4-1,2-dichloroethane (Surrogate)	%	-	83	87	88	84
d8-toluene (Surrogate)	%	-	83	86	87	83
Bromofluorobenzene (Surrogate)	%	-	70	74	83	71

Totals

Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6

Volatile Petroleum Hydrocarbons in Soil Method: AN433 Tested: 21/4/2021

TRH C6-C10	mg/kg	25	<25	<25	<25	<25
TRH C6-C9	mg/kg	20	<20	<20	<20	<20

Surrogates

d4-1,2-dichloroethane (Surrogate)	%	-	83	87	88	84
d8-toluene (Surrogate)	%	-	83	86	87	83
Bromofluorobenzene (Surrogate)	%	-	70	74	83	71

VPH F Bands

Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25

		Sample Number	SE218814.009	SE218814.010	SE218814.011	SE218814.012
		Sample Matrix	Soil	Soil	Soil	Soil
		Sample Date	20 Apr 2021	20 Apr 2021	20 Apr 2021	20 Apr 2021
		Sample Name	K5816/13	K5816/15	K5816/16	K5816/18
Parameter	Units	LOR				

TRH (Total Recoverable Hydrocarbons) in Soil Method: AN403 Tested: 21/4/2021

TRH C10-C14	mg/kg	20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	**54**	<45	<45	<45
TRH C29-C36	mg/kg	45	**62**	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100
TRH C10-C36 Total	mg/kg	110	**120**	<110	<110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210	<210

TRH F Bands

TRH >C10-C16	mg/kg	25	<25	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	**97**	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120

PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 Tested: 21/4/2021

Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	**0.2**	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	**0.5**	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	**0.2**	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	**1.4**	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	**1.4**	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	**0.4**	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.1	**0.5**	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	**0.5**	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	**0.5**	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	**0.7**	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	**0.5**	<0.1	<0.1	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	**0.7**	<0.1	<0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	**0.9**	<0.2	<0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	**1.0**	<0.3	<0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	**0.9**	<0.2	<0.2	<0.2
Total PAH (18)	mg/kg	0.8	**7.5**	<0.8	<0.8	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	**7.5**	<0.8	<0.8	<0.8

Surrogates

d5-nitrobenzene (Surrogate)	%	-	**122**	**121**	**113**	**107**
2-fluorobiphenyl (Surrogate)	%	-	**102**	**105**	**100**	**97**
d14-p-terphenyl (Surrogate)	%	-	**102**	**106**	**100**	**97**

OC Pesticides in Soil Method: AN420 Tested: 21/4/2021

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

		Sample Number Sample Matrix Sample Date Sample Name	SE218814.009 Soil 20 Apr 2021 K5816/13	SE218814.010 Soil 20 Apr 2021 K5816/15	SE218814.011 Soil 20 Apr 2021 K5816/16	SE218814.012 Soil 20 Apr 2021 K5816/18
Parameter	Units	LOR				

OC Pesticides in Soil Method: AN420 Tested: 21/4/2021 (continued)

Parameter	Units	LOR	SE218814.009	SE218814.010	SE218814.011	SE218814.012
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

Parameter	Units	LOR	SE218814.009	SE218814.010	SE218814.011	SE218814.012
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	114	116	114	116

Speciated Phenols in Soil Method: AN420 Tested: 21/4/2021

Parameter	Units	LOR	SE218814.009	SE218814.010	SE218814.011	SE218814.012
Phenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2-methyl phenol (o-cresol)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
3/4-methyl phenol (m/p-cresol)	mg/kg	1	<1	<1	<1	<1
Total Cresol	mg/kg	1.5	<1.5	<1.5	<1.5	<1.5
2-chlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2,4-dimethylphenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2,6-dichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2,4-dichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-trichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2-nitrophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
4-nitrophenol	mg/kg	1	<1	<1	<1	<1
2,4,5-trichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2,3,4,6/2,3,5,6-tetrachlorophenol	mg/kg	1	<1	<1	<1	<1
Pentachlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2,4-dinitrophenol	mg/kg	2	<2	<2	<2	<2
4-chloro-3-methylphenol	mg/kg	2	<2	<2	<2	<2

Surrogates

Parameter	Units	LOR	SE218814.009	SE218814.010	SE218814.011	SE218814.012
2,4,6-Tribromophenol (Surrogate)	%	-	81	90	91	91
d5-phenol (Surrogate)	%	-	88	95	92	90

Total Cyanide in soil by Discrete Analyser (Aquakem) Method: AN077/AN287 Tested: 26/4/2021

Parameter	Units	LOR	SE218814.009	SE218814.010	SE218814.011	SE218814.012
Total Cyanide	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE218814.009 Soil 20 Apr 2021 K5816/13	SE218814.010 Soil 20 Apr 2021 K5816/15	SE218814.011 Soil 20 Apr 2021 K5816/16	SE218814.012 Soil 20 Apr 2021 K5816/18
Moisture Content Method: AN002 Tested: 22/4/2021							
% Moisture	%w/w	1		20.8	16.1	13.4	19.0

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE218814.013 Soil 20 Apr 2021 K5816/19	SE218814.014 Soil 20 Apr 2021 K5816/21	SE218814.015 Soil 20 Apr 2021 K5816/22	SE218814.016 Soil 20 Apr 2021 K5816/24

VOC’s in Soil Method: AN433 Tested: 21/4/2021

Monocyclic Aromatic Hydrocarbons

Parameter	Units	LOR	SE218814.013	SE218814.014	SE218814.015	SE218814.016
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	**0.5**	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	**0.1**	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	**0.9**	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	**0.4**	<0.1	<0.1

Polycyclic VOCs

Parameter	Units	LOR	SE218814.013	SE218814.014	SE218814.015	SE218814.016
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1

Surrogates

Parameter	Units	LOR	SE218814.013	SE218814.014	SE218814.015	SE218814.016
d4-1,2-dichloroethane (Surrogate)	%	-	**87**	**85**	**87**	**80**
d8-toluene (Surrogate)	%	-	**87**	**85**	**87**	**80**
Bromofluorobenzene (Surrogate)	%	-	**74**	**74**	**74**	**68**

Totals

Parameter	Units	LOR	SE218814.013	SE218814.014	SE218814.015	SE218814.016
Total Xylenes	mg/kg	0.3	<0.3	**1.3**	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	**1.9**	<0.6	<0.6

Volatile Petroleum Hydrocarbons in Soil Method: AN433 Tested: 21/4/2021

Parameter	Units	LOR	SE218814.013	SE218814.014	SE218814.015	SE218814.016
TRH C6-C10	mg/kg	25	<25	<25	<25	<25
TRH C6-C9	mg/kg	20	<20	<20	<20	<20

Surrogates

Parameter	Units	LOR	SE218814.013	SE218814.014	SE218814.015	SE218814.016
d4-1,2-dichloroethane (Surrogate)	%	-	**87**	**85**	**87**	**80**
d8-toluene (Surrogate)	%	-	**87**	**85**	**87**	**80**
Bromofluorobenzene (Surrogate)	%	-	**74**	**74**	**74**	**68**

VPH F Bands

Parameter	Units	LOR	SE218814.013	SE218814.014	SE218814.015	SE218814.016
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25

		Sample Number	SE218814.013	SE218814.014	SE218814.015	SE218814.016
		Sample Matrix	Soil	Soil	Soil	Soil
		Sample Date	20 Apr 2021	20 Apr 2021	20 Apr 2021	20 Apr 2021
		Sample Name	K5816/19	K5816/21	K5816/22	K5816/24
Parameter	Units	LOR				

TRH (Total Recoverable Hydrocarbons) in Soil Method: AN403 Tested: 21/4/2021

TRH C10-C14	mg/kg	20	<20	**22**	<20	<20
TRH C15-C28	mg/kg	45	**90**	**60**	**46**	<45
TRH C29-C36	mg/kg	45	**72**	<45	**56**	**60**
TRH C37-C40	mg/kg	100	<100	<100	<100	<100
TRH C10-C36 Total	mg/kg	110	**160**	<110	<110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210	<210

TRH F Bands

TRH >C10-C16	mg/kg	25	<25	**31**	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	**31**	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	**120**	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120

PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 Tested: 21/4/2021

Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	**0.1**	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	**0.2**	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	**0.2**	<0.1	**0.6**	<0.1
Pyrene	mg/kg	0.1	**0.2**	<0.1	**0.5**	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	**0.2**	<0.1
Chrysene	mg/kg	0.1	<0.1	<0.1	**0.2**	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	**0.2**	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	**0.2**	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	**0.3**	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	**0.1**	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	**0.2**	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2	<0.2	**0.3**	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3	**0.4**	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	<0.2	**0.4**	<0.2
Total PAH (18)	mg/kg	0.8	<0.8	<0.8	**2.8**	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8	<0.8	**2.8**	<0.8

Surrogates

d5-nitrobenzene (Surrogate)	%	-	**114**	**115**	**115**	**115**
2-fluorobiphenyl (Surrogate)	%	-	**104**	**102**	**102**	**99**
d14-p-terphenyl (Surrogate)	%	-	**104**	**99**	**101**	**102**

OC Pesticides in Soil Method: AN420 Tested: 21/4/2021

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: SE218814.013 Soil 20 Apr 2021 K5816/19	SE218814.014 Soil 20 Apr 2021 K5816/21	SE218814.015 Soil 20 Apr 2021 K5816/22	SE218814.016 Soil 20 Apr 2021 K5816/24

OC Pesticides in Soil Method: AN420 Tested: 21/4/2021 (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)	%	-	115	116	124	122

Speciated Phenols in Soil Method: AN420 Tested: 21/4/2021

Phenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2-methyl phenol (o-cresol)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
3/4-methyl phenol (m/p-cresol)	mg/kg	1	<1	<1	<1	<1
Total Cresol	mg/kg	1.5	<1.5	<1.5	<1.5	<1.5
2-chlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2,4-dimethylphenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2,6-dichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2,4-dichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-trichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2-nitrophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
4-nitrophenol	mg/kg	1	<1	<1	<1	<1
2,4,5-trichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2,3,4,6/2,3,5,6-tetrachlorophenol	mg/kg	1	<1	<1	<1	<1
Pentachlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2,4-dinitrophenol	mg/kg	2	<2	<2	<2	<2
4-chloro-3-methylphenol	mg/kg	2	<2	<2	<2	<2

Surrogates

2,4,6-Tribromophenol (Surrogate)	%	-	92	93	94	95
d5-phenol (Surrogate)	%	-	88	91	91	93

Total Cyanide in soil by Discrete Analyser (Aquakem) Method: AN077/AN287 Tested: 26/4/2021

Total Cyanide	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5

Parameter	Units	LOR	SE218814.013	SE218814.014	SE218814.015	SE218814.016
Sample Matrix			Soil	Soil	Soil	Soil
Sample Date			20 Apr 2021	20 Apr 2021	20 Apr 2021	20 Apr 2021
Sample Name			K5816/19	K5816/21	K5816/22	K5816/24
Moisture Content Method: AN002 Tested: 22/4/2021						
% Moisture	%w/w	1	17.6	19.1	20.9	22.0

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE218814.017 Soil 20 Apr 2021 K5816/25	SE218814.018 Soil 20 Apr 2021 K5816/27	SE218814.019 Soil 20 Apr 2021 K5816/28	SE218814.020 Soil 20 Apr 2021 K5816/30

VOC's in Soil Method: AN433 Tested: 21/4/2021

Monocyclic Aromatic Hydrocarbons

Parameter	Units	LOR	SE218814.017	SE218814.018	SE218814.019	SE218814.020
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1

Polycyclic VOCs

Parameter	Units	LOR	SE218814.017	SE218814.018	SE218814.019	SE218814.020
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1

Surrogates

Parameter	Units	LOR	SE218814.017	SE218814.018	SE218814.019	SE218814.020
d4-1,2-dichloroethane (Surrogate)	%	-	87	84	86	84
d8-toluene (Surrogate)	%	-	87	84	85	84
Bromofluorobenzene (Surrogate)	%	-	76	72	72	70

Totals

Parameter	Units	LOR	SE218814.017	SE218814.018	SE218814.019	SE218814.020
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6

Volatile Petroleum Hydrocarbons in Soil Method: AN433 Tested: 21/4/2021

Parameter	Units	LOR	SE218814.017	SE218814.018	SE218814.019	SE218814.020
TRH C6-C10	mg/kg	25	<25	<25	<25	<25
TRH C6-C9	mg/kg	20	<20	<20	<20	<20

Surrogates

Parameter	Units	LOR	SE218814.017	SE218814.018	SE218814.019	SE218814.020
d4-1,2-dichloroethane (Surrogate)	%	-	87	84	86	84
d8-toluene (Surrogate)	%	-	87	84	85	84
Bromofluorobenzene (Surrogate)	%	-	76	72	72	70

VPH F Bands

Parameter	Units	LOR	SE218814.017	SE218814.018	SE218814.019	SE218814.020
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25

		Sample Number	SE218814.017	SE218814.018	SE218814.019	SE218814.020
		Sample Matrix	Soil	Soil	Soil	Soil
		Sample Date	20 Apr 2021	20 Apr 2021	20 Apr 2021	20 Apr 2021
		Sample Name	K5816/25	K5816/27	K5816/28	K5816/30
Parameter	Units	LOR				
TRH (Total Recoverable Hydrocarbons) in Soil Method: AN403 Tested: 21/4/2021						
TRH C10-C14	mg/kg	20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	64	<45	<45	<45
TRH C29-C36	mg/kg	45	75	<45	55	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100
TRH C10-C36 Total	mg/kg	110	140	<110	<110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210	<210
TRH F Bands						
TRH >C10-C16	mg/kg	25	<25	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	110	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 Tested: 21/4/2021						
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	0.4	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	0.7	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	0.3	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	1.4	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	1.6	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	0.5	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.1	0.7	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	0.5	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	0.5	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	0.8	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	0.4	<0.1	<0.1	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	0.6	<0.1	<0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	1.0	<0.2	<0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	1.1	<0.3	<0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	1.0	<0.2	<0.2	<0.2
Total PAH (18)	mg/kg	0.8	8.4	<0.8	<0.8	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	8.4	<0.8	<0.8	<0.8
Surrogates						
d5-nitrobenzene (Surrogate)	%	-	117	119	119	110
2-fluorobiphenyl (Surrogate)	%	-	102	100	100	94
d14-p-terphenyl (Surrogate)	%	-	99	102	101	99
OC Pesticides in Soil Method: AN420 Tested: 21/4/2021						
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: SE218814.017 Soil 20 Apr 2021 K5816/25	SE218814.018 Soil 20 Apr 2021 K5816/27	SE218814.019 Soil 20 Apr 2021 K5816/28	SE218814.020 Soil 20 Apr 2021 K5816/30

OC Pesticides in Soil Method: AN420 Tested: 21/4/2021 (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)	%	-	124	98	119	118

Speciated Phenols in Soil Method: AN420 Tested: 21/4/2021

Phenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2-methyl phenol (o-cresol)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
3/4-methyl phenol (m/p-cresol)	mg/kg	1	<1	<1	<1	<1
Total Cresol	mg/kg	1.5	<1.5	<1.5	<1.5	<1.5
2-chlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2,4-dimethylphenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2,6-dichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2,4-dichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-trichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2-nitrophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
4-nitrophenol	mg/kg	1	<1	<1	<1	<1
2,4,5-trichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2,3,4,6/2,3,5,6-tetrachlorophenol	mg/kg	1	<1	<1	<1	<1
Pentachlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2,4-dinitrophenol	mg/kg	2	<2	<2	<2	<2
4-chloro-3-methylphenol	mg/kg	2	<2	<2	<2	<2

Surrogates

2,4,6-Tribromophenol (Surrogate)	%	-	91	75	118	92
d5-phenol (Surrogate)	%	-	82	92	92	95

Total Cyanide in soil by Discrete Analyser (Aquakem) Method: AN077/AN287 Tested: 27/4/2021

Total Cyanide	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5

Parameter	Units	LOR	SE218814.017	SE218814.018	SE218814.019	SE218814.020
Sample Matrix			Soil	Soil	Soil	Soil
Sample Date			20 Apr 2021	20 Apr 2021	20 Apr 2021	20 Apr 2021
Sample Name			K5816/25	K5816/27	K5816/28	K5816/30
Moisture Content Method: AN002 Tested: 22/4/2021						
% Moisture	%w/w	1	23.8	19.8	19.9	18.0

Parameter	Units	LOR	SE218814.021 Soil 20 Apr 2021 K5816/31	SE218814.022 Soil 20 Apr 2021 K5816/33	SE218814.023 Soil 20 Apr 2021 K5816/34	SE218814.024 Soil 20 Apr 2021 K5816/36
Sample Number / Sample Matrix / Sample Date / Sample Name						

VOC's in Soil Method: AN433 Tested: 21/4/2021

Monocyclic Aromatic Hydrocarbons

Parameter	Units	LOR	SE218814.021	SE218814.022	SE218814.023	SE218814.024
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1

Polycyclic VOCs

Parameter	Units	LOR	SE218814.021	SE218814.022	SE218814.023	SE218814.024
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1

Surrogates

Parameter	Units	LOR	SE218814.021	SE218814.022	SE218814.023	SE218814.024
d4-1,2-dichloroethane (Surrogate)	%	-	**93**	**76**	**82**	**83**
d8-toluene (Surrogate)	%	-	**93**	**75**	**81**	**81**
Bromofluorobenzene (Surrogate)	%	-	**78**	**63**	**69**	**70**

Totals

Parameter	Units	LOR	SE218814.021	SE218814.022	SE218814.023	SE218814.024
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6

Volatile Petroleum Hydrocarbons in Soil Method: AN433 Tested: 21/4/2021

Parameter	Units	LOR	SE218814.021	SE218814.022	SE218814.023	SE218814.024
TRH C6-C10	mg/kg	25	<25	<25	<25	<25
TRH C6-C9	mg/kg	20	<20	<20	<20	<20

Surrogates

Parameter	Units	LOR	SE218814.021	SE218814.022	SE218814.023	SE218814.024
d4-1,2-dichloroethane (Surrogate)	%	-	**93**	**76**	**82**	**83**
d8-toluene (Surrogate)	%	-	**93**	**75**	**81**	**81**
Bromofluorobenzene (Surrogate)	%	-	**78**	**63**	**69**	**70**

VPH F Bands

Parameter	Units	LOR	SE218814.021	SE218814.022	SE218814.023	SE218814.024
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25

		Sample Number	SE218814.021	SE218814.022	SE218814.023	SE218814.024
		Sample Matrix	Soil	Soil	Soil	Soil
		Sample Date	20 Apr 2021	20 Apr 2021	20 Apr 2021	20 Apr 2021
		Sample Name	K5816/31	K5816/33	K5816/34	K5816/36
Parameter	Units	LOR				

TRH (Total Recoverable Hydrocarbons) in Soil Method: AN403 Tested: 21/4/2021

TRH C10-C14	mg/kg	20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45	**89**	<45
TRH C29-C36	mg/kg	45	<45	<45	**100**	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100
TRH C10-C36 Total	mg/kg	110	<110	<110	**190**	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210	<210

TRH F Bands

TRH >C10-C16	mg/kg	25	<25	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	**150**	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120

PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 Tested: 21/4/2021

Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	**0.1**	<0.1	**0.1**	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	**0.3**	<0.1	**0.6**	<0.1
Anthracene	mg/kg	0.1	**0.3**	<0.1	**0.2**	<0.1
Fluoranthene	mg/kg	0.1	**0.7**	<0.1	**1.4**	<0.1
Pyrene	mg/kg	0.1	**0.7**	<0.1	**1.2**	<0.1
Benzo(a)anthracene	mg/kg	0.1	**0.2**	<0.1	**0.4**	<0.1
Chrysene	mg/kg	0.1	**0.3**	<0.1	**0.5**	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	**0.2**	<0.1	**0.4**	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	**0.2**	<0.1	**0.4**	<0.1
Benzo(a)pyrene	mg/kg	0.1	**0.3**	<0.1	**0.5**	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	**0.2**	<0.1	**0.3**	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	**0.3**	<0.1	**0.4**	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	**0.4**	<0.2	**0.7**	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	**0.5**	<0.3	**0.8**	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	**0.5**	<0.2	**0.7**	<0.2
Total PAH (18)	mg/kg	0.8	**3.9**	<0.8	**6.5**	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	**3.9**	<0.8	**6.5**	<0.8

Surrogates

d5-nitrobenzene (Surrogate)	%	-	**116**	**115**	**109**	**119**
2-fluorobiphenyl (Surrogate)	%	-	**98**	**96**	**101**	**99**
d14-p-terphenyl (Surrogate)	%	-	**100**	**97**	**102**	**106**

OC Pesticides in Soil Method: AN420 Tested: 21/4/2021

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	SE218814.021	SE218814.022	SE218814.023	SE218814.024
Sample Matrix			Soil	Soil	Soil	Soil
Sample Date			20 Apr 2021	20 Apr 2021	20 Apr 2021	20 Apr 2021
Sample Name			K5816/31	K5816/33	K5816/34	K5816/36

OC Pesticides in Soil Method: AN420 Tested: 21/4/2021 (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)	%	-	104	102	107	103

Speciated Phenols in Soil Method: AN420 Tested: 21/4/2021

Phenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2-methyl phenol (o-cresol)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
3/4-methyl phenol (m/p-cresol)	mg/kg	1	<1	<1	<1	<1
Total Cresol	mg/kg	1.5	<1.5	<1.5	<1.5	<1.5
2-chlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2,4-dimethylphenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2,6-dichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2,4-dichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-trichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2-nitrophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
4-nitrophenol	mg/kg	1	<1	<1	<1	<1
2,4,5-trichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2,3,4,6/2,3,5,6-tetrachlorophenol	mg/kg	1	<1	<1	<1	<1
Pentachlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
2,4-dinitrophenol	mg/kg	2	<2	<2	<2	<2
4-chloro-3-methylphenol	mg/kg	2	<2	<2	<2	<2

