PLANNING PROPOSAL – SES RIVER STREET MACLEAN (REZ2019/0001)

Prepared by: **Clarence Valley Council, Environment, Development & Strategic Planning Section**

Date: 4 February 2019

Declaration

Document name:	Planning Proposal - SES River Street Maclean (REZ2019/0001)
Document Author:	Terry Dwyer
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Qualifications of document author:	B. App Sci (Natural Resources), Assoc Dip (Env Plan), MPIA, CPP
Declaration:	I, Terry Dwyer, declare that this Planning Proposal constitutes a planning proposal for the purposes of section 3.33 of the Environmental Planning and Assessment Act 1979 (the Act) and further declare that the document complies with the relevant provisions of the Environmental Planning and Assessment Act 1979 and the Department of Planning and Environment's *A guide to preparing planning proposals* (August 2016).
Date:	4 February 2019

Document History and Version Control				
Version	**Prepared by**	**Approved by**	**Date Approved**	**Brief Description**
1.0	Terry Dwyer	David Morrison	4/02/19	Draft for submission to Planning Gateway

TABLE OF CONTENTS

Appendices

1. PRELIMINARY

1.1 Context

This planning proposal constitutes a document referred to in Section 3.33 of the Environmental Planning and Assessment Act 1979. It has been prepared in accordance with the Department of Planning and Environment's "*A guide to preparing planning proposals"* (August 2016). A gateway determination under Section 3.34 of the Act is requested.

1.2 Subject Land

This planning proposal applies to Lots 721 and 722 DP 1148111, River Street, Maclean, as shown indicated in red edging on the location plan (Figure 1) below. Refer also to formal Site identification plan at Appendix 1.

The land is owned by Council and has an aggregate area of 4183m^2 (Lot 721- 2255m^2; Lot 722 - 1883m^2).

Figure 1 - Location plan

An aerial photo showing the land (red edged) is in Figure 2 below.

Figure 2 - Aerial image

1.3 Current Zoning & Use

The land is currently zoned IN4 - Working Waterfront, under the Clarence Valley Local Environmental Plan 2011 (CVLEP). The current zoning of the land is portrayed on the current Land zoning map at Appendix 1.

The height of buildings on the land is currently NOT limited by the *Clarence Valley Local Environmental Plan 2011 Height of Buildings Map.*

Lot 721 accommodates the Maclean SES building and provides access to an adjoining boat ramp associated with such emergency services function. Lot 722 accommodates an old slipway and a number of buildings associated with the former Maclean depot. The site overall is used by the Maclean SES.

1.4 Background

Council on 21 August 2018 resolved to rezone the subject land from IN4 - Working Waterfront to B2 - Local Centre. A copy of the report considered by the Council on 21 August 2018 is at Appendix 8. Prior to the CVLEP that land was zoned 5(a) Special Uses – Slipway under the Maclean LEP 2001.

The land is also the subject of a current land reclassification process. Currently the land is deemed to be classified as "Community" land under sections 25 and 26 of the Local Government Act 1993 (LG Act). The land was originally intended to be classified as "operational". However as outlined in *Planning Proposal - Reclassification of Council Land 2018 (REZ2017/0003)* the legality of resolutions of the former Maclean and Ulmarra Councils and the Lower Clarence County Council to classify their public land holdings as per the requirements of Schedule 7, Clause 6 of the then newly proclaimed LG Act during that Act's transitional period (1 July 1993 - 30 June 1994) was brought into question in more recent times.

The currently in progress *Planning Proposal - Reclassification of Council Land 2018 (REZ2017/0003)* is now seeking to reclassify the land as operational. This will involve amending Schedule 4 of Clarence Valley Local Environmental Plan 2011 so as to include the land in Part 1 Land classified, or reclassified, as operational land - no interests changed of Schedule 4 thereby confirming reclassification of the land from community to operational.

The reclassification planning proposal is in the final stages and it is hoped that the necessary amendment to Schedule 4 of the CVLEP will be finalised by June 2019.

2. PART 1 - OBJECTIVE OR INTENDED OUTCOME

The objective/s or intended outcome/s of the planning proposal is to permit a range of uses on Lots 721 and 722 DP 1148111, River Street, Maclean that are consistent with the B2 Local Centre zone under the Clarence Valley LEP 2011.

3. PART 2 - EXPLANATION OF PROVISIONS

The objective/s or intended outcome/s of the Proposal will be achieved by:

1. Amending the CVLEP 2011 Land Zoning Map (Sheet LZN_011F) so that the land is zoned B2 Local Centre.

2. Amending the CVLEP 2011 Height of Buildings Map (Sheet HOB_011F) to apply a 9 metre building height.

A draft Land Zoning map and draft Height of Buildings Map has been prepared for the purposes of community consultation/public exhibition. These maps are located at Appendix 1.

4. PART 3 - JUSTIFICATION

4.1 Is the planning proposal a result of any strategic study or report?

No, the planning proposal is not the result of any strategy or study.

It is more of a result of a Council resolution dated 21 August 2018 to rezone the subject land from IN4 - Working Waterfront to B2 - Local Centre. In turn the Council resolution is based on a report considered by Council on 21 August 2018 following a review of the current restrictive zoning of the site.

The report notes that the current IN4 zone is more of an historical anomaly being adopted during the CVLEP process presumably due to the adjoining slipway and boat ramp facility and reflecting its previous zoning under the Maclean LEP 2001, that being 5(a) Special Uses - Slipway.

The report also notes that:

(i) such zoning restricts development to marine based industrial uses thereby restricting potential future land use options for the site.

(ii) marine based industrial uses under the present zoning are likely to conflict with uses permitted under the adjoining commercial and residential zones

The report states that in terms of future potential zoning for the site, it is considered that consistency with the adjoining B2 - Local Centre commercial zone is, on balance, the most logical.

The land is also the subject of a current land reclassification process. Currently the land is deemed to be classified as “Community” land under sections 25 and 26 of the Local Government Act 1993 (LG Act). The land was originally intended to be classified as “operational”. However as outlined in *Planning Proposal - Reclassification of Council Land 2018 (REZ2017/0003)* the legality of resolutions of the former Maclean and Ulmarra Councils and the Lower Clarence County Council to classify their public land holdings as per the requirements of Schedule 7, Clause 6 of the then newly proclaimed LG Act during that Act’s transitional period (1 July 1993 - 30 June 1994) was brought into question in more recent times.

The currently in progress *Planning Proposal - Reclassification of Council Land 2018 (REZ2017/0003)* is now seeking to reclassify the land as operational. This will involve amending Schedule 4 of Clarence Valley Local Environmental Plan 2011 so as to include the land in Part 1 Land classified, or reclassified, as operational land - no interests changed of Schedule 4 thereby confirming reclassification of the land from community to operational.

The reclassification planning proposal is in the final stages and it is hoped that the necessary amendment to Schedule 4 of the CVLEP will be finalised by June 2019.

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

Yes. A planning proposal supporting a rezoning of the site to a more appropriate zone than the current IN4 zone is considered the best means of achieving the objectives or intended outcomes. This will provide more flexibility in the possible range of uses under a future B2 zone.

The other main alternative is a planning proposal that aims to permit an additional permitted use on the land utilizing the “additional permitted uses” provided for by clause 2.5 and Schedule 1 of the LEP. This would not alter zone and merely make an additional specifically nominated use permissible with consent on the land. This is considered a less flexible approach.

RELATIONSHIP TO STRATEGIC PLANNING FRAMEWORK

4.3 Applicable Regional Plan - Is the planning proposal consistent with the objectives and actions of the applicable regional, sub-regional or district plan or strategy (including any exhibited draft plans or strategies)?

The *North Coast Regional Plan 2036* (NCRP 2036) released in March 2017 is the applicable regional plan. It is the NSW Government’s strategy for guiding land use planning decisions for the North Coast region.

The Regional Plan comprises four goals, 25 directions and 80 actions. The goals articulate the intended outcome; the directions identify the broad issues or policy areas that need to be focused on; and the actions represent the steps needed to be taken or initiatives that need to be implemented to achieve the goals. Actions are either implemented as strategies or as initiatives.

The North Coast Delivery, Coordination and Monitoring Committee has been established to oversee implementation of the vision, goals and actions in the Regional Plan. In this regard the North Coast Regional Plan 2036 - Implementation Plan 2017-2019 has also been released to accompany the Regional Plan.

The proposal is considered to be consistent with the NCRP 2036. An assessment of the planning proposal's consistency against the regional plans goals, directions and actions is at Appendix 2 (consistency checklist).

4.4 Consistency with Council's local strategies and other local strategic plans

The Clarence 2027 is Council's adopted community strategic plan. It is supported by Council's Delivery Program and Annual Operational Plan applicable at the time.

Other local strategies include:

- Council's Delivery Program and Operational Plan (applicable at the time)
- Maclean Urban Catchment Local Growth Management Strategy 2011
- South Grafton Heights Precinct Strategy
- Clarence Valley Settlement Strategy
- Lower Clarence Retail Strategy (May 2007)
- Yamba Retail/Commercial Strategy (May 2002)
- Clarence Valley Economic Development Strategic Plan
- Clarence Valley Industrial Lands Strategy
- Clarence Marine Precinct (2010)
- Clarence Valley Affordable Housing Strategy
- Clarence Valley Council Biodiversity Management Strategy 2010
- Clarence River Way Masterplan 2009
- Clarence Valley Open Spaces Strategic Plan 2012

An assessment of the planning proposal against the relevant local strategies is at Appendix 3 (consistency checklist).

4.5 Consistency with applicable state environmental planning policies

The proposal is consistent with applicable state environmental planning policies (SEPPs).

Refer to the consistency checklist against these policies at Appendix 4.

4.6 Consistency with applicable Ministerial Directions (s.9.1 Directions)

The proposal is consistent with applicable Section 9.1 Directions, except as otherwise specified and discussed in the consistency checklist at Appendix 5. Refer to the consistency checklist against these Directions at Appendix 5.

ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACT

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

No – not likely. It is considered that any future built development enabled by the planning proposal is unlikely to adversely affect critical habitat or threatened species, populations or ecological communities, or their habitats.

The site is highly disturbed and developed, containing a number of buildings and structures including the following:

(i) SES operational shed
(ii) SES boat shed and part of an associated boat ramp
(iii) Former public toilets
(iv) Storage sheds along the southern boundary; and
(v) Former slipway and slipway motor house

Overgrown vegetation and weeds occupy the interface of the western (river boundary) section of the land with the eastern section of Lots 723 and 724 DP 1148111 both of which actually front the river and are subject to a current Crown licence.

Notwithstanding the above it is noted that the land is for reasons unknown mapped as potential high environmental value. Refer to Figure 3 below.

Potential high environmental values have been mapped as part of the NCRP 2036. Actions 1.2 and 2.1 of the plan relate to areas mapped as potential high environmental value. These have been addressed in the NCRP 2036 consistency checklist at Appendix 2.

Figure 3 – mapped potential high environmental value (NCRP 2036)

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

4.8.1 Land Contamination

In acknowledgement of the likelihood of the site being contaminated Council commissioned a preliminary site investigation (PSI) and detailed site investigation (DSI) which was undertaken by Cavvanba Consulting Pty Ltd. This DSI was conducted under State Environmental Planning Policy No.55 (Contaminated Land) as part of the preparation of the planning proposal. The DSI complies with the relevant guidelines including

- Department of Urban Affairs and Planning (1998) State Environmental Planning Policy No. 55: Managing Land Contamination, Planning Guidelines SEPP 55 - Remediation of Land.
- EPA (formerly Office of Environment and Heritage (OEH)) (2011) Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites; and
- EPA (2017) Contaminated Sites: Guidelines for the NSW Site Auditor Scheme (3rd edition); and

- National Environment Protection Council (NEPC) National Environment Protection (Assessment of Site Contamination) Measure 1999 (ASC NEPM (2013)) – Schedule B2: Guideline on Site Characterisation (2013).

Cavvanba Consulting submitted the DSI report entitled *Detailed Site Investigation - 74 River Street, Maclean NSW (January 2019, Ref. 18058 R01 V3)* on 17 January 2019. A copy of the DSI report is at Appendix 7. The DSI report flags a number of exceedances of a range of contamination parameters/criteria.

Amongst the reports conclusions (section 11.0) are:

(i) The primary issue is metals and hydrocarbon contamination associated with the former use of the site as a slipway. Metals and PAHs have been identified in excess of site criteria and TRH has been identified in soil in excess of management limits.

(ii) Due to the close proximity of the Clarence River, further investigation is required to determine if off-site migration is occurring and either management or remediation of the site is required to mitigate future potential migration.

(iii) The land use is currently proposed to remain as commercial/industrial. Should the land use change to a more sensitive use, further investigation and remediation may be required, and consideration may need to be given to potential aesthetics issues.

Table 11.1 of the report highlights the issues from the investigation which should be managed including:

- Elevated metals (including zinc, lead and copper), TRH and PAHs in soil.
- Tributyltin in soil.
- Potential asbestos containing materials (ACM) in and within some structures/buildings and possibly in the soil.

Additional actions/investigations recommended by the report include:

- Remediation or management of impacts of elevated metals (including zinc, lead and copper), TRH and PAHs in the soil (Table 11.1).
- sampling of groundwater and also sediment of the Clarence River to determine if a contamination pathway exists due to Tributyltin (Table 11.1).
- Undertake a hazardous materials audit of potential ACM at the site prior to demolition (Table 11.1).
- Further investigation for evidence of, or potential for migration of contaminants from the site including potential risk to off-site receptors, and reported to the site owner or occupier.
- Further investigation is required to determine the appropriate management strategy

The conclusions of the DSI report should not necessarily preclude a particular zoning nor suggest that the planning proposal in support of a zoning change from IN4 Working Waterfront to B2 Local Centre should not proceed. Site contamination is an aspect to be considered during the DA process for a redevelopment. The further investigations recommended by DSI report should be carried out as part of the development assessment process. Remediation or management of

impacts should be carried out and completed before new development is carried out on the site depending on the nature of the use proposed and approved.

Finally the discussion in this section of the planning proposal provides only a snapshot of the findings and conclusions of the DSI report and in no way substitutes for a proper overview of the site contamination status of the land. In this regard the DSI report at Appendix 7 should be consulted.

4.8.2 Acid Sulfate Soils

The land is mapped as class 3 (74%) and class 5 (26%) acid sulfate soils (ASS) as indicated by the map at Figure 4 below.

Figure 4 – Acid sulfate soils map

The Ministers section 9.1 Direction 4.1 Acid Sulfate Soils is relevant. This Direction states that *"a relevant planning authority must not prepare a planning proposal that proposes an intensification of land uses on land identified as having a probability of containing acid sulfate soils on the Acid Sulfate Soils Planning Maps unless the relevant planning authority has considered an acid sulfate soils study assessing the appropriateness of the change of land use given the presence of acid sulfate soils. The relevant planning authority must provide a copy of any such study to the Director General prior to undertaking community consultation in satisfaction of section 57 of the Act. (7)".*

Council has not considered an ASS study as per paragraph (5) of the Direction rendering the planning proposal technically inconsistent with this Direction. However there is a case for justifiable inconsistency given that the likely works associated with any future development on the site should be able to be readily addressed and managed via the development consent process and the ASS provisions in clause 7.1 of the CVLEP 2011.

Under LEP clause 7.1 any future development and construction that involves:

- Works more than 1 metre below the natural ground surface; and/or
- Works by which the watertable is likely to be lowered more than 1 metre below the natural ground surface,

will require an acid sulfate soils management plan prepared in accordance with the ASS Manual to be lodged with a development application.

In addition to this, the inconsistency with Direction 4.1 can also be considered to be of minor significance.

4.8.3 Flooding

The land is subject to flooding from the Clarence River. The map at Figure 5 below indicates the extent of the land inundated by the 1 in 100 year flood based on the Clarence Valley Local Environmental Plan 2011 Flood Planning Map. The map at Figure 6 below shows a range of spot heights over the land in relation to the 1 in 100 year inundation area indicated by Council's current flood mapping layer.

The flood height is in the range of 3.96 – 4.07 metres AHD. Spot heights over the land range between 1.73 and 8.67m AHD; and within the inundation area depth of flood waters would range between 0.15 - 2.34 metres.

Refer also to discussion in Appendix 5 in relation to addressing consistency with section 9.1 Direction 4.3 Flood Prone land.

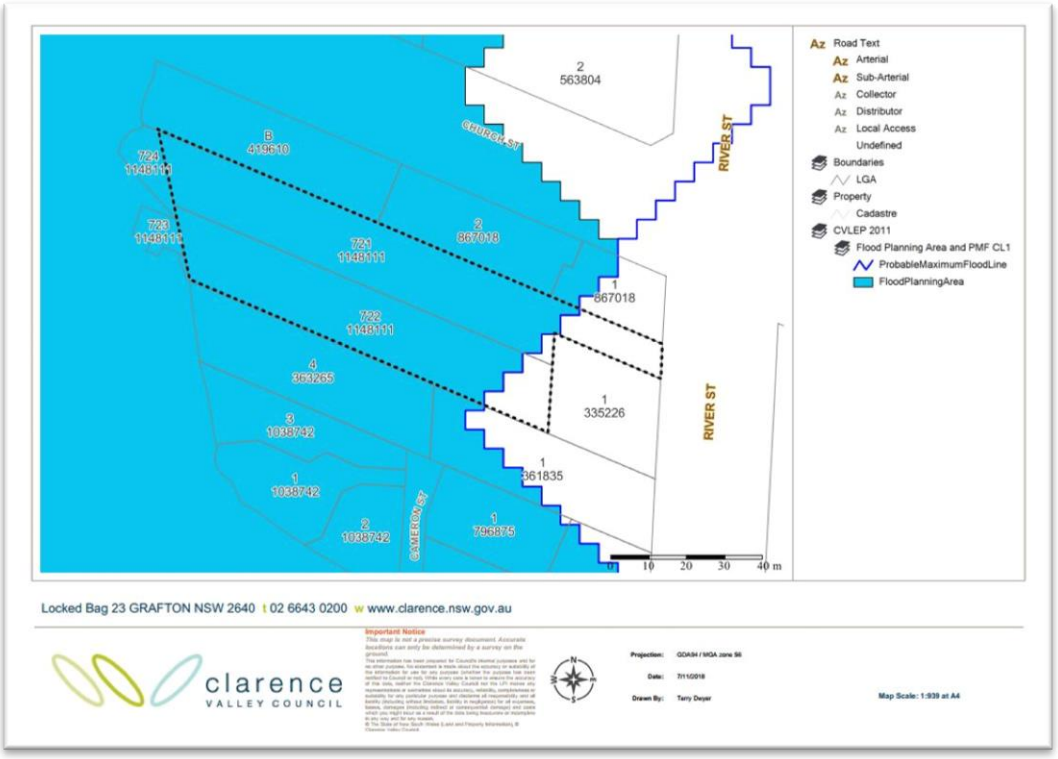


Figure 5 – Flood planning area map

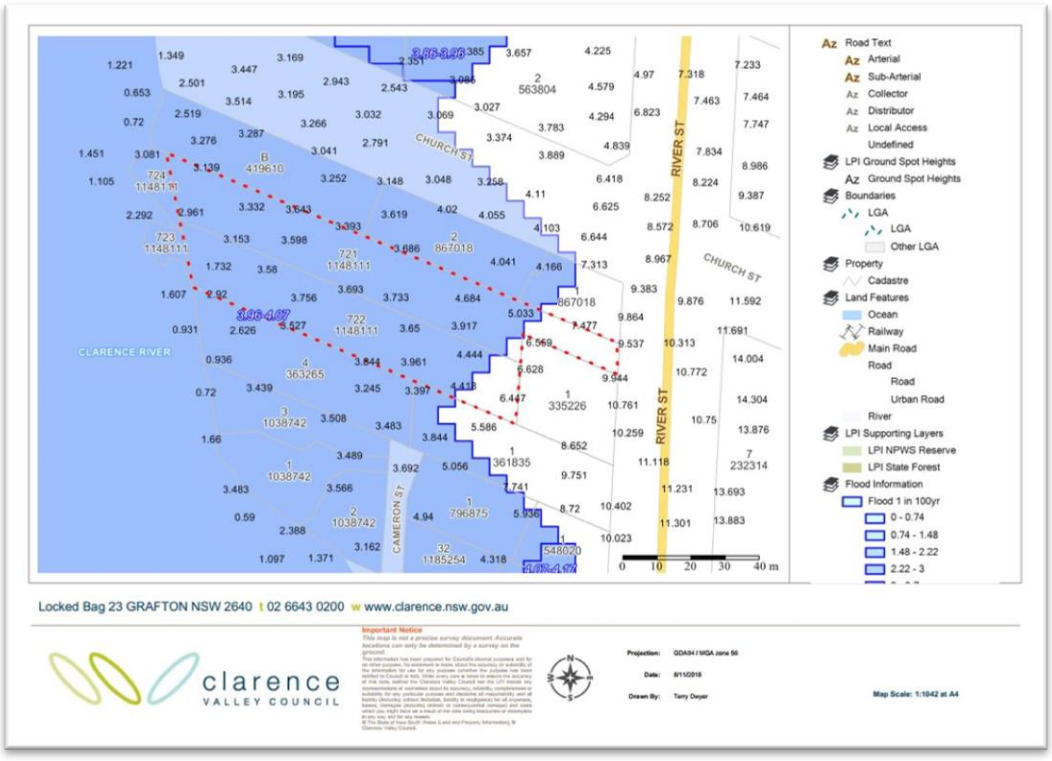


Figure 6 – spot heights of land (to AHD) in relation to flood level

4.9 Relevant social and economic effects?

Due to the minor nature and scale of the proposal there are not expected to be any adverse social impacts as the rezoning is unlikely to result in a significant change in land use. Similarly the minor nature and scale of the proposal is not expected to cause any adverse economic impacts as no significant change in land use is likely to result.

Action 18.2 of the NCRP mandates the undertaking of Aboriginal cultural heritage assessments to inform the design of planning and development proposals so that impacts to Aboriginal cultural heritage are minimised and appropriate heritage management mechanisms are identified. Refer to Appendix 2.

The site is highly disturbed and developed and principally for this reason it is intended to address Aboriginal cultural heritage issues at the development application (DA) stage.

The land is within a heritage conservation area (HCA). A heritage item (I253) is located upon adjoining 78 River Street (Lot 1, DP 361835). Refer to extract from the Clarence Valley Local Environmental Plan 2011 Heritage Map at Figure 7 below.

Figure 7 - Heritage map - CVLEP 2011

The statement of significance in the NSW State Heritage Register for 78 River Street, states the following:

"This building is historically significant as it is the first schoolmaster's residence in Maclean. It is also a representative example of a small early Victorian style cottage demonstrating brick construction with cement rendered over and steep galvanized iron multi hipped roof with no eaves".

Further the register listing also states that that the building/item is *"modified at the rear but presentation to River street has high integrity".*

A copy of the register listing for adjoining 78 River Street is at Appendix 6.

The historical significance of the slipway at the site has recently been drawn to the attention of Council via an email from Chris Towner a great nephew of Dugald (Dugie) Stuart Schwonberg and Claude Greybrook (Paddy) Schwonberg. The author has been made aware of *"a proposal to demolish the first slipway established on the Clarence River in northern NSW"*, referring in this instance to the old slipway at the site.

The email goes on to state:

"…The slipway and associated building is at Maclean, and a ship building enterprise was established at this site by Mr Joachim Nicolaus Schwonberg in 1866. Joachim Nicolaus' son Francis Henry Schwonberg, a past mayor of Maclean Council, entered the business with his father in the 1870s. Francis Henry used a hard hat diving suit, which he procured in the 1890s, to install the current slipway. He also used this diving suit, now on display at the Marine Discovery Centre at Terrigal, NSW, to install the slipway and for other significant underwater work and salvage, including of the S.S. Kallatina at Grafton. The slipway and remnants of the old wharf at Maclean, are perhaps the only remaining evidence of pioneering maritime history on the Clarence River, other than photographic and written material.

Schwonberg's Slipway and boat building and maintenance yard remained in operation until the 1930s, operated by Francis Henry and then his son Bruce Schwonberg. Other sons of Frank Schwonberg also learnt the trade of shipwright in this shipyard, as did Frank's grandson Dugald Stuart Towner. In the 1930s the business declined, and the slipway and surrounds were procured by Maclean Council. Stuart Towner was then employed by the Council to maintain the ferries on the Clarence, a duty he was recalled from the RAAF during WWII to perform, which he did until 1973 when he retired due to ill health. The shipyard and slipway had therefore been operated by this one family at Maclean for over 100 years.

The slipway, cradle and surrounds would require little effort to restore to a presentable condition, and it may even be possible to recover the motor used to winch up the cradle/boats/ferries from whoever removed it. Descendants of the Schwonbergs have many models that were used in the boat building enterprise, and some are already in the Maclean Museum, as well as historical photographs. Information on this history is available from the Maclean Museum, including in the book Finding Dugie and Claude, by Greg Towner, copies of which are also available in the NSW Parliamentary Library and the State Library, and a digital copy is attached.

I plead with you to preserve this important remnant of our Clarence River heritage. I realise there are financial implications for the Clarence River Council, but the descendants of the Schwonbergs, many still living in Maclean and the Northern Rivers area, as well as me, would I'm sure be willing to donate time, historical material, and money to support this site. Clarence Council could also apply for a grant from the NSW Office of Environment and Heritage, and this would be a worthy cause. Applications close this year by midday on 8 February".