Surrogates

2,4,6-Tribromophenol (Surrogate)	%	-	93	86	92	121
d5-phenol (Surrogate)	%	-	92	94	90	92

Total Cyanide in soil by Discrete Analyser (Aquakem) Method: AN077/AN287 Tested: 27/4/2021

Total Cyanide	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name			
			SE218814.021 Soil 20 Apr 2021 K5816/31	SE218814.022 Soil 20 Apr 2021 K5816/33	SE218814.023 Soil 20 Apr 2021 K5816/34	SE218814.024 Soil 20 Apr 2021 K5816/36
Moisture Content Method: AN002 Tested: 22/4/2021						
% Moisture	%w/w	1	11.2	18.6	30.4	18.3

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE218814.025 Soil 20 Apr 2021 K5816/37	SE218814.026 Soil 20 Apr 2021 K5816/38	SE218814.027 Soil 20 Apr 2021 K5816/39
VOC's in Soil Method: AN433 Tested: 21/4/2021						
Monocyclic Aromatic Hydrocarbons						
Benzene	mg/kg	0.1		<0.1	<0.1	<0.1
Toluene	mg/kg	0.1		<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1		<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2		<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1		<0.1	<0.1	<0.1
Polycyclic VOCs						
Naphthalene	mg/kg	0.1		<0.1	<0.1	<0.1
Surrogates						
d4-1,2-dichloroethane (Surrogate)	%	-		87	93	85
d8-toluene (Surrogate)	%	-		86	92	83
Bromofluorobenzene (Surrogate)	%	-		74	81	72
Totals						
Total Xylenes	mg/kg	0.3		<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6		<0.6	<0.6	<0.6
Volatile Petroleum Hydrocarbons in Soil Method: AN433 Tested: 21/4/2021						
TRH C6-C10	mg/kg	25		<25	<25	<25
TRH C6-C9	mg/kg	20		<20	<20	<20
Surrogates						
d4-1,2-dichloroethane (Surrogate)	%	-		87	93	85
d8-toluene (Surrogate)	%	-		86	92	83
Bromofluorobenzene (Surrogate)	%	-		74	81	72
VPH F Bands						
Benzene (F0)	mg/kg	0.1		<0.1	<0.1	<0.1
TRH C6-C10 minus BTEX (F1)	mg/kg	25		<25	<25	<25

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE218814.025 Soil 20 Apr 2021 K5816/37	SE218814.026 Soil 20 Apr 2021 K5816/38	SE218814.027 Soil 20 Apr 2021 K5816/39

TRH (Total Recoverable Hydrocarbons) in Soil Method: AN403 Tested: 21/4/2021

Parameter	Units	LOR	SE218814.025	SE218814.026	SE218814.027
TRH C10-C14	mg/kg	20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100
TRH C10-C36 Total	mg/kg	110	<110	<110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210

TRH F Bands

Parameter	Units	LOR	SE218814.025	SE218814.026	SE218814.027
TRH >C10-C16	mg/kg	25	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120

PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 Tested: 21/4/2021

Parameter	Units	LOR	SE218814.025	SE218814.026	SE218814.027
Naphthalene	mg/kg	0.1	<0.1	-	<0.1
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	<0.1	-	<0.1
Acenaphthene	mg/kg	0.1	<0.1	-	<0.1
Fluorene	mg/kg	0.1	<0.1	-	<0.1
Phenanthrene	mg/kg	0.1	<0.1	-	<0.1
Anthracene	mg/kg	0.1	<0.1	-	<0.1
Fluoranthene	mg/kg	0.1	**0.1**	-	<0.1
Pyrene	mg/kg	0.1	**0.1**	-	<0.1
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	<0.1	-	<0.1
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	<0.2	-	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	-	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	-	<0.2
Total PAH (18)	mg/kg	0.8	<0.8	-	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8	-	<0.8

Surrogates

Parameter	Units	LOR	SE218814.025	SE218814.026	SE218814.027
d5-nitrobenzene (Surrogate)	%	-	**121**	-	**114**
2-fluorobiphenyl (Surrogate)	%	-	**102**	-	**98**
d14-p-terphenyl (Surrogate)	%	-	**104**	-	**100**

OC Pesticides in Soil Method: AN420 Tested: 21/4/2021

Parameter	Units	LOR	SE218814.025	SE218814.026	SE218814.027
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
Dieldrin	mg/kg	0.2	<0.2	-	<0.2

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE218814.025 Soil 20 Apr 2021 K5816/37	SE218814.026 Soil 20 Apr 2021 K5816/38	SE218814.027 Soil 20 Apr 2021 K5816/39

OC Pesticides in Soil Method: AN420 Tested: 21/4/2021 (continued)

Parameter	Units	LOR	SE218814.025	SE218814.026	SE218814.027
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

Parameter	Units	LOR	SE218814.025	SE218814.026	SE218814.027
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	109	-	102

Speciated Phenols in Soil Method: AN420 Tested: 21/4/2021

Parameter	Units	LOR	SE218814.025	SE218814.026	SE218814.027
Phenol	mg/kg	0.5	<0.5	-	<0.5
2-methyl phenol (o-cresol)	mg/kg	0.5	<0.5	-	<0.5
3/4-methyl phenol (m/p-cresol)	mg/kg	1	<1	-	<1
Total Cresol	mg/kg	1.5	<1.5	-	<1.5
2-chlorophenol	mg/kg	0.5	<0.5	-	<0.5
2,4-dimethylphenol	mg/kg	0.5	<0.5	-	<0.5
2,6-dichlorophenol	mg/kg	0.5	<0.5	-	<0.5
2,4-dichlorophenol	mg/kg	0.5	<0.5	-	<0.5
2,4,6-trichlorophenol	mg/kg	0.5	<0.5	-	<0.5
2-nitrophenol	mg/kg	0.5	<0.5	-	<0.5
4-nitrophenol	mg/kg	1	<1	-	<1
2,4,5-trichlorophenol	mg/kg	0.5	<0.5	-	<0.5
2,3,4,6/2,3,5,6-tetrachlorophenol	mg/kg	1	<1	-	<1
Pentachlorophenol	mg/kg	0.5	<0.5	-	<0.5
2,4-dinitrophenol	mg/kg	2	<2	-	<2
4-chloro-3-methylphenol	mg/kg	2	<2	-	<2

Surrogates

Parameter	Units	LOR	SE218814.025	SE218814.026	SE218814.027
2,4,6-Tribromophenol (Surrogate)	%	-	96	-	94
d5-phenol (Surrogate)	%	-	113	-	91

Total Cyanide in soil by Discrete Analyser (Aquakem) Method: AN077/AN287 Tested: 27/4/2021

Parameter	Units	LOR	SE218814.025	SE218814.026	SE218814.027
Total Cyanide	mg/kg	0.5	<0.5	-	<0.5

		Sample Number Sample Matrix Sample Date Sample Name	SE218814.025 Soil 20 Apr 2021 K5816/37	SE218814.026 Soil 20 Apr 2021 K5816/38	SE218814.027 Soil 20 Apr 2021 K5816/39
Parameter	Units	LOR			
Moisture Content Method: AN002 Tested: 22/4/2021					
% Moisture	%w/w	1	21.8	<1.0	18.7

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.

Moisture Content **Method: ME-(AU)-[ENV]AN002**

Parameter	QC Reference	Units	LOR	DUP %RPD
% Moisture	LB223138	%w/w	1	0 - 9%
	LB223207	%w/w	1	4 - 19%

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Hexachlorobenzene (HCB)	LB223067	mg/kg	0.1	<0.1	0%	NA	NA
	LB223176	mg/kg	0.1	<0.1	0%	NA	NA
Alpha BHC	LB223067	mg/kg	0.1	<0.1	0%	NA	NA
	LB223176	mg/kg	0.1	<0.1	0%	NA	NA
Lindane	LB223067	mg/kg	0.1	<0.1	0%	NA	NA
	LB223176	mg/kg	0.1	<0.1	0%	NA	NA
Heptachlor	LB223067	mg/kg	0.1	<0.1	0%	118%	121%
	LB223176	mg/kg	0.1	<0.1	0%	80%	91%
Aldrin	LB223067	mg/kg	0.1	<0.1	0%	116%	119%
	LB223176	mg/kg	0.1	<0.1	0%	83%	92%
Beta BHC	LB223067	mg/kg	0.1	<0.1	0%	NA	NA
	LB223176	mg/kg	0.1	<0.1	0%	NA	NA
Delta BHC	LB223067	mg/kg	0.1	<0.1	0%	123%	125%
	LB223176	mg/kg	0.1	<0.1	0%	77%	85%
Heptachlor epoxide	LB223067	mg/kg	0.1	<0.1	0%	NA	NA
	LB223176	mg/kg	0.1	<0.1	0%	NA	NA
o,p'-DDE	LB223067	mg/kg	0.1	<0.1	0%	NA	NA
	LB223176	mg/kg	0.1	<0.1	0%	NA	NA
Alpha Endosulfan	LB223067	mg/kg	0.2	<0.2	0%	NA	NA
	LB223176	mg/kg	0.2	<0.2	0%	NA	NA
Gamma Chlordane	LB223067	mg/kg	0.1	<0.1	0%	NA	NA
	LB223176	mg/kg	0.1	<0.1	0%	NA	NA
Alpha Chlordane	LB223067	mg/kg	0.1	<0.1	0%	NA	NA
	LB223176	mg/kg	0.1	<0.1	0%	NA	NA
trans-Nonachlor	LB223067	mg/kg	0.1	<0.1	0%	NA	NA
	LB223176	mg/kg	0.1	<0.1	0%	NA	NA
p,p'-DDE	LB223067	mg/kg	0.1	<0.1	0%	NA	NA
	LB223176	mg/kg	0.1	<0.1	0%	NA	NA
Dieldrin	LB223067	mg/kg	0.2	<0.2	0%	116%	119%
	LB223176	mg/kg	0.2	<0.2	0%	82%	91%
Endrin	LB223067	mg/kg	0.2	<0.2	0%	125%	130%
	LB223176	mg/kg	0.2	<0.2	0%	91%	97%
o,p'-DDD	LB223067	mg/kg	0.1	<0.1	0%	NA	NA
	LB223176	mg/kg	0.1	<0.1	0%	NA	NA
o,p'-DDT	LB223067	mg/kg	0.1	<0.1	0%	NA	NA
	LB223176	mg/kg	0.1	<0.1	0%	NA	NA
Beta Endosulfan	LB223067	mg/kg	0.2	<0.2	0%	NA	NA
	LB223176	mg/kg	0.2	<0.2	0%	NA	NA
p,p'-DDD	LB223067	mg/kg	0.1	<0.1	0%	NA	NA
	LB223176	mg/kg	0.1	<0.1	0%	NA	NA
p,p'-DDT	LB223067	mg/kg	0.1	<0.1	0%	89%	73%
	LB223176	mg/kg	0.1	<0.1	0%	66%	80%
Endosulfan sulphate	LB223067	mg/kg	0.1	<0.1	0%	NA	NA
	LB223176	mg/kg	0.1	<0.1	0%	NA	NA
Endrin Aldehyde	LB223067	mg/kg	0.1	<0.1	0%	NA	NA
	LB223176	mg/kg	0.1	<0.1	0%	NA	NA
Methoxychlor	LB223067	mg/kg	0.1	<0.1	0%	NA	NA
	LB223176	mg/kg	0.1	<0.1	0%	NA	NA
Endrin Ketone	LB223067	mg/kg	0.1	<0.1	0%	NA	NA
	LB223176	mg/kg	0.1	<0.1	0%	NA	NA
Isodrin	LB223067	mg/kg	0.1	<0.1	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.

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

				MB	DUP %RPD	LCS %Recovery	MS %Recovery
Isodrin	LB223176	mg/kg	0.1	<0.1	0%	NA	NA
Mirex	LB223067	mg/kg	0.1	<0.1	0%	NA	NA
	LB223176	mg/kg	0.1	<0.1	0%	NA	NA
Total CLP OC Pesticides	LB223067	mg/kg	1	<1	0%	NA	NA
	LB223176	mg/kg	1	<1		NA	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Tetrachloro-m-xylene (TCMX) (Surrogate)	LB223067	%	-	116%	4%	106%	106%
	LB223176	%	-	93%	0 - 1%	93%	93%

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	LB223067	mg/kg	0.1	<0.1	0%	105%	106%
	LB223176	mg/kg	0.1	<0.1	0%	126%	123%
2-methylnaphthalene	LB223067	mg/kg	0.1	<0.1	0%	NA	NA
	LB223176	mg/kg	0.1	<0.1	0%	NA	NA
1-methylnaphthalene	LB223067	mg/kg	0.1	<0.1	0%	NA	NA
	LB223176	mg/kg	0.1	<0.1	0%	NA	NA
Acenaphthylene	LB223067	mg/kg	0.1	<0.1	0 - 94%	104%	110%
	LB223176	mg/kg	0.1	<0.1	0%	129%	130%
Acenaphthene	LB223067	mg/kg	0.1	<0.1	0%	109%	114%
	LB223176	mg/kg	0.1	<0.1	0%	137%	131%
Fluorene	LB223067	mg/kg	0.1	<0.1	0%	NA	NA
	LB223176	mg/kg	0.1	<0.1	0%	NA	NA
Phenanthrene	LB223067	mg/kg	0.1	<0.1	0 - 85%	112%	113%
	LB223176	mg/kg	0.1	<0.1	0%	130%	129%
Anthracene	LB223067	mg/kg	0.1	<0.1	0 - 86%	107%	110%
	LB223176	mg/kg	0.1	<0.1	0%	127%	124%
Fluoranthene	LB223067	mg/kg	0.1	<0.1	0 - 68%	115%	114%
	LB223176	mg/kg	0.1	<0.1	0%	133%	133%
Pyrene	LB223067	mg/kg	0.1	<0.1	0 - 75%	114%	118%
	LB223176	mg/kg	0.1	<0.1	0%	136%	132%
Benzo(a)anthracene	LB223067	mg/kg	0.1	<0.1	0 - 75%	NA	NA
	LB223176	mg/kg	0.1	<0.1	0%	NA	NA
Chrysene	LB223067	mg/kg	0.1	<0.1	0 - 83%	NA	NA
	LB223176	mg/kg	0.1	<0.1	0%	NA	NA
Benzo(b&j)fluoranthene	LB223067	mg/kg	0.1	<0.1	0 - 69%	NA	NA
	LB223176	mg/kg	0.1	<0.1	0%	NA	NA
Benzo(k)fluoranthene	LB223067	mg/kg	0.1	<0.1	0 - 66%	NA	NA
	LB223176	mg/kg	0.1	<0.1	0%	NA	NA
Benzo(a)pyrene	LB223067	mg/kg	0.1	<0.1	0 - 89%	114%	123%
	LB223176	mg/kg	0.1	<0.1	0%	138%	122%
Indeno(1,2,3-cd)pyrene	LB223067	mg/kg	0.1	<0.1	0 - 69%	NA	NA
	LB223176	mg/kg	0.1	<0.1	0%	NA	NA
Dibenzo(ah)anthracene	LB223067	mg/kg	0.1	<0.1	0%	NA	NA
	LB223176	mg/kg	0.1	<0.1	0%	NA	NA
Benzo(ghi)perylene	LB223067	mg/kg	0.1	<0.1	0 - 84%	NA	NA
	LB223176	mg/kg	0.1	<0.1	0%	NA	NA
Carcinogenic PAHs, BaP TEQ <LOR=0	LB223067	TEQ (mg/kg)	0.2	<0.2	0 - 85%	NA	NA
	LB223176	TEQ (mg/kg)	0.2	<0.2	0%	NA	NA
Carcinogenic PAHs, BaP TEQ <LOR=LOR	LB223067	TEQ (mg/kg)	0.3	<0.3	0 - 74%	NA	NA
	LB223176	TEQ (mg/kg)	0.3	<0.3	0%	NA	NA
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	LB223067	TEQ (mg/kg)	0.2	<0.2	0 - 79%	NA	NA
	LB223176	TEQ (mg/kg)	0.2	<0.2	0%	NA	NA
Total PAH (18)	LB223067	mg/kg	0.8	<0.8	0 - 77%	NA	NA
	LB223176	mg/kg	0.8	<0.8	0%	NA	NA
Total PAH (NEPM/WHO 16)	LB223067	mg/kg	0.8	<0.8			
	LB223176	mg/kg	0.8	<0.8			

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
d5-nitrobenzene (Surrogate)	LB223067	%	-	90%	1 - 5%	88%	90%
	LB223176	%	-	99%	1%	99%	95%
2-fluorobiphenyl (Surrogate)	LB223067	%	-	92%	0 - 2%	90%	96%
	LB223176	%	-	108%	30%	100%	105%
d14-p-terphenyl (Surrogate)	LB223067	%	-	90%	4%	92%	90%
	LB223176	%	-	108%	10%	92%	101%

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.

Speciated Phenols in Soil **Method: ME-(AU)-[ENV]AN420**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Phenol	LB223067	mg/kg	0.5	<0.5	0%	80%	79%
	LB223176	mg/kg	0.5	<0.5	0%	84%	160%
2-methyl phenol (o-cresol)	LB223067	mg/kg	0.5	<0.5	0%	NA	NA
	LB223176	mg/kg	0.5	<0.5	0%	NA	NA
3/4-methyl phenol (m/p-cresol)	LB223067	mg/kg	1	<1	0%	NA	NA
	LB223176	mg/kg	1	<1	0%	NA	NA
Total Cresol	LB223067	mg/kg	1.5	<1.5	0%	NA	NA
	LB223176	mg/kg	1.5	<1.5	0%	NA	NA
2-chlorophenol	LB223067	mg/kg	0.5	<0.5	0%	NA	NA
	LB223176	mg/kg	0.5	<0.5	0%	NA	NA
2,4-dimethylphenol	LB223067	mg/kg	0.5	<0.5	0%	NA	NA
	LB223176	mg/kg	0.5	<0.5	0%	NA	NA
2,6-dichlorophenol	LB223067	mg/kg	0.5	<0.5	0%	NA	NA
	LB223176	mg/kg	0.5	<0.5	0%	NA	NA
2,4-dichlorophenol	LB223067	mg/kg	0.5	<0.5	0%	113%	111%
	LB223176	mg/kg	0.5	<0.5	0%	80%	115%
2,4,6-trichlorophenol	LB223067	mg/kg	0.5	<0.5	0%	89%	85%
	LB223176	mg/kg	0.5	<0.5	0%	80%	80%
2-nitrophenol	LB223067	mg/kg	0.5	<0.5	0%	NA	NA
	LB223176	mg/kg	0.5	<0.5	0%	NA	NA
4-nitrophenol	LB223067	mg/kg	1	<1	0%	NA	NA
	LB223176	mg/kg	1	<1	0%	NA	NA
2,4,5-trichlorophenol	LB223067	mg/kg	0.5	<0.5	0%	NA	NA
	LB223176	mg/kg	0.5	<0.5	0%	NA	NA
2,3,4,6/2,3,5,6-tetrachlorophenol	LB223067	mg/kg	1	<1	0%	NA	NA
	LB223176	mg/kg	1	<1	0%	NA	NA
Pentachlorophenol	LB223067	mg/kg	0.5	<0.5	0%	104%	104%
	LB223176	mg/kg	0.5	<0.5	0%	102%	118%
2,4-dinitrophenol	LB223067	mg/kg	2	<2	0%	NA	NA
	LB223176	mg/kg	2	<2	0%	NA	NA
4-chloro-3-methylphenol	LB223067	mg/kg	2	<2	0%	NA	NA
	LB223176	mg/kg	2	<2	0%	NA	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
2,4,6-Tribromophenol (Surrogate)	LB223067	%	-	94%	3 - 13%	91%	89%
	LB223176	%	-	85%	15%	80%	85%
d5-phenol (Surrogate)	LB223067	%	-	99%	2 - 4%	97%	97%
	LB223176	%	-	95%	7%	87%	96%

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 Cyanide in soil by Discrete Analyser (Aquakem) Method: ME-(AU)-[ENV]AN077/AN287

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Total Cyanide	LB223335	mg/kg	0.5	<0.5	0%	112%	
	LB223437	mg/kg	0.5	<0.5	0%	96%	104%

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	LB223067	mg/kg	20	<20	0%	105%	105%
	LB223176	mg/kg	20	<20	0%	120%	100%
TRH C15-C28	LB223067	mg/kg	45	<45	0 - 6%	115%	115%
	LB223176	mg/kg	45	<45	0%	113%	90%
TRH C29-C36	LB223067	mg/kg	45	<45	0 - 28%	83%	123%
	LB223176	mg/kg	45	<45	0%	75%	83%
TRH C37-C40	LB223067	mg/kg	100	<100	0%	NA	NA
	LB223176	mg/kg	100	<100	0%	NA	NA
TRH C10-C36 Total	LB223067	mg/kg	110	<110	0 - 18%	NA	NA
	LB223176	mg/kg	110	<110	0%	NA	NA
TRH >C10-C40 Total (F bands)	LB223067	mg/kg	210	<210	0%	NA	NA
	LB223176	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	LB223067	mg/kg	25	<25	0%	100%	98%
	LB223176	mg/kg	25	<25	0%	118%	98%
TRH >C10-C16 - Naphthalene (F2)	LB223067	mg/kg	25	<25	0%	NA	NA
	LB223176	mg/kg	25	<25	0%	NA	NA
TRH >C16-C34 (F3)	LB223067	mg/kg	90	<90	0 - 14%	115%	65%
	LB223176	mg/kg	90	<90	0%	98%	88%
TRH >C34-C40 (F4)	LB223067	mg/kg	120	<120	0%	85%	NA
	LB223176	mg/kg	120	<120	0%	70%	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.