The information pertaining to the slipway is of great interest. However it should be noted that it is not proposed at this stage to demolish the old slipway rail/s, underlying concrete base and the timber slipway cradle which sits atop the slipway rail/s; these items appear to be of greatest concern to Chris Towner. It is proposed to undertake a heritage impact assessment of the slipway and cradle as part of a DA process associated with any proposed built development on the land.

It is otherwise considered that the scale and form of future development on the site can be designed and managed via the development assessment process so as not to adversely impact the values of the slipway and cradle structure, HCA, associated streetscape and adjoining heritage item. This is in part due the battle-axe style configuration of Lots 721 and 722 DP 1148111 combined with the topography i.e. "sloping away from the road" which should ensure that future development is located behind the heritage item and be able to be designed such that it should not unduly impose upon the heritage item nor dominate the streetscape.

STATE AND COMMONWEALTH INTERESTS

4.10 Is there adequate public infrastructure for the planning proposal?

There is considered to be adequate public infrastructure (water, sewer, electricity, telecommunications etc) available for the modest scale of future development that would be permitted under the proposed B2 zoning.

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

The views of any relevant State and Commonwealth public authorities have not been sought prior to the issue of a gateway determination.

A gateway determination has not yet been issued.

Refer also to Section 6. PART 5 - COMMUNITY CONSULTATION, below.

5. PART 4 - MAPPING

A site identification plan has been prepared to clearly indicate the land the subject of this planning proposal. This is located at Appendix 1.

A draft Land Zoning map and draft Height of Buildings Map has been prepared for the purposes of community consultation/public exhibition. These maps are located at Appendix 1.

6. PART 5 - COMMUNITY CONSULTATION

It is considered that the proposal is a 'low impact' for the purpose of community consultation under Section 5.5.2 of *"A guide to preparing local environmental plans, August 2016".*

Notwithstanding this, it is intended that the planning proposal be publicly exhibited/advertised for 28 days. It is also intended to provide written notification to land owners in the immediate vicinity of the subject land.

It is anticipated that the following State and Commonwealth authorities may be considered as relevant to consult following the issue of any gateway determination:

- NSW DPI Fisheries
- Office of Environment and Heritage
- Fisheries NSW
- Roads and Maritime Services
- Yaegl Local Aboriginal land Council.

A public hearing is not considered necessary.

7. PART 6 - PROJECT TIMELINE

An estimated timeline for this project is 9 months from the issue of a Gateway determination, providing such determination does not impose conditions that are onerous to satisfy. The table below provides some estimated timeframes or dates for specific milestones.

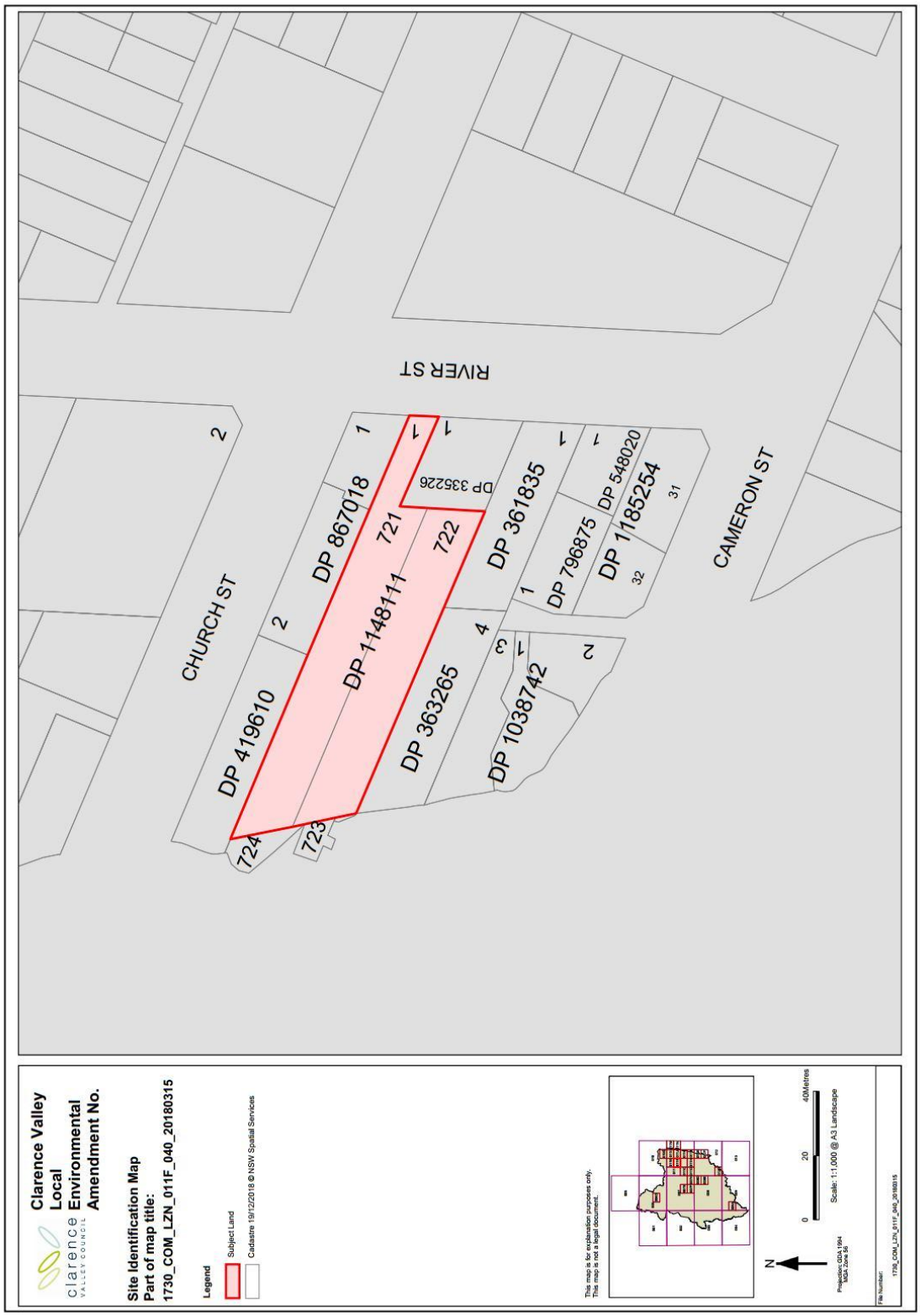
Specific milestone	Milestone timeframe or date
Date submitted to Planning Gateway	5 February 2019
Anticipated issue of Gateway determination	28 February 2019
Completion of required technical information	Timing depend on the nature and extent of required additional technical studies/investigations
Public exhibition including period	8 March - 5 April 2019 • *commencement date assumes no additional technical studies/investigations are required*
Dates for public hearing (if required)	N/A
Timeframe for the consideration of a proposal post exhibition	28 May 2019 – Ordinary Council meeting
Date of submission to the Dept. Planning and Environment to finalise the LEP (if not delegated to Council)	3 June 2019

APPENDIX 1: MAPPING

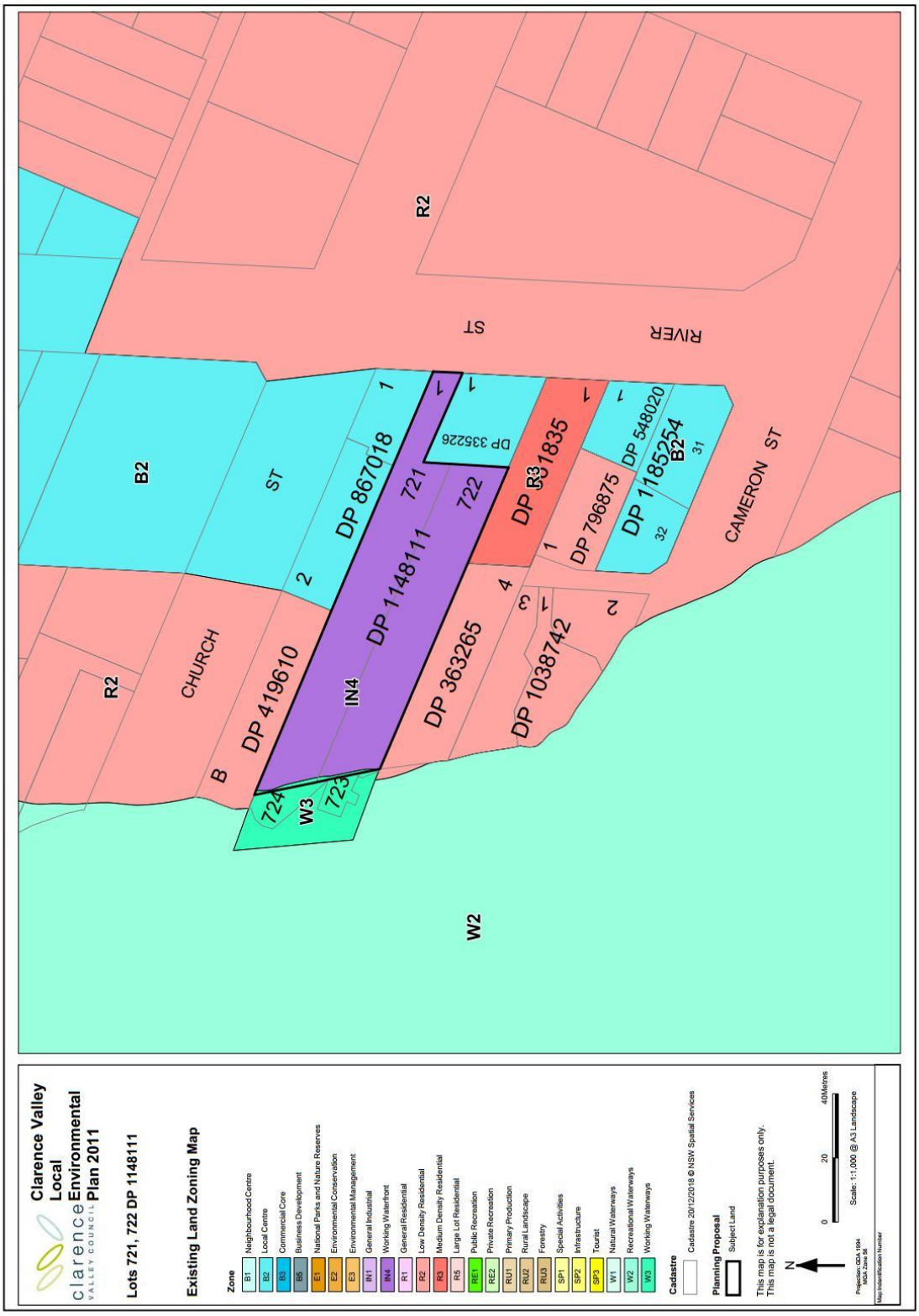
Maps include in APPENDIX 1:

- **Site identification plan**
- **Existing land zoning map**
- **Draft land zoning map**
- **Draft Height of buildings map**

APPENDIX 1 (cont): Site identification plan



APPENDIX 1 (cont): Existing land zoning map



APPENDIX 1 (cont): Draft land zoning map

(to be inserted)

APPENDIX 1 (cont): Draft Height of buildings map

(to be inserted)

APPENDIX 2: NORTH COAST REGIONAL PLAN 2036 CONSISTENCY CHECKLIST

(Note - refer to section 4.3 of this template document)

NORTH COAST REGIONAL PLAN 2036 GOALS, DIRECTIONS & ACTIONS	CONSISTENCY	COMMENTS
Goal 1 - The most stunning environment in NSW **Direction 1 - Deliver environmentally sustainable growth**		
Action 1.1 - Focus future urban development to mapped urban growth areas.	Yes	Consistent. The land is within an urban growth area. Therefore any new development on the land will be within an urban growth area.
Action 1.2 - Review areas identified as 'under investigation' within urban growth areas to identify and map sites of potentially high environmental value.	Yes	Consistent. It is noted that the land is for reasons unknown mapped as potential high environmental value. Action 1.2 relates more to areas 'under investigation' within urban growth areas. The land is within an existing urban growth area and is not part of an identified investigation area.
Action 1.3 - Identify residential, commercial or industrial uses in urban growth areas by developing local growth management strategies endorsed by the Department of Planning and Environment.	Yes	Consistent although Council has not yet developed a local growth management strategy.
Action 1.4 - Prepare land release criteria to assess appropriate locations for future residential, commercial and industrial uses.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Goal 1 - The most stunning environment in NSW **Direction 2 - Enhance biodiversity, coastal and aquatic habitats, and water catchments**		
Action 2.1 - Focus development to areas of least biodiversity sensitivity in the region and implement the 'avoid, minimise, offset' hierarchy to biodiversity, including areas of high environmental value.	Yes	Consistent. It is noted that the land is for reasons unknown mapped as potential high environmental value. Due to the disturbed and developed nature of the site biodiversity is not considered to be a significant issue.
Action 2.2 - Ensure local plans manage marine environments, water catchment areas and groundwater sources to avoid potential development impacts.	Yes	Consistent. It is expected that any potential impacts on marine environments and groundwater sources can be

NORTH COAST REGIONAL PLAN 2036 GOALS, DIRECTIONS & ACTIONS	CONSISTENCY	COMMENTS
		adequately managed via the development assessment process.
Goal 1 - The most stunning environment in NSW **Direction 3 - Manage natural hazards and climate change**		
Action 3.1 - Reduce the risk from natural hazards, including the projected effects of climate change, by identifying, avoiding and managing vulnerable areas and hazards.	Yes	Consistent. It is expected that any potential impacts on marine environments and groundwater sources can be adequately managed via the development assessment process.
Action 3.2 - Review and update floodplain risk, bushfire and coastal management mapping to manage risk, particularly where urban growth is being investigated.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Action 3.3 - Incorporate new knowledge on regional climate projections and related cumulative impacts in local plans for new urban development.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Goal 1 - The most stunning environment in NSW **Direction 4 - Promote renewable energy opportunities**		
Action 4.1 - Diversify the energy sector by identifying renewable energy resource precincts and infrastructure corridors with access to the electricity network.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Action 4.2 - Enable appropriate smaller-scale renewable energy projects using bio-waste, solar, wind, small-scale hydro, geothermal or other innovative storage technologies.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Action 4.3 - Promote appropriate smaller and community-scale renewable energy projects.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Goal 2 - A thriving, interconnected economy **Direction 5 - Strengthen communities of interest and cross-regional relationships**		
Action 5.1 - Collaborate on regional and intra-regional housing and employment land delivery, and industry development.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Action 5.2 - Integrate cross-border land use planning between NSW and South East Queensland, and remove barriers to economic, housing and jobs growth.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Action 5.3 - Encourage ongoing cooperation and land use planning between the City of Gold Coast and Tweed Shire Council.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Action 5.4 - Prepare a regional economic development strategy that drives economic growth opportunities by identifying key enabling infrastructure and other policy interventions to unlock growth.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Goal 2 - A thriving, interconnected economy		

NORTH COAST REGIONAL PLAN 2036 GOALS, DIRECTIONS & ACTIONS	CONSISTENCY	COMMENTS
Direction 6 - Develop successful centres of employment		
Action 6.1 - Facilitate economic activity around industry anchors such as health, education and airport facilities by considering new infrastructure needs and introducing planning controls that encourage clusters of related activity.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Action 6.3 - Promote knowledge industries by applying flexible planning controls, providing business park development opportunities and identifying opportunities for start-up industries.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Action 6.3 - Reinforce centres through local growth management strategies and local environmental plans as primary mixed-use locations for commerce, housing, tourism, social activity and regional services.	Yes	Consistent although Council has not yet developed a local growth management strategy.
Action 6.4 - Focus retail and commercial activities in existing centres and develop place–making focused planning strategies for centres.	Yes	Consistent. Future development in the proposed B2 zone over this land will be focused adjacent to land that is currently zoned B2 and that accommodates existing commercial activities.
Action 6.5 - Promote and enable an appropriate mix of land uses and prevent the encroachment of sensitive uses on employment land through local planning controls.	Yes	Consistent. Future development in the proposed B2 zone over this land will be capable of facilitating future development compatible with existing surround commercial development.
Action 6.6 - Deliver an adequate supply of employment land through local growth management strategies and local environmental plans to support jobs growth.	Yes	Consistent. The planning proposal will deliver a minor quantum of additional employment land complementing the existing stock of employment land in the locality.
Action 6.7 - Ensure employment land delivery is maintained through an annual North Coast Housing and Land Monitor.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Goal 2 - A thriving, interconnected economy **Direction 7 - Coordinate the growth of regional cities**		
Action 7.1 - Prepare action plans for regional cities that: ▪ ensure planning provisions promote employment growth and greater housing diversity; ▪ promote new job opportunities that complement existing employment nodes around existing education, health and airport precincts; ▪ identify infrastructure constraints and public domain improvements that can make areas more attractive for investment; and	Yes	Consistent although this action is not directly relevant to the planning proposal.

NORTH COAST REGIONAL PLAN 2036 GOALS, DIRECTIONS & ACTIONS	CONSISTENCY	COMMENTS
▪ deliver infrastructure and coordinate the most appropriate staging and sequencing of development.		
Goal 2 - A thriving, interconnected economy **Direction 8 - Promote the growth of tourism**		
Action 8.1 - Facilitate appropriate large-scale tourism developments in prime tourism development areas such as Tweed Heads, Tweed Coast, Ballina, Byron Bay, Coffs Harbour and Port Macquarie.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Action 8.2 - Facilitate tourism and visitor accommodation and supporting land uses in coastal and rural hinterland locations through local growth management strategies and local environmental plans.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Action 8.3 - Prepare destination management plans or other tourism focused strategies that: ▪ identify culturally appropriate Aboriginal tourism opportunities; ▪ encourage tourism development in natural areas that support conservation outcomes; and ▪ strategically plan for a growing international tourism market.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Action 8.4 - Promote opportunities to expand visitation to regionally significant nature-based tourism places, such as Ellenborough Falls, Dorrigo National Park, Wollumbin–Mount Warning National Park, Iluka Nature Reserve and Yuraygir Coastal Walk.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Action 8.5 - Preserve the region's existing tourist and visitor accommodation by directing permanent residential accommodation away from tourism developments, except where it is ancillary to existing tourism developments or part of an area otherwise identified for urban expansion in an endorsed local growth management strategy.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Goal 2 - A thriving, interconnected economy **Direction 9: Strengthen regionally significant transport corridors**		
Action 9.1 - Enhance the competitive value of the region by encouraging business and employment activities that leverage major inter-regional transport connections, such as the Pacific Highway, to South East Queensland and the Hunter.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Action 9.2 - Identify buffer and mitigation measures to minimise the impact of development on regionally significant transport infrastructure including regional and state road network and rail corridors.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Action 9.3 - Ensure the effective management of the State and regional road network by: ▪ preventing development directly adjoining the Pacific Highway;	Yes	Consistent although this action is not directly relevant to the planning proposal.

NORTH COAST REGIONAL PLAN 2036 GOALS, DIRECTIONS & ACTIONS	CONSISTENCY	COMMENTS
▪ preventing additional direct 'at grade' access to motorway-class sections of the Pacific Highway; ▪ locating highway service centres on the Pacific Highway at Chinderah, Ballina, Maclean, Woolgoolga, Nambucca Heads, Kempsey and Port Macquarie, approved by the Department of Planning and Environment and Roads and Maritime Services; and ▪ identifying strategic sites for major road freight transport facilities.		
Goal 2 - A thriving, interconnected economy **Direction 10 - Facilitate air, rail and public transport infrastructure**		
Action 10.1 - Deliver airport precinct plans for Ballina–Byron, Lismore, Coffs Harbour and Port Macquarie that capitalise on opportunities to diversify and maximise the potential of value-adding industries close to airports.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Action 10.2 - Consider airport-related employment opportunities and precincts that can capitalise on the expansion proposed around Gold Coast Airport.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Action 10.3 - Protect the North Coast Rail Line and high-speed rail corridor to ensure network opportunities are not sterilised by incompatible land uses or land fragmentation.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Action 10.4 - Provide public transport where the size of the urban area has the potential to generate sufficient demand.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Action 10.5 - Deliver a safe and efficient transport network to serve future release areas.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Goal 2 - A thriving, interconnected economy **Direction 11: Protect and enhance productive agricultural lands**		
Action 11.1 - Enable the growth of the agricultural sector by directing urban and rural residential development away from important farmland and identifying locations to support existing and small-lot primary production, such as horticulture in Coffs Harbour.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Action 11.2 - Deliver a consistent management approach to important farmland across the region by updating the Northern Rivers Farmland Protection Project (2005) and Mid North Coast Farmland Mapping Project (2008).	Yes	Consistent although this action is not directly relevant to the planning proposal.
Action 11.3 - Identify and protect intensive agriculture clusters in local plans to avoid land use conflicts, particularly with residential and rural residential expansion.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Action 11.4 - Encourage niche commercial, tourist and recreation activities	Yes	Consistent although this action is not

NORTH COAST REGIONAL PLAN 2036 GOALS, DIRECTIONS & ACTIONS	CONSISTENCY	COMMENTS
that complement and promote a stronger agricultural sector, and build the sector's capacity to adapt to changing circumstances.		directly relevant to the planning proposal.
Action 11.5 - Address sector-specific considerations for agricultural industries through local plans.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Goal 2 - A thriving, interconnected economy **Direction 12 - Grow agribusiness across the region**		
Action 12.1 - Promote the expansion of food and fibre production, agrichemicals, farm machinery, wholesale and distribution, freight and logistics, and processing through flexible planning provisions in local growth management strategies and local environmental plans.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Action 12.2 - Encourage the co-location of intensive primary industries, such as feedlots and compatible processing activities.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Action 12.3 - Examine options for agribusiness to leverage proximity from the Gold Coast and Brisbane West Wellcamp airports.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Action 12.4 - Facilitate investment in the agricultural supply chain by protecting assets, including freight and logistics facilities, from land use conflicts arising from the encroachment of incompatible land uses.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Goal 2 - A thriving, interconnected economy **Direction 13 - Sustainably manage natural resources**		
Action 13.1 - Enable the development of the region's natural, mineral and forestry resources by directing to suitable locations land uses such as residential development that are sensitive to impacts from noise, dust and light interference.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Action 13.2 - Plan for the ongoing productive use of lands with regionally significant construction material resources in locations with established infrastructure and resource accessibility.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Goal 3 - Vibrant and engaged communities **Direction 14 - Provide great places to live and work**		
Action 14.1 - Prepare precinct plans in growth areas, such as Kingscliff, or centres bypassed by the Pacific Highway, such as Woodburn and Grafton, to guide development and establish appropriate land use zoning, development standards and developer contributions.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Action 14.2 - Deliver precinct plans that are consistent with the Precinct Plan Guidelines (Appendix C).	Yes	Consistent although this action is not directly relevant to the planning proposal.
Goal 3 - Vibrant and engaged communities **Direction 15 - Develop healthy, safe, socially engaged and well-connected communities**		
Action 15.1 - Deliver best-practice guidelines for planning, designing and	Yes	Consistent although this action is not

NORTH COAST REGIONAL PLAN 2036 GOALS, DIRECTIONS & ACTIONS	CONSISTENCY	COMMENTS
developing healthy built environments that respond to the ageing demographic and subtropical climate.		directly relevant to the planning proposal.
Action 15.2 - Facilitate more recreational walking and cycling paths and expand inter-regional and intra-regional walking and cycling links, including the NSW Coastline Cycleway.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Action 15.3 - Implement actions and invest in boating infrastructure priorities identified in regional boating plans to improve boating safety, boat storage and waterway access.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Action 15.4 - Create socially inclusive communities by establishing social infrastructure benchmarks, minimum standards and social impact assessment frameworks within local planning.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Action 15.5 - Deliver crime prevention through environmental design outcomes through urban design processes.		
Goal 3 - Vibrant and engaged communities **Direction 16 - Collaborate and partner with Aboriginal communities**		
Action 16.1 - Develop partnerships with Aboriginal communities to facilitate engagement during the planning process, including the development of engagement protocols.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Action 16.2 - Ensure Aboriginal communities are engaged throughout the preparation of local growth management strategies and local environmental plans.	Yes	Consistent. This proposal is of minor nature and scale and is considered unlikely to impact the interests of Aboriginal communities to the extent that would warrant targeted consultation or engagement. It is proposed to consult the Yaegl Local Aboriginal Land Council.
Goal 3 - Vibrant and engaged communities **Direction 17: Increase the economic self-determination of Aboriginal communities**		
Action 17.1 - Deliver opportunities to increase the economic independence of Aboriginal communities through training, employment and tourism.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Action 17.2 - Foster closer cooperation with Local Aboriginal Land Councils to identify the unique potential and assets of the North Coast communities.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Action 17.3 - Identify priority sites with economic development potential that Local Aboriginal Land Councils may wish to consider for further investigation.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Goal 3 - Vibrant and engaged communities **Direction 18 - Respect and protect the North Coast's Aboriginal heritage**		

NORTH COAST REGIONAL PLAN 2036 GOALS, DIRECTIONS & ACTIONS	CONSISTENCY	COMMENTS
Action 18.1 - Ensure Aboriginal objects and places are protected, managed and respected in accordance with legislative requirements and the wishes of local Aboriginal communities.	Yes	Consistent. The planning proposal will ensure that any Aboriginal objects that occur or likely to occur will be managed to ensure their protection as part of any new development. The site is highly disturbed and developed and principally for this reason it is intended to address Aboriginal cultural heritage issues at the development application (DA) stage.
Action 18.2 - Undertake Aboriginal cultural heritage assessments to inform the design of planning and development proposals so that impacts to Aboriginal cultural heritage are minimised and appropriate heritage management mechanisms are identified.	Yes	Consistent. The site is highly disturbed and developed and principally for this reason it is intended to address Aboriginal cultural heritage issues at the development application (DA) stage.
Action 18.3 - Develop local heritage studies in consultation with the local Aboriginal community, and adopt appropriate measures in planning strategies and local plans to protect Aboriginal heritage.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Action 18.4 - Prepare maps to identify sites of Aboriginal heritage in 'investigation' areas, where culturally appropriate, to inform planning strategies and local plans to protect Aboriginal heritage.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Goal 3 - Vibrant and engaged communities **Direction 19 - Protect historic heritage**		
Action 19.1 - Ensure best-practice guidelines are considered such as the Australia International Council on Monuments and Sites (ICOMOS) Charter for Places of Cultural Significance and the NSW Heritage Manual when assessing heritage significance.	Yes	Consistent. Refer also section 4.9 of the planning proposal document.
Action 19.2 - Prepare, review and update heritage studies in consultation with the wider community to identify and protect historic heritage items, and include appropriate local planning controls.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Action 19.3 - Deliver the adaptive or sympathetic use of heritage items and assets.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Goal 3 - Vibrant and engaged communities **Direction 20 - Maintain the region's distinctive built character**		
Action 20.1 - Deliver new high-quality development that protects the distinct character of the North Coast, consistent with the North Coast Urban Design Guidelines (2009)	Yes	Consistent although this action is not directly relevant to the planning proposal.