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	LB223065	mg/kg	0.1	<0.1	0%	87%	76%
	LB223182	mg/kg	0.1	<0.1	0%	81%	74%
Toluene	LB223065	mg/kg	0.1	<0.1	0%	88%	77%
	LB223182	mg/kg	0.1	<0.1	0%	83%	79%
Ethylbenzene	LB223065	mg/kg	0.1	<0.1	0%	91%	80%
	LB223182	mg/kg	0.1	<0.1	0%	87%	83%
m/p-xylene	LB223065	mg/kg	0.2	<0.2	0%	91%	80%
	LB223182	mg/kg	0.2	<0.2	0%	88%	85%
o-xylene	LB223065	mg/kg	0.1	<0.1	0%	91%	80%
	LB223182	mg/kg	0.1	<0.1	0%	87%	85%

Polycyclic VOCs

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Naphthalene	LB223065	mg/kg	0.1	<0.1	0%	NA	NA
	LB223182	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)	LB223065	%	-	92%	3%	98%	86%
	LB223182	%	-	91%	1 - 12%	92%	89%
d8-toluene (Surrogate)	LB223065	%	-	92%	4%	98%	86%
	LB223182	%	-	91%	2 - 33%	91%	89%
Bromofluorobenzene (Surrogate)	LB223065	%	-	81%	0 - 6%	85%	74%
	LB223182	%	-	80%	2 - 36%	80%	80%

Totals

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Total Xylenes	LB223065	mg/kg	0.3	<0.3	0%	NA	NA
	LB223182	mg/kg	0.3	<0.3	0%	NA	NA
Total BTEX	LB223065	mg/kg	0.6	<0.6	0%	NA	NA
	LB223182	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	LB223065	mg/kg	25	<25	0%	85%	74%
	LB223182	mg/kg	25	<25	0%	82%	73%
TRH C6-C9	LB223065	mg/kg	20	<20	0%	87%	76%
	LB223182	mg/kg	20	<20	0%	84%	75%

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
d4-1,2-dichloroethane (Surrogate)	LB223065	%	-	92%	3%	98%	86%
	LB223182	%	-	91%	1 - 12%	92%	89%
d8-toluene (Surrogate)	LB223065	%	-	92%	4%	98%	86%
	LB223182	%	-	91%	2 - 33%	91%	89%
Bromofluorobenzene (Surrogate)	LB223065	%	-	81%	0 - 6%	85%	74%
	LB223182	%	-	80%	2 - 36%	80%	80%

VPH F Bands

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Benzene (F0)	LB223065	mg/kg	0.1	<0.1	0%	NA	NA
	LB223182	mg/kg	0.1	<0.1	0%	NA	NA
TRH C6-C10 minus BTEX (F1)	LB223065	mg/kg	25	<25	0%	83%	72%
	LB223182	mg/kg	25	<25	0%	80%	69%

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.
AN077	Hydrogen cyanide is liberated from an acidified alkali soil extract by distillation and purging with air. The hydrogen cyanide gas is then collected by passing it through a sodium hydroxide scrubbing solution. The scrubbing solution will then be analysed for cyanide by the appropriate method.
AN287	A buffered distillate or water sample is treated with chloramine/barbituric acid reagents and the intensity of the colour developed is proportional to the cyanide concentration by Aquakem DA .
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
***	Indicates that both * and ** apply.	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.

STATEMENT OF QA/QC PERFORMANCE

SE218814 R0

CLIENT DETAILS		LABORATORY DETAILS	
Contact	Graham Lancaster	Manager	Huong Crawford
Client	ENVIRONMENTAL ANALYSIS LABORATORY	Laboratory	SGS Alexandria Environmental
Address	PO BOX 157 LISMORE NSW 2480	Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	61 2 6620 3678	Telephone	+61 2 8594 0400
Facsimile	(Not specified)	Facsimile	+61 2 8594 0499
Email	Graham.Lancaster@scu.edu.au	Email	au.environmental.sydney@sgs.com
Project	**K5816**	SGS Reference	**SE218814 R0**
Order Number	**K5816**	Date Received	21 Apr 2021
Samples	27	Date Reported	29 Apr 2021

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:

Duplicate	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	16 items
	Volatile Petroleum Hydrocarbons in Soil	2 items
Matrix Spike	Speciated Phenols in Soil	1 item

SAMPLE SUMMARY

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	Client	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	27 Soil
Date documentation received	21/4/2021	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	17°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

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

Moisture Content

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
K5816/1	SE218814.001	LB223207	20 Apr 2021	21 Apr 2021	04 May 2021	23 Apr 2021	28 Apr 2021	26 Apr 2021
K5816/3	SE218814.002	LB223207	20 Apr 2021	21 Apr 2021	04 May 2021	23 Apr 2021	28 Apr 2021	26 Apr 2021
K5816/4	SE218814.003	LB223207	20 Apr 2021	21 Apr 2021	04 May 2021	23 Apr 2021	28 Apr 2021	26 Apr 2021
K5816/6	SE218814.004	LB223207	20 Apr 2021	21 Apr 2021	04 May 2021	23 Apr 2021	28 Apr 2021	26 Apr 2021
K5816/7	SE218814.005	LB223207	20 Apr 2021	21 Apr 2021	04 May 2021	23 Apr 2021	28 Apr 2021	26 Apr 2021
K5816/9	SE218814.006	LB223207	20 Apr 2021	21 Apr 2021	04 May 2021	23 Apr 2021	28 Apr 2021	26 Apr 2021
K5816/10	SE218814.007	LB223207	20 Apr 2021	21 Apr 2021	04 May 2021	23 Apr 2021	28 Apr 2021	26 Apr 2021
K5816/12	SE218814.008	LB223138	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	27 Apr 2021	26 Apr 2021
K5816/13	SE218814.009	LB223138	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	27 Apr 2021	26 Apr 2021
K5816/15	SE218814.010	LB223138	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	27 Apr 2021	26 Apr 2021
K5816/16	SE218814.011	LB223138	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	27 Apr 2021	26 Apr 2021
K5816/18	SE218814.012	LB223138	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	27 Apr 2021	26 Apr 2021
K5816/19	SE218814.013	LB223138	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	27 Apr 2021	26 Apr 2021
K5816/21	SE218814.014	LB223138	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	27 Apr 2021	26 Apr 2021
K5816/22	SE218814.015	LB223138	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	27 Apr 2021	26 Apr 2021
K5816/24	SE218814.016	LB223138	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	27 Apr 2021	26 Apr 2021
K5816/25	SE218814.017	LB223138	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	27 Apr 2021	26 Apr 2021
K5816/27	SE218814.018	LB223138	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	27 Apr 2021	26 Apr 2021
K5816/28	SE218814.019	LB223138	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	27 Apr 2021	26 Apr 2021
K5816/30	SE218814.020	LB223138	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	27 Apr 2021	26 Apr 2021
K5816/31	SE218814.021	LB223138	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	27 Apr 2021	26 Apr 2021
K5816/33	SE218814.022	LB223138	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	27 Apr 2021	26 Apr 2021
K5816/34	SE218814.023	LB223138	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	27 Apr 2021	26 Apr 2021
K5816/36	SE218814.024	LB223138	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	27 Apr 2021	26 Apr 2021
K5816/37	SE218814.025	LB223138	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	27 Apr 2021	26 Apr 2021
K5816/38	SE218814.026	LB223138	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	27 Apr 2021	26 Apr 2021
K5816/39	SE218814.027	LB223138	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	27 Apr 2021	26 Apr 2021

OC Pesticides in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
K5816/1	SE218814.001	LB223176	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	27 Apr 2021
K5816/3	SE218814.002	LB223176	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	27 Apr 2021
K5816/4	SE218814.003	LB223176	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	27 Apr 2021
K5816/6	SE218814.004	LB223176	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	27 Apr 2021
K5816/7	SE218814.005	LB223176	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	27 Apr 2021
K5816/9	SE218814.006	LB223176	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	27 Apr 2021
K5816/10	SE218814.007	LB223176	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	27 Apr 2021
K5816/12	SE218814.008	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/13	SE218814.009	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/15	SE218814.010	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/16	SE218814.011	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/18	SE218814.012	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/19	SE218814.013	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/21	SE218814.014	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/22	SE218814.015	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/24	SE218814.016	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/25	SE218814.017	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/27	SE218814.018	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/28	SE218814.019	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/30	SE218814.020	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/31	SE218814.021	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/33	SE218814.022	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/34	SE218814.023	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/36	SE218814.024	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/37	SE218814.025	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/38	SE218814.026	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/39	SE218814.027	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Name	Sample No.	QC Ref

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

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
K5816/1	SE218814.001	LB223176	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	27 Apr 2021
K5816/3	SE218814.002	LB223176	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	27 Apr 2021
K5816/4	SE218814.003	LB223176	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	27 Apr 2021
K5816/6	SE218814.004	LB223176	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	27 Apr 2021
K5816/7	SE218814.005	LB223176	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	27 Apr 2021
K5816/9	SE218814.006	LB223176	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	27 Apr 2021
K5816/10	SE218814.007	LB223176	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	27 Apr 2021
K5816/12	SE218814.008	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/13	SE218814.009	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/15	SE218814.010	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/16	SE218814.011	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/18	SE218814.012	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/19	SE218814.013	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/21	SE218814.014	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/22	SE218814.015	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/24	SE218814.016	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/25	SE218814.017	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/27	SE218814.018	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/28	SE218814.019	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/30	SE218814.020	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/31	SE218814.021	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/33	SE218814.022	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/34	SE218814.023	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	27 Apr 2021
K5816/36	SE218814.024	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	27 Apr 2021
K5816/37	SE218814.025	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	27 Apr 2021
K5816/38	SE218814.026	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/39	SE218814.027	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	27 Apr 2021

Speciated Phenols in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
K5816/1	SE218814.001	LB223176	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	27 Apr 2021
K5816/3	SE218814.002	LB223176	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	27 Apr 2021
K5816/4	SE218814.003	LB223176	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	27 Apr 2021
K5816/6	SE218814.004	LB223176	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	27 Apr 2021
K5816/7	SE218814.005	LB223176	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	27 Apr 2021
K5816/9	SE218814.006	LB223176	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	27 Apr 2021
K5816/10	SE218814.007	LB223176	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	27 Apr 2021
K5816/12	SE218814.008	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	27 Apr 2021
K5816/13	SE218814.009	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	27 Apr 2021
K5816/15	SE218814.010	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	27 Apr 2021
K5816/16	SE218814.011	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	27 Apr 2021
K5816/18	SE218814.012	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	27 Apr 2021
K5816/19	SE218814.013	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	27 Apr 2021
K5816/21	SE218814.014	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	27 Apr 2021
K5816/22	SE218814.015	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	27 Apr 2021
K5816/24	SE218814.016	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	27 Apr 2021
K5816/25	SE218814.017	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	27 Apr 2021
K5816/27	SE218814.018	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	27 Apr 2021
K5816/28	SE218814.019	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	27 Apr 2021
K5816/30	SE218814.020	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	27 Apr 2021
K5816/31	SE218814.021	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	27 Apr 2021
K5816/33	SE218814.022	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	27 Apr 2021
K5816/34	SE218814.023	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	27 Apr 2021
K5816/36	SE218814.024	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	27 Apr 2021
K5816/37	SE218814.025	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	27 Apr 2021
K5816/38	SE218814.026	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	27 Apr 2021
K5816/39	SE218814.027	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	27 Apr 2021

Total Cyanide in soil by Discrete Analyser (Aquakem)

Method: ME-(AU)-[ENV]AN077/AN287

Sample Name	Sample No.	QC Ref

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

Total Cyanide in soil by Discrete Analyser (Aquakem) (continued)

Method: ME-(AU)-[ENV]AN077/AN287

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
K5816/1	SE218814.001	LB223335	20 Apr 2021	21 Apr 2021	04 May 2021	26 Apr 2021	04 May 2021	26 Apr 2021
K5816/3	SE218814.002	LB223335	20 Apr 2021	21 Apr 2021	04 May 2021	26 Apr 2021	04 May 2021	26 Apr 2021
K5816/4	SE218814.003	LB223335	20 Apr 2021	21 Apr 2021	04 May 2021	26 Apr 2021	04 May 2021	26 Apr 2021
K5816/6	SE218814.004	LB223335	20 Apr 2021	21 Apr 2021	04 May 2021	26 Apr 2021	04 May 2021	26 Apr 2021
K5816/7	SE218814.005	LB223335	20 Apr 2021	21 Apr 2021	04 May 2021	26 Apr 2021	04 May 2021	26 Apr 2021
K5816/9	SE218814.006	LB223335	20 Apr 2021	21 Apr 2021	04 May 2021	26 Apr 2021	04 May 2021	26 Apr 2021
K5816/10	SE218814.007	LB223335	20 Apr 2021	21 Apr 2021	04 May 2021	26 Apr 2021	04 May 2021	26 Apr 2021
K5816/12	SE218814.008	LB223335	20 Apr 2021	21 Apr 2021	04 May 2021	26 Apr 2021	04 May 2021	26 Apr 2021
K5816/13	SE218814.009	LB223335	20 Apr 2021	21 Apr 2021	04 May 2021	26 Apr 2021	04 May 2021	26 Apr 2021
K5816/15	SE218814.010	LB223335	20 Apr 2021	21 Apr 2021	04 May 2021	26 Apr 2021	04 May 2021	26 Apr 2021
K5816/16	SE218814.011	LB223335	20 Apr 2021	21 Apr 2021	04 May 2021	26 Apr 2021	04 May 2021	26 Apr 2021
K5816/18	SE218814.012	LB223335	20 Apr 2021	21 Apr 2021	04 May 2021	26 Apr 2021	04 May 2021	26 Apr 2021
K5816/19	SE218814.013	LB223335	20 Apr 2021	21 Apr 2021	04 May 2021	26 Apr 2021	04 May 2021	26 Apr 2021
K5816/21	SE218814.014	LB223437	20 Apr 2021	21 Apr 2021	04 May 2021	27 Apr 2021	04 May 2021	27 Apr 2021
K5816/22	SE218814.015	LB223437	20 Apr 2021	21 Apr 2021	04 May 2021	27 Apr 2021	04 May 2021	27 Apr 2021
K5816/24	SE218814.016	LB223437	20 Apr 2021	21 Apr 2021	04 May 2021	27 Apr 2021	04 May 2021	27 Apr 2021
K5816/25	SE218814.017	LB223437	20 Apr 2021	21 Apr 2021	04 May 2021	27 Apr 2021	04 May 2021	27 Apr 2021
K5816/27	SE218814.018	LB223437	20 Apr 2021	21 Apr 2021	04 May 2021	27 Apr 2021	04 May 2021	27 Apr 2021
K5816/28	SE218814.019	LB223437	20 Apr 2021	21 Apr 2021	04 May 2021	27 Apr 2021	04 May 2021	27 Apr 2021
K5816/30	SE218814.020	LB223437	20 Apr 2021	21 Apr 2021	04 May 2021	27 Apr 2021	04 May 2021	27 Apr 2021
K5816/31	SE218814.021	LB223437	20 Apr 2021	21 Apr 2021	04 May 2021	27 Apr 2021	04 May 2021	27 Apr 2021
K5816/33	SE218814.022	LB223437	20 Apr 2021	21 Apr 2021	04 May 2021	27 Apr 2021	04 May 2021	27 Apr 2021
K5816/34	SE218814.023	LB223437	20 Apr 2021	21 Apr 2021	04 May 2021	27 Apr 2021	04 May 2021	27 Apr 2021
K5816/36	SE218814.024	LB223437	20 Apr 2021	21 Apr 2021	04 May 2021	27 Apr 2021	04 May 2021	27 Apr 2021
K5816/37	SE218814.025	LB223437	20 Apr 2021	21 Apr 2021	04 May 2021	27 Apr 2021	04 May 2021	27 Apr 2021
K5816/39	SE218814.027	LB223437	20 Apr 2021	21 Apr 2021	04 May 2021	27 Apr 2021	04 May 2021	27 Apr 2021

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
K5816/1	SE218814.001	LB223176	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	28 Apr 2021
K5816/3	SE218814.002	LB223176	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	28 Apr 2021
K5816/4	SE218814.003	LB223176	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	28 Apr 2021
K5816/6	SE218814.004	LB223176	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	28 Apr 2021
K5816/7	SE218814.005	LB223176	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	28 Apr 2021
K5816/9	SE218814.006	LB223176	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	28 Apr 2021
K5816/10	SE218814.007	LB223176	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	28 Apr 2021
K5816/12	SE218814.008	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/13	SE218814.009	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/15	SE218814.010	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/16	SE218814.011	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/18	SE218814.012	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	28 Apr 2021
K5816/19	SE218814.013	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	29 Apr 2021
K5816/21	SE218814.014	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	29 Apr 2021
K5816/22	SE218814.015	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	29 Apr 2021
K5816/24	SE218814.016	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	29 Apr 2021
K5816/25	SE218814.017	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	29 Apr 2021
K5816/27	SE218814.018	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	29 Apr 2021
K5816/28	SE218814.019	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	29 Apr 2021
K5816/30	SE218814.020	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	29 Apr 2021
K5816/31	SE218814.021	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	29 Apr 2021
K5816/33	SE218814.022	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	29 Apr 2021
K5816/34	SE218814.023	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	29 Apr 2021
K5816/36	SE218814.024	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	29 Apr 2021
K5816/37	SE218814.025	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	29 Apr 2021
K5816/38	SE218814.026	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	29 Apr 2021
K5816/39	SE218814.027	LB223067	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	29 Apr 2021

VOC's in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
K5816/1	SE218814.001	LB223182	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	26 Apr 2021
K5816/3	SE218814.002	LB223182	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	26 Apr 2021

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

VOC's in Soil (continued)

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
K5816/4	SE218814.003	LB223182	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	26 Apr 2021
K5816/6	SE218814.004	LB223182	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	26 Apr 2021
K5816/7	SE218814.005	LB223182	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	26 Apr 2021
K5816/9	SE218814.006	LB223182	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	26 Apr 2021
K5816/10	SE218814.007	LB223182	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	26 Apr 2021
K5816/12	SE218814.008	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021
K5816/13	SE218814.009	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021
K5816/15	SE218814.010	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021
K5816/16	SE218814.011	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021
K5816/18	SE218814.012	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021
K5816/19	SE218814.013	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021
K5816/21	SE218814.014	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021
K5816/22	SE218814.015	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021
K5816/24	SE218814.016	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021
K5816/25	SE218814.017	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021
K5816/27	SE218814.018	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021
K5816/28	SE218814.019	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021
K5816/30	SE218814.020	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021
K5816/31	SE218814.021	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021
K5816/33	SE218814.022	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021
K5816/34	SE218814.023	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021
K5816/36	SE218814.024	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021
K5816/37	SE218814.025	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021
K5816/38	SE218814.026	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021
K5816/39	SE218814.027	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021

Volatile Petroleum Hydrocarbons in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
K5816/1	SE218814.001	LB223182	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	26 Apr 2021
K5816/3	SE218814.002	LB223182	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	26 Apr 2021
K5816/4	SE218814.003	LB223182	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	26 Apr 2021
K5816/6	SE218814.004	LB223182	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	26 Apr 2021
K5816/7	SE218814.005	LB223182	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	26 Apr 2021
K5816/9	SE218814.006	LB223182	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	26 Apr 2021
K5816/10	SE218814.007	LB223182	20 Apr 2021	21 Apr 2021	04 May 2021	22 Apr 2021	01 Jun 2021	26 Apr 2021
K5816/12	SE218814.008	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021
K5816/13	SE218814.009	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021
K5816/15	SE218814.010	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021
K5816/16	SE218814.011	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021
K5816/18	SE218814.012	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021
K5816/19	SE218814.013	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021
K5816/21	SE218814.014	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021
K5816/22	SE218814.015	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021
K5816/24	SE218814.016	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021
K5816/25	SE218814.017	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021
K5816/27	SE218814.018	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021
K5816/28	SE218814.019	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021
K5816/30	SE218814.020	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021
K5816/31	SE218814.021	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021
K5816/33	SE218814.022	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021
K5816/34	SE218814.023	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021
K5816/36	SE218814.024	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021
K5816/37	SE218814.025	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021
K5816/38	SE218814.026	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021
K5816/39	SE218814.027	LB223065	20 Apr 2021	21 Apr 2021	04 May 2021	21 Apr 2021	31 May 2021	26 Apr 2021