NORTH COAST REGIONAL PLAN 2036 GOALS, DIRECTIONS & ACTIONS	CONSISTENCY	COMMENTS
Action 20.2 - Review the North Coast Urban Design Guidelines (2009).	Yes	Consistent although this action is not directly relevant to the planning proposal.
Goal 3 - Vibrant and engaged communities **Direction 21 - Coordinate local infrastructure delivery**		
Action 21.1 - Undertake detailed infrastructure service planning to support proposals for new major release areas.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Action 21.2 - Maximise the cost-effective and efficient use of infrastructure by directing development towards existing infrastructure or promoting the co-location of new infrastructure.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Goal 4 - Great housing choice and lifestyle options **Direction 22 - Deliver greater housing supply**		
Action 22.1 - Deliver an appropriate supply of residential land within local growth management strategies and local plans to meet the region's projected housing needs.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Action 22.2 - Facilitate housing and accommodation options for temporary residents by: ▪ preparing planning guidelines for seasonal and itinerant workers accommodation to inform the location and design of future facilities; and ▪ working with councils to consider opportunities to permit such facilities through local environmental plans.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Action 22.3 - Monitor the supply of residential land and housing through the North Coast Housing and Land Monitor.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Goal 4 - Great housing choice and lifestyle options **Direction 23 - Increase housing diversity and choice**		
Action 23.1 - Encourage housing diversity by delivering 40 per cent of new housing in the form of dual occupancies, apartments, townhouses, villas or dwellings on lots less than 400 square metres, by 2036.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Action 23.1 - Develop local growth management strategies to respond to changing housing needs, including household and demographic changes, and support initiatives to increase ageing in place.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Goal 4 - Great housing choice and lifestyle options **Direction 24: Deliver well-planned rural residential housing areas**		
Action 24.1 - Facilitate the delivery of well-planned rural residential housing areas by: ▪ identifying new rural residential areas in a local growth management strategy or rural residential land release strategy endorsed by the	Yes	Consistent although this action is not directly relevant to the planning proposal.

NORTH COAST REGIONAL PLAN 2036 GOALS, DIRECTIONS & ACTIONS	CONSISTENCY	COMMENTS
Department of Planning and Environment; and ▪ ensure that such proposals are consistent with the Settlement Planning Guidelines: Mid and Far North Coast Regional Strategies (2007) or land release criteria (once finalised).		
Action 24.2 - Enable sustainable use of the region's sensitive coastal strip by ensuring new rural residential areas are located outside the coastal strip, unless already identified in a local growth management strategy or rural residential land release strategy endorsed by the Department of Planning and Environment.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Goal 4 - Great housing choice and lifestyle options **Direction 25 - Deliver more opportunities for affordable housing**		
Action 25.1 - Deliver more opportunities for affordable housing by incorporating policies and tools into local growth management strategies and local planning controls that will enable a greater variety of housing types and incentivize private investment in affordable housing.	Yes	Consistent although this action is not directly relevant to the planning proposal.
Action 25.2 - Prepare guidelines for local housing strategies that will provide guidance on planning for local affordable housing needs.	Yes	Consistent although this action is not directly relevant to the planning proposal.

APPENDIX 3: COUNCILS LOCAL STRATEGY AND STRATEGIC PLAN/S CONSISTENCY CHECKLIST

(Note - refer to section 4.4 of this template document)

Strategy/Strategic Plan	Relevant component/statement of consistency
The Clarence 2027	The proposal is relevant to the following Community Plan themes and objectives: *(Note - list below)*
	Theme – Economy Objective 3.1 We will have an attractive and diverse environment for business, tourism and industry
Council's Delivery Program and Operational Plan (Note: this changes annually)	The planning proposal will complement and is consistent with the following strategies and actions under the current Delivery Program and Operational Plan. *(Note - list below)*
	Objective 3.1 We will have an attractive and diverse environment for business, tourism and industry Strategy 3.1.3 – Provide land use planning that facilitates and balances economic growth, environmental protection and social equity
Maclean Urban Catchment Local Growth Management Strategy 2011	Not relevant. This strategy is only applicable to the urban growth areas of Townsend, Gulmarrad and James Creek.
South Grafton Heights Precinct Strategy	Not relevant. The planning proposal has no direct relevance to this strategy and vice versa.
Clarence Valley Settlement Strategy	The CVSS is broadly relevant to this proposal. The planning proposal is considered broadly consistent with the strategy including its settlement hierarchy, objectives, principles as well as the specific area strategy for Maclean – Townsend.
Lower Clarence Retail Strategy (May 2007)	The scale proposed the proposal is neither explicitly consistent nor inconsistent with the LCRS. At worst it could be regarded to be of minor inconsistency particularly given its location between two areas zoned B2.
Yamba Retail/Commercial Strategy (May 2002)	Not relevant. The planning proposal has no direct relevance to this strategy and vice versa.
Clarence Valley Economic Development Strategic Plan	Although this plan has some relevance it appears that the planning proposal does not exhibit any explicit inconsistency with it. More appropriately the proposal can be regarded as not antipathetic to the plan and its strategies.
Clarence Valley Industrial Lands Strategy	This strategy is relevant in the context of the marine industry component of the Strategy. Strategic Intent V – Marine industry of the strategy states: *"Support for the provision of lands located on the Clarence River to leverage competitive locational advantages and provide for industry expansion:* • *The River access and established nature of the marine industry in the Clarence Valley provide an obvious opportunity for expansion. There is the potential to expand the current sector and to cluster supporting marine businesses in the Clarence Valley to respond to market trends. The preferred area for marine sector development and marine support services would*

	be in the Lower Clarence close to existing industry, skilled labour force and with access to the Clarence River". In July 2015 approximately 17 ha of land at Harwood (Harwood Marine/Slipway) was rezoned to IN4 thus contributing significantly to the achievement of the strategy's Strategic Intent V. The sites IN4 Working Waterfront generally facilitates development, including light industries, relating to waterfront industrial and maritime activities. However under the current tenure (Council ownership) a future "marine/waterfront industrial" use is unlikely and may not be desirable in the current mixed urban setting (commercial/residential) due to the likelihood of land use conflict. Further the land has an area of 4138m2 which at best can only offer a smaller scale "marine/waterfront industrial" opportunity. The rezoning of the land from IN4 to B2 is not considered to be antipathetic to the Councils Industrial Lands Strategy and Clarence Marine Precinct Plan due to the above factors and also that there is ample zoned area available in the Lower Clarence (e.g. approximately 23ha at Harwood - Harwood Marine/Slipway) available for "marine/waterfront industrial" use and activity.
Clarence Marine Precinct (2010)	Refer to comment on Clarence Valley Industrial Lands Strategy, above.
Clarence Valley Affordable Housing Strategy	Not relevant. The planning proposal has no direct relevance to this strategy and vice versa.
Clarence Valley Council Biodiversity Management Strategy 2010	Not relevant. The planning proposal has no direct relevance to this strategy and vice versa.
Clarence River Way Masterplan 2009	Not relevant. The land does not play a role in this masterplan.
Clarence Valley Open Spaces Strategic Plan 2012	Not relevant. The land does not play a role in this strategic plan.

APPENDIX 4: STATE ENVIRONMENTAL PLANNING POLICY CONSISTENCY CHECKLIST

(Note - refer to section 4.5 of this template document)

Name of SEPP	Relevant/applicable?	Comment/statement of consistency
The following State Environmental Planning Policies (SEPPs) are current and whilst not all may be applicable to the Clarence Valley LGA they are all being acknowledged and some are considered in more detail where relevant.		
State Environmental Planning Policy No 1 - Development Standards	No	Not applicable to the CVLEP 2011 or to the planning proposal.
State Environmental Planning Policy No 19 - Bushland in Urban Areas	No	N/A
State Environmental Planning Policy No 21 - Caravan Parks	No	N/A - as this proposal is not for a caravan park; nor is development application (DA).
State Environmental Planning Policy No 30 - Intensive Agriculture	No	N/A
State Environmental Planning Policy No 33 - Hazardous and Offensive Development	No	N/A
State Environmental Planning Policy No 36 - Manufactured Home Estates	No	N/A
State Environmental Planning Policy No 44 - Koala Habitat Protection	No	This is not a development application (DA). The planning proposal is not proposing to rezone land or facilitate the carrying of a particular development.
State Environmental Planning Policy No 47 - Moore Park Showground	No	N/A
State Environmental Planning Policy No 50 - Canal Estate Development	No	N/A
State Environmental Planning Policy No 52 - Farm Dams and Other Works in Land and Water Management Plan Areas	No	N/A
State Environmental Planning Policy No 55 - Remediation of Land	Yes	Consistent. Council's initial consideration has already acknowledged the potential for the land to be contaminated. The planning proposal is supported by a preliminary and detailed site investigation in order to comply with SEPP 55. Refer to section 4.8.1 and Appendix 7 of the planning proposal.
State Environmental Planning Policy No 62 - Sustainable Aquaculture	No	N/A
State Environmental Planning Policy No 64 - Advertising and Signage	No	N/A
State Environmental Planning Policy No 65 - Design Quality of Residential Flat Development	No	N/A
State Environmental Planning Policy No 70 - Affordable Housing (Revised Schemes)	No	N/A
State Environmental Planning Policy (Affordable Rental Housing) 2009	No	N/A - this is not a development application (DA).
State Environmental Planning Policy (Building Sustainability Index: BASIX)	No	N/A

Name of SEPP	Relevant/applicable?	Comment/statement of consistency
2004		
State Environmental Planning Policy (Coastal Management) 2018	No	The land is within the coastal zone, as defined under the Coastal Management Act 2016 and is affected by the provisions of this SEPP. However the SEPP is not relevant to be considered as part of a planning proposal and proposed change to an environmental planning instrument. The SEPP is for consideration of matters requiring development consent only.
State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017	No	N/A
State Environmental Planning Policy (Exempt and Complying Development Codes) 2008	No	N/A
State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004	No	N/A - this is not a development application (DA). The planning proposal is not proposing to facilitate the type of development assessed under this SEPP.
State Environmental Planning Policy (Infrastructure) 2007	No	N/A
State Environmental Planning Policy (Integration and Repeals) 2016	No	*(Note: applicable only in respect of development that is a rural land sharing community as defined in former SEPP No. 15 - Rural Landsharing Communities.* *The requirement to consider Schedule 1 of SEPP (Integration and Repeals) 2016 lapses on 5 August 2018.)*
State Environmental Planning Policy (Kosciuszko National Park - Alpine Resorts) 2007	No	N/A
State Environmental Planning Policy (Kurnell Peninsula) 1989	No	N/A
State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007	No	N/A
State Environmental Planning Policy (Miscellaneous Consent Provisions) 2007	No	N/A
State Environmental Planning Policy (Penrith Lakes Scheme) 1989	No	N/A
State Environmental Planning Policy (Rural Lands) 2008	No	N/A
State Environmental Planning Policy (State and Regional Development) 2011	No	N/A
State Environmental Planning Policy (State Significant Precincts) 2005	No	N/A
State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011	No	N/A
State Environmental Planning Policy	No	N/A

Name of SEPP	Relevant/applicable?	Comment/statement of consistency
(Sydney Region Growth Centres) 2006		
State Environmental Planning Policy (Three Ports) 2013	No	N/A
State Environmental Planning Policy (Urban Renewal) 2010	No	N/A
State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017	Yes	Consistent.
State Environmental Planning Policy (Western Sydney Employment Area) 2009	No	N/A
State Environmental Planning Policy (Western Sydney Parklands) 2009	No	N/A

APPENDIX 5: SECTION 9.1 DIRECTION CONSISTENCY CHECKLIST

(Note - refer to section 4.6 of this template document)

SECTION 9.1 DIRECTION	CONSISTENCY	COMMENTS
1. EMPLOYMENT AND RESOURCES		
1.1 Business and Industrial Zones	Inconsistent	The direction is applicable as the land is within an existing industrial zone and the planning proposal supports the application of a business zones on the land. Strictly speaking the planning proposal is inconsistent with the direction because it aims to remove the industrial (IN4) zone on the land and apply a business (B2) zone without being justified by a strategy or study. The inconsistency is considered to be justified in the circumstances for the following reasons: (i) The scale of the rezoning is considered to be of minor significance; and (ii) The current zoning land caters for a type of development that is likely to be incompatible with surrounding land uses.
1.2 Rural Zones	Not applicable	This direction is not applicable as the land is not within an existing or proposed rural zone.
1.3 Mining, Petroleum Production and Extractive industries	Consistent	It is considered that the planning proposal will not: (i) prohibit the mining of coal or other minerals, production of petroleum, or winning or obtaining of extractive materials, or (ii) restrict the potential development of resources of coal, other minerals, petroleum or extractive materials which are of State or regional significance by permitting a land use that is likely to be incompatible with such development.
1.4 Oyster Aquaculture	Consistent	The land is not nor does it affect a Priority Oyster Aquaculture Areas in terms of this direction.
1.5 Rural Lands	Not applicable	This direction is not applicable as the land is not within an existing or proposed rural or environment protection zone.
2. ENVIRONMENT AND HERITAGE		
2.1 Environmental protection Zones	Not applicable	This direction is not applicable as the land is not an environmentally sensitive area or within an environment protection zone.
2.2 Coastal management	Consistent	The land is within the coastal zone, as defined under the Coastal Management Act 2016 and is affected by the provisions of State Environmental Planning Policy (Coastal Management) 2018. Therefore this Direction is relevant to be considered. It is arguable that the B2 zone proposed by the planning proposal would facilitate increased development or more intensive land-use on land than would the current IN4 zoning.

SECTION 9.1 DIRECTION	CONSISTENCY	COMMENTS
		Further the land is NOT: • within a coastal vulnerability area identified by SEPP (Coastal Management) 2018 - Direction 2.2 (5) (a); • identified as land affected by a current or future coastal hazard in a local environmental plan or development control plan, or a study or assessment - Direction 2.2 (5) (b). Accordingly, the proposal is considered to be consistent with this direction.
2.3 Heritage Conservation	Consistent	Consistent – subject to confirmation by means of an Aboriginal cultural heritage assessment or similar. Refer also to section 4.9 of the planning proposal document.
2.4 Recreation Vehicle Areas	Not applicable	The planning proposal does not propose to enable the land to be developed for the purpose of a recreation vehicle area.
2.5 Application of E2 and E3 Zones and Environmental Overlays in Far North Coast LEPs	Not applicable	This direction does not apply to the Clarence Valley Council area.
3. HOUSING, INFRASTRUCTURE AND URBAN DEVELOPMENT		
3.1 Residential Zones	Not applicable	This direction is not applicable as the land is not within an existing or proposed residential zone.
3.2 Caravan Parks and Manufactured Home Estates	Not applicable	This direction is not applicable in this instance as it not intending to introduce provisions in relation to caravan parks or manufactured home estates (MHEs).
3.3 Home Occupations	Not applicable	The planning proposal does not intend to alter the status quo in relation to home occupations in dwelling houses.
3.4 Integrated Land Use and Transport	Consistent	It is considered that the planning proposal supports a B2 zoning in a location that is not inconsistent wit the objectives of this Direction. Further the location of the proposed B2 zoning is generally consistent with the aims, objectives and principles of: (a) Improving Transport Choice – Guidelines for planning and development (DUAP 2001), and (b) The Right Place for Business and Services – Planning Policy (DUAP 2001). In this regard the planning proposal is considered to be consistent with paragraph (4) of Direction 3.4.
3.5 Development Near Regulated Airports and Defence Airfields	Not applicable	The planning proposal is not intending to create, alter or remove a zone or a provision relating to land near a regulated airport which includes a defence airfield. Further the land is not near a regulated airport which includes a defence airfield.

SECTION 9.1 DIRECTION	CONSISTENCY	COMMENTS
3.6 Shooting Ranges	Not applicable	The planning proposal is not intending to affect, create, alter or remove a zone or a provision relating to land adjacent to and/or adjoining an existing shooting range.
4. HAZARD AND RISK		
4.1 Acid Sulfate Soils	Inconsistent	The land is mapped as class 3 (74%) and class 5 (26%) acid sulfate soils (ASS). The planning proposal is strictly inconsistent with this Direction as Council as the relevant planning authority has not as yet considered an acid sulfate soils study as per paragraph (5) of the Direction. It is considered that the inconsistency can be justified in the circumstances for reasons that include: (i) the type of works associated with any future development on the site should be able to be readily addressed and managed via the development consent process and the ASS provisions in clause 7.1 of the CVLEP 2011. (ii) The inconsistency is of minor significance.
4.2 Mine Subsidence and Unstable land	Not applicable	The land is not within a mine subsidence district nor identified as unstable land in term of this Direction.
4.3 Flood Prone Land	Consistent	The land is subject to flooding and is therefore within the flood planning areas. Refer to section 4.8.3 of the planning proposal. The planning proposal is consistent with paragraph (5) of the Direction. Further the planning proposal is unlikely to facilitate a development on the land that will be more intense or of a larger scale than would be permitted under the current IN4 zoning. In this regard it is considered that the planning proposal is consistent with paragraph (6) of the Direction.
4.4 Planning for Bushfire Protection	Not applicable	The land is not mapped as bushfire prone land on Council's bushfire prone land map.
5. REGIONAL PLANNING		
5.1 Implementation of Regional Strategies	Not applicable	No longer applicable as the Mid North Coast Regional Strategy has now been replaced by the North Coast Regional Plan 2036. Refer to Direction 5.10 below.
5.2 Sydney Drinking Water Catchment	Not applicable.	This Direction does not apply to the Clarence Valley Council area.
5.3 Farmland of State and Regional Significance on the NSW Far North Coast	Not applicable.	This Direction does not apply to the Clarence Valley Council area.
5.4 Commercial and Retail Development along the	Not applicable.	The land is not the vicinity of the existing and/or proposed alignment of the Pacific Highway.

SECTION 9.1 DIRECTION	CONSISTENCY	COMMENTS
Pacific Highway, North Coast		
5.5 Development in the Vicinity of Ellalong, Paxton and Millfield (Cessnock LGA)	Not applicable.	*Revoked 18 June 2010*
5.6 Sydney to Canberra Corridor	Not applicable.	*Revoked 10 July 2008 - See amended Direction 5.1*
5.7 Central Coast	Not applicable.	*Revoked 10 July 2008 - See amended Direction 5.1*
5.8 Second Sydney Airport: Badgerys Creek	Not applicable.	This Direction does not apply to the Clarence Valley Council area. Direction revoked 20 August 2018.
5.9 North West Rail Link Corridor Strategy	Not applicable.	This Direction does not apply to the Clarence Valley Council area.
5.10 Implementation of Regional Plans		The applicable regional plan is the North Coast Regional Plan 2036. The NCRP 2036 has very few if any actions (or goals or directions) that are of relevance to a planning proposal of this nature. Conversely the planning proposal does not impact nor is considered to be inconsistent with any action (or goal or direction) contained within the NCRP 2036. Accordingly, the proposal is considered to be consistent with the NCRP 2036. A detailed assessment of the planning proposal against the NCRP 2036 actions is at Appendix 2.
6. LOCAL PLAN MAKING		
6.1 Approval and Referral Requirements	Not applicable.	The planning proposal is not proposing to do any of the matters specified in paragraph (4) of the Direction.
6.2 Reserving Land for Public Purposes	Not applicable.	The planning proposal is not proposing to create, alter or reduce existing zonings or reservations of land for public purposes.
6.3 Site Specific Provisions	Not applicable.	The planning proposal is not proposing that the CVLEP 2011 be amended to allow a particular development to be carried out.
7. METROLPOLITAN PLANNING		
7.1 Implementation of a Plan for Growing Sydney	Not applicable.	This Direction does not apply to the Clarence Valley Council area.
7.2 Implementation of Greater Macarthur Land Release Investigation	Not applicable.	This Direction does not apply to the Clarence Valley Council area.
7.3 Parramatta Road Corridor Urban Transformation Strategy	Not applicable.	This Direction does not apply to the Clarence Valley Council area.
7.4 Implementation of North West Priority Growth Area Land Use	Not applicable.	This Direction does not apply to the Clarence Valley Council area.

SECTION 9.1 DIRECTION	CONSISTENCY	COMMENTS
and Infrastructure Implementation Plan		
7.5 Implementation of Greater Parramatta Priority Growth Area Interim Land Use and Infrastructure Implementation Plan	Not applicable.	This Direction does not apply to the Clarence Valley Council area.
7.6 Implementation of Wilton Priority Growth Area Interim Land Use and Infrastructure Implementation Plan	Not applicable.	This Direction does not apply to the Clarence Valley Council area.
7.7 Implementation of Glenfield to Macarthur Urban Renewal Corridor	Not applicable.	This Direction does not apply to the Clarence Valley Council area.
7.8 Implementation of Western Sydney Aerotropolis Interim Land Use and Infrastructure Implementation Plan	Not applicable.	This Direction does not apply to the Clarence Valley Council area.
7.9 Implementation of Bayside West Precincts 2036 Plan	Not applicable.	This Direction does not apply to the Clarence Valley Council area.
7.10 Implementation of Planning Principles for the Cooks Cove Precinct	Not applicable.	This Direction does not apply to the Clarence Valley Council area.

APPENDIX 6: HERITAGE REGISTER LISTING

Maclean River Street Residence

Item details

Name of item:	Maclean River Street Residence
Other name/s:	Old School House, flats, B&B
Type of item:	Built
Group/Collection:	Residential buildings (private)
Category:	House
Primary address:	78 River Street, Maclean, NSW 2463
Parish:	Taloumbi
County:	Clarence
Local govt. area:	Clarence Valley

The property boundary.

Boundary:

All addresses

Street Address	Suburb/town	LGA	Parish	County	Type
78 River Street	Maclean	Clarence Valley	Taloumbi	Clarence	Primary Address

Statement of significance:

This building is historically significant as it is the first schoolmaster's residence in Maclean. It is also a representative example of a small early Victorian style cottage demonstrating brick construction with cement rendered over and steep galvanised iron multi hipped roof with no eaves.

Date significance updated: 19 Jan 06

Note: The State Heritage Inventory provides information about heritage items listed by local and State government agencies. The State Heritage Inventory is continually being updated by local and State agencies as new information becomes available. Read the OEH ***copyright and disclaimer****.*

Description

Builder/Maker:	Tom Goddard
Physical description:	Small early Victorian style cottage being of brick construction cement rendered over and steep galvanised iron multi hipped roof with no eaves. A box gutter is formed parallel to

	the front face of the building emptying to the right. Separate timber kitchen wing at rear with separate hipped roof. Also brick out house. Symmetrical façade with central four paned door and matching twelve pane windows each side and four prominent chimneys off the side walls. Small draped iron stopped verandah to front originally. Alterations include pergola to front and skillion roof additions to left hand side. The house originally faced the river not River Street.
Physical condition and/or Archaeological potential:	Well maintained with cottage garden to the front
	Date condition updated:05 Dec 05
Modifications and dates:	1920 extension to the rear of the residence
Further information:	One of the most important small houses architecturally in Maclean. It is unique to the area. Its prominent location and quality of construction over the junction of the river arms and its early record of use as first schoolmaster's residence give it much local history. Its careful restoration is essential.
Current use:	Bed & Breakfast
Former use:	School masters residence

History

Historical notes:	According to McSwan (1992, 71) the school residence was included with extensions to the school in 1877. A newly arrived Mr Tom Goddard won the contract and a brick residence of four rooms and a detached kitchen was built next to the school on the northern side. Mr Charles Willis from Coraki was appointed Headmaster in 1879 and was the first to occupy the residence completed in 1878. When a new Public School was established on a better site in Woodford street in 1903 a new residence for the Headmaster was also erected. This was much superior to the old residence and consisted of a parlour, dining room, three bedrooms, kitchen, pantry, bathroom, wash house and built in copper. It is assumed that the old residence was then sold as the Infants Department at the old site went to the Showground in 1904.

Historic themes

Australian theme (abbrev)	New South Wales theme	Local theme
6. Educating-Educating	Education-Activities associated with teaching and learning by children and adults, formally and informally.	(none)-

Assessment of significance

SHR Criteria a) [Historical significance]	This building is historically significant as it is the first schoolmaster's residence.
SHR Criteria c) [Aesthetic significance]	This mall early Victorian style cottage is technically significant demonstrating brick construction cement rendered over and steep galvanised iron multi hipped roof with no eaves.
SHR Criteria e) [Research potential]	The site has archaeological potential .
Integrity/Intactness:	Modified at the rear but presentation to River street has high integrity.
Assessment criteria:	Items are assessed against the **State Heritage Register (SHR) Criteria** to determine the level of significance. Refer to the Listings below for the level of statutory protection.

Listings

Heritage Listing	Listing Title	Listing Number	Gazette Date	Gazette Number	Gazette Page
Local Environmental Plan			11 May 01	81	2497
Heritage study					

Study details

Title	Year	Number	Author	Inspected by	Guidelines used
Maclean Heritage Study	2006		Jane Gardiner	J. Gardiner	Yes
Maclean Shire Heritage Study	1989	63	T. Shellshear		No

References, internet links & images

Type	Author	Year	Title	Internet Links
Written	E.McSwan	1992	Maclean The First Fifty Years 1862 -1912	
Written	Leslie Apps	2003	Boarding School	

Note: internet links may be to web pages, documents or images.



(Click on thumbnail for full size image and image details)

Data source

The information for this entry comes from the following source:

Name: Local Government

Database number: 1990037

Return to previous page

APPENDIX 7: Detailed Site Investigation - 74 River Street, Maclean (Cavvanba Consulting)

Detailed Site Investigation

74 River Street,
Maclean, NSW 2463

January 2019, Ref. 18058 R01 V3

CAVVANBA
consulting

Cavvanba Consulting Pty Ltd
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Report Details

Report:

Detailed Site Investigation

74 River Street, Maclean NSW

Ref: 18058 R01

for

Clarence Valley Council

Distribution:

Deliverables	Status	Date	Recipient
1	18058 R01 V1 18058 R01 V2 18058 R01 V3	09/01/2019 14/01/2019 17/01/2019	Terry Dwyer, Clarence Valley Council
1	18058 R01 V1 18058 R01 V2 18058 R01 V3	09/01/2019 14/01/2019 17/01/2019	Cavvanba project file
1	18058 R01 V1 18058 R01 V2 18058 R01 V3	09/01/2019 14/01/2019 17/01/2019	Cavvanba library

This document was prepared in accordance with the scope of services described in Cavvanba's proposal and our Standard Trading Conditions, and the Limitations in Section 1.4 herein, for the sole use of Clarence Valley Council, their agents, the site owner and the relevant regulatory authorities. This document should not be used or copied by other parties without written authorisation from Cavvanba.

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Glen Chisnall
Environmental Scientist

Date: 17 January 2019

Ben Wackett
Principal Environmental Scientist

Date: 17 January 2019

Table of Contents

Figures

Tables

Appendices

1.0 Introduction

This detailed site investigation (DSI) was conducted by Cavvanba Consulting at 74 River Street, Maclean NSW 2463. The proposed scope of work was detailed in Cavvanba's proposal to Clarence Valley Council (CVC) on 5 September 2018, and their acceptance of the engagement was confirmed on 19 October 2018.

1.1 Background

The site is a commercial site located adjacent to the Clarence River and consists of the following:
- State Emergency Services (SES) offices;
- SES boat shed and associated slipway;
- public toilets;
- Council maintenance facility;
- former Clarence River Fisherman's Co-operative Slipway; and
- slipway.

The site has been leased to the SES since at least 1989, and the south-western portion which includes a slipway was also leased to the Clarence River Fisherman's Co-operative since 1982. Further information is provided on the site history in Section 4.

Due to a long history of use as a slipway, the potential of contamination is considered to be high. Tributyl tin (TBT), copper and zinc are common contaminants associated with this landuse. TBT was a common compound found in older types of anti-fouling paints. It was banned more than 10 years ago in Australia because of its toxicity. Copper and zinc are the active ingredients in modern antifouling paints and are used on most boats to prevent marine organisms from growing on the hulls.

1.1.1 Planning proposal

It is understood that Council has resolved to prepare a planning proposal to rezone the site from IN4 – Working Waterfront to B2 – Local Centre, under the Clarence Valley Local Environmental Plan, 2011. This DSI was conducted under State Environmental Planning Policy No. 55 (Contaminated Land) as part of the preparation of the planning proposal.

Based on correspondence with CVC, a possible future use of the site post rezoning is public administration building or office or similar as would be permissible within a B2 zone.

1.2 Objectives

The objectives are based on those described by the Environment Protection Authority (EPA) (formerly Office of Environment and Heritage (OEH)) for a preliminary site investigation (PSI) and a detailed site investigation (DSI).

OEH (2011) describes that the objectives are to:
- identify all past and present potentially contaminating activities;
- identify potential contaminant types;
- discuss the site conditions;
- provide a preliminary assessment of site contamination; and
- assess the need for further investigations.

1.3 Scope of work

The scope of work included:

- Compilation of desktop information, identifying all past and present potentially contaminating activities conducted at the site.

- Advancement of seventeen pre-marked soil borings across the site using a drill rig. Soil borings were advanced to maximum depths of 2.0 m below the ground surface.

- In addition, three of the soil boring locations were advanced to depths of ~ 6 m for installation of groundwater monitoring wells. Wells were placed in strategic locations to intercept potential contamination and allow triangulation to estimate groundwater flow direction.

- Soil was screened in the field using a photo-ionisation detector (PID) to assess the presence of volatile organic compounds to aid in sample selection.

- Soil samples were collected and submitted for analysis by a NATA accredited laboratory for the following potential contaminants of concern (PCOCs):
  - asbestos;
  - heavy metals (arsenic, cadmium, chromium, copper, lead, nickel, mercury, zinc);
  - tributyltin (TBT);
  - total recoverable hydrocarbons (TRH);
  - benzene, toluene, ethyl-benzene, toluene, naphthalene (BTEXN); and
  - polycyclic aromatic hydrocarbons (PAHs).

- Groundwater monitoring wells were sampled a minimum of 3 days after installation and analysed for:
  - TRH, BTEXN, PAHs;
  - heavy metals;
  - plus 10% QC duplicates and trip spike and blank.

- Preparation of a report detailing the results of the investigation which will include figures, analytical tables, data usability and a statement regarding site suitability, and any recommendation for further work if necessary.

Guidance that will be considered in preparing a DSI includes:
- Department of Urban Affairs and Planning (1998) *State Environmental Planning Policy number 55: Managing Land Contamination, Planning Guidelines SEPP 55 – Remediation of Land.*
- EPA (formerly Office of Environment and Heritage (OEH)) (2011) *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites*; and
- EPA (2017) *Contaminated Sites: Guidelines for the NSW Site Auditor Scheme (3rd edition); and*
- National Environment Protection Council (NEPC) *National Environment Protection (Assessment of Site Contamination) Measure 1999 (ASC NEPM (2013)) – Schedule B2: Guideline on Site Characterisation* (2013).

1.4 Limitations

The findings of this report are based on the objectives and scope of work outlined above. Cavvanba performed the services in a manner consistent with the normal level of care and expertise exercised by members of the environmental assessment profession. No warranties or guarantees, express or implied, are made. Subject to the scope of work, Cavvanba's assessment is limited strictly to identifying typical environmental conditions associated with the subject property, and does not include evaluation of any other issues. This report does not comment on any regulatory obligations based on the findings, for which a legal opinion should be sought. This report relates only to the objectives and scope of work stated, and does not relate to any other works undertaken for the Client.

The report and conclusions are based on the information obtained at the time of the assessment. Changes to the subsurface conditions may occur subsequent to the

investigation described herein, through natural processes or through the intentional or accidental addition of contaminants, and these conditions may change with space and time.

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

Further chemicals or categories of chemicals may exist at the site, which were not identified in the site history, and which may not be expected at the site. The absence of any identified hazardous or toxic materials on the subject property, should not be interpreted as a warranty or guarantee that such materials do not exist on the site. If additional certainty is required, additional site history or desktop studies, or environmental sampling and analysis, should be commissioned.

The results of this assessment are based upon site inspection and fieldwork conducted by Cavvanba personnel and information provided by the Client. All conclusions regarding the property area are the professional opinions of the Cavvanba personnel involved with the project, subject to the qualifications made above. While normal assessments of data reliability have been made, Cavvanba assumes no responsibility or liability for errors in any data obtained from regulatory agencies, information from sources outside of Cavvanba, or developments resulting from situations outside the scope of this project.

2.0 Site identification and surrounds

2.1 Site identification and surrounds

The site location is shown on Figure 1. The site identification and landuse details are:

Street address:	74 River Street, Maclean, 2463.
Property description:	Lot 721 and Lot 722 DP 1148111.
Property area:	Lot 721 – approximately 0.2088 hectares; and Lot 722 – approximately 0.1757 hectares.
Co-ordinates:	Latitude: -29.46173362 Longitude: 153.196315248
Local government area:	Clarence Valley Council.
Elevation:	Approximately 4 m above Australian height datum (AHD).
Landuse – existing:	Commercial/Industrial.
Landuse – proposed:	Commercial/Industrial (public administration building or office).
Zoning – existing:	IN4 - Working Waterfront.
Zoning – proposed:	B2 – Local Centre.

2.2 Surrounding landuse

The site is located in an area of mainly commercial and residential landuse, with the surrounding landuses identified as:

North: Maclean Tyrepower store followed by Church Street.

East: River Street followed by Maclean Presbyterian Church.

West: Clarence River.

South: Residential dwellings.

2.3 Surrounding environment

The site is located within the Lower Clarence catchment area. The Clarence River is located directly adjacent to the west of the site. The river discharges to the Coral Sea approximately 30 km to the north-east at Yamba.

The marine river environment of the Clarence River is considered to be a sensitive ecological receptor. The terrestrial and aquatic ecosystems and associated dependent species would be potential environmental receptors. Sensitive receptors also include humans, where primary contact (e.g. swimming) and secondary contact (e.g. boating) recreational uses would be potential human receptors of the river.

3.0 Environmental setting

3.1 Local meteorology

A summary of the climatic data for the nearby Harwood Island (Harwood Sugar Mill – located 6.6 km away) is shown in Table 3.1.

Table 3.1: Climatic summary

	Temperature ^{0}C		Rainfall mm	Mean number of raindays
	Minimum	Maximum	Average monthly	
January	18.9	29.0	144.7	9.9
February	19.0	28.7	163.9	10.5
March	17.9	27.7	173.1	12.0
April	14.8	26.0	134.7	9.8
May	11.6	23.3	127.8	8.6
June	8.9	21.1	112.6	7.4
July	7.8	20.8	70.3	5.8
August	8.4	21.8	55.8	5.1
September	10.8	24.0	48.6	5.4
October	13.7	26.0	71.8	6.7
November	15.9	27.8	97.8	7.9
December	17.7	28.8	109.3	9.0

Notes: Data from 1915 to 2018 from Harwood Sugar Mill (Bureau of Meteorology Climate data website). A rain day occurs when a daily rainfall of at least 0.1 mm is recorded.

3.2 Topography and hydrology

The site has a steep slope in the eastern portion off River Street with a relatively flat section across the central portion before gently sloping into the Clarence River. According to Google Maps, the site is located at 4 m AHD.

3.3 Geology and soils

3.3.1 Geology

Based on the Geological Survey of NSW Quaternary Geology mapping (2008), the site is located on two units:

- The western portion of the site adjacent to the Clarence River is located on Holocene alluvial levee deposits, consisting of fluvial sand, silt and clay.
- The eastern portion of the site is located on bedrock geology consisting of Triassic to Cretaceous sedimentary rocks including coal measures (Clarence-Moreton Basin).

3.3.2 Soils

Based on the NSW Environment & Heritage Soil and Land Information (eSPADE) mapping, the site is located on the Cliff Road unit.

The landscape is described as rolling low hills and hills on Kangaroo Creek Sandstone (quartz sandstone). Relief 80 – 150 m; elevation 50 – 180 m; slopes 10 – 20%, with some

areas 30 – 35%. Rock outcrop is common. Uncleared, tall to very tall open-forest, although previously logged.

Soils are described as shallow (30 cm), well-drained Leptic Rudosols (Lithosols); shallow to moderately deep (50 – 100 cm), moderately well-drained Orthic Tenosols (Earthy Sands/Siliceous Sands); Brown Kandosols (Yellow Podzolic Soils); and Brown Kurosols (Yellow Podzolic Soils) throughout the slope sequence.

3.3.3 Acid sulfate soils

Based on the NSW Environment & Heritage Soil and Land Information (eSPADE) Acid Sulfate Risk Map, the site is in an area of high probability of acid sulfate soil occurrence.

3.4 Hydrogeology

Based on the low-lying nature of the site, groundwater is likely to be encountered within 5 m of the ground surface.

A search of NSW Department of Primary Industries Office of Water licensed bores within a 1 km radius of the site identified five registered bores, which are all located to the north and north-east of the site.

The results of the groundwater bore search are summarised in Table 3.2 below and included in full in Appendix A.

Table 3.2: Licensed bore summary

Bore ID	Registered use	Distance from site	Geology	Depth (m)	Water bearing zone (m)
GW303634.1.1	Water Supply	300 m north-east	N/A	N/A	No details
GW20410164.1.1	Not Known	530 m north	N/A	N/A	No details
GW065622.1.1	Water Supply	250 m north-east	0 – 2 m Sand 2 – 10m Soft sandstone 10 – 14m Hard sandstone 14 – 23m Black Shale	23 m	No details
GW304298.1.1	Water Supply	320m north	0 – 3 m Sandy soil 3 – 12 m Dec sandstone 12 – 42 m Sandstone	39.6 m	No details
GW011124.1.1	Water Supply	900 m north-east	0 – 7.62 m Alluvium 7.62 – 9.14 m Sand water supply 9.14 – 39.62 m Sandstone rock	42 m	No details

4.0 Site History

4.1 Landuse summary

The site has a long history of commercial/industrial use associated with the slipway. Previous owners have been boat builders, marine engineer and motor mechanic between the years of 1867 and 1940.

Council has owned the site since 1940 and it is understood to have been occupied by State Emergency Services (SES). In addition, the south-western portion (part of Lot 722) of the site has been subleased to the Clarence River Fisherman's Co-operative (CRFC) between 1982 and 2012.

Based on Council records, improvements were made to the CRFC slipway in approximately 2001 due to concerns regarding heavy metal contamination.

4.2 Title Search

The historical title search and cadastral layout is provided in Appendix B. The site consists of Lot 721 and Lot 722 DP 1148111, which is shown on Figure 1. A summary provided by Advance Legal Searchers Pty Ltd is detailed below in Tables 4.1 and 4.2.

Table 4.1: Land title search summary of Lot 721 DP 1148111

Year	Proprietor description
(Lot 721 DP 1148111)	
2010 – to date	Clarence Valley Council
(Lots 1 & 2 DP 783972 – A/C 4921-17)	
2007 – 2010	Clarence Valley Council
1992 – 2007	The Council of the Shire of Harwood
(1992 – 2010)	*(various leases shown on Historical Auto Consol 4921-17)*
(Part Allotment 2 & 3 Section 3 Town Maclean – Area 3 Roods 33 ¾ Perches – CTVol 4921 Fol 17)	
1940 – 1992	The Council of the Shire of Harwood
(1987 – 1992)	*(lease to Clarence River Fishermans Co-operative Limited of part)*
(1982 – 1987)	*(lease to Clarence River Fishermans Co-operative Limited of part)*
1938 – 1940	Henry Claude Towner, motor mechanic
(Allotment 2 Section 3 Town Maclean – Area 2 Roods 13 Perches – CTVol 478 Fol 63)	
1938 – 1938	Henry Claude Towner, motor mechanic
1931 – 1938	Helen Schwonberg, widow
1910 – 1931	Francis Henry Schwonberg, marine engineer
1879 – 1910	Joachim Nicolaus Schwonberg, shipbuilder

Table 4.2 Land title search summary for Lot 722 DP 1148111

Year	Proprietor description
(Lot 722 DP 1148111)	
2010 – to date	Clarence Valley Council
(Lots 1 & 2 DP 783972 – A/C 4921-17)	
2007 – 2010	Clarence Valley Council
1992 – 2007	The Council of the Shire of Harwood
(1992 – 2010)	*(various leases shown on Historical Auto Consol 4921-17)*
(Part Allotment 2 & 3 Section 3 Town Maclean – Area 3 Roods 33 ¾ Perches – CTVol 4921 Fol 17)	
1940 – 1992	The Council of the Shire of Harwood
(1987 – 1992)	*(lease to Clarence River Fishermans Co-operative Limited of part)*
(1982 – 1987)	*(lease to Clarence River Fishermans Co-operative Limited of part)*
1938 – 1940	Henry Claude Towner, motor mechanic
(Allotment 3 Section 3 Town Maclean – Area 2 Roods 11 Perches – CTVol 39 Fol 61)	
1938 – 1938	Henry Claude Towner, motor mechanic
1931 – 1938	Helen Schwonberg, widow
1910 – 1931	Francis Henry Schwonberg, marine engineer
1867 – 1910	Joachim Nicolas Schwonberg, boat builder

The ownership and of the two Lots have largely been consistent with each other, however the information regarding these occupants is limited. The occupation of the owners has varied with a boat builder, marine engineer and motor mechanic between the years of 1867 and 1940.

It can be assumed that the occupation of these owners (boat builder, marine engineer) has been likely associated with the use of the site as a slipway with access to the Clarence River i.e. it's a commercial site, so the occupation is likely to translate as the activity. The site appears to have been owned by local council since 1940.

4.3 Historical aerial photograph review

A historical aerial photograph review was conducted using select aerial photographs from the Department of Lands, consisting of 1958, 1964, 1977, 1989 and 1993. In addition, an aerial photograph from 2004 is included, sourced from Google Earth. The historical aerial photographs are included in Appendix C. The following information was determined from interpretation of the aerial photographs:

Table 4.3: Aerial photograph summary

Photograph	Site interpretation
1958	A summary of the photograph is provided below: – two small buildings appear to be present in the western portion of the site, bordering Clarence River; – a road/driveway enters the site off River Street to the east; – further to the east looks to be undeveloped and cleared grassland; – a row of trees appears to border the site to the north, beyond this is a road followed by cleared grass land; – residential dwellings appear to be present to the south of the site.
1964	The general layout of the site appears to be consistent with the previous aerial photograph.
1977	A summary of the photograph is provided below: – two buildings are now present on the northern and southern boundaries; – the centre of the site appears to be used as a carpark area; – the area to the north of the site, beyond Church Street, is now developed with buildings now occupying the cleared land.
1989	A summary of the photograph is provided below: – the building adjacent to the northern boundary in the centre of the site is no longer present; and – a structure/boat is present on the slipway. The remaining features of the site appear to be consistent with the previous aerial photograph.
1993	A summary of the photograph is provided below: – A large building is now present in the centre of the site, bordering the northern boundary; – the building in the southern portion of site appears to have been rebuilt and or extended. The remaining features of the site appear to be consistent with the previous aerial photograph.
2004	A summary of the photograph is provided below: – a large building is now present to the north of the site and the vacant land beyond Church Street now appears to be developed. The remaining features of the site appear to be consistent with the previous aerial photograph.

4.4 Site development

The western portion of the site appears to have been developed as far back as the earliest aerial photograph available (1958). It is likely that the site was used as a boat building yard by Joachim Nicolas Schwonberg between the years of 1867 and 1910, however no aerial photographs were available for this time period.

The most significant development at the site visible in the aerial photographs occurred between the years of 1964 and 1977 where two large buildings were established in the centre of the southern and northern boundaries. During this time period the site was owned by the Shire of Harwood Council and it is understood that the site was used for maintenance works.

In addition, the SES building was constructed on-site between 1989 and 1993.

4.5 Council records

4.5.1 Section 10.7 Certificate

Two Section 10.7 Certificates were obtained for Lot 721 DP 1148111 and Lot 722 DP 1148111, 74 River Street, Maclean 2463. The Section 10.7 Certificates have been included in Appendix D in full and summarised in Table 4.4 and 4.5 below and on the following page.

Table 4.4: Lot 721 DP 1148111 Council records summary

Item	Council Response
(20) Site Loose-fill asbestos insultation If the land includes any residential premises (within the meaning of Division 1A of Part 8 of the Home Building Act 1989) that are listed on the register that is required to be maintained under that Division, a statement to that effect.	No
Matters arising under the Contaminated Land Management Act 1997 Note. The following matters are prescribed by Section 59 (2) of the Contaminated Land Management Act 1997 as additional matters to be specified in a planning certificate.	
(a) That the land to which the certificate relates is significantly contaminated land within the meaning of that Act – if the land (or part of the land) is significantly contaminated land at the date when the certificate is issued.	Potentially or actually contaminated
(b) That the land to which the certificate relates is subject to a management order within the meaning of the Act – if it is subject to such an order at the date when the certificate is issued.	No
(c) That the land to which the certificate relates is the subject of an approved voluntary management proposal within the meaning of that Act – if it is the subject of such an approved proposal at the site when the certificate is issued.	No
(d) That the land to which the certificate relates is subject to an ongoing maintenance order within the meaning of that Act – if it is subject to such an order at the date when the certificate is issued.	No
(e) That the land to which the certificate relates is the subject of a site audit statement within the meaning of that Act – if a copy of such a statement has been provided at any time to the local authority issuing the certificate.	No

Table 4.5: Lot 722 DP 1148111 Council records summary

Item	Council Response
(20) Site Loose-fill asbestos insultation If the land includes any residential premises (within the meaning of Division 1A of Part 8 of the Home Building Act 1989) that are listed on the register that is required to be maintained under that Division, a statement to that effect.	No
Matters arising under the Contaminated Land Management Act 1997 Note. The following matters are prescribed by Section 59 (2) of the Contaminated Land Management Act 1997 as additional matters to be specified in a planning certificate.	

Item		Council Response
(f)	That the land to which the certificate relates is significantly contaminated land within the meaning of that Act – if the land (or part of the land) is significantly contaminated land at the date when the certificate is issued.	Potentially or actually contaminated
(g)	That the land to which the certificate relates is subject to a management order within the meaning of the Act – if it is subject to such an order at the date when the certificate is issued.	No
(h)	That the land to which the certificate relates is the subject of an approved voluntary management proposal within the meaning of that Act – if it is the subject of such an approved proposal at the site when the certificate is issued.	No
(i)	That the land to which the certificate relates is subject to an ongoing maintenance order within the meaning of that Act – if it is subject to such an order at the date when the certificate is issued.	No
(j)	That the land to which the certificate relates is the subject of a site audit statement within the meaning of that Act – if a copy of such a statement has been provided at any time to the local authority issuing the certificate.	No

4.5.2 Council provided information

A number of Council documents related to the site were provided to Cavvanba for review purposes. Table 4.6 below summarises the information relevant for environmental purposes.

Table 4.6: Council information summary

Date	Summary
1982 - 2012	Southern slipway area subleased to Clarence River Fisherman's Co-operative for Trawler activities. Figures included in the lease documentation show it is limited to the southern slipway only.
1989	Construction of the SES Building commences on-site.
1992	Development application submitted for the proposed storage shed expansion, next to the "paint" shed.
2001	Correspondence regarding the Maclean Slipway being upgraded, in partnership with the Clarence River Fisherman's Co-operative. "*Testing of the site indicates that it is contaminated by heavy metals from decades of use without appropriate pollution controls. If the slipway were to close the clean up cost for the site may be significant. The proposed upgrade works will cap much of the contaminated area to reduce movement of pollutants off site and minimise the risk of any further contamination."* CVC, Ordinary Meeting 13 June 2001. *"The upgrade included diversion of clean stormwater around the slipway, installation of pollution control equipment, upgrade and extension of the rails, replacement of the winch, renewal and topping of the hardstand and general improvements to the facility.* *The upgrade is now complete and in use mainly by river trawler operators. The response to the upgrade from users has been positive…The facility is also a safer facility and reduces both the Clarence River Fisherman's Cooperative and Council's risk associated with the ongoing operation of the facility."* CVC, Ordinary Meeting 14 November 2001.

Date	Summary
2007	Email correspondence regarding oil/water separator at the Clarence River Fisherman's Co-operative. Includes information that the separator was cleaned out on a sixth monthly basis.
2018	Development Application completed by Council for demolition of the existing sheds at Maclean SES and removal of the slipway structure.

4.6 SES Information

During the site works, an interview was conducted with Ron Rushton, the Maclean Deputy Unit Commander of the SES. Ron described that the SES slipway was improved in October 2011, which included excavation in front of the SES boatshed and the placement of hardstand. During excavation, a large number of anthropogenic materials were identified in soil excavated from this area of the site, including a large number of metal bolts, wire from the slipway and other large metal finds. These were likely to be associated with the historical use of the site as a slipway and/or boat building yard since 1867.

4.7 History of filling

Fill material was observed across the site to maximum depths of 1.0 m. It is likely that the fill material was associated with previous site uses, and/or had been imported to the site historically for levelling purposes.

4.8 Chemical usage and storage

Site occupiers are required to notify SafeWork NSW if they store, handle or process hazardous chemicals that exceed quantities specified in the relevant legislation. A search of SafeWork NSW dangerous goods licences database has identified no records held for this site (refer to Appendix E).

4.9 Licenses, permits and notices

A summary of licenses, permits and notices, accessed 19/10/2018, is provided in Table 4.7 below, and included in Appendix F in full.