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)	K5816/1	SE218814.001	%	60 - 130%	100
	K5816/3	SE218814.002	%	60 - 130%	97
	K5816/4	SE218814.003	%	60 - 130%	103
	K5816/6	SE218814.004	%	60 - 130%	99
	K5816/7	SE218814.005	%	60 - 130%	102
	K5816/9	SE218814.006	%	60 - 130%	96
	K5816/10	SE218814.007	%	60 - 130%	102
	K5816/12	SE218814.008	%	60 - 130%	109
	K5816/13	SE218814.009	%	60 - 130%	114
	K5816/15	SE218814.010	%	60 - 130%	116
	K5816/16	SE218814.011	%	60 - 130%	114
	K5816/18	SE218814.012	%	60 - 130%	116
	K5816/19	SE218814.013	%	60 - 130%	115
	K5816/21	SE218814.014	%	60 - 130%	116
	K5816/22	SE218814.015	%	60 - 130%	124
	K5816/24	SE218814.016	%	60 - 130%	122
	K5816/25	SE218814.017	%	60 - 130%	124
	K5816/27	SE218814.018	%	60 - 130%	98
	K5816/28	SE218814.019	%	60 - 130%	119
	K5816/30	SE218814.020	%	60 - 130%	118
	K5816/31	SE218814.021	%	60 - 130%	104
	K5816/33	SE218814.022	%	60 - 130%	102
	K5816/34	SE218814.023	%	60 - 130%	107
	K5816/36	SE218814.024	%	60 - 130%	103
	K5816/37	SE218814.025	%	60 - 130%	109
	K5816/39	SE218814.027	%	60 - 130%	102

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	K5816/1	SE218814.001	%	70 - 130%	80
	K5816/3	SE218814.002	%	70 - 130%	79
	K5816/4	SE218814.003	%	70 - 130%	72
	K5816/6	SE218814.004	%	70 - 130%	117
	K5816/7	SE218814.005	%	70 - 130%	77
	K5816/9	SE218814.006	%	70 - 130%	82
	K5816/10	SE218814.007	%	70 - 130%	87
	K5816/12	SE218814.008	%	70 - 130%	98
	K5816/13	SE218814.009	%	70 - 130%	102
	K5816/15	SE218814.010	%	70 - 130%	105
	K5816/16	SE218814.011	%	70 - 130%	100
	K5816/18	SE218814.012	%	70 - 130%	97
	K5816/19	SE218814.013	%	70 - 130%	104
	K5816/21	SE218814.014	%	70 - 130%	102
	K5816/22	SE218814.015	%	70 - 130%	102
	K5816/24	SE218814.016	%	70 - 130%	99
	K5816/25	SE218814.017	%	70 - 130%	102
	K5816/27	SE218814.018	%	70 - 130%	100
	K5816/28	SE218814.019	%	70 - 130%	100
	K5816/30	SE218814.020	%	70 - 130%	94
	K5816/31	SE218814.021	%	70 - 130%	98
	K5816/33	SE218814.022	%	70 - 130%	96
	K5816/34	SE218814.023	%	70 - 130%	101
	K5816/36	SE218814.024	%	70 - 130%	99
	K5816/37	SE218814.025	%	70 - 130%	102
	K5816/39	SE218814.027	%	70 - 130%	98
d14-p-terphenyl (Surrogate)	K5816/1	SE218814.001	%	70 - 130%	113
	K5816/3	SE218814.002	%	70 - 130%	115
	K5816/4	SE218814.003	%	70 - 130%	106
	K5816/6	SE218814.004	%	70 - 130%	106
	K5816/7	SE218814.005	%	70 - 130%	109
	K5816/9	SE218814.006	%	70 - 130%	111

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.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
d14-p-terphenyl (Surrogate)	K5816/10	SE218814.007	%	70 - 130%	113
	K5816/12	SE218814.008	%	70 - 130%	99
	K5816/13	SE218814.009	%	70 - 130%	102
	K5816/15	SE218814.010	%	70 - 130%	106
	K5816/16	SE218814.011	%	70 - 130%	100
	K5816/18	SE218814.012	%	70 - 130%	97
	K5816/19	SE218814.013	%	70 - 130%	104
	K5816/21	SE218814.014	%	70 - 130%	99
	K5816/22	SE218814.015	%	70 - 130%	101
	K5816/24	SE218814.016	%	70 - 130%	102
	K5816/25	SE218814.017	%	70 - 130%	99
	K5816/27	SE218814.018	%	70 - 130%	102
	K5816/28	SE218814.019	%	70 - 130%	101
	K5816/30	SE218814.020	%	70 - 130%	99
	K5816/31	SE218814.021	%	70 - 130%	100
	K5816/33	SE218814.022	%	70 - 130%	97
	K5816/34	SE218814.023	%	70 - 130%	102
	K5816/36	SE218814.024	%	70 - 130%	106
	K5816/37	SE218814.025	%	70 - 130%	104
	K5816/39	SE218814.027	%	70 - 130%	100
d5-nitrobenzene (Surrogate)	K5816/1	SE218814.001	%	70 - 130%	127
	K5816/3	SE218814.002	%	70 - 130%	110
	K5816/4	SE218814.003	%	70 - 130%	109
	K5816/6	SE218814.004	%	70 - 130%	124
	K5816/7	SE218814.005	%	70 - 130%	118
	K5816/9	SE218814.006	%	70 - 130%	123
	K5816/10	SE218814.007	%	70 - 130%	125
	K5816/12	SE218814.008	%	70 - 130%	104
	K5816/13	SE218814.009	%	70 - 130%	122
	K5816/15	SE218814.010	%	70 - 130%	121
	K5816/16	SE218814.011	%	70 - 130%	113
	K5816/18	SE218814.012	%	70 - 130%	107
	K5816/19	SE218814.013	%	70 - 130%	114
	K5816/21	SE218814.014	%	70 - 130%	115
	K5816/22	SE218814.015	%	70 - 130%	115
	K5816/24	SE218814.016	%	70 - 130%	115
	K5816/25	SE218814.017	%	70 - 130%	117
	K5816/27	SE218814.018	%	70 - 130%	119
	K5816/28	SE218814.019	%	70 - 130%	119
	K5816/30	SE218814.020	%	70 - 130%	110
	K5816/31	SE218814.021	%	70 - 130%	116
	K5816/33	SE218814.022	%	70 - 130%	115
	K5816/34	SE218814.023	%	70 - 130%	109
	K5816/36	SE218814.024	%	70 - 130%	119
	K5816/37	SE218814.025	%	70 - 130%	121
	K5816/39	SE218814.027	%	70 - 130%	114

Speciated Phenols in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2,4,6-Tribromophenol (Surrogate)	K5816/1	SE218814.001	%	70 - 130%	83
	K5816/3	SE218814.002	%	70 - 130%	83
	K5816/4	SE218814.003	%	70 - 130%	78
	K5816/6	SE218814.004	%	70 - 130%	84
	K5816/7	SE218814.005	%	70 - 130%	88
	K5816/9	SE218814.006	%	70 - 130%	81
	K5816/10	SE218814.007	%	70 - 130%	75
	K5816/12	SE218814.008	%	70 - 130%	90
	K5816/13	SE218814.009	%	70 - 130%	81
	K5816/15	SE218814.010	%	70 - 130%	90
	K5816/16	SE218814.011	%	70 - 130%	91
	K5816/18	SE218814.012	%	70 - 130%	91

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.

Speciated Phenols in Soil (continued)

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2,4,6-Tribromophenol (Surrogate)	K5816/19	SE218814.013	%	70 - 130%	92
	K5816/21	SE218814.014	%	70 - 130%	93
	K5816/22	SE218814.015	%	70 - 130%	94
	K5816/24	SE218814.016	%	70 - 130%	95
	K5816/25	SE218814.017	%	70 - 130%	91
	K5816/27	SE218814.018	%	70 - 130%	75
	K5816/28	SE218814.019	%	70 - 130%	118
	K5816/30	SE218814.020	%	70 - 130%	92
	K5816/31	SE218814.021	%	70 - 130%	93
	K5816/33	SE218814.022	%	70 - 130%	86
	K5816/34	SE218814.023	%	70 - 130%	92
	K5816/36	SE218814.024	%	70 - 130%	121
	K5816/37	SE218814.025	%	70 - 130%	96
	K5816/39	SE218814.027	%	70 - 130%	94
d5-phenol (Surrogate)	K5816/1	SE218814.001	%	50 - 130%	83
	K5816/3	SE218814.002	%	50 - 130%	93
	K5816/4	SE218814.003	%	50 - 130%	83
	K5816/6	SE218814.004	%	50 - 130%	91
	K5816/7	SE218814.005	%	50 - 130%	83
	K5816/9	SE218814.006	%	50 - 130%	90
	K5816/10	SE218814.007	%	50 - 130%	88
	K5816/12	SE218814.008	%	50 - 130%	97
	K5816/13	SE218814.009	%	50 - 130%	88
	K5816/15	SE218814.010	%	50 - 130%	95
	K5816/16	SE218814.011	%	50 - 130%	92
	K5816/18	SE218814.012	%	50 - 130%	90
	K5816/19	SE218814.013	%	50 - 130%	88
	K5816/21	SE218814.014	%	50 - 130%	91
	K5816/22	SE218814.015	%	50 - 130%	91
	K5816/24	SE218814.016	%	50 - 130%	93
	K5816/25	SE218814.017	%	50 - 130%	82
	K5816/27	SE218814.018	%	50 - 130%	92
	K5816/28	SE218814.019	%	50 - 130%	92
	K5816/30	SE218814.020	%	50 - 130%	95
	K5816/31	SE218814.021	%	50 - 130%	92
	K5816/33	SE218814.022	%	50 - 130%	94
	K5816/34	SE218814.023	%	50 - 130%	90
	K5816/36	SE218814.024	%	50 - 130%	92
	K5816/37	SE218814.025	%	50 - 130%	113
	K5816/39	SE218814.027	%	50 - 130%	91

VOC's in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	K5816/1	SE218814.001	%	60 - 130%	71
	K5816/3	SE218814.002	%	60 - 130%	74
	K5816/4	SE218814.003	%	60 - 130%	74
	K5816/6	SE218814.004	%	60 - 130%	74
	K5816/7	SE218814.005	%	60 - 130%	71
	K5816/9	SE218814.006	%	60 - 130%	73
	K5816/10	SE218814.007	%	60 - 130%	103
	K5816/12	SE218814.008	%	60 - 130%	75
	K5816/13	SE218814.009	%	60 - 130%	70
	K5816/15	SE218814.010	%	60 - 130%	74
	K5816/16	SE218814.011	%	60 - 130%	83
	K5816/18	SE218814.012	%	60 - 130%	71
	K5816/19	SE218814.013	%	60 - 130%	74
	K5816/21	SE218814.014	%	60 - 130%	74
	K5816/22	SE218814.015	%	60 - 130%	74
	K5816/24	SE218814.016	%	60 - 130%	68
	K5816/25	SE218814.017	%	60 - 130%	76
	K5816/27	SE218814.018	%	60 - 130%	72

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.

VOC's in Soil (continued)

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	K5816/28	SE218814.019	%	60 - 130%	72
	K5816/30	SE218814.020	%	60 - 130%	70
	K5816/31	SE218814.021	%	60 - 130%	78
	K5816/33	SE218814.022	%	60 - 130%	63
	K5816/34	SE218814.023	%	60 - 130%	69
	K5816/36	SE218814.024	%	60 - 130%	70
	K5816/37	SE218814.025	%	60 - 130%	74
	K5816/38	SE218814.026	%	60 - 130%	81
	K5816/39	SE218814.027	%	60 - 130%	72
d4-1,2-dichloroethane (Surrogate)	K5816/1	SE218814.001	%	60 - 130%	78
	K5816/3	SE218814.002	%	60 - 130%	83
	K5816/4	SE218814.003	%	60 - 130%	82
	K5816/6	SE218814.004	%	60 - 130%	85
	K5816/7	SE218814.005	%	60 - 130%	79
	K5816/9	SE218814.006	%	60 - 130%	82
	K5816/10	SE218814.007	%	60 - 130%	92
	K5816/12	SE218814.008	%	60 - 130%	88
	K5816/13	SE218814.009	%	60 - 130%	83
	K5816/15	SE218814.010	%	60 - 130%	87
	K5816/16	SE218814.011	%	60 - 130%	88
	K5816/18	SE218814.012	%	60 - 130%	84
	K5816/19	SE218814.013	%	60 - 130%	87
	K5816/21	SE218814.014	%	60 - 130%	85
	K5816/22	SE218814.015	%	60 - 130%	87
	K5816/24	SE218814.016	%	60 - 130%	80
	K5816/25	SE218814.017	%	60 - 130%	87
	K5816/27	SE218814.018	%	60 - 130%	84
	K5816/28	SE218814.019	%	60 - 130%	86
	K5816/30	SE218814.020	%	60 - 130%	84
	K5816/31	SE218814.021	%	60 - 130%	93
	K5816/33	SE218814.022	%	60 - 130%	76
	K5816/34	SE218814.023	%	60 - 130%	82
	K5816/36	SE218814.024	%	60 - 130%	83
	K5816/37	SE218814.025	%	60 - 130%	87
	K5816/38	SE218814.026	%	60 - 130%	93
	K5816/39	SE218814.027	%	60 - 130%	85
d8-toluene (Surrogate)	K5816/1	SE218814.001	%	60 - 130%	77
	K5816/3	SE218814.002	%	60 - 130%	81
	K5816/4	SE218814.003	%	60 - 130%	81
	K5816/6	SE218814.004	%	60 - 130%	82
	K5816/7	SE218814.005	%	60 - 130%	77
	K5816/9	SE218814.006	%	60 - 130%	80
	K5816/10	SE218814.007	%	60 - 130%	112
	K5816/12	SE218814.008	%	60 - 130%	87
	K5816/13	SE218814.009	%	60 - 130%	83
	K5816/15	SE218814.010	%	60 - 130%	86
	K5816/16	SE218814.011	%	60 - 130%	87
	K5816/18	SE218814.012	%	60 - 130%	83
	K5816/19	SE218814.013	%	60 - 130%	87
	K5816/21	SE218814.014	%	60 - 130%	85
	K5816/22	SE218814.015	%	60 - 130%	87
	K5816/24	SE218814.016	%	60 - 130%	80
	K5816/25	SE218814.017	%	60 - 130%	87
	K5816/27	SE218814.018	%	60 - 130%	84
	K5816/28	SE218814.019	%	60 - 130%	85
	K5816/30	SE218814.020	%	60 - 130%	84
	K5816/31	SE218814.021	%	60 - 130%	93
	K5816/33	SE218814.022	%	60 - 130%	75
	K5816/34	SE218814.023	%	60 - 130%	81
	K5816/36	SE218814.024	%	60 - 130%	81
	K5816/37	SE218814.025	%	60 - 130%	86

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.

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
d8-toluene (Surrogate)	K5816/38	SE218814.026	%	60 - 130%	92
	K5816/39	SE218814.027	%	60 - 130%	83

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	K5816/1	SE218814.001	%	60 - 130%	71
	K5816/3	SE218814.002	%	60 - 130%	74
	K5816/4	SE218814.003	%	60 - 130%	74
	K5816/6	SE218814.004	%	60 - 130%	74
	K5816/7	SE218814.005	%	60 - 130%	71
	K5816/9	SE218814.006	%	60 - 130%	73
	K5816/10	SE218814.007	%	60 - 130%	103
	K5816/12	SE218814.008	%	60 - 130%	75
	K5816/13	SE218814.009	%	60 - 130%	70
	K5816/15	SE218814.010	%	60 - 130%	74
	K5816/16	SE218814.011	%	60 - 130%	83
	K5816/18	SE218814.012	%	60 - 130%	71
	K5816/19	SE218814.013	%	60 - 130%	74
	K5816/21	SE218814.014	%	60 - 130%	74
	K5816/22	SE218814.015	%	60 - 130%	74
	K5816/24	SE218814.016	%	60 - 130%	68
	K5816/25	SE218814.017	%	60 - 130%	76
	K5816/27	SE218814.018	%	60 - 130%	72
	K5816/28	SE218814.019	%	60 - 130%	72
	K5816/30	SE218814.020	%	60 - 130%	70
	K5816/31	SE218814.021	%	60 - 130%	78
	K5816/33	SE218814.022	%	60 - 130%	63
	K5816/34	SE218814.023	%	60 - 130%	69
	K5816/36	SE218814.024	%	60 - 130%	70
	K5816/37	SE218814.025	%	60 - 130%	74
	K5816/38	SE218814.026	%	60 - 130%	81
	K5816/39	SE218814.027	%	60 - 130%	72
d4-1,2-dichloroethane (Surrogate)	K5816/1	SE218814.001	%	60 - 130%	78
	K5816/3	SE218814.002	%	60 - 130%	83
	K5816/4	SE218814.003	%	60 - 130%	82
	K5816/6	SE218814.004	%	60 - 130%	85
	K5816/7	SE218814.005	%	60 - 130%	79
	K5816/9	SE218814.006	%	60 - 130%	82
	K5816/10	SE218814.007	%	60 - 130%	92
	K5816/12	SE218814.008	%	60 - 130%	88
	K5816/13	SE218814.009	%	60 - 130%	83
	K5816/15	SE218814.010	%	60 - 130%	87
	K5816/16	SE218814.011	%	60 - 130%	88
	K5816/18	SE218814.012	%	60 - 130%	84
	K5816/19	SE218814.013	%	60 - 130%	87
	K5816/21	SE218814.014	%	60 - 130%	85
	K5816/22	SE218814.015	%	60 - 130%	87
	K5816/24	SE218814.016	%	60 - 130%	80
	K5816/25	SE218814.017	%	60 - 130%	87
	K5816/27	SE218814.018	%	60 - 130%	84
	K5816/28	SE218814.019	%	60 - 130%	86
	K5816/30	SE218814.020	%	60 - 130%	84
	K5816/31	SE218814.021	%	60 - 130%	93
	K5816/33	SE218814.022	%	60 - 130%	76
	K5816/34	SE218814.023	%	60 - 130%	82
	K5816/36	SE218814.024	%	60 - 130%	83
	K5816/37	SE218814.025	%	60 - 130%	87
	K5816/38	SE218814.026	%	60 - 130%	93
	K5816/39	SE218814.027	%	60 - 130%	85
d8-toluene (Surrogate)	K5816/1	SE218814.001	%	60 - 130%	77
	K5816/3	SE218814.002	%	60 - 130%	81

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.

Volatile Petroleum Hydrocarbons in Soil (continued)

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
d8-toluene (Surrogate)	K5816/4	SE218814.003	%	60 - 130%	81
	K5816/6	SE218814.004	%	60 - 130%	82
	K5816/7	SE218814.005	%	60 - 130%	77
	K5816/9	SE218814.006	%	60 - 130%	80
	K5816/10	SE218814.007	%	60 - 130%	112
	K5816/12	SE218814.008	%	60 - 130%	87
	K5816/13	SE218814.009	%	60 - 130%	83
	K5816/15	SE218814.010	%	60 - 130%	86
	K5816/16	SE218814.011	%	60 - 130%	87
	K5816/18	SE218814.012	%	60 - 130%	83
	K5816/19	SE218814.013	%	60 - 130%	87
	K5816/21	SE218814.014	%	60 - 130%	85
	K5816/22	SE218814.015	%	60 - 130%	87
	K5816/24	SE218814.016	%	60 - 130%	80
	K5816/25	SE218814.017	%	60 - 130%	87
	K5816/27	SE218814.018	%	60 - 130%	84
	K5816/28	SE218814.019	%	60 - 130%	85
	K5816/30	SE218814.020	%	60 - 130%	84
	K5816/31	SE218814.021	%	60 - 130%	93
	K5816/33	SE218814.022	%	60 - 130%	75
	K5816/34	SE218814.023	%	60 - 130%	81
	K5816/36	SE218814.024	%	60 - 130%	81
	K5816/37	SE218814.025	%	60 - 130%	86
	K5816/38	SE218814.026	%	60 - 130%	92
	K5816/39	SE218814.027	%	60 - 130%	83

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.

OC Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB223067.001		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)	%	-	116
LB223176.001		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)	%	-	93

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB223067.001		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

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.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

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

Sample Number		Parameter	Units	LOR	Result
LB223067.001		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)	%	-	90
		2-fluorobiphenyl (Surrogate)	%	-	92
		d14-p-terphenyl (Surrogate)	%	-	90
LB223176.001		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)	%	-	99
		2-fluorobiphenyl (Surrogate)	%	-	108
		d14-p-terphenyl (Surrogate)	%	-	108

Speciated Phenols in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB223067.001		Phenol	mg/kg	0.5	<0.5
		2-methyl phenol (o-cresol)	mg/kg	0.5	<0.5
		3/4-methyl phenol (m/p-cresol)	mg/kg	1	<1
		2-chlorophenol	mg/kg	0.5	<0.5
		2,4-dimethylphenol	mg/kg	0.5	<0.5
		2,6-dichlorophenol	mg/kg	0.5	<0.5
		2,4-dichlorophenol	mg/kg	0.5	<0.5
		2,4,6-trichlorophenol	mg/kg	0.5	<0.5
		2-nitrophenol	mg/kg	0.5	<0.5
		4-nitrophenol	mg/kg	1	<1
		2,4,5-trichlorophenol	mg/kg	0.5	<0.5
		2,3,4,6/2,3,5,6-tetrachlorophenol	mg/kg	1	<1
		Pentachlorophenol	mg/kg	0.5	<0.5
		2,4-dinitrophenol	mg/kg	2	<2
		4-chloro-3-methylphenol	mg/kg	2	<2
	Surrogates	2,4,6-Tribromophenol (Surrogate)	%	-	94
		d5-phenol (Surrogate)	%	-	99
LB223176.001		Phenol	mg/kg	0.5	<0.5
		2-methyl phenol (o-cresol)	mg/kg	0.5	<0.5
		3/4-methyl phenol (m/p-cresol)	mg/kg	1	<1
		2-chlorophenol	mg/kg	0.5	<0.5
		2,4-dimethylphenol	mg/kg	0.5	<0.5
		2,6-dichlorophenol	mg/kg	0.5	<0.5
		2,4-dichlorophenol	mg/kg	0.5	<0.5
		2,4,6-trichlorophenol	mg/kg	0.5	<0.5
		2-nitrophenol	mg/kg	0.5	<0.5
		4-nitrophenol	mg/kg	1	<1
		2,4,5-trichlorophenol	mg/kg	0.5	<0.5

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.