Table 4.7: Online search results for licences, permits and notices

Search	Description	Result
Protection of the Environment Operations (POEO) Public register	Environment protection licences, applications and notices.	No results applicable for the site.
Contaminated Land Management (CLM) Records	Notices for: – Declaration of significantly Contaminated Land; – Approved Voluntary Management Proposals; Management orders; – Ongoing maintenance orders; – repeal, revocation or variation notices; – Site audit statements.	No results applicable for the site.

Search	Description	Result
The Department of Defence	Unexploded ordinance risk.	No results applicable for the site.
NSW Department of Primary Industries *Cattle Dip Locator*	Contains the most current list of cattle dip sites.	No results applicable for the site.

4.10 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 and NBN Co have assets leading into the site.

Underground service plans are provided in Appendix G.

4.11 Previous environmental investigations

Information sourced from a CVC, ordinary meeting dated 13 June 2001 stated that testing at the site indicated that it is contaminated by heavy metals from decades of use without appropriate pollution controls. A copy of this report has not provided.

4.12 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, Cavvanba considers that sufficient historical information and site condition information has been obtained to allow for a thorough investigation of the investigation area's environmental condition.

5.0 Site Inspection

A site inspection was undertaken to confirm anecdotal evidence and consolidate the findings of the information review through physical inspection of potential contaminant sources, pathways and receptors.

5.1 Site observations

A site inspection was undertaken by Glen Chisnall on 7 November 2018. A photographic log has been provided as Appendix H and an overview of the site layout and features has been provided in Figure 2.

The following observations, relevant to the use and environmental condition of the investigation area were made:

- a tarsealed road entered the site from River Street;
- a healthy grass cover was present in the sites eastern portion;
- a small shed potentially containing ACM was located to the north of the tarsealed road;
- the SES office building was located in the centre of the site, bordering its northern boundary;
- maintenance sheds were located parallel to the SES office building, bordering the southern portion;
- a former toilet block was located ~ 10 m to the west of the SES office building, the outside venting pipe was identified as potential ACM;
- the fisherman's co-operative shed was located ~ 5 m to the west of the maintenance sheds, followed by the former slipway area;
- potential ACM was identified in the upper inside walls of the fisherman's co-operative shed;
- the SES boatshed was located in the sites western portion;
- flakes of potential lead paint were observed on the ground, underneath the northern walls; and
- a small sandy stockpile ~ 4 m^2 was located in the north western portion of the site.

6.0 Soil assessment

Prior to conducting site works, Cavvanba undertook the data quality objectives (DQOs) planning process. The contaminants, media and environmental criteria are summarised below, based on the DQO outputs.

6.1 Contaminants of concern

The PCOC's are described below, and are associated with the primary contamination activities, being use of the site as a slipway.

Table 6.1: PCOCs and summary of areas of concern

PCOCs	Description and common relationship
Heavy Metals	arsenic (As), cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), mercury (Hg), nickel (Ni) and zinc (Zn). Lead and antifouling paint. Waste water contaminants, pest control, fertilisers and fuels/oils, fill, metal working, buildings, fences, urban runoff, electrical components, etc.
TRHs	Total recoverable hydrocarbons including volatile fractions (C_6 – C_9 TRHs) and semi-volatile fractions (C_{10} – C_{36} TRHs). Fuels, oils and grease, fill material, solvents.
BTEXN	Benzene, toluene, ethyl benzene, xylenes and naphthalene (BTEXN). Volatile hydrocarbons. Fuel constituents, fill materials, solvents.
PAHs	Polycyclic aromatic hydrocarbons. Semi-volatile hydrocarbons. Constituents in bitumen, tar, asphalt, fuel constituents, oil, grease, ash.
Asbestos	Asbestos in the form of free fibres and asbestos containing materials (ACMs). Commonly used in pipework, buildings (fibro), etc.
TBT	Tributyltin. Common compound found in antifouling paints used on most boats to prevent marine organisms from growing on hulls.

6.2 Relevant environmental media

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

6.3 Relevant environmental criteria

6.3.1 Soil

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) and health screening levels (HSLs) applicable for commercial/industrial landuse.

HSLs and ESLs – soil type

Based on the sandy nature of the fill material at the surface, 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 consideration 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.

Tributyltin

There is currently no published Australian criteria for tributyltin (TBT) in soil. It is generally recommended that as slipways / boat maintenance facilities are directly in contact with the marine ecosystem, particularly during flooding events, the application of sediment quality criteria is considered appropriate.

The ANZECC and ARMCANZ (2000) *Australia and New Zealand Guidelines for Fresh and Marine Water Quality*, hereafter referred to as ANZECC (2000), provides trigger values for the protection of both marine and freshwater environments. The *Revision of the ANZECC / ARMCANZ Sediment Quality Guidelines* (CSIRO Land and Water, 2013) provides current sediment quality guidelines values. In accordance with the guidelines (CSIRO Land and Water, 2013), the recommended application of the sediment quality guideline values involves a tiered, decision-tree approach, in accordance with the risk-based approach introduced in the water quality guidelines. The total contaminant concentrations are to be compared to the sediment quality guidelines values and if the contaminant concentrations exceed one or a number of guideline values, further investigations should be initiated to determine whether there is an environmental risk associated with the exceedance.

Tributyltin is highly toxic to a wide range of aquatic species and is linked to imposex in snails and immuno-suppression in bivalves. TBT is hydrophobic and adsorbs strongly to the organic carbon in sediments, and is relatively persistent, with a half-life of years.

Cavvanba have adopted the sediment quality guidelines value for TBT of 9.0 μg Sn/kg which assumes that the values provided for TBT is normalised to 1% organic carbon content. However, it is acknowledged that the high sediment quality guideline value for TBT is 70 μg Sn/kg. The significance of any exceedances identified will be further discussed within Section 9.0.

6.3.2 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 marine water 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. bioaccumulative).

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).

7.0 Site assessment

The field work was undertaken in general accordance with the DQOs. Field works were conducted on:
- 7 and 8 November for the soil investigation; and
- 13 November for the groundwater investigation.

All fieldwork was completed by Glen Chisnall and Ross Nicolson of Cavvanba Consulting. Ross has over 13 years of experience in conducting contaminated land investigations.

The sampling and analytical strategy and methodology are described below. The results of the assessment are provided in Section 7. Soil sample locations are shown on Figure 2.

7.1 Sampling strategy

7.1.1 Soil

A total of fourteen soil borings were advanced across the site on 7 and 8 November 2018, in order to gain general spatial coverage and to target specific infrastructure, land use practices and/or events which may represent potential sources of contamination. The rationale for each sampling location is further detailed in Table 7.1, below.

Table 7.1: Rationale for sampling design

Location ID	Rationale
SB01 – SB08	Providing broad spatial coverage across the site.
SB09 – SB14	Targeting the area formerly used as a slipway.

The sampling strategy was designed to provide an assessment of potential soil contamination issues at the site with locations selected based on professional judgement in accordance with the ASC NEPM (2013). As such, the sampling approach was considered appropriate to achieve the desired objectives outlined in Section 1.2.

Initial sample analysis selection aimed to target the following:
- surface soils (0.1 m depth);
- fill material; and
- odours.

Additional analysis was undertaken at greater depths to delineate any criteria exceedances. The sampling strategy completed was considered to meet the definition of a systematic approach, and meets the minimum sampling requirements in accordance with *Sampling Design Guidelines* (NSW EPA, 1995).

7.1.2 Groundwater

To evaluate the impact and extent of groundwater contamination associated with the historical use of the site as a slipway, three monitoring wells were installed. Monitoring well locations were chosen to provide triangulation for groundwater flow direction purposes. The monitoring well locations and strategy is detailed in Table 7.2 on the following page and shown on Figure 2.

Table 7.2: Groundwater sampling and analytical strategy

Well location	Strategy	Analysis
MW01	Centre – approximately 3 m east of the Storage shed building	TRHs, BTEXN, PAHs, 8 metals,
MW02	Upgradient - located to the east of the SES building.	TRHs, BTEXN, PAHs, 8 metals,
MW03	Downgradient – Located in close proximity to the slipway	TRHs, BTEXN, PAHs, 8 metals,

7.2 Methodology

7.2.1 Soil

Soil borings were advanced using a trailer mounted solid flight auger at pre-marked locations using a trailer mounted drill rig with a solid flight auger. This method allowed for an accurate assessment to the required depth.

Once the desired sampling depth was achieved, the solid flight auger was retracted and cleaned before advancing back into the borehole to take a cork screw sample. Samples were collected from the centre of solid flight auger, limiting the chance of direct contact with the auger during the drilling process.

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 Cavvanba fieldwork procedures.

Overburden was placed alongside the borehole sequentially during drilling, and backfilled in the same sequence it was drilled

7.2.2 Groundwater

Monitoring wells were installed using a trailer mounted drill rig with a solid flight auger. Groundwater well construction is consistent with the *Minimum Construction Requirements for Water Bores in Australia* (Land and Water Biodiversity Committee, 2003). Monitoring wells were installed to a maximum depth of 5.0 m, and screened in the first water bearing zone encountered. All wells were constructed of 50 mm diameter Class 18 uPCV casing and screen, with a bentonite seal above the screen. Groundwater wells were developed following installation. A new bailer was used for each well.

Groundwater sampling was conducted within a week period of installation of the groundwater monitoring wells.

Groundwater sampling was conducted on 13 November. All sampling was completed by Glen Chisnall of Cavvanba Consulting, using a peristaltic pump in accordance with *Cavvanba Fieldwork Procedures for Groundwater sampling*, which generally meets NEPM requirements. All wells were inspected for the presence of LNAPL, gauged and sampled.

To ensure 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 were measured using a calibrated Horiba water quality meter; and
- water quality parameters recorded consecutive readings within 10% prior to sampling.

Groundwater parameter probe calibration records are included in Appendix I, monitoring well installation logs are included in Appendix J, and groundwater sampling sheets are included in Appendix K.

Samples were collected directly from single use disposable tubing into appropriately preserved laboratory prepared and supplied sample bottles and quickly capped with no headspace remaining to minimise the loss of any volatiles. It should be noted that a new length of tubing was used at each monitoring well. A new pair of nitrile gloves were worn for each location.

All groundwater samples were collected into laboratory supplied bottles, in accordance with Cavvanba fieldwork procedures. All samples were placed directly into chilled eskies and transported to the laboratory under chain of custody documentation.

7.3 Data usability

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

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

- summary of field quality assurance/quality control;
- field quality control soil samples summary; and
- summary of laboratory quality assurance/quality control.

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

8.0 Conditions encountered

The subsurface conditions encountered are summarised below. For descriptions of the subsurface conditions at specific locations, refer to the geological logs in Appendix J, and for specific samples, refer to Table 1, attached. A photo log is provided as Appendix H.

8.1 Soils

The natural soil profile at the site generally consisted of the following:
- fill material: loose, red and brown silty gravelly sand to maximum depths of 1.8 m; followed by
- clayey sand: loose, course grained, dark brown/orange mottled to the maximum explored depth of 5.0 m.

8.2 Groundwater

Groundwater was encountered at depths of 1.5 m below the natural ground surface across the site during advancement of soil borings. Monitoring wells were installed flush mounted/level with the ground surface. Groundwater levels were observed to be between 1.351 m (MW02) and 2.140 m (MW03) depth below casing during sampling.

Given the sites close proximity to the Clarence River, groundwater is anticipated to flow towards the west. Generally, the depth to groundwater encountered during drilling was similar to the stabilised level (taking into consideration the height of the stick-up pipe). This suggests the groundwater is not under confined conditions.

The groundwater quality parameters recorded prior to groundwater sampling are shown in Table 8.3.

Table 8.3: Groundwater quality parameters

Sample location	Date sampled	pH	Cond. (mS/cm)	Temp (°C)	DO (mg/L)	Redox as Eh (mV)	Comments
Groundwater quality parameters							
MW01	13/11/18	5.71	0.332	25.16	2.58	378	Clear then turbid. No odour or sheen.
MW02	13/11/18	4.35	0.043	26.42	2.69	498	Clear then turbid. No odour or sheen.
MW03	13/11/18	5.84	0.418	23.84	7.89	263	Clear, no odour or sheen.

Notes:
DO = dissolved oxygen.
H_2S = Hydrogen sulphide (reducing odour).
Cond. = conductivity.
Redox value has been corrected for standard hydrogen electrode by adding 199.
Redox range, <0 mV reducing, 0 – 400 mV moderately reducing, >400 mV well oxygenated.

Based on the groundwater quality parameter measurements, the groundwater underlying the site can be described as relatively neutral to acidic pH, poorly oxygenated, moderately reducing, and have a high total dissolved solids (TDS) and be associated with excessive scaling, corrosion and unsatisfactory taste.

9.0 Analytical results

The analytical results are presented below, split by media type.

9.1 Soil

The results from the soil borings and monitoring wells are summarised below by contaminant. The laboratory analytical reports are included in Appendix M. The analytical results have been compared to the screening criteria for commercial/industrial land use which includes ecological, health levels, management levels and direct contact criteria to ascertain the magnitude of impacts, if any. The laboratory limits of reporting were below the applicable criteria for the investigation. The analytical results are summarised in the attached tables (Tables 1 - 5).

Table 9.1: Soil analytical summary

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	3,000	160	-	18	0	25	Yes
Cadmium	900	-	-		0	5	Yes
Chromium	3,600	670	-		0	36	Yes
Copper	240,000	320	-		6	4,600	No
Lead	**1,500**	1,800	-	19	1	**3,970**	**No**
Nickel	6,000	460	-	18	0	26	Yes
Zinc	400,000	1,200	-		4	4,860	No
Mercury	180	-	-		0	3	Yes
TRH and BTEXN							
Benzene	0.5	75	-	19	0	0.3	Yes
Toluene	160	135	-		0	<0.5	Yes
Ethylbenzene	55	165	-		0	<0.5	Yes
Meta - & para - Xylenes	230	180	-		0	<0.5	Yes
Ortho-xylene	230	180	-		0	<0.5	Yes
Naphthalene	NL	370	-		0	<0.5	Yes
F1 TRHs C_6-C_{10}	260	215	-		0	<10	Yes
F2 TRHs >C_{10}-C_{16}	NL	170	1,000[4]		1	240	No
F3 TRHs >C_{16} – C_{34}	-	1,700	**3,500**		3	**12,000**	**No**
F4 TRHs >C_{34} – C_{40}	-	3,300	10,000		0	2,920	Yes
PAHs							
Benzo(a)pyrene	NL	1.4	-	20	11	188	No
B(a)P TEQ	**40**	NL	-		4	**272**	**No**
Total PAHs	4,000	-	-		0	2,140	Yes
Organotins							
Tributyltin		0.009[5]	-	9	3	0.023	No

Table notes:
1 - Health screening levels for commercial/industrial landuse, 0m to <1m depth, phenols, TRH and BTEXN.
2 – Health investigation levels for commercial/indsutrial landuse (HILs D) not including phenols, TRH, BTEXN.
3 – Environmental screening/investigation levels for commercial/industrial, assuming coarse soil type due to disturbed nature of soils.
4 – Management limits – Commercial/industrial
5 – Value for TBT is based on Sediment Quality Guideline Value (CSIRO Land and Water, 2013).
- = not detected above the LOR.

Heath investigation or screening criteria was exceeded as follows:
- lead: One sample exceeded the HIL with a maximum concentration of 3,970 mg/kg, > 250% of the criteria (collected from SB11, 0.1 m depth);
- B(a)P TEQ: Four samples exceeded the HILs with a maximum reported concentration of 272 mg/kg (SB02, SB10 and SB11 at depths of 0.1 m and 0.4 m at SB10).

Environmental investigation or screening criteria was exceeded as follows:
- copper: six samples exceeded the EILs with a maximum reported concentration of 4,600 mg/kg (SB05, SB10, SB11, SB12, SB13 and SB14 at 0.1 m);
- lead: One sample exceeded the EILs with a maximum concentration of 3,970 mg/kg, > 250% of the criteria (collected from SB11, 0.1 m depth);
- zinc: four samples exceeded the EILs with a maximum reported concentration of 4,860 mg/kg (collected from SB02, SB11, SB12 and SB14 at 0.1 m depth);
- tributyltin: three samples exceeded the sediment guidance concentrations with a maximum concentration of 0.0203 mg/kg (SB12 at 0.1 m depth)
- TRH >C_{10} – C_{16}: One sample exceeded ESLs with a maximum reported concentration of 240 mg/kg (SB10 at 0.1 m);
- TRH >C_{16} – C_{34}: three samples exceeded the ESLs and management limits with a maximum reported concentration of 12,000 mg/kg;
- Benzo(a)pyrene: Eleven samples exceeded the ESLs with a maximum reported concentration of 188 mg/kg (collected from SB01, SB02, SB03, SB07, SB09, SB10, SB11, SB12, SB13 and SB14 at 0.1 m depth and 0.4 m at SB10); and

Management limits for TRH were exceeded as follows:
- TRH >C_{16} – C_{34}: one sample exceeded the management limits with a maximum reported concentration of 12,000 mg/kg (SB10 at 0.1 m depth).

More detailed soil analytical results can be found in Tables 2 – 5 and are shown on Figure 3.

9.2 Groundwater

The groundwater results from the initial round are summarised below. The laboratory analytical reports are included in Appendix M. The analytical results are summarised in the attached tables (Tables 6 - 9) and summarised in Table 9.2 below.

Table 9.2: Summary of groundwater analytical results (ug/L)

Analyte	Marine Waters[1]	Drinking Water	Health Screening Levels[2]	Recreational[3]	Site maximum concentration	Sample location
Metals						
Arsenic	**2.3/4.5**	**10**	-	100	**12**	**MW03**
Cadmium	0.7	2	-	20	<0.1	-
Chromium	4.4	50	-	500	<1	-
Copper	1.3	2,000	-	20,000	1	MW01
Lead	4.4	10	-	100	<1	-
Nickel	7	20	-	200	<1	-

Analyte	Marine Waters[1]	Drinking Water	Health Screening Levels[2]	Recreational[3]	Site maximum concentration	Sample location
Zinc	**15**	-	-	-	**34**	**MW03**
Mercury	0.1	1	-	10	<0.1	-
Volatile hydrocarbons						
Benzene	500	1	800	10	<1	-
Toluene	-	800	NL	8,000	<2	-
Ethyl-benzene	-	300	NL	3,000	<2	-
Xylenes	-	600	NL	6,000	<2	-
Naphthalene	50	-	NL	-	<2	-
F1 TRHs C6 – C10	-	-	1,000	-	<20	-
Semi-volatile hydrocarbons						
F2 TRHs >C10 – C16	-	-	NL	-	<20	-
F3 TRHs >C16 - C34	-	-	NL	-	<100	-
F4 TRHs >C34 – C40	-	-	NL	-	<100	-
TRHs >C10 – C40	-	-	NL	-	<100	-

Table notes:
1. Criteria from NEPM, 2013.
2. HSLs for commercial purposes used.
3. NHMRC Guidelines for Managing Risks in Recreational Water (2008).

Bold – exceeds highlighted criterion.
NL – no limit.

Marine water and drinking water criteria were exceeded on-site with respect to metals only. No hydrocarbons were detected in excess of the laboratory limits of reporting. A summary is provided below:

- arsenic: One location (MW03) exceeded marine waters and drinking water criteria with a maximum reported of 12 ug/L; and
- zinc: Three locations (MW01, MW02, MW03) exceeded marine waters criteria with a maximum reported concentration of 34 ug/L.

10.0 Discussion and Conceptual Site Model

10.1 Soil discussion

Exceedances of site criteria have been reported for heavy metals and hydrocarbons. A large number of these exceedances have occurred in the western portion of the site, in close proximity to the historical slipway and are likely associated with the industrial use, boat activities and or fuel storage. This is discussed in further detail in the following sections.

10.1.1 Lead exceedances in soil

Based on the analytical results from the soil sampling, exceedances of criteria were reported for heavy metals with respect to copper, lead and zinc.

With respect to lead, one sample exceeded both the commercial/industrial EILs and HILs with reported lead concentrations >250% of the criteria.

Further analysis was conducted at this sample location at 0.4 m below ground surface (SB11_0.4) which reported lower concentrations of 168 mg/kg. It can therefore be concluded that lead impact is limited to shallow soils within this area. This is located in close proximity to the former shed and is likely to be associated with either general industrial site use or lead paint.

10.1.2 Copper and zinc exceedances in soil

Copper and zinc are common contaminants associated with anti-fouling paints, and exceedances of environmental site criteria were present in shallow soils across the majority of the western slipway portion of the site.

10.1.3 Tributyltin exceedances in soil

Tributyltin was reported in excess of the adopted sediment criteria in three samples (collected from SB10 at 0.9 m depth, SB12 at 0.1 m depth and SB14 at 0.1 m depth).

All three of these samples were collected from the slipway portion of the site in close proximity to the Clarence River.

Normalisation of criteria

The adopted default guideline values for TBTcan be varied taking into consideration the total organic carbon content (TOC). The criteria is appliccable for 1% TOC and if different, reported TBT concentrations are able to be manipulated.

With a 5.19% TOC as reported for the highest concentration sample, the concentration identified can be divided by 5.19, lowering the concentration to below the criteria, as shown in Table 10.1 below.

Table 10.1: Normalisation of TBT criteria

Sample	Reported TBT Concentration (mg/kg)	Reported TOC	1% normalised TOC TBT Concentration (mg/kg)	Criteria (mg/kg)
SB12_0.1	**0.0203**	5.19%	0.0017	0.009

10.1.4 PAHs exceedances in soil

Based on the analytical results from the soil sampling, exceedances of criteria were reported for PAHs with respect to benzo(a)pyrene and benzo(a)pyrene TEQ. A total of

eleven samples exceeded the commercial and industrial ESLs for benzo(a)pyrene to maximum depths of 0.4 m below the ground surface.

Field observations indicated that the material at this depth was fill given the presence of anthropogenic materials. Based on these observations and the presence of contamination at this depth, it can be concluded that the exceedances of benzo(a)pyrene are likely to be limited to the fill layer.

A total of four samples exceeded the commercial/industrial HILs for Benzo(a)pyrene TEQ (zero) at depths of up to 0.4 m. It was also noted at these locations that the material from ground surface to 0.4 m was of fill nature and that contamination is likely limited to this extent.

These samples were collected from the slipway portion of the site in close proximity to the Clarence River, but also extended to SB07 in the central portion of the site in close proximity to the SES building.

10.1.5 Hydrocarbons in soil

A total of three samples exceeded TRHs C_{10} - C_{16} and C_{16} – C_{34} ecological levels and the management limits for commercial/industrial criteria. The highest reported concentration of TRHs C_{16} – C_{34} was 12,000 mg/kg at sample location SB10 at 0.1 m depth. Further analysis was conducted at this sample location at 0.4 m below the surface with a reported concentration of 1,360 mg/kg, below site criteria. All exceedances of TRHs C_{10} - C_{16} and C_{16} – C_{34} were limited to 0.1 m below the ground surface.

This impact is likely associated with the former oil/water separator which was historically present in this portion of the site.

10.2 Groundwater discussion

Groundwater sampling detected exceedances of site criteria for metals, limited to arsenic and zinc only, no hydrocarbons were identified. While zinc does tend to be associated with anti-fouling activities, arsenic does not. These concentrations are likely to be associated with local conditions, rather than contamination associated with historical site use.

10.3 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 10.2 below.

Table 10.2: CSM discussion

Element	Site specific information
The physical and built environment, including former, existing and proposed structures.	The site is a former slipway facility, which was used historically for boatbuilding, maintenance as well as including an oil/water separator. The site consists of approximately fill material of variable thickness overlying the natural soil.
Known and potential sources of contamination and contaminants of concern, including chemical storage, use and disposal.	Elevated metals consisting of copper, lead, zinc and tributyltin have been identified across the slipway portion of the site. In addition, hydrocarbons (TRH) and PAHs, including benzo(a)pyrene have also been detected in excess of site criteria.

Element	Site specific information
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. Limited scale shallow (< 0.4 m) soil impact was identified in the vicinity of the slipway. Groundwater impact is not considered to be present at this stage.
Human and ecological receptors.	The following potential human and ecological receptors exist on and off-site: – site occupiers; – future construction workers; and – Clarence River (via surface or groundwater).
Potential and complete exposure pathway to human and/or environmental receptors.	Due to the distance to the Clarence River, ecological exposure pathways are considered to be possible but further investigation is required. The immediate risk to human health at the site in its current state is considered low. Ecological exposure may be at risk during demolition works from runoff and erosion. Potential exposure is limited to on-site workers during the proposed construction works, who may be exposed to petroleum odours and contaminated soil/groundwater: Vapour intrusion is not considered likely due to the non-volatile nature of the diesel, as well as the proposed capped land use.
Data gaps	No investigation of tributyltin was conducted in sediment adjacent to the river or groundwater.

11.0 Conclusions

These investigation conclusions are based on the information described in this report and appendices, and the conclusions should be read in conjunction with the complete report, including Section 1.4, General limitations to environmental information.

This DSI has been undertaken on this site prior to demolition works.

The primary issue is metals and hydrocarbon contamination associated with the former use of the site as a slipway. Metals and PAHs have been identified in excess of site criteria and TRH has been identified in soil in excess of management limits.

Due to the close proximity of the Clarence River, further investigation is required to determine if off-site migration is occurring and either management or remediation of the site is required to mitigate future potential migration.

The landuse is currently proposed to remain as commercial/industrial. Should the landuse change to a more sensitive use, further investigation and remediation may be required, and consideration may need to be given to potential aesthetics issues.

Table 11.1 highlights the issues from the investigation which should be managed, and Table 11.2 summarises the decision making process for NSW EPA (EPA, 2017).

Table 11.1: Primary issues from the investigation

Issue	DSI outcome	Recommendation
Elevated metals and TRH and PAHs in soil	Metals associated with anti-fouling on boats (zinc and copper), lead paint and hydrocarbon contamination associated with fuel storage was identified in soil in the vicinity of the slipway. Concentrations of metals and PAHs exceeded health and environmental based criteria and concentrations of TRH exceeded the management limits.	Remediation or management of impact.
Tributyltin identified in soil	Tributyltin concentrations were identified in soil in the vicinity of the slipway. Current guidance is generally appropriate for sediment only, and not directly applicable for soil.	Conduct sampling of groundwater and also sediment of the Clarence River to determine if a contamination pathway exists.
Potential ACM	Potential asbestos containing materials (ACM) have been identified in the small shed to the east of the SES building, within the storage sheds and on the edge of the former toilet block. No laboratory analysis has been conducted on the potential ACM, however given the visible appearance of the material, Cavvanba consider's it be treated as containing asbestos.	A hazardous materials audit should be conducted at the site prior to demolition. During any ACM removal, a Licenced Asbestos Assessor (LAA) will be required to undertake air quality monitoring and issue clearance certificates following the completion of removal works. In Cavvanba's experience it should be expected that some ACM will be present in soil.

Table 11.2: Evaluation of decision making process, EPA, 2017

EPA, 2017	Evaluation
All site assessment, remediation and validation reports follow applicable guidelines.	This report has been prepared based on the relevant guidelines as listed in Section 1.3. It has also taken into account the relevant updates in the amended NEPM (2013).
Any aesthetic issues relating to site soils have been adequately addressed.	Aesthetic issues are present on-site associated with fill material as well as TRH contamination exceeding management limits.
Soils have been assessed against relevant health-based investigation levels and, if required, any potential impacts to buildings and structures from the presence of contaminants considered.	Yes – exceedances of health based investigation levels present for lead, TRHs and PAHs.
Groundwater (where relevant) has been assessed against relevant health-based investigation levels and, if required, any potential impacts to buildings and structures from the presence of contaminants considered.	Yes – exceedances of drinking water and marine criteria for arsenic and zinc but likely to be regional.
Hazardous ground gases (where relevant) have been assessed against relevant health-based investigation levels and screening values.	N/A
Any issues relating to local area background soil concentrations that exceed appropriate site soil criteria have been adequately addressed in the site assessment reports.	No issues have arisen for soil.
The impacts of chemical mixtures have been assessed.	No issues have arisen.
The potential ecological risks have been assessed.	Exceedances of ecological criteria require further consideration and/or management along with the management limit exceedances.
Any evidence of, or potential for, migration of contaminants from the site has been appropriately addressed, including potential risk to off-site receptors, and reported to the site owner or occupier.	Further investigation is required to determine if there is evidence of off-site migration.
The site management strategy is appropriate.	Further investigation is required to determine the appropriate management strategy.

12.0 Glossary and references

12.1 Glossary

AST	Aboveground storage tank
BTEXN	Benzene, toluene, ethyl benzene, xylenes and naphthalene
CSM	Conceptual site model
EIL	Environmental Investigation Level
ESL	Environmental Screening Level
EMP	Environmental Management Plan
ESA	Environmental site assessment
GME	Groundwater monitoring event
HHRA	Human health risk assessment
HIL	Health Investigation Level
HSL	Health Screening Level
LOR	Limit of reporting
Metals	Arsenic (As), cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), mercury (Hg), nickel (Ni), and zinc (Zn)
NATA	National Association of Testing Authorities
NEPM/C	National Environmental Protection Measure/Council
OCPs	Organochlorine pesticides
OH&S	Occupational health and safety
OPPs	Organophosphorus pesticides
PAHs	Polycyclic aromatic hydrocarbons, including the USEPA 16 priority pollutants: naphthalene; acenaphthylene; acenaphthene; fluorine; phenanthrene; anthracene; fluoranthene; pyrene; benzo(a) anthracene; chrysene; benzo(b)fluoranthene; benzo(k) fluoranthene; benzo(a)pyrene; indeno(1.2.3.cd)pyrene; dibenz (a.h)anthracene; and benzo(g.h.i)perylene
PCBs	Polychlorinated biphenyls
PID	Photo-ionisation detector
PSH	Phase separated hydrocarbons
QA/QC	Quality assurance/quality control
RAP	Remediation action plan

RPD	Relative Percentage Difference
SWL	Standing water level
TRHs	Total recoverable hydrocarbons, including volatile C6 – C10 fraction and semi- and non-volatile >C10 – C36 fractions
UCL	Upper confidence limit
UST	Underground storage tank
VRP	Voluntary remediation proposal
VOCs	Volatile organic compounds

12.2 References

Other References

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Figures

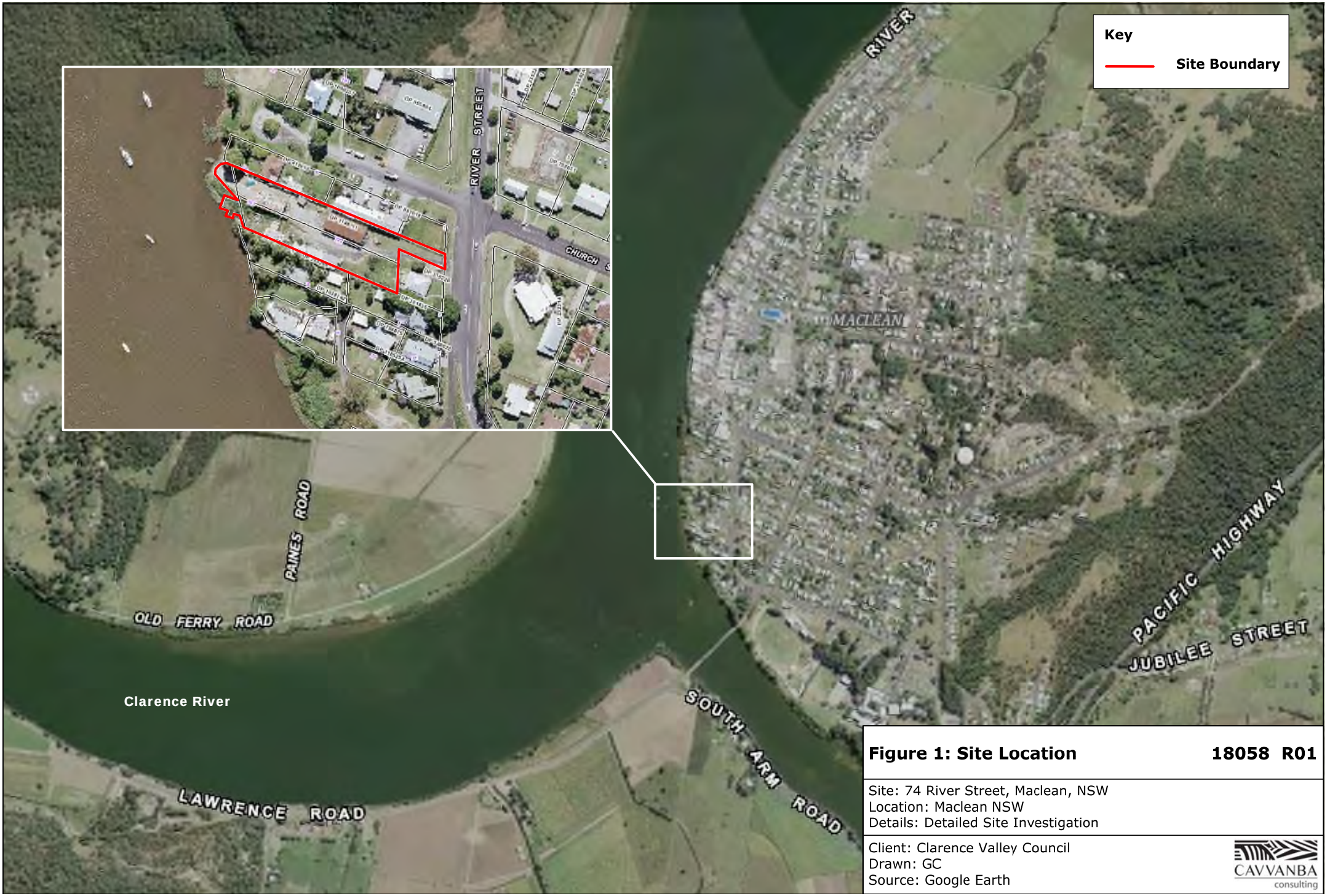


Figure 1: Site Location **18058 R01**

Site: 74 River Street, Maclean, NSW
Location: Maclean NSW
Details: Detailed Site Investigation

Client: Clarence Valley Council
Drawn: GC
Source: Google Earth

CAVVANBA consulting

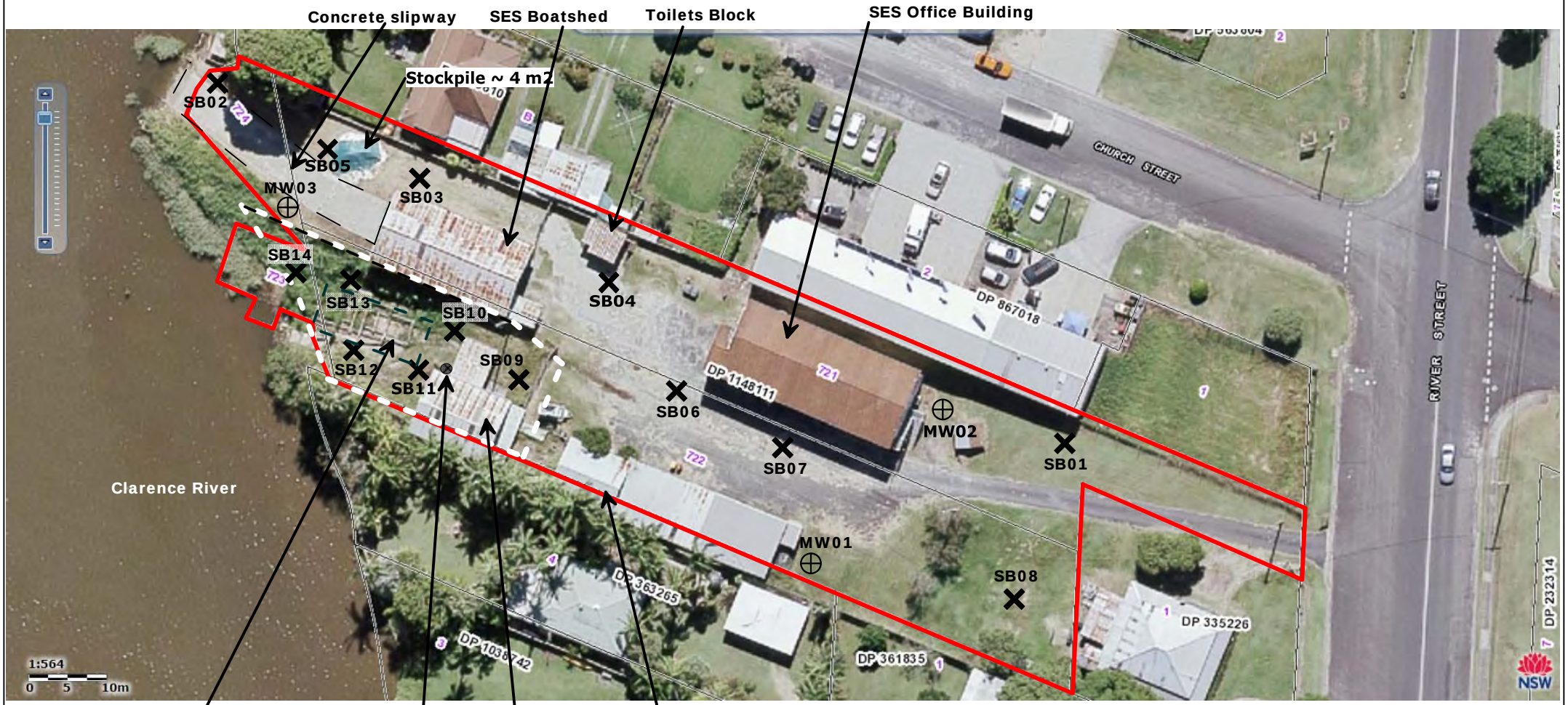
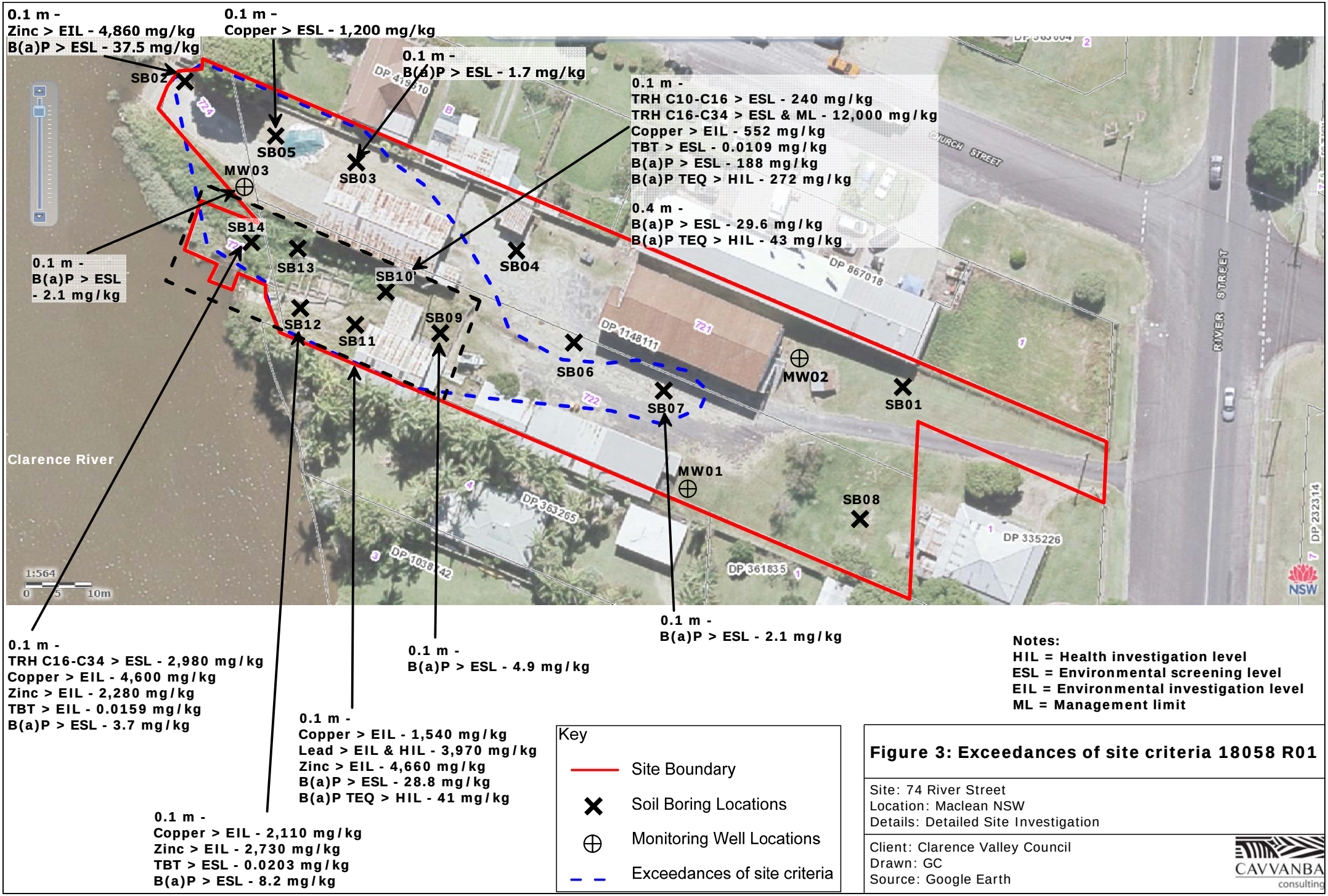


Figure 2: Site layout and features **18058 R01**

Site: 74 River Street
Location: Maclean NSW
Details: Detailed Site Investigation

Client: Clarence Valley Council
Drawn: GC
Source: Google Earth

CAVVANBA consulting



Notes:
HIL = Health investigation level
ESL = Environmental screening level
EIL = Environmental investigation level
ML = Management limit

Key

- Site Boundary
- Soil Boring Locations
- Monitoring Well Locations
- Exceedances of site criteria

Figure 3: Exceedances of site criteria 18058 R01

Site: 74 River Street
Location: Maclean NSW
Details: Detailed Site Investigation

Client: Clarence Valley Council
Drawn: GC
Source: Google Earth

CAVVANBA consulting

Tables

Table 1: Sample Description and Analytical Summary

Sample	Depth (m)	PID (ppm)	Date sampled	Description	Analysis						
					TRHs	BTEXN	PAHs	Heavy metals	Lead	TBT	SVOC/VOC
Analytical - Soil Borings											
MW01	0.1	-	07/11/18	FILL: Silty SAND - light brown, loose and dry.	•	•	•	•			
MW02	0.1	-	07/11/18	FILL: Gravelly SAND - light brown, very loose and dry.	•	•	•	•			
MW03	0.1	-	07/11/18	FILL: Silty SAND - light brown, loose and dry. Inclusions of glass and sub-angular stones <20mm.	•	•	•	•		•	
SB01	0.1	-	07/11/18	FILL: Silty SAND - light brown, loose and dry.	•	•	•	•			
SB02	0.1	-	07/11/18	FILL: Silty SAND - dark brown, loose and dry.	•	•	•	•		•	
SB02	1.0	-	07/11/18	FILL: Silty SAND - light brown, loose and dry.			•				
SB03	0.1	-	07/11/18	FILL: Silty, gravelly SAND - dark brown, loose and dry. Inclsuions of charcoal.	•	•	•	•			
SB04	0.1	-	07/11/18	FILL: Sandy GRAVEL - light brown, loose and dry.	•	•	•	•			
SB05	0.1	-	07/11/18	FILL: Gravelly SAND - light brown, loose and dry. Inclsuions of glass and sub-angular stones <20mm.	•	•	•	•			
SB06	0.1	-	08/11/18	FILL: Gravelly SAND - orange/grey, loose and dry. Inclsuions of sub-angular stones <20mm.	•	•	•	•			
SB07	1.0	40.6	08/11/18	FILL: Clayey, gravelly SAND - brown to grey mottled with green staining, medium dense and moist with hydrocarbon odours.	•	•	•	•			•
SB08	0.1	-	08/11/18	SAND - light grey, loose and dry.	•	•	•	•			
SB09	0.1	-	08/11/18	FILL: Silty SAND - dark brown, loose and slightly moist with inclusions of glass.	•	•	•	•		•	
SB10	0.1	-	08/11/18	FILL: Silty SAND - dark brown, loose and dry with inclusions of glass and plastic.	•	•	•	•		•	
SB10	0.4		08/11/18	FILL: Silty SAND - dark brown, medium dense and slightly moist.	•	•	•				
SB11	0.1	-	08/11/18	FILL: Sandy SILT - dark brown, loose and dry with inclsuions of glass and tiles.	•	•	•	•		•	

Table 1: Sample Description and Analytical Summary

Sample	Depth (m)	PID (ppm)	Date sampled	Description	Analysis						
					TRHs	BTEXN	PAHs	Heavy metals	Lead	TBT	SVOC/VOC
Analytical - Soil Borings											
SB11	0.4	-	08/11/18	FILL: Silty SAND - dark brown, medium dense and slightly moist.			•		•		
SB12	0.1	-	08/11/18	FILL: SAND - light grey, very loose and dry with inclusions of ash.	•	•	•	•		•	
SB13	0.1	-	08/11/18	FILL: Silty SAND - light brown, very loose and dry with inclsuions of paint flecks and plastic.	•	•	•	•		•	
SB14	0.1	-	08/11/18	FILL: Silty SAND - dark brown, loose and dry. Inclsuions of glass and paint flecks.	•	•	•	•		•	
Analytical - Monitoring Wells											
MW01	-	-	08/11/18	-	•	•	•	•			
MW02	-	-	08/11/18	-	•	•	•	•			
MW03	-	-	08/11/18	-	•	•	•	•			

Table 2: Soil Analytical Summary, BTEXN and TRHs (mg/kg)

Sample	Depth (m)	Benzene	Toluene	Ethyl benzene	meta- & para-Xylenes	ortho-Xylene	Naphthalene	TRHs C6 - C10	TRHs >C10 - C16	TRHs >C16 - C34	TRHs C34 - C40
LORs		*0.2*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*10*	*50*	*100*	*100*
Analytical - Soil Borings											
MW01	0.1	nd	nd	nd	nd	nd	nd	nd	nd	160	nd
MW02	0.1	nd	nd	nd	nd	nd	nd	nd	nd	100	nd
MW03	0.1	nd	nd	nd	nd	nd	nd	nd	nd	210	nd
SB01	0.1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
SB02	0.1	nd	nd	nd	nd	nd	nd	nd	nd	1,580	540
SB03	0.1	nd	nd	nd	nd	nd	nd	nd	nd	230	110
SB04	0.1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
SB05	0.1	nd	nd	nd	nd	nd	nd	nd	nd	160	nd
SB06	0.1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
SB07	1.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
SB08	0.1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
SB09	0.1	nd	nd	nd	nd	nd	nd	nd	nd	290	nd
SB10	0.1	nd	nd	nd	nd	nd	nd	nd	240	**12,000**	2,920
SB10	0.4	nd	nd	nd	nd	nd	nd	nd	nd	1,360	540
SB11	0.1	nd	nd	nd	nd	nd	nd	nd	nd	2,010	650
SB12	0.1	nd	nd	nd	nd	nd	nd	nd	nd	770	380
SB13	0.1	nd	nd	nd	nd	nd	nd	nd	nd	360	220
SB14	0.1	0.3	nd	nd	nd	nd	nd	nd	70	2,980	500
Statistics											
Samples analysed		18	18	18	18	18	18	18	18	18	18
Detects		1	0	0	0	0	0	0	2	13	8
% detect		6%	0%	0%	0%	0%	0%	0%	11%	72%	44%
Maximum		0.3	0	0	0	0	0	0	240	**12,000**	2,920
Mean		0	0	0	0	0	0	0	17	1,234	326
Median		-	-	-	-	-	-	-	240	325	540
Minimum		-	-	-	-	-	-	-	-	-	-
Criteria											
Commercial/industrial landuse with sandy soils (HSL D)											
Health levels 0m to <1m		3	NL	NL	230		NL	260	NL	NL	NL
Health levels 1m to <2m		3	NL	NL	NL		NL	370	NL	NL	NL
Health levels 2m to <4m		3	NL	NL	NL		NL	630	NL	NL	NL
Health levels 4m+		3	NL	NL	NL		NL	NL	NL	NL	NL
Health investigation level		-	-	-	-		-	-	-	-	-
Ecological levels		75	135	165	180		370	215	170	1,700	3,300
Management limits		-	-	-	-		-	**-**	1,000	**3,500**	10,000
Direct Contact Criteria		430	99,000	27,000	81,000		-	26,000	20,000	27,000	38,000

See table notes at end of section

Table 3: Soil Analytical Summary - PAHs and VOCs (mg/kg)

Sample	Depth (m)	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benz(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1.2.3.cd)pyrene	Dibenz(a.h)anthracene	Benzo(g.h.i)perylene	Total PAHs	B(a)P TEQ	Total VOCs
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*	-	-	-
Analytical																				
MW01	0.1	nd	nd	nd	nd	nd	nd	nd	0.5	nd	nd	nd	nd	nd	nd	nd	nd	0.5	nd	-
MW02	0.1	nd	nd	nd	nd	nd	nd	nd	0.7	nd	nd	nd	nd	nd	nd	nd	nd	0.7	nd	-
MW03	0.1	nd	nd	nd	nd	2.5	0.6	5	4.8	1.7	1.6	2.3	0.9	2.1	1.2	nd	1.6	24.3	2.7	-
SB01	0.1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-
SB02	0.1	nd	2.1	nd	0.7	13.8	4.8	59.4	57.4	36.7	35.4	45.2	16.8	37.5	16.6	4.2	18.3	349	**53.8**	-
SB02	1.0	nd	nd	nd	nd	0.5	nd	0.8	0.8	nd	nd	0.5	nd	nd	nd	nd	nd	2.6	nd	-
SB03	0.1	nd	nd	nd	nd	0.8	nd	2.4	2.8	1.3	1.3	1.8	0.6	1.7	0.8	nd	1	14.5	2.2	-
SB04	0.1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-
SB05	0.1	nd	nd	nd	nd	1.2	nd	2.4	2.4	1.1	1	1.4	0.5	1.2	0.6	nd	0.7	12.5	1.6	-
SB06	0.1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-
SB07	1.0	nd	nd	nd	nd	2.7	0.7	5.2	5.1	2.3	2.2	2.6	1.1	2.1	1.2	nd	1.5	26.7	2.8	nd
SB08	0.1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-
SB09	0.1	nd	0.9	nd	0.7	6.5	2.2	11.1	11.2	5.1	4.5	5.3	2	4.9	2.1	0.6	2.6	59.7	7	-
SB10	0.1	5.6	32.2	nd	12.2	190	66.4	363	402	199	177	214	66.8	188	87.2	24.2	111	2,140	**272**	-
SB10	0.4	0.9	6.9	nd	1	12.8	5.3	34.6	39.1	23.7	24	32.6	12.1	29.6	15.8	4.5	19.5	262	**43**	-
SB11	0.1	1.6	6.3	0.5	2.1	35.5	7.6	56.4	57.9	26.6	27.1	34.9	11.3	28.8	12.8	3.2	14.2	327	**41**	-
SB11	0.4	nd	nd	nd	nd	nd	nd	0.7	0.8	nd	nd	nd	nd	nd	nd	nd	nd	1.5	nd	-
SB12	0.1	nd	1.6	nd	nd	7.1	1.7	14	13.8	7	7.2	10.5	3.4	8.2	4	1.1	4.8	84.4	11.9	-
SB13	0.1	nd	nd	nd	nd	1.6	nd	3.7	3.9	1.8	1.8	2.5	1	2.2	1	nd	1.1	20.6	2.8	-
SB14	0.1	nd	0.7	nd	nd	7.1	1	12.1	9.8	5.3	5.2	5.9	1.9	3.7	1.5	nd	1.6	55.8	5.2	-