Speciated Phenols in Soil (continued)

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

Sample Number		Parameter	Units	LOR	Result
LB223176.001		2,3,4,6/2,3,5,6-tetrachlorophenol	mg/kg	1	<1
		Pentachlorophenol	mg/kg	0.5	<0.5
		2,4-dinitrophenol	mg/kg	2	<2
		4-chloro-3-methylphenol	mg/kg	2	<2
	Surrogates	2,4,6-Tribromophenol (Surrogate)	%	-	85
		d5-phenol (Surrogate)	%	-	95

Total Cyanide in soil by Discrete Analyser (Aquakem)

Method: ME-(AU)-[ENV]AN077/AN287

Sample Number	Parameter	Units	LOR	Result
LB223335.001	Total Cyanide	mg/kg	0.5	<0.5
LB223437.001	Total Cyanide	mg/kg	0.5	<0.5

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB223067.001	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
LB223176.001	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

VOC's in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB223065.001	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)	%	-	92
		d8-toluene (Surrogate)	%	-	92
		Bromofluorobenzene (Surrogate)	%	-	81
	Totals	Total BTEX	mg/kg	0.6	<0.6
LB223182.001	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)	%	-	91
		d8-toluene (Surrogate)	%	-	91
		Bromofluorobenzene (Surrogate)	%	-	80
	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
LB223065.001		TRH C6-C9	mg/kg	20	<20
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	92
LB223182.001		TRH C6-C9	mg/kg	20	<20
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	91

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.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

Moisture Content

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218811.001	LB223207.011	% Moisture	%w/w	1	1.8	2.2	80	19
SE218814.017	LB223138.011	% Moisture	%w/w	1	23.8	21.7	34	9
SE218814.027	LB223138.022	% Moisture	%w/w	1	18.7	18.6	35	0
SE218834.003	LB223207.022	% Moisture	%w/w	1	12.9	10.6	39	20
SE218834.013	LB223207.033	% Moisture	%w/w	1	14.8	14.2	37	4

OC Pesticides in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218814.017	LB223067.014		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	192	0
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	170	0
			Lindane	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor	mg/kg	0.1	<0.1	<0.1	187	0
			Aldrin	mg/kg	0.1	<0.1	<0.1	192	0
			Beta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Delta BHC	mg/kg	0.1	<0.1	<0.1	173	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	193	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	178	0
			Endrin	mg/kg	0.2	<0.2	<0.2	186	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	146	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	178	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	164	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.19	0.18	30	4
SE218834.003	LB223176.031		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	168	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

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.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

OC Pesticides in Soil (continued)

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218834.003	LB223176.031		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
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.14	0.14	30	0
SE218834.011	LB223176.025		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
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.14	0.14	30	1

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218814.004	LB223176.029		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	TEQ (mg/kg)	0.2	<0.2	<0.2	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3	134	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (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	-	0.6	0.6	30	1
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.6	0.4	30	30
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.6	30	10
SE218814.017	LB223067.014		Naphthalene	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.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218814.017	LB223067.014		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	0.4	0.1	69	94 ②
			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	0.7	0.3	51	85 ②
			Anthracene	mg/kg	0.1	0.3	0.1	75	86 ②
			Fluoranthene	mg/kg	0.1	1.4	0.7	40	68 ②
			Pyrene	mg/kg	0.1	1.6	0.7	39	75 ②
			Benzo(a)anthracene	mg/kg	0.1	0.5	0.2	56	75 ②
			Chrysene	mg/kg	0.1	0.7	0.3	51	83 ②
			Benzo(b&j)fluoranthene	mg/kg	0.1	0.5	0.2	59	69 ②
			Benzo(k)fluoranthene	mg/kg	0.1	0.5	0.2	58	66 ②
			Benzo(a)pyrene	mg/kg	0.1	0.8	0.3	48	89 ②
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	0.4	0.2	63	69 ②
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	mg/kg	0.1	0.6	0.3	52	84 ②
			Carcinogenic PAHs, BaP TEQ <LOR=0	mg/kg	0.2	1.0	0.4	39	85 ②
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	mg/kg	0.3	1.1	0.5	48	74 ②
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	mg/kg	0.2	1.0	0.4	37	79 ②
			Total PAH (18)	mg/kg	0.8	8.4	3.7	43	77 ②
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.6	0.6	30	5
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	0
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	4
SE218814.027	LB223067.025		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	-	0.6	0.6	30	1
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	2
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	4

Speciated Phenols in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218814.007	LB223176.028		Phenol	mg/kg	0.5	<0.5	<0.5	200	0
			2-methyl phenol (o-cresol)	mg/kg	0.5	<0.5	<0.5	200	0
			3/4-methyl phenol (m/p-cresol)	mg/kg	1	<1	<1	200	0
			Total Cresol	mg/kg	1.5	<1.5	<1.5	200	0
			2-chlorophenol	mg/kg	0.5	<0.5	<0.5	200	0
			2,4-dimethylphenol	mg/kg	0.5	<0.5	<0.5	200	0
			2,6-dichlorophenol	mg/kg	0.5	<0.5	<0.5	200	0
			2,4-dichlorophenol	mg/kg	0.5	<0.5	<0.5	200	0
			2,4,6-trichlorophenol	mg/kg	0.5	<0.5	<0.5	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.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

Speciated Phenols in Soil (continued)

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218814.007	LB223176.028		2-nitrophenol	mg/kg	0.5	<0.5	<0.5	200	0
			4-nitrophenol	mg/kg	1	<1	<1	200	0
			2,4,5-trichlorophenol	mg/kg	0.5	<0.5	<0.5	200	0
			2,3,4,6/2,3,5,6-tetrachlorophenol	mg/kg	1	<1	<1	200	0
			Pentachlorophenol	mg/kg	0.5	<0.5	<0.5	200	0
			2,4-dinitrophenol	mg/kg	2	<2	<2	200	0
			4-chloro-3-methylphenol	mg/kg	2	<2	<2	200	0
		Surrogates	2,4,6-Tribromophenol (Surrogate)	mg/kg	-	3.7	4.4	30	15
			d5-phenol (Surrogate)	mg/kg	-	1.8	1.9	30	7
SE218814.017	LB223067.014		Phenol	mg/kg	0.5	<0.5	<0.5	200	0
			2-methyl phenol (o-cresol)	mg/kg	0.5	<0.5	<0.5	200	0
			3/4-methyl phenol (m/p-cresol)	mg/kg	1	<1	<1	200	0
			Total Cresol	mg/kg	1.5	<1.5	<1.5	200	0
			2-chlorophenol	mg/kg	0.5	<0.5	<0.5	200	0
			2,4-dimethylphenol	mg/kg	0.5	<0.5	<0.5	200	0
			2,6-dichlorophenol	mg/kg	0.5	<0.5	<0.5	200	0
			2,4-dichlorophenol	mg/kg	0.5	<0.5	<0.5	200	0
			2,4,6-trichlorophenol	mg/kg	0.5	<0.5	<0.5	200	0
			2-nitrophenol	mg/kg	0.5	<0.5	<0.5	200	0
			4-nitrophenol	mg/kg	1	<1	<1	200	0
			2,4,5-trichlorophenol	mg/kg	0.5	<0.5	<0.5	200	0
			2,3,4,6/2,3,5,6-tetrachlorophenol	mg/kg	1	<1	<1	200	0
			Pentachlorophenol	mg/kg	0.5	<0.5	<0.5	200	0
			2,4-dinitrophenol	mg/kg	2	<2	<2	200	0
			4-chloro-3-methylphenol	mg/kg	2	<2	<2	200	0
		Surrogates	2,4,6-Tribromophenol (Surrogate)	mg/kg	-	4.6	5.2	30	13
			d5-phenol (Surrogate)	mg/kg	-	1.6	1.7	30	4
SE218814.027	LB223067.025		Phenol	mg/kg	0.5	<0.5	<0.5	200	0
			2-methyl phenol (o-cresol)	mg/kg	0.5	<0.5	<0.5	200	0
			3/4-methyl phenol (m/p-cresol)	mg/kg	1	<1	<1	200	0
			Total Cresol	mg/kg	1.5	<1.5	<1.5	200	0
			2-chlorophenol	mg/kg	0.5	<0.5	<0.5	200	0
			2,4-dimethylphenol	mg/kg	0.5	<0.5	<0.5	200	0
			2,6-dichlorophenol	mg/kg	0.5	<0.5	<0.5	200	0
			2,4-dichlorophenol	mg/kg	0.5	<0.5	<0.5	200	0
			2,4,6-trichlorophenol	mg/kg	0.5	<0.5	<0.5	200	0
			2-nitrophenol	mg/kg	0.5	<0.5	<0.5	200	0
			4-nitrophenol	mg/kg	1	<1	<1	200	0
			2,4,5-trichlorophenol	mg/kg	0.5	<0.5	<0.5	200	0
			2,3,4,6/2,3,5,6-tetrachlorophenol	mg/kg	1	<1	<1	200	0
			Pentachlorophenol	mg/kg	0.5	<0.5	<0.5	200	0
			2,4-dinitrophenol	mg/kg	2	<2	<2	200	0
			4-chloro-3-methylphenol	mg/kg	2	<2	<2	200	0
		Surrogates	2,4,6-Tribromophenol (Surrogate)	mg/kg	-	4.7	4.6	30	3
			d5-phenol (Surrogate)	mg/kg	-	1.8	1.8	30	2

Total Cyanide in soil by Discrete Analyser (Aquakem)

Method: ME-(AU)-[ENV]AN077/AN287

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218814.001	LB223335.004		Total Cyanide	mg/kg	0.5	<0.5	<0.5	200	0
SE218814.014	LB223437.004		Total Cyanide	mg/kg	0.5	<0.5	<0.5	200	0

TRH (Total Recoverable Hydrocarbons) in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218814.004	LB223176.027		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

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.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

TRH (Total Recoverable Hydrocarbons) in Soil (continued)

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218814.004	LB223176.027	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
SE218814.007	LB223176.033		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
			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
SE218814.017	LB223067.014		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	64	68	98	6
			TRH C29-C36	mg/kg	45	75	99	82	28
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	140	170	102	18
			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
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	200	0
			TRH >C16-C34 (F3)	mg/kg	90	110	130	105	14
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0
SE218814.027	LB223067.025		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
			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 %
SE218814.005	LB223182.014	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	-	7.9	7.8	50	1
			d8-toluene (Surrogate)	mg/kg	-	7.7	7.6	50	2
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.1	6.9	50	2
		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
SE218814.007	LB223182.017	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	-	9.2	8.1	50	12
			d8-toluene (Surrogate)	mg/kg	-	11.2	8.0	50	33
			Bromofluorobenzene (Surrogate)	mg/kg	-	10.3	7.2	50	36
		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
SE218814.017	LB223065.014	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

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.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

VOC's in Soil (continued)

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218814.017	LB223065.014	Monocyclic Aromatic	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	-	8.7	8.4	50	3
			d8-toluene (Surrogate)	mg/kg	-	8.7	8.4	50	4
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.6	7.1	50	6
		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
SE218814.027	LB223065.025	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	-	8.5	8.8	50	3
			d8-toluene (Surrogate)	mg/kg	-	8.3	8.6	50	4
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.2	7.2	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

Volatile Petroleum Hydrocarbons in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218814.005	LB223182.014		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	-	7.9	7.8	30	1
			d8-toluene (Surrogate)	mg/kg	-	7.7	7.6	30	2
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.1	6.9	30	2
		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
SE218814.007	LB223182.017		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	-	9.2	8.1	30	12
			d8-toluene (Surrogate)	mg/kg	-	11.2	8.0	30	33 ②
			Bromofluorobenzene (Surrogate)	mg/kg	-	10.3	7.2	30	36 ②
		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
SE218814.017	LB223065.014		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	-	8.7	8.4	30	3
			d8-toluene (Surrogate)	mg/kg	-	8.7	8.4	30	4
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.6	7.1	30	6
		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
SE218814.027	LB223065.025		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	-	8.5	8.8	30	3
			d8-toluene (Surrogate)	mg/kg	-	8.3	8.6	30	4
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.2	7.2	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

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.

OC Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB223067.002		Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	118
		Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	116
		Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	123
		Dieldrin	mg/kg	0.2	0.2	0.2	60 - 140	116
		Endrin	mg/kg	0.2	0.2	0.2	60 - 140	125
		p,p'-DDT	mg/kg	0.1	0.2	0.2	60 - 140	89
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.16	0.15	40 - 130	106
LB223176.002		Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	80
		Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	83
		Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	77
		Dieldrin	mg/kg	0.2	<0.2	0.2	60 - 140	82
		Endrin	mg/kg	0.2	<0.2	0.2	60 - 140	91
		p,p'-DDT	mg/kg	0.1	0.1	0.2	60 - 140	66
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.14	0.15	40 - 130	93

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB223067.002		Naphthalene	mg/kg	0.1	4.2	4	60 - 140	105
		Acenaphthylene	mg/kg	0.1	4.2	4	60 - 140	104
		Acenaphthene	mg/kg	0.1	4.4	4	60 - 140	109
		Phenanthrene	mg/kg	0.1	4.5	4	60 - 140	112
		Anthracene	mg/kg	0.1	4.3	4	60 - 140	107
		Fluoranthene	mg/kg	0.1	4.6	4	60 - 140	115
		Pyrene	mg/kg	0.1	4.6	4	60 - 140	114
		Benzo(a)pyrene	mg/kg	0.1	4.5	4	60 - 140	114
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	88
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	90
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	92
LB223176.002		Naphthalene	mg/kg	0.1	5.0	4	60 - 140	126
		Acenaphthylene	mg/kg	0.1	5.2	4	60 - 140	129
		Acenaphthene	mg/kg	0.1	5.5	4	60 - 140	137
		Phenanthrene	mg/kg	0.1	5.2	4	60 - 140	130
		Anthracene	mg/kg	0.1	5.1	4	60 - 140	127
		Fluoranthene	mg/kg	0.1	5.3	4	60 - 140	133
		Pyrene	mg/kg	0.1	5.4	4	60 - 140	136
		Benzo(a)pyrene	mg/kg	0.1	5.5	4	60 - 140	138
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	99
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	100
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	92

Speciated Phenols in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB223067.002		Phenol	mg/kg	0.5	0.8	1	70 - 130	80
		2,4-dichlorophenol	mg/kg	0.5	1.1	1	70 - 130	113
		2,4,6-trichlorophenol	mg/kg	0.5	0.9	1	70 - 130	89
		Pentachlorophenol	mg/kg	0.5	1.0	1	70 - 130	104
	Surrogates	2,4,6-Tribromophenol (Surrogate)	mg/kg	-	4.6	5	40 - 130	91
		d5-phenol (Surrogate)	mg/kg	-	1.9	2	40 - 130	97
LB223176.002		Phenol	mg/kg	0.5	0.8	1	70 - 130	84
		2,4-dichlorophenol	mg/kg	0.5	0.8	1	70 - 130	80
		2,4,6-trichlorophenol	mg/kg	0.5	0.8	1	70 - 130	80
		Pentachlorophenol	mg/kg	0.5	1.0	1	70 - 130	102
	Surrogates	2,4,6-Tribromophenol (Surrogate)	mg/kg	-	4.0	5	40 - 130	80
		d5-phenol (Surrogate)	mg/kg	-	1.7	2	40 - 130	87

Total Cyanide in soil by Discrete Analyser (Aquakem)

Method: ME-(AU)-[ENV]AN077/AN287

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB223335.002	Total Cyanide	mg/kg	0.5	<0.5	0.25	70 - 130	112
LB223437.002	Total Cyanide	mg/kg	0.5	<0.5	0.25	70 - 130	96

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 %
LB223067.002		TRH C10-C14	mg/kg	20	42	40	60 - 140	105
		TRH C15-C28	mg/kg	45	46	40	60 - 140	115
		TRH C29-C36	mg/kg	45	<45	40	60 - 140	83
	TRH F Bands	TRH >C10-C16	mg/kg	25	40	40	60 - 140	100
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	115
		TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	85
LB223176.002		TRH C10-C14	mg/kg	20	48	40	60 - 140	120
		TRH C15-C28	mg/kg	45	45	40	60 - 140	113
		TRH C29-C36	mg/kg	45	<45	40	60 - 140	75
	TRH F Bands	TRH >C10-C16	mg/kg	25	47	40	60 - 140	118
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	98
		TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	70

VOC's in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB223065.002	Monocyclic Aromatic	Benzene	mg/kg	0.1	4.4	5	60 - 140	87
		Toluene	mg/kg	0.1	4.4	5	60 - 140	88
		Ethylbenzene	mg/kg	0.1	4.5	5	60 - 140	91
		m/p-xylene	mg/kg	0.2	9.1	10	60 - 140	91
		o-xylene	mg/kg	0.1	4.5	5	60 - 140	91
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.8	10	70 - 130	98
		d8-toluene (Surrogate)	mg/kg	-	9.8	10	70 - 130	98
		Bromofluorobenzene (Surrogate)	mg/kg	-	8.5	10	70 - 130	85
LB223182.002	Monocyclic Aromatic	Benzene	mg/kg	0.1	4.0	5	60 - 140	81
		Toluene	mg/kg	0.1	4.2	5	60 - 140	83
		Ethylbenzene	mg/kg	0.1	4.3	5	60 - 140	87
		m/p-xylene	mg/kg	0.2	8.8	10	60 - 140	88
		o-xylene	mg/kg	0.1	4.4	5	60 - 140	87
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.2	10	70 - 130	92
		d8-toluene (Surrogate)	mg/kg	-	9.1	10	70 - 130	91
		Bromofluorobenzene (Surrogate)	mg/kg	-	8.0	10	70 - 130	80

Volatile Petroleum Hydrocarbons in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB223065.002		TRH C6-C10	mg/kg	25	79	92.5	60 - 140	85
		TRH C6-C9	mg/kg	20	70	80	60 - 140	87
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.8	10	70 - 130	98
		Bromofluorobenzene (Surrogate)	mg/kg	-	8.5	10	70 - 130	85
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	52	62.5	60 - 140	83
LB223182.002		TRH C6-C10	mg/kg	25	76	92.5	60 - 140	82
		TRH C6-C9	mg/kg	20	67	80	60 - 140	84
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.2	10	70 - 130	92
		Bromofluorobenzene (Surrogate)	mg/kg	-	8.0	10	70 - 130	80
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	50	62.5	60 - 140	80

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.

OC Pesticides in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE218775.001	LB223176.030		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	91
			Aldrin	mg/kg	0.1	0.2	<0.1	0.2	92
			Beta BHC	mg/kg	0.1	<0.1	<0.1	-	-
			Delta BHC	mg/kg	0.1	0.2	<0.1	0.2	85
			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	91
			Endrin	mg/kg	0.2	0.2	<0.2	0.2	97
			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	80
			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	-	0.14	0.15	-	93
SE218814.008	LB223067.004		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	0.3	<0.1	0.2	121
			Aldrin	mg/kg	0.1	0.3	<0.1	0.2	119
			Beta BHC	mg/kg	0.1	<0.1	<0.1	-	-
			Delta BHC	mg/kg	0.1	0.3	<0.1	0.2	125
			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	0.3	<0.2	0.2	119
			Endrin	mg/kg	0.2	0.3	<0.2	0.2	130
			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	0.2	<0.1	-	-
			p,p'-DDT	mg/kg	0.1	0.2	<0.1	0.2	73
			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	3	<1	-	-
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.16	0.16	-	106

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR

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%
SE218775.001	LB223176.034		Naphthalene	mg/kg	0.1	4.9	<0.1	4	123
			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	5.2	<0.1	4	130
			Acenaphthene	mg/kg	0.1	5.3	<0.1	4	131
			Fluorene	mg/kg	0.1	<0.1	<0.1	-	-
			Phenanthrene	mg/kg	0.1	5.2	<0.1	4	129
			Anthracene	mg/kg	0.1	5.0	<0.1	4	124
			Fluoranthene	mg/kg	0.1	5.4	<0.1	4	133
			Pyrene	mg/kg	0.1	5.3	<0.1	4	132
			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	4.9	<0.1	4	122
			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	4.9	<0.2	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	5.0	<0.3	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	5.0	<0.2	-	-
			Total PAH (18)	mg/kg	0.8	41	<0.8	-	-
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	-	95
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	-	105
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	-	101
SE218814.008	LB223067.004		Naphthalene	mg/kg	0.1	4.3	<0.1	4	106
			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	4.4	<0.1	4	110
			Acenaphthene	mg/kg	0.1	4.6	<0.1	4	114
			Fluorene	mg/kg	0.1	<0.1	<0.1	-	-
			Phenanthrene	mg/kg	0.1	4.5	<0.1	4	113
			Anthracene	mg/kg	0.1	4.4	<0.1	4	110
			Fluoranthene	mg/kg	0.1	4.6	<0.1	4	114
			Pyrene	mg/kg	0.1	4.7	<0.1	4	118
			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	4.9	<0.1	4	123
			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	4.9	<0.2	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	5.1	<0.3	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	5.0	<0.2	-	-
			Total PAH (18)	mg/kg	0.8	36	<0.8	-	-
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	-	90
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	-	96
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	-	90

Speciated Phenols in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE218811.001	LB223176.027	Phenol	mg/kg	0.5	24	22	1	160 ⑤
		2-methyl phenol (o-cresol)	mg/kg	0.5	3.8	4.4	-	-
		3/4-methyl phenol (m/p-cresol)	mg/kg	1	<1	<1	-	-
		Total Cresol	mg/kg	1.5	4.5	5.2	-	-
		2-chlorophenol	mg/kg	0.5	<0.5	<0.5	-	-
		2,4-dimethylphenol	mg/kg	0.5	<0.5	0.9	-	-
		2,6-dichlorophenol	mg/kg	0.5	<0.5	<0.5	-	-
		2,4-dichlorophenol	mg/kg	0.5	1.2	<0.5	1	115

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.