Table 3: Soil Analytical Summary - PAHs and VOCs (mg/kg)

Sample	Depth (m)	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benz(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1.2.3.cd)pyrene	Dibenz(a.h)anthracene	Benzo(g.h.i)perylene	Total PAHs	B(a)P TEQ	Total VOCs
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*	-	-	-
Analytical																				
Statistics																				
Samples analysed		20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	1
Detects		3	7	1	5	13	9	14	16	12	12	13	12	12	12	6	12	16	12	0
% detect		15%	35%	5%	25%	65%	45%	70%	80%	60%	60%	65%	60%	60%	60%	30%	60%	80%	60%	0%
Maximum		5.6	32.2	0.5	12.2	190	66.4	363	402	199	177	214	66.8	188	87.2	24.2	111	2,140	**272**	-
Mean		0.4	2.5	0.0	0.8	14.1	4.5	28.5	30.7	15.6	14.4	18.0	5.9	15.5	7.2	1.9	8.9	169.1	22.3	-
Median		1.6	2.1	0.5	1.0	6.5	2.2	8.2	5.0	5.2	4.9	5.3	2.0	4.3	1.8	3.7	2.1	25.5	6.1	-
Minimum		0.9	0.7	0.5	0.7	0.5	0.6	0.7	0.5	1.1	1.0	0.5	0.5	1.2	0.6	0.6	0.7	0.5	1.6	-
Criteria																				
HILs - Commercial/Industrial D		NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	4,000	**40**	-
ESLs - Commercial and Industrial (Aged)		370	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	NL	1.4	NL	NL	NL	NL	NL	-

See table notes at end of section

Table 4: Soil Analytical Summary, Metals and organotins (mg/kg)

		Heavy metals								Organotins
Sample	Depth (m)	Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Mercury	Tributyltin
LORs		*5*	*1*	*2*	*5*	*5*	*2*	*5*	*0.1*	*0.0005*
Analytical - Soil Borings										
MW01	0.1	nd	nd	14	50	93	4	158	nd	-
MW02	0.1	nd	nd	8	10	26	nd	29	nd	-
MW03	0.1	7	nd	19	240	289	26	402	0.3	0.0088
SB01	0.1	nd	nd	9	16	42	nd	38	nd	-
SB02	0.1	8	4	24	62	217	20	4,860	0.2	nd
SB02	1.0	5	nd	16	16	66	13	165	nd	nd
SB03	0.1	nd	nd	12	74	150	9	112	nd	-
SB04	0.1	nd	nd	4	nd	6	3	21	nd	-
SB05	0.1	nd	nd	7	1,200	115	4	116	nd	-
SB06	0.1	nd	nd	16	nd	6	nd	nd	nd	-
SB07	1.0	5	nd	16	30	132	8	89	nd	-
SB08	0.1	nd	nd	3	nd	6	nd	13	nd	-
SB09	0.1	5	nd	14	52	194	8	426	0.1	nd
SB10	0.1	16	nd	9	552	333	7	699	0.6	0.0109
SB11	0.1	25	5	23	1,540	**3,970**	26	4,660	3.4	nd
SB11	0.4	-	-	-	-	168	-	-	-	-
SB12	0.1	16	nd	31	2,110	844	17	2,730	0.7	0.0203
SB13	0.1	10	nd	26	389	108	15	320	0.9	nd
SB14	0.1	9	nd	36	4,600	127	19	2,280	0.3	0.0159

Table 4: Soil Analytical Summary, Metals and organotins (mg/kg)

		Heavy metals								Organotins
Sample	Depth (m)	Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Mercury	Tributyltin
LORs		*5*	*1*	*2*	*5*	*5*	*2*	*5*	*0.1*	*0.0005*
Statistics										
Samples analysed		18	18	18	18	19	18	18	18	9
Detects		10	2	18	15	19	14	17	7	4
% detect		56%	0%	100%	83%	100%	78%	94%	39%	44%
Maximum		25	5	36	4,600	**3,970**	26	4,860	3.4	0.0203
Mean		6	1	16	608	363	10	951	0	0
Median		9	5	15	74	127	11	165	0	0
Minimum		5	4	3	10	6	3	13	0.1	0.0
Criteria										
HILs - Commercial/Industrial D		3,000	900	3,600	240,000	**1,500**	6,000	400,000	730/180	-
EILs - Commercial and Industrial, aged criteria		160	-	670	320	1,800	460	1,200	-	-
DGVs*		-	-	-	-	-	-	-	-	0.009
GV-high**		-	-	-	-	-	-	-	-	70
US EPA Outdoor Worker RSL***		-	-	-	-	-	-	-	-	27,400

See table notes at end of section

*DGVs = Default guideline values (ANZECC & ARMCANZ, 2000)

**GV-high = upper guideline values (ANZECC & ARMCANZ 2000)

***US EPA RSL = US EPA Outdoor Worker Risk-Based Regional Screening Level for soil

Table 5: Soil Analytical Summary, Quality Control (mg/kg)

Analyte	LOR mg/kg	MW03_0.1	QS01	**RPD**	SB07_1.0	QS03	**RPD**	MW03_0.1	QS02	**RPD**	SB12_0.1	QS04	**RPD**	Trip Blank	Trip Spike	TSC	**RPD**
Type	-	*Primary*	*Duplicate*	*%*	*Primary*	*Duplicate*	*%*	*Primary*	*Inter-laboratory Duplicate*	*%*	*Primary*	*Interlabor-atory duplicate*	*%*	-	-	-	*%*
Date	-	07/11/18	07/11/18	-	08/11/18	08/11/18	-	07/11/18	07/11/18	-	08/11/18	08/11/18	-	05/11/18	05/11/18	05/11/18	-
Media	*Soil*	*Soil*	*Soil*	-	*Soil*	*Soil*	-	*Soil*	*Soil*	-	*Soil*	*Soil*	-	-	-	-	-
Heavy metals																	
Arsenic	5	nd	nd	-	5	6	18	nd	nd	-	16	16	0	-	-	-	-
Cadmium	1	nd	nd	-	nd	nd	-	nd	1	-	nd	1	-	-	-	-	-
Chromium	2	14	26	**60**	16	14	13	14	22	44	31	530	**178**	-	-	-	-
Copper	5	50	228	**128**	30	46	42	50	200	**120**	2,110	5,900	**95**	-	-	-	-
Lead	5	93	255	**93**	132	225	**52**	93	190	**69**	844	960	13	-	-	-	-
Nickel	2	4	25	**145**	8	6	29	4	22	**138**	17	760	**191**	-	-	-	-
Zinc	5	158	386	**84**	89	91	2	158	280	**56**	2,730	2,500	9	-	-	-	-
Mercury	*0.1*	nd	0.3	-	nd	0	-	nd	0.3	-	0.7	1.2	**53**	-	-	-	-
Organics																	
Benzene	0.2	nd	nd	-	nd	nd	**-**	nd	nd	-	nd	nd	**-**	nd	nd	nd	-
Toluene	0.5	nd	nd	-	nd	nd	**-**	nd	nd	-	nd	nd	**-**	nd	7.4	9	19.5
Ethyl benzene	0.5	nd	nd	-	nd	nd	**-**	nd	nd	-	nd	nd	**-**	nd	1.2	1.3	8.0
meta- & para-Xylene	0.5	nd	nd	-	nd	nd	**-**	nd	nd	-	nd	nd	**-**	nd	6	6.9	14.0
ortho-Xylene	0.5	nd	nd	-	nd	nd	**-**	nd	nd	-	nd	nd	**-**	nd	2.4	2.9	18.9
TRHs C6 – C10	10	nd	nd	-	nd	nd	**-**	nd	nd	-	nd	nd	**-**	nd	38	33	14.1
TRHs >C10 - C16	50	nd	nd	-	nd	nd	**-**	nd	nd	-	nd	nd	-	-	-	-	-
TRHs >C16 - C34	100	210	170	21	nd	190	**-**	210	300	35	770	560	32	-	-	-	-
TRHs >C34 - C40	100	nd	120	-	nd	120	**-**	nd	150	-	380	240	45	-	-	-	-
Data Quality Indicator		-	-	***<50%***	-	-	***<50%***	-	-	***<50%***	-	-	***<50%***	-	-	-	*<50%*

See tables notes at end of section

Soil Analytical Summary Table Notes

LOR denotes limit of reporting (standard LOR unless otherwise shown)

PBILs denotes phytotoxicity based investigation levels

nd denotes not detected above the LOR

NL denotes non-limiting

- denotes not analysed/not available

Bold - Exceeds HILs criteria

Underscore - Exceeds EILs criteria

^ denotes raised LOR

TRH C6-C10 F1 = TRH C6-C10 minus BTEX compounds

*analyte list shown on laboratory report

1. Methyl mercury / inorganic mercury
2. Netherlands protection of terrestrial organisms/ Netherlands human health based and human health and ecologically based protection level.
3. Criteria for phenol

Table 6: Groundwater Analytical Summary, BTEXN, TRHs (ug/L)

Sample location	Date sampled	Depth to water (m)	Benzene	Toluene	Ethyl benzene	Total Xylenes	Naphthalene	F1 C6 - C10 TRHs	F2 >C10 - C16 TRHs	F3 >C16 - C34 TRHs	F4 >C34 - C40 TRHs	>C10 - C40 TRHs
LORs		-	*1*	*2*	*2*	*2*	*2*	*20*	*100*	*100*	*100*	*100*
Analytical												
MW01	13/11/18	1.735	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW02	13/11/18	1.351	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW03	13/11/18	2.140	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
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			0	0	0	0	0	0	0	0	0	0
Mean			-	-	-	-	-	-	-	-	-	-
Median			-	-	-	-	-	-	-	-	-	-
Minimum			-	-	-	-	-	-	-	-	-	-
Criteria - Commercial/Industrial												
Health levels 2 m - < 4 m			800	NL	NL	NL	NL	1,000	NL	NL	NL	NL
Marine water [1]			500	-	-	-	50	-	-	-	-	-
Drinking water[2]			1	800 (25)	300 (3)	600 (20)	-	-	-	-	-	-
Recreational Criteria			10	8,000	3,000	6,000	-	-	-	-	-	-

See tables notes at end of section

Table 7: Groundwater Analytical Summary, PAHs (ug/L)

Sample	Date sampled	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benz(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1.2.3.cd)pyrene	Dibenz(a.h)anthracene	Benzo(g.h.i)perylene	Total PAHs	B(a)P TEQ
LORs		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*0.5*	*1*	*1*	*1*	*0.5*	*0.5*
Analytical																			
MW01	13/11/18	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW02	13/11/18	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW03	13/11/18	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Statistics																			
Samples analysed		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Detects		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% detect		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Maximum		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mean		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Median		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Minimum		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Criteria																			
Marine water GILs		50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Drinking Water		-	-	-	-	-	-	-	-	-	-	-	-	0.01	-	-	-	-	-
Recreational Criteria		-	-	-	-	-	-	-	-	-	-	-	-	0.1	-	-	-	-	-

See table notes at end of section

Table 8: Groundwater Analytical Summary, Metals (ug/L)

Sample	Date sampled	Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Mercury
LORs		*1*	*0.1*	*1*	*1*	*1*	*1*	*5*	*0.1*
Analytical									
MW01	13/11/18	nd	nd	nd	1	nd	nd	**27**	nd
MW02	13/11/18	**4**	nd	nd	nd	nd	nd	**31**	nd
MW03	13/11/18	**12**	nd	nd	nd	nd	nd	**34**	nd
Statistics									
Samples analysed		3	3	3	3	3	3	3	3
Detects		2	0	0	1	0	0	3	0
% detect		67%	0%	0%	33%	0%	0%	100%	0%
Maximum		4	-	-	-	-	-	31	-
Mean		5.33	-	-	-	-	-	30.67	-
Median		8.0	-	-	1.0	-	-	31.0	-
Minimum		-	-	-	-	-	-	-	-
Criteria									
GILs - Drinking Water		**10**	2	50*	2	10	20	-	1
GILs - Marine water		**2.3 / 4.5****	0.7	4.4	1.3	4.4	**7**	**15**	0.1
Recreational Criteria		100	20	500	20,000	100	200	-	10

* - Chromium criteria as Cr(VI)

** - Arsenic criteria as As (III) / As (V)

*** - Canadian interim value

See table notes at end of section

Table 9: Groundwater Analytical Summary, Quality Control (ug/L)

Analyte	LOR ug/L	MW01	QS01	**RPD**	MW01	QS02	**RPD**	Trip Blank	Trip Spike	Trip Spike	Trip Spike
Type	-	*Primary*	*Duplicate*	*%*	*Primary*	*Inter-laboratory Duplicate*	*%*	*Lab prep*	*Field*	*Lab*	*Recovery*
Date	-	*13/11/18*	*13/11/18*	-	*13/11/18*	*13/11/18*	-	*12/11/18*	*12/11/18*	*12/11/18*	-
Metals											
Arsenic	1	nd	nd	-	nd	nd	-	-	-	-	-
Cadmium	0.1	nd	nd	-	nd	nd	-	-	-	-	-
Chromium	1	nd	nd	-	nd	nd	-	-	-	-	-
Copper	1	1	1	0	1	2	**67**	-	-	-	-
Lead	1	nd	nd	-	nd	nd	-	-	-	-	-
Nickel	1	nd	nd	-	nd	nd	-	-	-	-	-
Zinc	5	27	28	4	27	37	31	-	-	-	-
Mercury	0.1	nd	nd	-	nd	nd	-	-	-	-	-
TRHs											
C6 - C10 Fraction	20	nd	nd	-	nd	nd	-	nd	-	-	-
C6 - C10 Fraction minus BTEX (F1)	20	nd	nd	-	nd	nd	-	nd	-	-	-
> C10 - C16 Fraction (F2)	50	nd	nd	-	nd	nd	-	-	-	-	-
> C16 - C34 Fraction	100	nd	nd	-	nd	nd	-	-	-	-	-
< C34 - C40 Fraction	50	nd	nd	-	nd	nd	-	-	-	-	-
> C10 - C40 Fraction (sum)	50	nd	nd	-	nd	nd	-	-	-	-	-
BTEXN											
Benzene	1	nd	nd	-	nd	nd	-	nd	15	20	75
Toluene	2	nd	nd	-	nd	nd	-	nd	19	20	95
Ethylbenzene	2	nd	nd	-	nd	nd	-	nd	16	20	80
Total Xylenes	2	nd	nd	-	nd	nd	-	nd	30	40	75
Naphthalene	5	nd	nd	-	nd	nd	-	nd	17	20	85
Data Quality Indicator	-	-	-	*<50%*	-	-	***<50%***	-	-	-	*70-130%*

See tables notes at end of section

Groundwater Analytical Summary Table Notes

LOR denotes limit of reporting (standard LOR unless otherwise shown)

nd denotes not detected above the LOR

Bold - Exceeds criteria

^ denotes LOR raised

- denotes not analysed/not available

* TPHs in waters used as screening analysis. If > LOR, check specific toxicants e.g. BTEX, PAHs, etc. For recreational waters/aesthetics, oil/petrol not to be noticeable as a visible film on the water or detectable by odour.

1. Aquatic ecosystem criteria from Australian New Zealand Environment and Conservation Council (ANZECC) / Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) (2000) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* , including Table 3.4.1 and Section 8.3.7.

DECCW/DERM specify 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. bioaccumulative).

2. Drinking water criteria from National Health and Medical Research Council (NHMRC) & Natural Resource Management Ministerial Council (NRMMC) (2011) *Australian Drinking Water Guidelines* .

The guideline values are health related and are described as the concentration that does not result in any significant risk to the health of the consumer over a lifetime of consumption. Numbers in brackets are aesthetic values, e.g. appearance, taste and/or odour. The guideline values relate to the quality of water at the point of use, e.g. kitchen or bathroom tap.

While exposure is predominately through ingestion, skin adsorption and/or inhalation are considered in calculating the guideline value (Page 6-7, NHMRC/NRMMC 2004). However, this only addresses consumption/use of drinking water, it does not address inhalation from subsurface, and drinking water criteria should not be used as risk assessment screening values for onsite contaminant concentrations.

Appendix A

Spatial report

Broadcrest Consulting

MAPPING & SPATIAL SERVICES

LOCATION: 74 River Street, Maclean NSW

REPORT 216

DATE 19.10.2018

Disclaimer

Broadcrest Consulting has taken all reasonable care in collating and providing the data within this report on the basis that any person given access to this report are responsible for assessing the relevance of the content. The purpose of this report is to provide an overview of the site based on some data collated from various government, public and private sources. You should obtain independent advice before you make any decision based on the information in this report.

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Broadcrest Consulting Pty Ltd | ABN: 622 508 187

Client Cavvanba Consulting Pty Ltd	**Map** Site Aerial Photograph
Location 74 River Street, Maclean NSW LOT: 721 DP 1148111	**LGA** CLARENCE VALLEY COUNCIL

Data Source

Base map
DFSI Spatial Services Imagery | © Department of Finance, Services & Innovation 2017
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Client Cavvanba Consulting Pty Ltd	**Map** Site Location with Terrain
Location 74 River Street, Maclean NSW	**LGA** CLARENCE VALLEY COUNCIL

Data Source
Geoscience Australia | Obtained on 18.07.2018
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Base map
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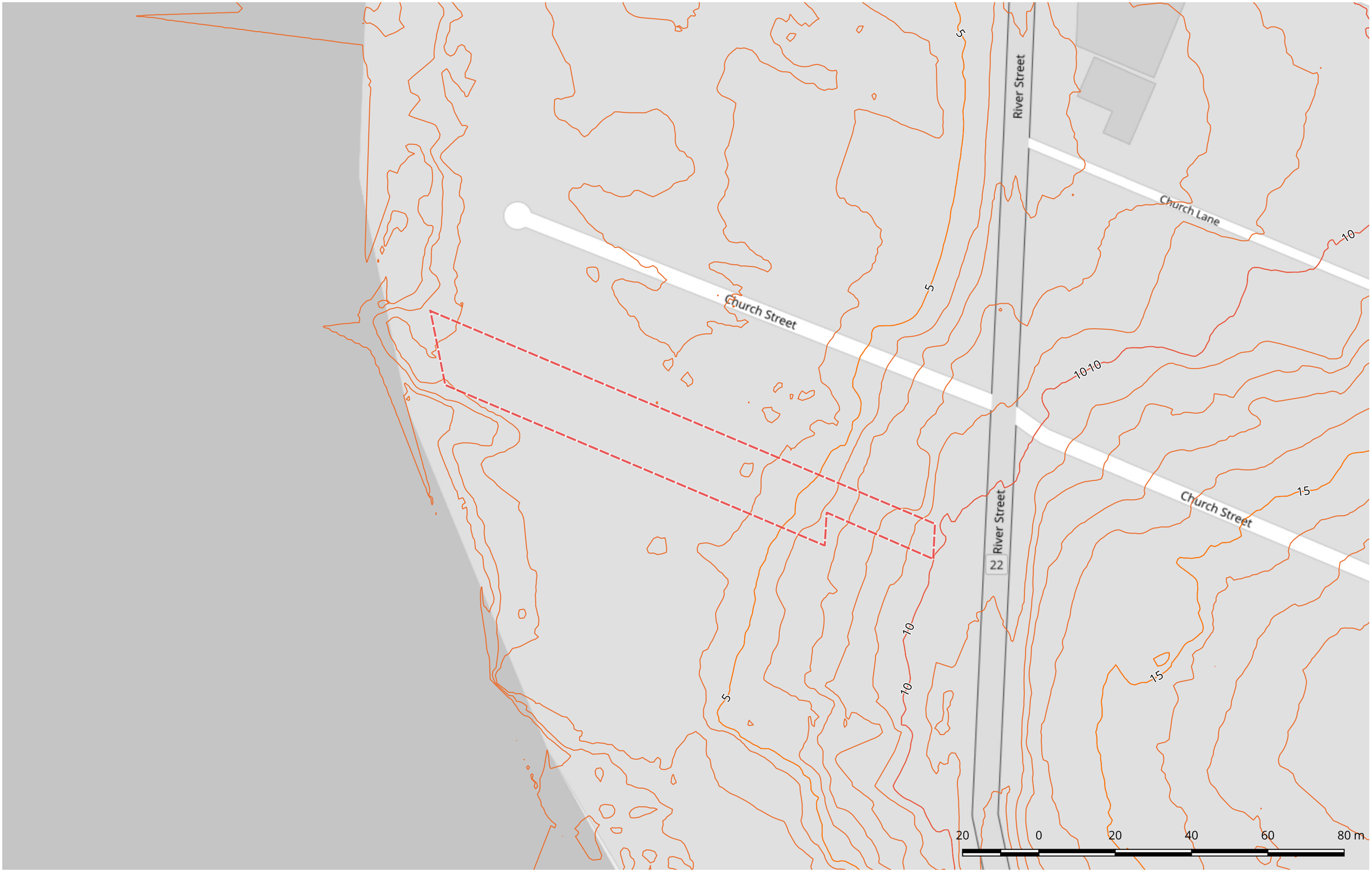

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Client Cavvanba Consulting Pty Ltd	**Map** Topography
Location 74 River Street, Maclean NSW	**LGA** CLARENCE VALLEY COUNCIL

Data Source
Derived from LiDAR Data | Geoscience Australia | Obtained on 18.07.2018
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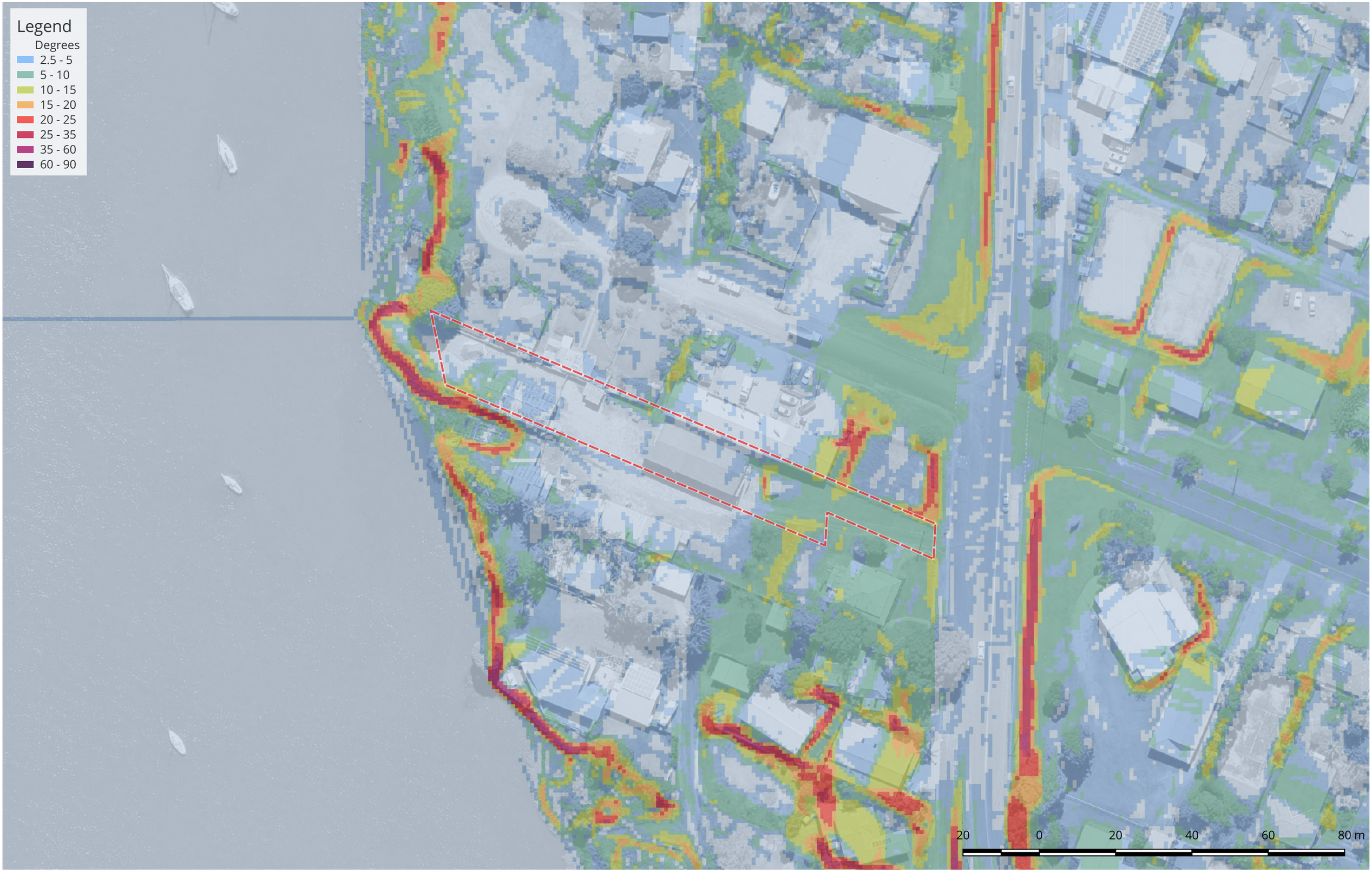