Speciated Phenols in Soil (continued)

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE218811.001	LB223176.027		2,4,6-trichlorophenol	mg/kg	0.5	0.8	<0.5	1	80
			2-nitrophenol	mg/kg	0.5	<0.5	<0.5	-	-
			4-nitrophenol	mg/kg	1	<1	<1	-	-
			2,4,5-trichlorophenol	mg/kg	0.5	0.6	<0.5	-	-
			2,3,4,6/2,3,5,6-tetrachlorophenol	mg/kg	1	<1	<1	-	-
			Pentachlorophenol	mg/kg	0.5	1.2	<0.5	1	118
			2,4-dinitrophenol	mg/kg	2	<2	<2	-	-
			4-chloro-3-methylphenol	mg/kg	2	<2	<1	-	-
		Surrogates	2,4,6-Tribromophenol (Surrogate)	mg/kg	-	4.2	4.2	-	85
			d5-phenol (Surrogate)	mg/kg	-	1.9	2.1	-	96
SE218814.008	LB223067.004		Phenol	mg/kg	0.5	0.8	<0.5	1	79
			2-methyl phenol (o-cresol)	mg/kg	0.5	<0.5	<0.5	-	-
			3/4-methyl phenol (m/p-cresol)	mg/kg	1	<1	<1	-	-
			Total Cresol	mg/kg	1.5	<1.5	<1.5	-	-
			2-chlorophenol	mg/kg	0.5	<0.5	<0.5	-	-
			2,4-dimethylphenol	mg/kg	0.5	<0.5	<0.5	-	-
			2,6-dichlorophenol	mg/kg	0.5	<0.5	<0.5	-	-
			2,4-dichlorophenol	mg/kg	0.5	1.1	<0.5	1	111
			2,4,6-trichlorophenol	mg/kg	0.5	0.9	<0.5	1	85
			2-nitrophenol	mg/kg	0.5	<0.5	<0.5	-	-
			4-nitrophenol	mg/kg	1	<1	<1	-	-
			2,4,5-trichlorophenol	mg/kg	0.5	0.6	<0.5	-	-
			2,3,4,6/2,3,5,6-tetrachlorophenol	mg/kg	1	<1	<1	-	-
			Pentachlorophenol	mg/kg	0.5	1.0	<0.5	1	104
			2,4-dinitrophenol	mg/kg	2	<2	<2	-	-
			4-chloro-3-methylphenol	mg/kg	2	<2	<2	-	-
		Surrogates	2,4,6-Tribromophenol (Surrogate)	mg/kg	-	4.4	4.5	-	89
			d5-phenol (Surrogate)	mg/kg	-	1.9	1.9	-	97

Total Cyanide in soil by Discrete Analyser (Aquakem)

Method: ME-(AU)-[ENV]AN077/AN287

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE218814.027	LB223437.018	Total Cyanide	mg/kg	0.5	<0.5	<0.5	0.25	104

TRH (Total Recoverable Hydrocarbons) in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE218775.001	LB223176.032		TRH C10-C14	mg/kg	20	40	<20	40	100
			TRH C15-C28	mg/kg	45	<45	<45	40	90
			TRH C29-C36	mg/kg	45	<45	<45	40	83
			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	39	<25	40	98
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	34	<25	-	-
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	40	88
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	-	-
SE218814.008	LB223067.004		TRH C10-C14	mg/kg	20	42	<20	40	105
			TRH C15-C28	mg/kg	45	46	<45	40	115
			TRH C29-C36	mg/kg	45	49	<45	40	123
			TRH C37-C40	mg/kg	100	<100	<100	-	-
			TRH C10-C36 Total	mg/kg	110	140	<110	-	-
			TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	-	-
		TRH F Bands	TRH >C10-C16	mg/kg	25	39	<25	40	98
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	34	<25	-	-
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	40	65
			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

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.

VOC's in Soil (continued)

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE218775.001	LB223182.004	Monocyclic Aromatic	Benzene	mg/kg	0.1	3.7	<0.1	5	74
			Toluene	mg/kg	0.1	4.0	<0.1	5	79
			Ethylbenzene	mg/kg	0.1	4.2	<0.1	5	83
			m/p-xylene	mg/kg	0.2	8.6	<0.2	10	85
			o-xylene	mg/kg	0.1	4.3	<0.1	5	85
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.9	8.8	10	89
			d8-toluene (Surrogate)	mg/kg	-	8.9	8.7	10	89
			Bromofluorobenzene (Surrogate)	mg/kg	-	8.0	8.1	10	80
		Totals	Total Xylenes	mg/kg	0.3	13	<0.3	-	-
			Total BTEX	mg/kg	0.6	25	<0.6	-	-
SE218814.008	LB223065.004	Monocyclic Aromatic	Benzene	mg/kg	0.1	3.8	<0.1	5	76
			Toluene	mg/kg	0.1	3.9	<0.1	5	77
			Ethylbenzene	mg/kg	0.1	4.0	<0.1	5	80
			m/p-xylene	mg/kg	0.2	8.1	<0.2	10	80
			o-xylene	mg/kg	0.1	4.0	<0.1	5	80
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.6	8.8	10	86
			d8-toluene (Surrogate)	mg/kg	-	8.6	8.7	10	86
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.4	7.5	10	74
		Totals	Total Xylenes	mg/kg	0.3	12	<0.3	-	-
			Total BTEX	mg/kg	0.6	24	<0.6	-	-

Volatile Petroleum Hydrocarbons in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE218775.001	LB223182.004		TRH C6-C10	mg/kg	25	69	<25	92.5	73
			TRH C6-C9	mg/kg	20	61	<20	80	75
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.9	8.8	10	89
			d8-toluene (Surrogate)	mg/kg	-	8.9	8.7	10	89
			Bromofluorobenzene (Surrogate)	mg/kg	-	8.0	8.1	-	80
		VPH F Bands	Benzene (F0)	mg/kg	0.1	3.7	<0.1	-	-
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	44	<25	62.5	69
SE218814.008	LB223065.004		TRH C6-C10	mg/kg	25	69	<25	92.5	74
			TRH C6-C9	mg/kg	20	61	<20	80	76
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.6	8.8	10	86
			d8-toluene (Surrogate)	mg/kg	-	8.6	8.7	10	86
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.4	7.5	-	74
		VPH F Bands	Benzene (F0)	mg/kg	0.1	3.8	<0.1	-	-
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	45	<25	62.5	72

MATRIX SPIKE DUPLICATES

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

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.
***	Indicates that both * and ** apply.
-	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.

Ameded p.3 21/04 KW

SGS

CHAIN OF CUSTODY & ANALYSIS REQUEST

Page 1 of 3

SGS Environmental Services
Unit 16, 33 Maddox Street
Alexandria NSW 2015
Telephone No: (02) 85940400
Facsimile No: (02) 85940499
Email: au.samplereceipt.sydney@sgs.com

Company Name: EAL
Address: PO Box 157
LISMORE NSW 2480
Contact Name: Graham Lancaster

Project Name/No: – –
Purchase Order No: – K5816
Results Required By:
Telephone: 02 6620 3678
Facsimile:
Email Results: eal@scu.edu.au

Client Sample ID	Date Sampled	Lab Sample ID	WATER	SOIL	PRESERVATIVE	NO OF CONTAINERS	CL5 TRH/BTEX C6-C40	~~CL8 TRH/BTEX/PAH~~	CL11TRH/BTEX/PAH/ Phenols	~~Total Phenols~~	SV3 OC/OP	SV6 OC/PCB Low Level	SV9 OC/OP/PCB		Speciated Phenolics	Total Cyanide	Asbestos ID	OC	TRH C10-C40	BTEX C6-C9	Hexavalent Cr Vi	
K5816/1	–	1		X		1		~~X~~	X	~~X~~						X		X				
3		2							X							X		X				Note K5816/38
4		3		↓		↓			X							X		X				tph/btex only
6		4							X							X		X				
7		5							X							X		X				↓
9		6							X							X		X				
10		7							X							X		X				
12		8							X							X		X				
K5816/13		9							X							X		X				

Relinquished By: K Whitney
Date/Time: 20-4-21 1pm
Received By: Emily K.
Date/Time 21/4/21 @ 9.4

Relinquished By:
Date/Time:
Received By:
Date/Time

Samples Intact: [✓ Yes]/ No
Temperature: Ambient / [✓ Chilled]
Sample Cooler Sealed: Yes/ No
Laboratory Quotation No:

Comments:

SGS EHS Sydney COC
SE218814

Uncontrolled template when printed

Ref: SGS COC Standard packs/ver.2/16.08.2007/Page 1 of 1

SGS

CHAIN OF CUSTODY & ANALYSIS REQUEST

Page 2 of 3

SGS Environmental Services
Unit 16, 33 Maddox Street
Alexandria NSW 2015
Telephone No: (02) 85940400
Facsimile No: (02) 85940499
Email: au.samplereceipt.sydney@sgs.com

Company Name: EAL
Address: PO Box 157
LISMORE NSW 2480
Contact Name: Graham Lancaster

Project Name/No:
Purchase Order No: K5816
Results Required By:
Telephone: 02 6620 3678
Facsimile:
Email Results: eal@scu.edu.au

Client Sample ID	Date Sampled	Lab Sample ID	WATER	SOIL	PRESERVATIVE	NO OF CONTAINERS	CL5 TRH/BTEX C6-C40	CL8 TRH/BTEX/PAH	CL11TRH/BTEX/PAH/ Phenols		SV3 OC/OP	SV6 OC/PCB Low Level	SV9 OC/OP/PCB		Speciated Phenolics	Total Cyanide	Asbestos ID	OC	TRH C10-C40	BTEX C6-C9	Hexavalent Cr Vi	
K5816/15		10		+		1			X							X		X				
16		11							+							+		+				
18		12		↓		↓			+							+		+				
19		13							+							+		+				
21		14							+							+		+				
22		15							+							+		+				
24		16							+							+		+				
25		17							+							+		+				
K5816/27		18							+							+		+				

Relinquished By: K Whitney
Date/Time: 20-4-21 1pm
Received By: George Zhi
Date/Time 21/4/21 @ 9:45am

Relinquished By:
Date/Time:
Received By:
Date/Time

Samples Intact: [✓ Yes]/ No
Temperature: Ambient / [✓ Chilled]
Sample Cooler Sealed: Yes/ No
Laboratory Quotation No:

Comments:

SGS

CHAIN OF CUSTODY & ANALYSIS REQUEST

Page 3 of 3

SGS Environmental Services
Unit 16, 33 Maddox Street
Alexandria NSW 2015
Telephone No: (02) 85940400
Facsimile No: (02) 85940499
Email: au.samplereceipt.sydney@sgs.com

Company Name: EAL
Address: PO Box 157
LISMORE NSW 2480
Contact Name: Graham Lancaster

Project Name/No:
Purchase Order No: K5816
Results Required By:
Telephone: 02 6620 3678
Facsimile:
Email Results: eal@scu.edu.au

Client Sample ID	Date Sampled	Lab Sample ID	WATER	SOIL	PRESERVATIVE	NO OF CONTAINERS	CL5 TRH/BTEX C6-C40	CL8 TRH/BTEX/PAH	CL11TRH/BTEX/PAH/ Phenols		SV3 OC/OP	SV6 OC/PCB Low Level	SV9 OC/OP/PCB		Speciated Phenolics	Total Cyanide	Asbestos ID	OC	TRH C10-C40	BTEX C6-C9	Hexavalent Cr Vi	
K5816/28		-19		+		1			X							X		+				
30		20							+							+		+				
31		21		↓		↓			+							+		+				
33		22							+							+		+				
34		23							+							+		+				
~~35~~ 36	Lab	Dup 1 24							+							+		+				
~~36~~ 37	Lab	Dup 2 25							+							+		+				
38 ✓	Trip	Blank 26					X															
K5816/39 ✓	Field	Dup 6C 27							X							X		X				

Relinquished By: K Whitney
Date/Time: 20-4-21 1pm
Received By:
Date/Time 21/4/21 @ 9.45
Relinquished By:
Date/Time:
Received By:
Date/Time
Samples Intact: [✓ Yes]/ No
Temperature: Ambient / [✓ Chilled]
Sample Cooler Sealed: Yes/ No
Laboratory Quotation No:
Comments:

SAMPLE RECEIPT ADVICE

SE218814

CLIENT DETAILS

Contact	Graham Lancaster
Client	ENVIRONMENTAL ANALYSIS LABORATORY
Address	PO BOX 157 LISMORE NSW 2480
Telephone	61 2 6620 3678
Facsimile	(Not specified)
Email	Graham.Lancaster@scu.edu.au
Project	**K5816**
Order Number	**K5816**
Samples	27

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Wed 21/4/2021
Report Due	Wed 28/4/2021
SGS Reference	**SE218814**

SUBMISSION DETAILS

This is to confirm that 27 samples were received on Wednesday 21/4/2021. Results are expected to be ready by COB Wednesday 28/4/2021. Please quote SGS reference SE218814 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	Client	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	27 Soil
Date documentation received	21/4/2021	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	17°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

Unless otherwise instructed, water and bulk samples will be held for one month from date of report, and soil samples will be held for two months.

COMMENTS

Sampling date was not provided. It is assumed to be as date samples were relinquished.

SAMPLE RECEIPT ADVICE

CLIENT DETAILS

Client ENVIRONMENTAL ANALYSIS LABORATORY

Project K5816

SUMMARY OF ANALYSIS

No.	Sample ID	Moisture Content	OC Pesticides in Soil	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	Speciated Phenols in Soil	Total Cyanide in soil by Discrete Analyser	TRH (Total Recoverable Hydrocarbons) in Soil	VOC's in Soil	Volatile Petroleum Hydrocarbons in Soil
001	K5816/1	1	29	26	18	1	10	11	7
002	K5816/3	1	29	26	18	1	10	11	7
003	K5816/4	1	29	26	18	1	10	11	7
004	K5816/6	1	29	26	18	1	10	11	7
005	K5816/7	1	29	26	18	1	10	11	7
006	K5816/9	1	29	26	18	1	10	11	7
007	K5816/10	1	29	26	18	1	10	11	7
008	K5816/12	1	29	26	18	1	10	11	7
009	K5816/13	1	29	26	18	1	10	11	7
010	K5816/15	1	29	26	18	1	10	11	7
011	K5816/16	1	29	26	18	1	10	11	7
012	K5816/18	1	29	26	18	1	10	11	7
013	K5816/19	1	29	26	18	1	10	11	7
014	K5816/21	1	29	26	18	1	10	11	7
015	K5816/22	1	29	26	18	1	10	11	7
016	K5816/24	1	29	26	18	1	10	11	7
017	K5816/25	1	29	26	18	1	10	11	7
018	K5816/27	1	29	26	18	1	10	11	7
019	K5816/28	1	29	26	18	1	10	11	7
020	K5816/30	1	29	26	18	1	10	11	7
021	K5816/31	1	29	26	18	1	10	11	7
022	K5816/33	1	29	26	18	1	10	11	7
023	K5816/34	1	29	26	18	1	10	11	7
024	K5816/36	1	29	26	18	1	10	11	7

CONTINUED OVERLEAF

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

SAMPLE RECEIPT ADVICE

CLIENT DETAILS

Client ENVIRONMENTAL ANALYSIS LABORATORY

Project K5816

SUMMARY OF ANALYSIS

No.	Sample ID	Moisture Content	OC Pesticides in Soil	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	Speciated Phenols in Soil	Total Cyanide in soil by Discrete Analyser	TRH (Total Recoverable Hydrocarbons) in Soil	VOC's in Soil	Volatile Petroleum Hydrocarbons in Soil
025	K5816/37	1	29	26	18	1	10	11	7
026	K5816/38	1	-	-	-	-	10	11	7
027	K5816/39	1	29	26	18	1	10	11	7

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS		LABORATORY DETAILS	
Contact	Graham Lancaster	Manager	Huong Crawford
Client	ENVIRONMENTAL ANALYSIS LABORATORY	Laboratory	SGS Alexandria Environmental
Address	PO BOX 157 LISMORE NSW 2480	Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	61 2 6620 3678	Telephone	+61 2 8594 0400
Facsimile	(Not specified)	Facsimile	+61 2 8594 0499
Email	Graham.Lancaster@scu.edu.au	Email	au.environmental.sydney@sgs.com
Project	**K6066**	SGS Reference	**SE219063 R0**
Order Number	**K6066**	Date Received	29 Apr 2021
Samples	5	Date Reported	30 Apr 2021

COMMENTS

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

SIGNATORIES

Ly Kim HA
Organic Section Head

		Sample Number	SE219063.001	SE219063.002	SE219063.003	SE219063.004
		Sample Matrix	Water	Water	Water	Water
		Sample Date	23 Apr 2021	23 Apr 2021	23 Apr 2021	23 Apr 2021
		Sample Name	K6066/1	K6066/2	K6066/3	K6066/4
Parameter	**Units**	**LOR**				

VOCs in Water Method: AN433 Tested: 29/4/2021

Monocyclic Aromatic Hydrocarbons

Benzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
Toluene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
m/p-xylene	µg/L	1	<1	<1	<1	<1
o-xylene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5

Polycyclic VOCs

Naphthalene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5

Surrogates

d4-1,2-dichloroethane (Surrogate)	%	-	184	108	102	110
d8-toluene (Surrogate)	%	-	100	100	47	100
Bromofluorobenzene (Surrogate)	%	-	107	105	104	104

Totals

Total Xylenes	µg/L	1.5	<1.5	<1.5	<1.5	<1.5
Total BTEX	µg/L	3	<3	<3	<3	<3

Volatile Petroleum Hydrocarbons in Water Method: AN433 Tested: 29/4/2021

TRH C6-C10	µg/L	50	<50	<50	<50	<50
TRH C6-C9	µg/L	40	<40	<40	<40	<40

Surrogates

d4-1,2-dichloroethane (Surrogate)	%	-	184	108	102	110
d8-toluene (Surrogate)	%	-	100	100	47	100
Bromofluorobenzene (Surrogate)	%	-	107	105	104	104

VPH F Bands

Benzene (F0)	µg/L	0.5	<0.5	<0.5	<0.5	<0.5
TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	<50	<50	<50

Parameter	Units	LOR	SE219063.001 Water 23 Apr 2021 K6066/1	SE219063.002 Water 23 Apr 2021 K6066/2	SE219063.003 Water 23 Apr 2021 K6066/3	SE219063.004 Water 23 Apr 2021 K6066/4
Sample Number / Sample Matrix / Sample Date / Sample Name						
Low Level TRH (Total Recoverable Hydrocarbons) in Water Method: AN403 Tested: 29/4/2021						
LLTRH C10-C14	µg/L	50	<50	<50	<50	<50
LLTRH C15-C28	µg/L	100	<100	<100	<100	<100
LLTRH C29-C36	µg/L	50	<50	<50	<50	<50
TRH Sum C10-C36	µg/L	100	<100	<100	<100	<100
TRH F Bands						
LLTRH >C10-C16	µg/L	60	<60	<60	<60	<60
LLTRH >C16-C34 (F3)	µg/L	200	<200	<200	<200	<200
LLTRH >C34-C40 (F4)	µg/L	100	<100	<100	<100	<100

Parameter	Units	LOR	Sample Number SE219063.005 Sample Matrix Water Sample Date 23 Apr 2021 Sample Name K6066/5

VOCs in Water Method: AN433 Tested: 29/4/2021

Monocyclic Aromatic Hydrocarbons

Benzene	µg/L	0.5	<0.5
Toluene	µg/L	0.5	<0.5
Ethylbenzene	µg/L	0.5	<0.5
m/p-xylene	µg/L	1	<1
o-xylene	µg/L	0.5	<0.5

Polycyclic VOCs

Naphthalene	µg/L	0.5	<0.5

Surrogates

d4-1,2-dichloroethane (Surrogate)	%	-	**98**
d8-toluene (Surrogate)	%	-	**97**
Bromofluorobenzene (Surrogate)	%	-	**101**

Totals

Total Xylenes	µg/L	1.5	<1.5
Total BTEX	µg/L	3	<3

Volatile Petroleum Hydrocarbons in Water Method: AN433 Tested: 29/4/2021

TRH C6-C10	µg/L	50	<50
TRH C6-C9	µg/L	40	<40

Surrogates

d4-1,2-dichloroethane (Surrogate)	%	-	**98**
d8-toluene (Surrogate)	%	-	**97**
Bromofluorobenzene (Surrogate)	%	-	**101**

			Sample Number	SE219063.005
			Sample Matrix	Water
			Sample Date	23 Apr 2021
			Sample Name	K6066/5
Parameter	Units	LOR		

Volatile Petroleum Hydrocarbons in Water Method: AN433 Tested: 29/4/2021 (continued)

VPH F Bands

Benzene (F0)	µg/L	0.5	<0.5
TRH C6-C10 minus BTEX (F1)	µg/L	50	<50

Low Level TRH (Total Recoverable Hydrocarbons) in Water Method: AN403 Tested: 29/4/2021

LLTRH C10-C14	µg/L	50	<50
LLTRH C15-C28	µg/L	100	**320**
LLTRH C29-C36	µg/L	50	<50
TRH Sum C10-C36	µg/L	100	**320**

TRH F Bands

LLTRH >C10-C16	µg/L	60	<60
LLTRH >C16-C34 (F3)	µg/L	200	**350**
LLTRH >C34-C40 (F4)	µg/L	100	<100

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.

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

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
LLTRH C10-C14	LB223609	µg/L	50	<50	105%
LLTRH C15-C28	LB223609	µg/L	100	<100	120%
LLTRH C29-C36	LB223609	µg/L	50	<50	123%
TRH Sum C10-C36	LB223609	µg/L	100	<100	

TRH F Bands

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
LLTRH >C10-C16	LB223609	µg/L	60	<60	NA
LLTRH >C16-C34 (F3)	LB223609	µg/L	200	<200	NA
LLTRH >C34-C40 (F4)	LB223609	µg/L	100	<100	NA

VOCs in Water Method: ME-(AU)-[ENV]AN433

Monocyclic Aromatic Hydrocarbons

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Benzene	LB223620	µg/L	0.5	<0.5	0%	93%	104%
Toluene	LB223620	µg/L	0.5	<0.5	0%	104%	104%
Ethylbenzene	LB223620	µg/L	0.5	<0.5	0%	105%	106%
m/p-xylene	LB223620	µg/L	1	<1	0%	109%	105%
o-xylene	LB223620	µg/L	0.5	<0.5	0%	106%	105%

Polycyclic VOCs

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Naphthalene	LB223620	µg/L	0.5	<0.5	0%	NA	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
d4-1,2-dichloroethane (Surrogate)	LB223620	%	-	96%	7 - 8%	111%	103%
d8-toluene (Surrogate)	LB223620	%	-	93%	0 - 1%	98%	99%
Bromofluorobenzene (Surrogate)	LB223620	%	-	99%	5 - 6%	104%	99%

Totals

Parameter	QC Reference	Units	LOR	MB
Total Xylenes	LB223620	µg/L	1.5	<1.5
Total BTEX	LB223620	µg/L	3	<3

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
TRH C6-C10	LB223620	µg/L	50	<50	0%	85%	92%
TRH C6-C9	LB223620	µg/L	40	<40	0%	85%	92%

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
d4-1,2-dichloroethane (Surrogate)	LB223620	%	-	96%	7 - 8%	111%	103%
d8-toluene (Surrogate)	LB223620	%	-	93%	0 - 1%	98%	99%
Bromofluorobenzene (Surrogate)	LB223620	%	-	99%	5 - 6%	104%	99%

VPH F Bands

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Benzene (F0)	LB223620	µg/L	0.5		0%	NA	NA
TRH C6-C10 minus BTEX (F1)	LB223620	µg/L	50	<50	0%	82%	91%

METHOD	METHODOLOGY SUMMARY
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 not corrected for Naphthalene.
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.
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
***	Indicates that both * and ** apply.	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.

STATEMENT OF QA/QC PERFORMANCE

SE219063 R0

CLIENT DETAILS

Contact	Graham Lancaster	Manager	Huong Crawford
Client	ENVIRONMENTAL ANALYSIS LABORATORY	Laboratory	SGS Alexandria Environmental
Address	PO BOX 157 LISMORE NSW 2480	Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	61 2 6620 3678	Telephone	+61 2 8594 0400
Facsimile	(Not specified)	Facsimile	+61 2 8594 0499
Email	Graham.Lancaster@scu.edu.au	Email	au.environmental.sydney@sgs.com
Project	**K6066**	SGS Reference	**SE219063 R0**
Order Number	**K6066**	Date Received	29 Apr 2021
Samples	5	Date Reported	30 Apr 2021

LABORATORY DETAILS

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	VOCs in Water	1 item
	Volatile Petroleum Hydrocarbons in Water	1 item

SAMPLE SUMMARY

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	5 Water
Date documentation received	29/4/2021	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	19.0°C	Sufficient sample for analysis	Yes
Turnaround time requested	Next Day		

HOLDING TIME SUMMARY

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

Low Level TRH (Total Recoverable Hydrocarbons) in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
K6066/1	SE219063.001	LB223609	23 Apr 2021	29 Apr 2021	30 Apr 2021	29 Apr 2021	08 Jun 2021	30 Apr 2021
K6066/2	SE219063.002	LB223609	23 Apr 2021	29 Apr 2021	30 Apr 2021	29 Apr 2021	08 Jun 2021	30 Apr 2021
K6066/3	SE219063.003	LB223609	23 Apr 2021	29 Apr 2021	30 Apr 2021	29 Apr 2021	08 Jun 2021	30 Apr 2021
K6066/4	SE219063.004	LB223609	23 Apr 2021	29 Apr 2021	30 Apr 2021	29 Apr 2021	08 Jun 2021	30 Apr 2021
K6066/5	SE219063.005	LB223609	23 Apr 2021	29 Apr 2021	30 Apr 2021	29 Apr 2021	08 Jun 2021	30 Apr 2021

VOCs in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
K6066/1	SE219063.001	LB223620	23 Apr 2021	29 Apr 2021	30 Apr 2021	29 Apr 2021	08 Jun 2021	30 Apr 2021
K6066/2	SE219063.002	LB223620	23 Apr 2021	29 Apr 2021	30 Apr 2021	29 Apr 2021	08 Jun 2021	30 Apr 2021
K6066/3	SE219063.003	LB223620	23 Apr 2021	29 Apr 2021	30 Apr 2021	29 Apr 2021	08 Jun 2021	30 Apr 2021
K6066/4	SE219063.004	LB223620	23 Apr 2021	29 Apr 2021	30 Apr 2021	29 Apr 2021	08 Jun 2021	30 Apr 2021
K6066/5	SE219063.005	LB223620	23 Apr 2021	29 Apr 2021	30 Apr 2021	29 Apr 2021	08 Jun 2021	30 Apr 2021

Volatile Petroleum Hydrocarbons in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
K6066/1	SE219063.001	LB223620	23 Apr 2021	29 Apr 2021	30 Apr 2021	29 Apr 2021	08 Jun 2021	30 Apr 2021
K6066/2	SE219063.002	LB223620	23 Apr 2021	29 Apr 2021	30 Apr 2021	29 Apr 2021	08 Jun 2021	30 Apr 2021
K6066/3	SE219063.003	LB223620	23 Apr 2021	29 Apr 2021	30 Apr 2021	29 Apr 2021	08 Jun 2021	30 Apr 2021
K6066/4	SE219063.004	LB223620	23 Apr 2021	29 Apr 2021	30 Apr 2021	29 Apr 2021	08 Jun 2021	30 Apr 2021
K6066/5	SE219063.005	LB223620	23 Apr 2021	29 Apr 2021	30 Apr 2021	29 Apr 2021	08 Jun 2021	30 Apr 2021

SURROGATES

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.

VOCs in Water

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	K6066/1	SE219063.001	%	40 - 130%	107
	K6066/2	SE219063.002	%	40 - 130%	105
	K6066/3	SE219063.003	%	40 - 130%	104
	K6066/4	SE219063.004	%	40 - 130%	104
	K6066/5	SE219063.005	%	40 - 130%	101
d4-1,2-dichloroethane (Surrogate)	K6066/1	SE219063.001	%	40 - 130%	184 ①
	K6066/2	SE219063.002	%	40 - 130%	108
	K6066/3	SE219063.003	%	40 - 130%	102
	K6066/4	SE219063.004	%	40 - 130%	110
	K6066/5	SE219063.005	%	40 - 130%	98
d8-toluene (Surrogate)	K6066/1	SE219063.001	%	40 - 130%	100
	K6066/2	SE219063.002	%	40 - 130%	100
	K6066/3	SE219063.003	%	40 - 130%	47
	K6066/4	SE219063.004	%	40 - 130%	100
	K6066/5	SE219063.005	%	40 - 130%	97

Volatile Petroleum Hydrocarbons in Water

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	K6066/1	SE219063.001	%	40 - 130%	107
	K6066/2	SE219063.002	%	40 - 130%	105
	K6066/3	SE219063.003	%	40 - 130%	104
	K6066/4	SE219063.004	%	40 - 130%	104
	K6066/5	SE219063.005	%	40 - 130%	101
d4-1,2-dichloroethane (Surrogate)	K6066/1	SE219063.001	%	60 - 130%	184 ①
	K6066/2	SE219063.002	%	60 - 130%	108
	K6066/3	SE219063.003	%	60 - 130%	102
	K6066/4	SE219063.004	%	60 - 130%	110
	K6066/5	SE219063.005	%	60 - 130%	98
d8-toluene (Surrogate)	K6066/1	SE219063.001	%	40 - 130%	100
	K6066/2	SE219063.002	%	40 - 130%	100
	K6066/3	SE219063.003	%	40 - 130%	47
	K6066/4	SE219063.004	%	40 - 130%	100
	K6066/5	SE219063.005	%	40 - 130%	97

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.

Low Level TRH (Total Recoverable Hydrocarbons) in Water

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

Sample Number		Parameter	Units	LOR	Result
LB223609.001		LLTRH C10-C14	µg/L	50	<50
		LLTRH C15-C28	µg/L	100	<100
		LLTRH C29-C36	µg/L	50	<50

VOCs in Water

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

Sample Number		Parameter	Units	LOR	Result
LB223620.001	Monocyclic Aromatic Hydrocarbons	Benzene	µg/L	0.5	<0.5
		Toluene	µg/L	0.5	<0.5
		Ethylbenzene	µg/L	0.5	<0.5
		m/p-xylene	µg/L	1	<1
		o-xylene	µg/L	0.5	<0.5
	Polycyclic VOCs	Naphthalene	µg/L	0.5	<0.5
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	96
		d8-toluene (Surrogate)	%	-	93
		Bromofluorobenzene (Surrogate)	%	-	99

Volatile Petroleum Hydrocarbons in Water

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

Sample Number		Parameter	Units	LOR	Result
LB223620.001		TRH C6-C9	µg/L	40	<40
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	96
		d8-toluene (Surrogate)	%	-	93
		Bromofluorobenzene (Surrogate)	%	-	99

DUPLICATES

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.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

VOCs in Water

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218964.034	LB223620.025	Monocyclic Aromatic	Benzene	µg/L	0.5	<0.5	<0.5	200	0
			Toluene	µg/L	0.5	<0.5	<0.5	200	0
			Ethylbenzene	µg/L	0.5	<0.5	<0.5	200	0
			m/p-xylene	µg/L	1	<1	<1	200	0
			o-xylene	µg/L	0.5	<0.5	<0.5	200	0
		Polycyclic	Naphthalene	µg/L	0.5	<0.5	<0.5	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	11	10	30	7
			d8-toluene (Surrogate)	µg/L	-	10	9.9	30	0
			Bromofluorobenzene (Surrogate)	µg/L	-	10	9.7	30	5
SE219026.002	LB223620.024	Monocyclic Aromatic	Benzene	µg/L	0.5	<0.5	<0.5	200	0
			Toluene	µg/L	0.5	<0.5	<0.5	200	0
			Ethylbenzene	µg/L	0.5	<0.5	<0.5	200	0
			m/p-xylene	µg/L	1	<1	<1	200	0
			o-xylene	µg/L	0.5	<0.5	<0.5	200	0
		Polycyclic	Naphthalene	µg/L	0.5	<0.5	<0.5	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	11	10	30	8
			d8-toluene (Surrogate)	µg/L	-	10	9.9	30	1
			Bromofluorobenzene (Surrogate)	µg/L	-	10	9.8	30	6

Volatile Petroleum Hydrocarbons in Water

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218964.034	LB223620.025		TRH C6-C10	µg/L	50	<50	<50	200	0
			TRH C6-C9	µg/L	40	<40	<40	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	11	10	30	7
			d8-toluene (Surrogate)	µg/L	-	10	9.9	30	0
			Bromofluorobenzene (Surrogate)	µg/L	-	10	9.7	30	5
		VPH F Bands	Benzene (F0)	µg/L	0.5	<0.5	<0.5	200	0
			TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	<50	200	0
SE219026.002	LB223620.024		TRH C6-C10	µg/L	50	<50	<50	200	0
			TRH C6-C9	µg/L	40	<40	<40	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	11	10	30	8
			d8-toluene (Surrogate)	µg/L	-	10	9.9	30	1
			Bromofluorobenzene (Surrogate)	µg/L	-	10	9.8	30	6
		VPH F Bands	Benzene (F0)	µg/L	0.5	<0.5	<0.5	200	0
			TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	<50	200	0

LABORATORY CONTROL SAMPLES

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.

Low Level TRH (Total Recoverable Hydrocarbons) in Water

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB223609.002		LLTRH C10-C14	µg/L	50	1300	1200	60 - 140	105
		LLTRH C15-C28	µg/L	100	1400	1200	60 - 140	120
		LLTRH C29-C36	µg/L	50	1500	1200	60 - 140	123

VOCs in Water

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB223620.002	Monocyclic Aromatic	Benzene	µg/L	0.5	42	45.45	60 - 140	93
		Toluene	µg/L	0.5	47	45.45	60 - 140	104
		Ethylbenzene	µg/L	0.5	48	45.45	60 - 140	105
		m/p-xylene	µg/L	1	99	90.9	60 - 140	109
		o-xylene	µg/L	0.5	48	45.45	60 - 140	106
	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	11	10	60 - 140	111
		d8-toluene (Surrogate)	µg/L	-	9.8	10	70 - 130	98
		Bromofluorobenzene (Surrogate)	µg/L	-	10	10	70 - 130	104

Volatile Petroleum Hydrocarbons in Water

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB223620.002		TRH C6-C10	µg/L	50	810	946.63	60 - 140	85
		TRH C6-C9	µg/L	40	700	818.71	60 - 140	85
	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	11	10	60 - 140	111
		d8-toluene (Surrogate)	µg/L	-	9.8	10	70 - 130	98
		Bromofluorobenzene (Surrogate)	µg/L	-	10	10	70 - 130	104
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	520	639.67	60 - 140	82

MATRIX SPIKES

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.

VOCs in Water

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE219026.001	LB223620.026	Monocyclic Aromatic	Benzene	µg/L	0.5	47	0	45.45	104
			Toluene	µg/L	0.5	47	0.00904567514	45.45	104
			Ethylbenzene	µg/L	0.5	48	0.00535730725	45.45	106
			m/p-xylene	µg/L	1	96	0.01551681614	90.9	105
			o-xylene	µg/L	0.5	48	0.00557667654	45.45	105
		Polycyclic	Naphthalene	µg/L	0.5	48	0.06274486494	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10	10.96338860944	-	103
			d8-toluene (Surrogate)	µg/L	-	9.9	9.99386594026	-	99
			Bromofluorobenzene (Surrogate)	µg/L	-	9.9	10.43739002422	-	99

Volatile Petroleum Hydrocarbons in Water

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE219026.001	LB223620.026		TRH C6-C10	µg/L	50	870	0	946.63	92
			TRH C6-C9	µg/L	40	760	0	818.71	92
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10	10.96338860944	-	103
			d8-toluene (Surrogate)	µg/L	-	9.9	9.99386594026	-	99
			Bromofluorobenzene (Surrogate)	µg/L	-	9.9	10.43739002422	-	99
		VPH F Bands	Benzene (F0)	µg/L	0.5		0	-	-
			TRH C6-C10 minus BTEX (F1)	µg/L	50	580	0	639.67	91

MATRIX SPIKE DUPLICATES

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

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.
***	Indicates that both * and ** apply.
-	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.

SGS

CHAIN OF CUSTODY & ANALYSIS REQUEST

Page 1 of 1

SGS Environmental Services
Unit 16, 33 Maddox Street
Alexandria NSW 2015
Telephone No: (02) 85940400
Facsimile No: (02) 85940499
Email: au.samplereceipt.sydney@sgs.com

Company Name: EAL
Address: PO Box 157
LISMORE NSW 2480
Contact Name: Graham Lancaster

URGENT

Project Name/No:
Purchase Order No: K6066
Results Required By: 2 day - due Wednesday 28th April
Telephone: 02 6620 3678
Facsimile:
Email Results: eal@scu.edu.au

Client Sample ID	Date Sampled	Lab Sample ID	WATER	SOIL	PRESERVATIVE	NO OF CONTAINERS	CL5 TRH/BTEX C6-C40	CL8 TRH/BTEX/PAH	CL11TRH/BTEX/PAH/ Phenols		SV3 OC/OP	SV6 OC/PCB Low Level	SV9 OC/OP/PCB		Speciated Phenolics	Total Cyanide	Asbestos ID	OC	TRH C10-C40	BTEX C6-C9	Hexavalent Cr Vi	
K6066/1	-	1	+			2	X															
2	-	2	+				+															
3	-	3	+				+															
4	-	4	+				+															
5	-	5	+				+															

SGS EHS Sydney COC
SE219063

Relinquished By: KWhitney
Date/Time: 23.4.21 1pm
Received By:
Date/Time 29.4.21 9:30
Relinquished By:
Date/Time:
Received By:
Date/Time
Samples Intact: [✓ Yes]/ No
Temperature: Ambient / [✓ Chilled] 19.0
Sample Cooler Sealed: [✓ Yes]/ No
Laboratory Quotation No:
Comments:

AU.Environmental.Sydney (Sydney)

From:	Katie Whitney <katie.whitney@scu.edu.au>
Sent:	Thursday, 29 April 2021 9:40 AM
To:	AU.Environmental.Sydney (Sydney); AU.SampleReceipt.Sydney (Sydney)
Subject:	[EXTERNAL] Urgent waters to arrive today (delayed on courier) Urgent 24hr please
Attachments:	SGSurgent230421.pdf
Importance:	High

Hi,

TOLL couriers advised this esky of waters should be delivered today. Due date was for yesterday. Instead can we please have a 24hr TAT with results due tomorrow please?

Thank you

Kind regards,

Katie Whitney

My current hours 8am to 3:30pm

Administration / Client Liaison Officer

T 02 6620 3678

EAL Environmental Analysis Laboratory

Southern Cross University

LISMORE CAMPUS

Military Road, East Lismore NSW 2480

www.scu.edu.au/eal
CRICOS Provider: 01241G

SAMPLE RECEIPT ADVICE

SE219063

CLIENT DETAILS

Contact	Graham Lancaster
Client	ENVIRONMENTAL ANALYSIS LABORATORY
Address	PO BOX 157 LISMORE NSW 2480
Telephone	61 2 6620 3678
Facsimile	(Not specified)
Email	Graham.Lancaster@scu.edu.au
Project	**K6066**
Order Number	**K6066**
Samples	5

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Thu 29/4/2021
Report Due	Fri 30/4/2021
SGS Reference	**SE219063**

SUBMISSION DETAILS

This is to confirm that 5 samples were received on Thursday 29/4/2021. Results are expected to be ready by COB Friday 30/4/2021. Please quote SGS reference SE219063 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	5 Water
Date documentation received	29/4/2021	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	19.0°C	Sufficient sample for analysis	Yes
Turnaround time requested	Next Day		

Unless otherwise instructed, water and bulk samples will be held for one month from date of report, and soil samples will be held for two months.

COMMENTS

Sampling date was not provided. It is assumed to be as date samples were relinquished.

SAMPLE RECEIPT ADVICE

CLIENT DETAILS

Client ENVIRONMENTAL ANALYSIS LABORATORY

Project K6066

SUMMARY OF ANALYSIS

No.	Sample ID	Low Level TRH (Total Recoverable	VOCs in Water	Volatile Petroleum Hydrocarbons in Water
001	K6066/1	7	11	7
002	K6066/2	7	11	7
003	K6066/3	7	11	7
004	K6066/4	7	11	7
005	K6066/5	7	11	7

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

EAL Environmental Analysis Laboratory

Southern Cross University
PO Box 157 Lismore NSW 2480
P: +61 2 6620 3678
E: eal@scu.edu.au
www.scu.edu.au/eal
ABN: 41 995 651 524

Sample Receipt Notification (SRN)

Project:	**EAL/K5816**
Customer:	Tim Fitzroy & Associates Pty Ltd
Contact:	Tim Fitzroy
Client Job ID:	15/2021 BSC Lot 12 Bayshore Drive
No. of Samples	39 x soil
Date Received:	16 APR 2021
Comments:	email quote 20% discount

Biller: **Tim Fitzroy & Associates Pty Ltd** - Tim Fitzroy

		Test Request		
		SS-PACK-017	SS-PACK-042	SS-SING-161
Sample Text ID	**Client Sample ID**	Petroleum Compounds Assessment 1a	Health Investigation Level (HIL) Soil Assessment	Asbestos Identification and Quantification in Soil
K5816/001	TFA 1 A	0	1	1
K5816/002	TFA 1 B	0	0	1
K5816/003	TFA 1 C	0	1	0

		SS-PACK-017	SS-PACK-042	SS-SING-161
		Petroleum Compounds Assessment 1a	Health Investigation Level (HIL) Soil Assessment	Asbestos Identification and Quantification in Soil
K5816/004	TFA 2 A	0	1	1
K5816/005	TFA 2 B	0	0	1
K5816/006	TFA 2 C	0	1	0
K5816/007	TFA 3 A	0	1	0
K5816/008	TFA 3 B	0	0	1
K5816/009	TFA 3 C	0	1	0
K5816/010	TFA 4 A	0	1	1
K5816/011	TFA 4 B	0	0	1
K5816/012	TFA 4 C	0	1	0
K5816/013	TFA 5 A	0	1	1

Sample Receipt Notification (SRN) for EAL/K5816

		SS-PACK-017	SS-PACK-042	SS-SING-161
		Petroleum Compounds Assessment 1a	Health Investigation Level (HIL) Soil Assessment	Asbestos Identification and Quantification in Soil
K5816/014	TFA 5 B	0	0	1
K5816/015	TFA 5 C	0	1	0
K5816/016	TFA 6 A	0	1	1
K5816/017	TFA 6 B	0	0	1
K5816/018	TFA 6 C	0	1	0
K5816/019	TFA 7 A	0	1	1
K5816/020	TFA 7 B	0	0	1
K5816/021	TFA 7 C	0	1	0
K5816/022	TFA 8 A	0	1	1
K5816/023	TFA 8 B	0	0	1

Sample Receipt Notification (SRN)

for EAL/K5816

		Petroleum Compounds Assessment 1a	Health Investigation Level (HIL) Soil Assessment	Asbestos Identification and Quantification in Soil
		SS-PACK-017	SS-PACK-042	SS-SING-161
K5816/024	TFA 8 C	0	1	0
K5816/025	TFA 9 A	0	1	1
K5816/026	TFA 9 B	0	0	1
K5816/027	TFA 9 C	0	1	0
K5816/028	TFA 10 A	0	1	1
K5816/029	TFA 10 B	0	0	1
K5816/030	TFA 10 C	0	1	0
K5816/031	TFA 11 A	0	1	1
K5816/032	TFA 11 B	0	0	1
K5816/033	TFA 11 C	0	1	0

Sample Receipt Notification (SRN)

for EAL/K5816

		SS-PACK-017	SS-PACK-042	SS-SING-161
		Petroleum Compounds Assessment 1a	Health Investigation Level (HIL) Soil Assessment	Asbestos Identification and Quantification in Soil
K5816/034	Field Dup 1A	0	1	1
K5816/035	Field Dup 6B	0	0	1
K5816/036	Lab Dup 1	0	1	1
K5816/037	Lab Dup 2	0	1	1
K5816/038	Trip Blank	1	0	0
K5816/039	Field Dup 6C	0	1	0
Total		1	26	25

Test Descriptions

Test List Item	Item Description
SS-PACK-017	**Petroleum Compounds Assessment 1a** TPH(C10-C36) and BTEX (equivalent to TPHC6- C9) SUBCONTRACTED
SS-PACK-042	**Health Investigation Level (HIL) Soil Assessment** Includes Copper, Lead, Cadmium, Zinc, Arsenic, Chromium, Nickel, Mercury, Beryllium, Boron, Cobalt; Polycyclic Aromatic Hyrdrocarbons (PAH), Total Petroleum Hyrdrocarbons (TPH), BTEX Hydrocarbons; Pesticides (Organo-chorines (OC)); Total Phenols; Total Cyanide.
SS-SING-161	**Asbestos Identification and Quantification in Soil** Identification and quantification in soil (using AS4964-2004 or WA/NEPM) (% ACM, % Friable). SUBCONTRACTED TO AUSTRALIAN SAFER ENVIRONMENT & TECHNOLOGY PTY LTD, SYDNEY

EAL Environmental Analysis Laboratory

PO Box 157 (Military Road)
LISMORE NSW 2480
T: 02 6620 3678 E: eal@scu.edu.au W: www.scu.edu.au

Submitting Client Details

Quote Id: EALQ6034
Job Ref: 15/2021 BSC Lot 12 Bayshore Drive
Company: Tim Fitzroy & Associates
Contact: Tim Fitzroy
Phone:
Mobile: 0448 483 837
Email: tim@timfitzroy.com.au
Postal address: 61 Pine Ave, East Ballina

Billing Client Details

☐ Tick if same as submitting details
ABN:
Company:
Contact:
Phone:
Mobile:
Email:
Postal address:

Payment Method:

☐ Purchase Order
☐ Cheque
☐ Credit/Debit Card (EAL staff will phone for details)
☐ Invoice (prior approval)

Relinquished: Date:
Received: ls Date: 16.4.21

Preservation: none - freezer bricks - ice - acidified - filtered - other
Condition on receipt: ambient - cool - frozen - other

In submitting samples, the Client agrees to the EAL Laboratory Services Terms and Conditions. These Terms and Conditions are available on the EAL website: scu.edu.au/eal, or on request.

Comments:

SS-Pack-042 Health Investigation (HIL) Soil Assessment Bag 3D Jar 6C
Email Quote 20% reduction missing - disposed

Note: 2 Lab Duplicates + 2 field Dups +1 Rinsate (BTEX) + 1 Trip Blank (TRH). All individual samples.
Likelihood and nature of Hazardous material: Possible Asbestos

Total number of samples: 29

Sample Analysis Request
Price list code (e.g. SW-PACK-06)

Lab ID	Sample ID	Sample Depth	Sampling Date	Sampler	Your Client	Crop ID	Sample Type (e.g. water, leaf, soil)	SS-Pack-042	SW-Pack-056	SS-Pack-017	SS-Sing-161 Asbestos	
1	TFA 1A	0-0.1m	16.4.21	T Fitzroy	BSC		Soil	x			x	
2	TFA 1B	1-1.2m	16.4.21	T Fitzroy	BSC		Soil				x	
3	TFA 1C	1.4-1.5m	16.4.21	T Fitzroy	BSC		Soil	x				
4	TFA 2A	0-0.1m	16.4.21	T Fitzroy	BSC		Soil	x			x	

EAL Project Reference: K5816 x 309

5	TFA 2B	0.6-0.7m	16.4.21	T Fitzroy	BSC						x		5

Comments:

Likelihood and nature of Hazardous material:

Sample Analysis Request

Price List Code (e.g. SW-PACK-06

Lab ID	Sample ID	Sample Depth	Sampling Date	Sampler	Your Client	Crop ID	Sample Type (e.g. water, leaf, soil)	SS-Pack-042	SW-Pack-056	SS-Pack-017	SS-Sing-161		
	TFA 2C	1.1-1.2m	16.4.21	T Fitzroy	BSC		Soil	x				6	
	TFA 3A	0-0.1m	16.4.21	T Fitzroy	BSC		Soil	x			x	7	bag
	TFA 3B	0.5-0.6m	16.4.21	T Fitzroy	BSC		Soil				x	8	
	TFA 3C	0.8-0.9m	16.4.21	T Fitzroy	BSC		Soil	x				9	
	10 TFA 4A	0-0.1m	16.4.21	T Fitzroy	BSC		Soil	x			x	10	
	TFA 4B	0.5-0.6m	16.4.21	T Fitzroy	BSC		Soil				x	11	
	TFA 4C	1.2-1.3m	16.4.21	T Fitzroy	BSC		Soil	x				12	
	TFA 5A	0-0.1m	16.4.21	T Fitzroy	BSC		Soil	x			x	13	
	TFA 5B	0.9-1m	16.4.21	T Fitzroy	BSC		Soil				x	14	
	15 TFA 5C	1.4-1.5m	16.4.21	T Fitzroy	BSC		Soil	x				15	
	TFA 6A	0-0.1m	16.4.21	T Fitzroy	BSC		Soil	x			x	16	
	TFA 6B	0.5-0.6m	16.4.21	T Fitzroy	BSC		Soil				x	17	
	TFA 6C	1.2-1.3m	16.4.21	T Fitzroy	BSC		Soil	x				18	
	TFA 7A	0-0.1m	16.4.21	T Fitzroy	BSC		Soil	x			x	19	
	20 TFA 7B	0.5-0.6m	16.4.21	T Fitzroy	BSC		Soil				x	20	
	TFA 7C	1.2-1.3m	16.4.21	T Fitzroy	BSC		Soil	x				21	
	TFA 8A	0-0.1m	16.4.21	T Fitzroy	BSC		Soil	x			x	22	
	TFA 8B	1-1.1m	16.4.21	T Fitzroy	BSC		Soil				x	23	
	TFA 8C	1.3-1.4m	16.4.21	T Fitzroy	BSC		Soil	x				24	
	25 TFA 9A	0-0.1m	16.4.21	T Fitzroy	BSC		Soil	x			x	25	
	TFA 9B	1-1.1m	16.4.21	T Fitzroy	BSC		Soil				x	26	
	TFA 9C	1.3-1.4m	16.4.21	T Fitzroy	BSC		Soil	x				27	

EAL Project Reference:

	28 TFA 10A	0-0.1m	16.4.21	T Fitzroy	BSC		Soil	x		JJ-PK-01	x	28	
	TFA 10B	0.3-0.4m	16.4.21	T Fitzroy	BSC		Soil				x	29	
	30 TFA 10C	1.4-1.5m	16.4.21	T Fitzroy	BSC		Soil	x				30	
	TFA11A	0-0.1m	16.4.21	T Fitzroy	BSC		Soil	x			x	31	
	TFA11B	0.3-0.4m	16.4.21	T Fitzroy	BSC		Soil				x	32	
	TFA 11C	1.6-1.7m	16.4.21	T Fitzroy	BSC		Soil	x				33	
	Field Dup 1A	0-0.1m	16.4.21	T Fitzroy	BSC		Soil	x			x	34	
	Field Dup 6B	0.5-0.6m	16.4.21	T Fitzroy	BSC		Soil				x		
	Lab Dup 1		16.4.21	T Fitzroy	BSC		Soil	x			x		
	39 Lab Dup 2		16.4.21	T Fitzroy	BSC		Soil	x			x	39	
	38 ~~Trip Blank~~		16.4.21	T Fitzroy	BSC		Sand			x		38	
	Rinsate Blank		16.4.21	T Fitzroy	BSC				x				

Comments:

39 Field Dup 6C = JJ-PK.042

Likelihood and nature of Hazardous material:

Sample Analysis Request

Price List Code (e.g. SW-PACK-06

Lab ID	Sample ID	Sample Depth	Sampling Date	Sampler	Your Client	Crop ID	Sample Type (e.g. water, leaf, soil)	X					

Southern Cross University
PO Box 157 Lismore NSW 2480
P: +61 2 6620 3678
E: eal@scu.edu.au
www.scu.edu.au/eal

ABN: 41 995 651 524

Sample Receipt Notification (SRN)

Project:	**EAL/K6066**
Customer:	Tim Fitzroy & Associates Pty Ltd
Contact:	Tim Fitzroy
Client Job ID:	15/2021 BSC Lot 12 Bayshore Dr
No. of Samples	5 x Water
Date Received:	23 APR 2021
Comments:	Urgent- 3 Day TAT- Due 28th of April

Biler: **Tim Fitzroy & Associates Pty Ltd** - Tim Fitzroy

		Test Request
		SW-PACK-056
Sample Text ID	**Client Sample ID**	Gas Contamination Water Quality Monitoring
K6066/001	GW1	1
K6066/002	GW1 Field Dup	1
K6066/003	Lab Dup	1

Sample Receipt Notification (SRN) for EAL/K6066

		SW-PACK-056 Gas Contamination Water Quality Monitoring
K6066/004	GW2	1
K6066/005	GW3	1
Total		5

Sample Receipt Notification (SRN) for EAL/K6066

Test Descriptions

Test List Item	Item Description
SW-PACK-056	**Gas Contamination Water Quality Monitoring** pH, EC, TDS (by calc.), Total Alkalinity, TSS Metals (Al, As, Cd, Cr,Cu, Fe, Pb, Mn, Hg, Ni, Se, Ag, Zn) Subcontracting (TPH, BTEX)

EAL Environmental Analysis Laboratory

PO Box 157 (Military Road)
LISMORE NSW 2480
T: 02 6620 3678 E: eal@scu.edu.au W: www.scu.edu.au

Submitting Client Details

Quote Id: EALQ6034
Job Ref: 15/2021 BSC Lot 12 Bayshore Dr
Company: Tim Fitzroy & Associates
Contact: Tim Fitzroy
Phone:
Mobile: 0448 483 837
Email: tim@timfitzroy.com.au
Postal address: 61 Pine Ave, East Ballina

Billing Client Details

☐ Tick if same as submitting details
ABN:
Company:
Contact:
Phone:
Mobile:
Email:
Postal address:

Payment Method:

☐ Purchase Order
☐ Cheque
☐ Credit/Debit Card (EAL staff will phone for details)
☐ Invoice (prior approval)

Relinquished: Date:
Received: Date:

Preservation: none - freezer bricks - ice - acidified - filtered - other
Condition on receipt: ambient - cool - frozen - other

In submitting samples, the Client agrees to the EAL Laboratory Services Terms and Conditions. These Terms and Conditions are available on the EAL website: scu.edu.au/eal, or on request.

Comments:

URGENT

Email Quote 20% reduction

Urgency Fee: Add 25% to discounted fee for 3 days turnaround on results. 3day TAT

Comments: 1 Field + 1 Lab Duplicate Due [redacted]/28.

SW-Pack -056 Contamination Water Quality Monitoring

Total number of samples: 5

Sample Analysis Request

Price list code (e.g. SW-PACK-06)

Lab ID	Sample ID	Sample Depth	Sampling Date	Sampler	Your Client	Crop ID	Sample Type (e.g. water, leaf, soil)		SW-Pack-056				
	GW1				BSC		Groundwater		x				
	GW1 Field Dup				BSC		Groundwater		x				
	Lab Dup				BSC		Groundwater		x				
	GW2				BSC		Groundwater		x				

EAL Sample Submission Form
Issue: September 2018

EAL Project Reference: K 6066 x 6 water.

QFORM 4.2

Comments:

Likelihood and nature of Hazardous material:

Sample Analysis Request

Price List Code (e.g. SW-PACK-06)

Lab ID	Sample ID	Sample Depth	Sampling Date	Sampler	Your Client	Crop ID	Sample Type (e.g. water, leaf, soil)		SW-Pack-056				
	GW3				BSC		Groundwater		x				

EAL Project Reference:

Report Date/Time: 21 April 2021 11:11:03AM

Environmental Analysis Laboratory

Southern Cross University
PO Box 157 Lismore NSW 2480
P: +61 2 6620 3678
E: eal@scu.edu.au
www.scu.edu.au/eal

ABN: 41 995 651 524

Sample Receipt Notification (SRN)

Project:	**EAL/K5815**
Customer:	Tim Fitzroy & Associates Pty Ltd
Contact:	Tim Fitzroy
Client Job ID:	15/2021 BSC Lot 12 Bayshore Drive
No. of Samples	1 x Water
Date Received:	16 APR 2021
Comments:	Standard Request

Biler: **Tim Fitzroy & Associates Pty Ltd** - Tim Fitzroy

		Test Request
		SW-PACK-056
Sample Text ID	**Client Sample ID**	Gas Contamination Water Quality Monitoring
K5815/001	Rinsate Blank	1
Total		1

Southern Cross University
PO Box 157 Lismore NSW 2480
P: +61 2 6620 3678
E: eal@scu.edu.au
www.scu.edu.au/eal
ABN: 41 995 651 524

Sample Receipt Notification (SRN) for EAL/K5815

Test Descriptions

Test List Item	Item Description
SW-PACK-056	**Gas Contamination Water Quality Monitoring** pH, EC, TDS (by calc.), Total Alkalinity, TSS Metals (Al, As, Cd, Cr,Cu, Fe, Pb, Mn, Hg, Ni, Se, Ag, Zn) Subcontracting (TPH, BTEX)

21-1
1 of 1

Date/Time: 19 April 2021 2:44 pm

EAL Environmental Analysis Laboratory

PO Box 157 (Military Road)
LISMORE NSW 2480
T: 02 6620 3678 E: eal@scu.edu.au W: www.scu.edu.au

Submitting Client Details
Quote Id: EALQ6034
Job Ref: 15/2021 BSC Lot 12 Bayshore Drive
Company: Tim Fitzroy & Associates
Contact: Tim Fitzroy
Phone:
Mobile: 0448 483 837
Email: tim@timfitzroy.com.au
Postal address: 61 Pine Ave, East Ballina

Billing Client Details
☐ Tick if same as submitting details
ABN:
Company:
Contact:
Phone:
Mobile:
Email:
Postal address:

Payment Method:
☐ Purchase Order
☐ Cheque
☐ Credit/Debit Card (EAL staff will phone for details)
☐ Invoice (prior approval)

Relinquished: Date:
Received: Date:

Preservation: none - freezer bricks - ice - acidified - filtered - other
Condition on receipt: ambient - cool - frozen - other

In submitting samples, the Client agrees to the EAL Laboratory Services Terms and Conditions. These Terms and Conditions are available on the EAL website: scu.edu.au/eal, or on request.

Comments:
SS-Pack-042 Health Investigation (HIL) Soil Assessment
Email Quote 20% reduction

Note: 2 Lab Duplicates + 2 field Dups +1 Rinsate (BTEX) + 1 Trip Blank (TRH). All individual samples.
Likelihood and nature of Hazardous material:

Total number of samples: 29

Sample Analysis Request
Price list code (e.g. SW-PACK-06)

Lab ID	Sample ID	Sample Depth	Sampling Date	Sampler	Your Client	Crop ID	Sample Type (e.g. water, leaf, soil)	SS-Pack-042	SW-Pack-056	SS-Pack-017	SS-Sing-161		
	TFA 1A	0-0.1m	16.4.21	T Fitzroy	BSC		Soil	x			x		
	TFA 1B	1-1.2m	16.4.21	T Fitzroy	BSC		Soil				x		
	TFA 1C	1.4-1.5m	16.4.21	T Fitzroy	BSC		Soil	x					
	TFA 2A	0-0.1m	16.4.21	T Fitzroy	BSC		Soil	x			x		

EAL Project Reference: K5815 x 1 water

QFORM 4.2
Page 1 of 8

	TFA 2B	0.6-0.7m	16.4.21	T Fitzroy	BSC						x		

Comments:

Likelihood and nature of Hazardous material:

Sample Analysis Request

Price List Code (e.g. SW-PACK-06)

Lab ID	Sample ID	Sample Depth	Sampling Date	Sampler	Your Client	Crop ID	Sample Type (e.g. water, leaf, soil)	SS-Pack-042	SW-Pack-056	SS-Pack-017	SS-Sing-161		
	TFA 2C	1.1-1.2m	16.4.21	T Fitzroy	BSC		Soil	x					
	TFA 3A	0-0.1m	16.4.21	T Fitzroy	BSC		Soil	x			x		
	TFA 3B	0.5-0.6m	16.4.21	T Fitzroy	BSC		Soil				x		
	TFA 3C	0.8-0.9m	16.4.21	T Fitzroy	BSC		Soil	x					
	TFA 4A	0-0.1m	16.4.21	T Fitzroy	BSC		Soil	x			x		
	TFA 4B	0.5-0.6m	16.4.21	T Fitzroy	BSC		Soil				x		
	TFA 4C	1.2-1.3m	16.4.21	T Fitzroy	BSC		Soil	x					
	TFA 5A	0-0.1m	16.4.21	T Fitzroy	BSC		Soil	x			x		
	TFA 5B	0.9-1m	16.4.21	T Fitzroy	BSC		Soil				x		
	TFA 5C	1.4-1.5m	16.4.21	T Fitzroy	BSC		Soil	x					
	TFA 6A	0-0.1m	16.4.21	T Fitzroy	BSC		Soil	x			x		
	TFA 6B	0.5-0.6m	16.4.21	T Fitzroy	BSC		Soil				x		
	TFA 6C	1.2-1.3m	16.4.21	T Fitzroy	BSC		Soil	x					
	TFA 7A	0-0.1m	16.4.21	T Fitzroy	BSC		Soil	x			x		
	TFA 7B	0.5-0.6m	16.4.21	T Fitzroy	BSC		Soil				x		
	TFA 7C	1.2-1.3m	16.4.21	T Fitzroy	BSC		Soil	x					
	TFA 8A	0-0.1m	16.4.21	T Fitzroy	BSC		Soil	x			x		
	TFA 8B	1-1.1m	16.4.21	T Fitzroy	BSC		Soil				x		
	TFA 8C	1.3-1.4m	16.4.21	T Fitzroy	BSC		Soil	x					
	TFA 9A	0-0.1m	16.4.21	T Fitzroy	BSC		Soil	x			x		
	TFA 9B	1-1.1m	16.4.21	T Fitzroy	BSC		Soil				x		
	TFA 9C	1.3-1.4m	16.4.21	T Fitzroy	BSC		Soil	x					

EAL Project Reference:

	TFA 10A	0-0.1m	16.4.21	T Fitzroy	BSC		Soil	x			x		
	TFA 10B	0.3-0.4m	16.4.21	T Fitzroy	BSC		Soil				x		
	TFA 10C	1.4-1.5m	16.4.21	T Fitzroy	BSC		Soil	x					
	TFA11A	0-0.1m	16.4.21	T Fitzroy	BSC		Soil	x			x		
	TFA11B	0.3-0.4m	16.4.21	T Fitzroy	BSC		Soil				x		
	TFA 11C	1.6-1.7m	16.4.21	T Fitzroy	BSC		Soil	x					
	Field Dup 1A	0-0.1m	16.4.21	T Fitzroy	BSC		Soil	x			x		
	Field Dup 6B	0.5-0.6m	16.4.21	T Fitzroy	BSC		Soil				x		
	Lab Dup 1		16.4.21	T Fitzroy	BSC		Soil	x			x		
	Lab Dup 2		16.4.21	T Fitzroy	BSC		Soil	x			x		
	Trip Blank		16.4.21	T Fitzroy	BSC					x			
	Rinsate Blank		16.4.21	T Fitzroy	BSC				x				

Comments:

Likelihood and nature of Hazardous material:

Sample Analysis Request

Price List Code (e.g. SW-PACK-06)

Lab ID	Sample ID	Sample Depth	Sampling Date	Sampler	Your Client	Crop ID	Sample Type (e.g. water, leaf, soil)						

EAL Project Reference:

A Preliminary Site Investigation (BMack 2014)