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Client Cavvanba Consulting Pty Ltd	**Map** Slope Heat Map
Location 74 River Street, Maclean NSW	**LGA** CLARENCE VALLEY COUNCIL

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Client Cavvanba Consulting Pty Ltd	**Map** Land Zone Map
Location 74 River Street, Maclean NSW	**LGA** CLARENCE VALLEY COUNCIL

Data Source
NSW Planning and the Environment | Obtained on 18.07.2018
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Base map
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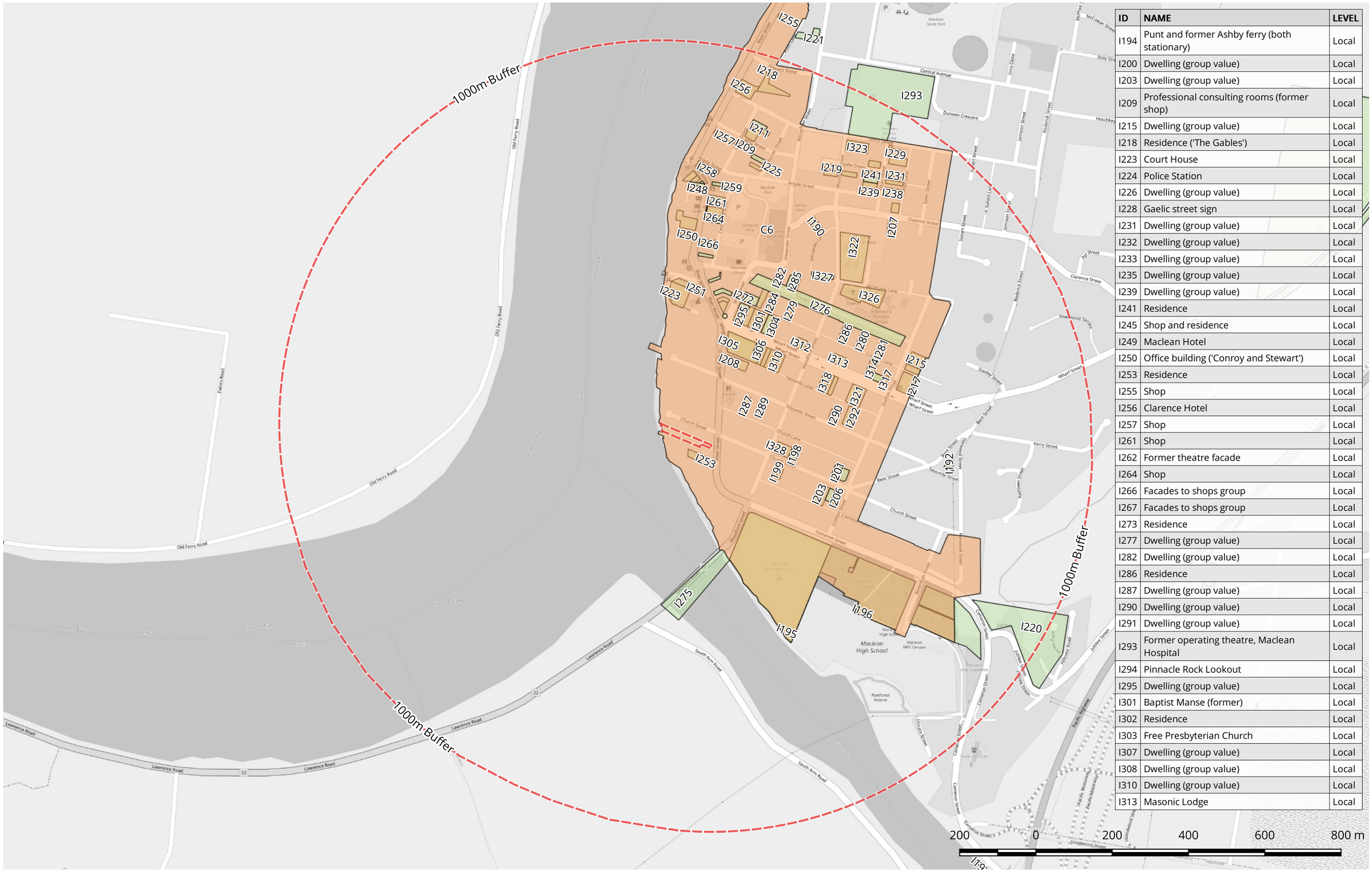

ID	NAME	LEVEL
I194	Punt and former Ashby ferry (both stationary)	Local
I200	Dwelling (group value)	Local
I203	Dwelling (group value)	Local
I209	Professional consulting rooms (former shop)	Local
I215	Dwelling (group value)	Local
I218	Residence ('The Gables')	Local
I223	Court House	Local
I224	Police Station	Local
I226	Dwelling (group value)	Local
I228	Gaelic street sign	Local
I231	Dwelling (group value)	Local
I232	Dwelling (group value)	Local
I233	Dwelling (group value)	Local
I235	Dwelling (group value)	Local
I239	Dwelling (group value)	Local
I241	Residence	Local
I245	Shop and residence	Local
I249	Maclean Hotel	Local
I250	Office building ('Conroy and Stewart')	Local
I253	Residence	Local
I255	Shop	Local
I256	Clarence Hotel	Local
I257	Shop	Local
I261	Shop	Local
I262	Former theatre facade	Local
I264	Shop	Local
I266	Facades to shops group	Local
I267	Facades to shops group	Local
I273	Residence	Local
I277	Dwelling (group value)	Local
I282	Dwelling (group value)	Local
I286	Residence	Local
I287	Dwelling (group value)	Local
I290	Dwelling (group value)	Local
I291	Dwelling (group value)	Local
I293	Former operating theatre, Maclean Hospital	Local
I294	Pinnacle Rock Lookout	Local
I295	Dwelling (group value)	Local
I301	Baptist Manse (former)	Local
I302	Residence	Local
I303	Free Presbyterian Church	Local
I307	Dwelling (group value)	Local
I308	Dwelling (group value)	Local
I310	Dwelling (group value)	Local
I313	Masonic Lodge	Local

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Client
Cavvanba Consulting Pty Ltd

Location
74 River Street, Maclean NSW

Map
Heritage Listed Sites

LGA
CLARENCE VALLEY COUNCIL

Data Source
NSW Planning and the Environment | Obtained on 18.07.2018
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Base map
Open Street Maps | Obtained on 19.10.2018
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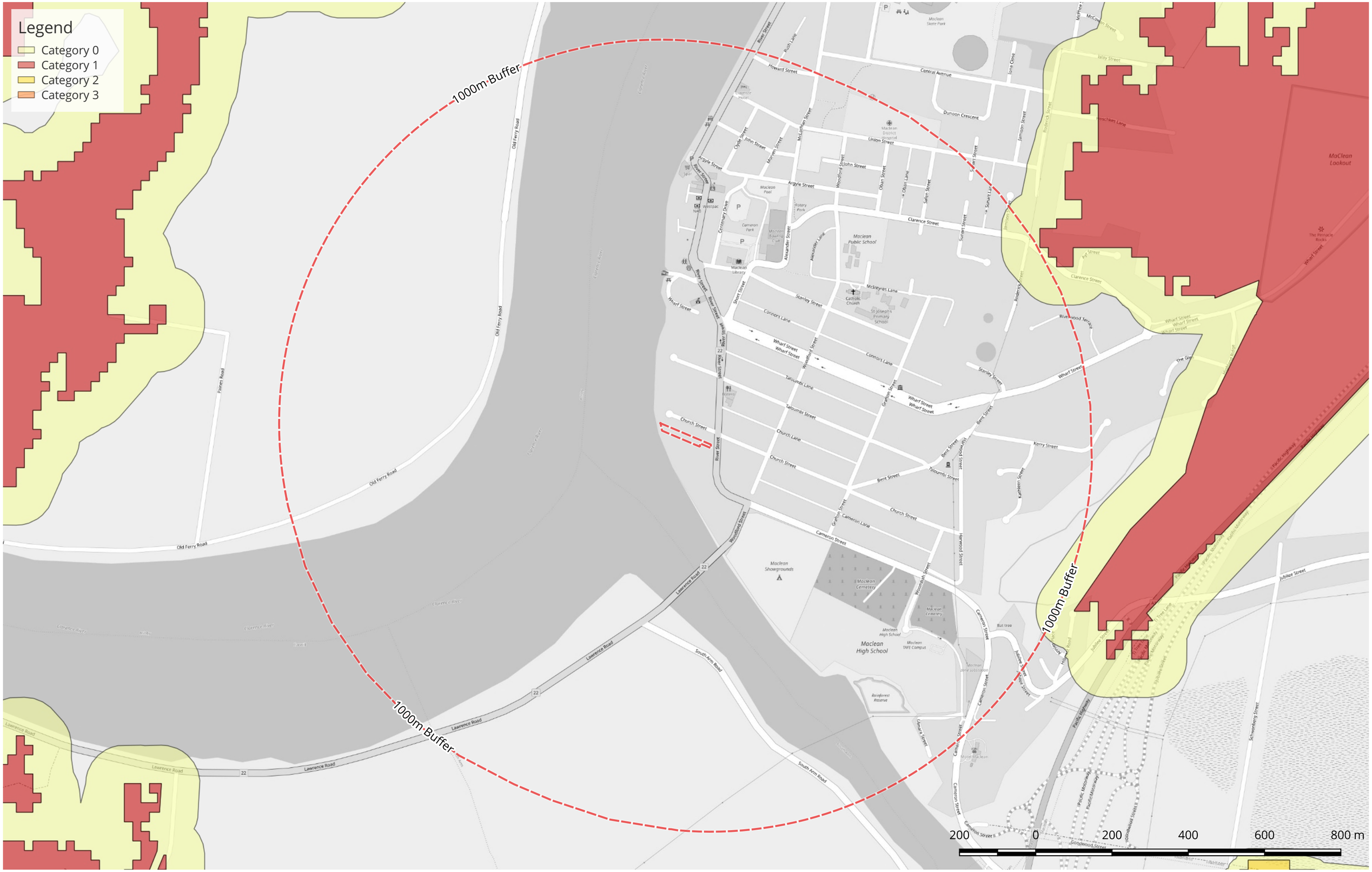
Scale
1:10000

Project
216



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Client Cavvanba Consulting Pty Ltd	**Map** Bushfire Prone Land
Location 74 River Street, Maclean NSW	**LGA** CLARENCE VALLEY COUNCIL

Data Source
NSW Planning and the Environment | Obtained on 18.07.2018
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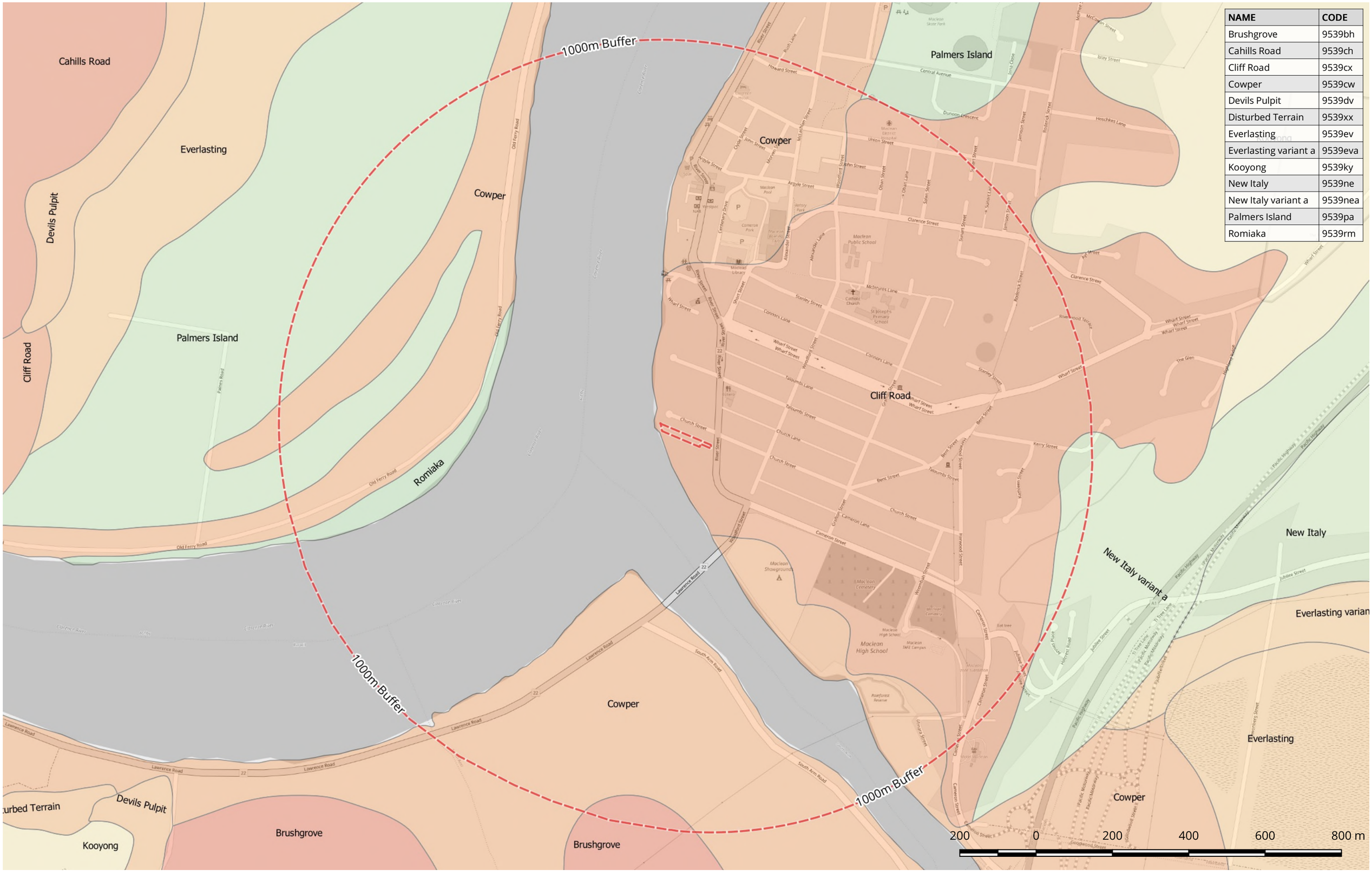
Project
216



NAME	CODE
Brushgrove	9539bh
Cahills Road	9539ch
Cliff Road	9539cx
Cowper	9539cw
Devils Pulpit	9539dv
Disturbed Terrain	9539xx
Everlasting	9539ev
Everlasting variant a	9539eva
Kooyong	9539ky
New Italy	9539ne
New Italy variant a	9539nea
Palmers Island	9539pa
Romiaka	9539rm

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Client
Cavvanba Consulting Pty Ltd

Location
74 River Street, Maclean NSW

Map
Soil Landscapes

LGA
CLARENCE VALLEY COUNCIL

Data Source
Office of Environment and Heritage | Obtained on 18.07.2018

Base map
Open Street Maps | Obtained on 19.10.2018

Scale
1:10000

Project
216

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Client Cavvanba Consulting Pty Ltd	**Map** Soil Formation
Location 74 River Street, Maclean NSW	**LGA** CLARENCE VALLEY COUNCIL

Data Source
Office of Environment and Heritage | Obtained on 18.07.2018
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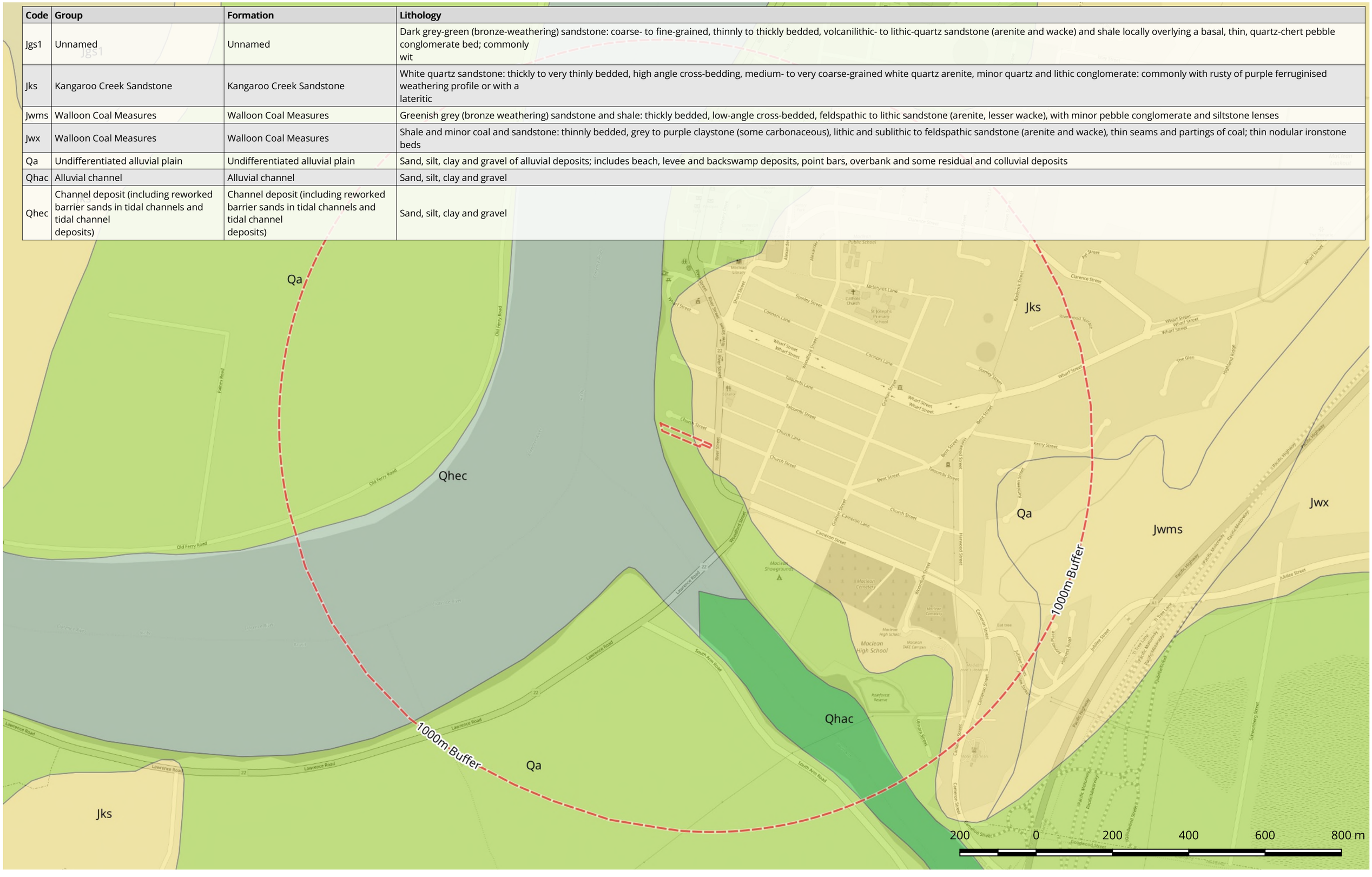
1:10000

Project
216

Code	Group	Formation	Lithology
Jgs1	Unnamed	Unnamed	Dark grey-green (bronze-weathering) sandstone: coarse- to fine-grained, thinnly to thickly bedded, volcanilithic- to lithic-quartz sandstone (arenite and wacke) and shale locally overlying a basal, thin, quartz-chert pebble conglomerate bed; commonly wit
Jks	Kangaroo Creek Sandstone	Kangaroo Creek Sandstone	White quartz sandstone: thickly to very thinly bedded, high angle cross-bedding, medium- to very coarse-grained white quartz arenite, minor quartz and lithic conglomerate: commonly with rusty of purple ferruginised weathering profile or with a lateritic
Jwms	Walloon Coal Measures	Walloon Coal Measures	Greenish grey (bronze weathering) sandstone and shale: thickly bedded, low-angle cross-bedded, feldspathic to lithic sandstone (arenite, lesser wacke), with minor pebble conglomerate and siltstone lenses
Jwx	Walloon Coal Measures	Walloon Coal Measures	Shale and minor coal and sandstone: thinnly bedded, grey to purple claystone (some carbonaceous), lithic and sublithic to feldspathic sandstone (arenite and wacke), thin seams and partings of coal; thin nodular ironstone beds
Qa	Undifferentiated alluvial plain	Undifferentiated alluvial plain	Sand, silt, clay and gravel of alluvial deposits; includes beach, levee and backswamp deposits, point bars, overbank and some residual and colluvial deposits
Qhac	Alluvial channel	Alluvial channel	Sand, silt, clay and gravel
Qhec	Channel deposit (including reworked barrier sands in tidal channels and tidal channel deposits)	Channel deposit (including reworked barrier sands in tidal channels and tidal channel deposits)	Sand, silt, clay and gravel



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Client Cavvanba Consulting Pty Ltd	**Map** Geology (1:100,000 Mapping)
Location 74 River Street, Maclean NSW	**LGA** CLARENCE VALLEY COUNCIL

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Project
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Client Cavvanba Consulting Pty Ltd	**Map** Hydrogeological Landscapes
Location 74 River Street, Maclean NSW	**LGA** CLARENCE VALLEY COUNCIL

Data Source
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Project
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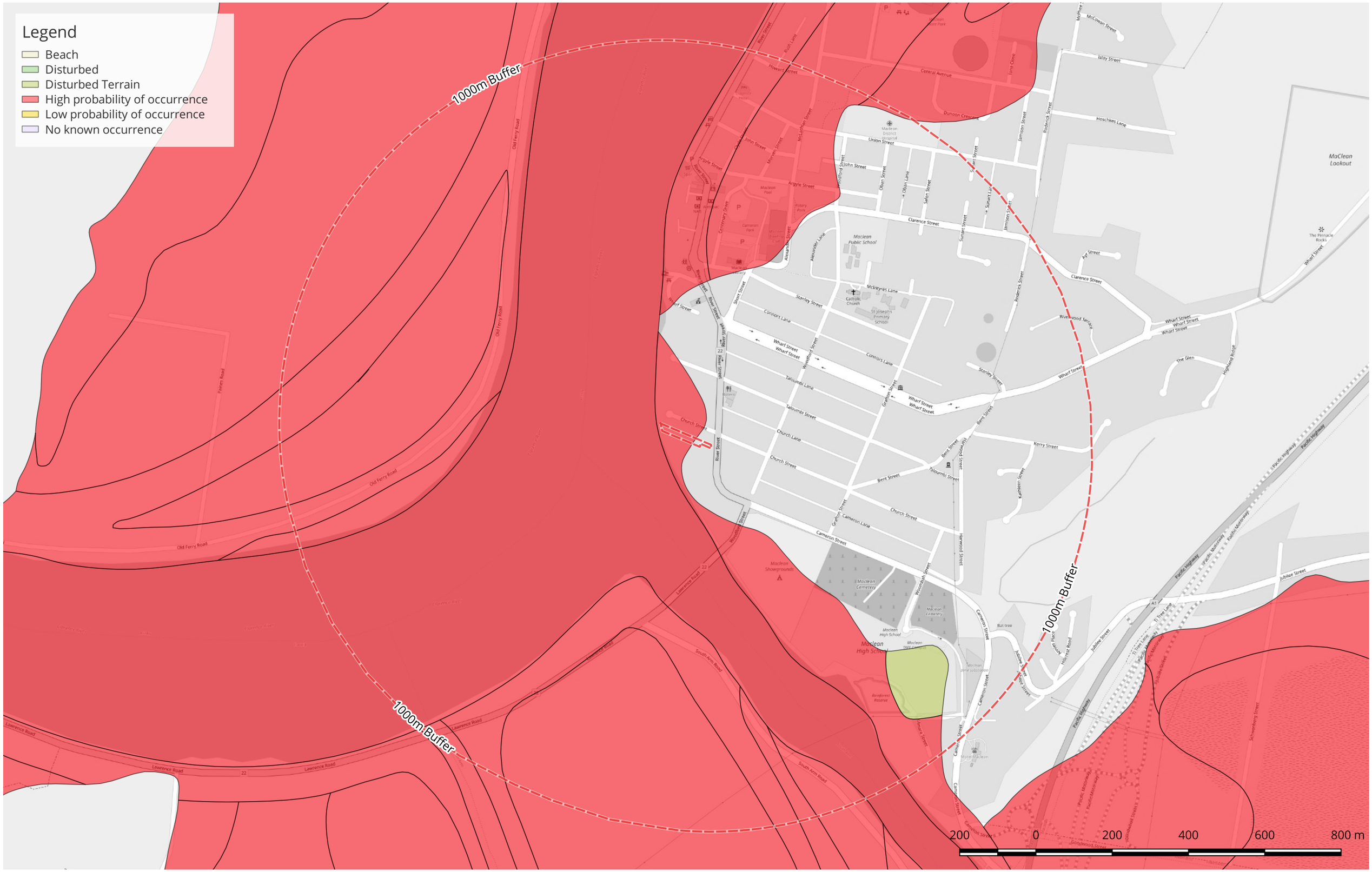

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Client Cavvanba Consulting Pty Ltd	**Map** Acid Sulfate Risk map
Location 74 River Street, Maclean NSW	**LGA** CLARENCE VALLEY COUNCIL

Data Source
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Open Street Maps | Obtained on 19.10.2018
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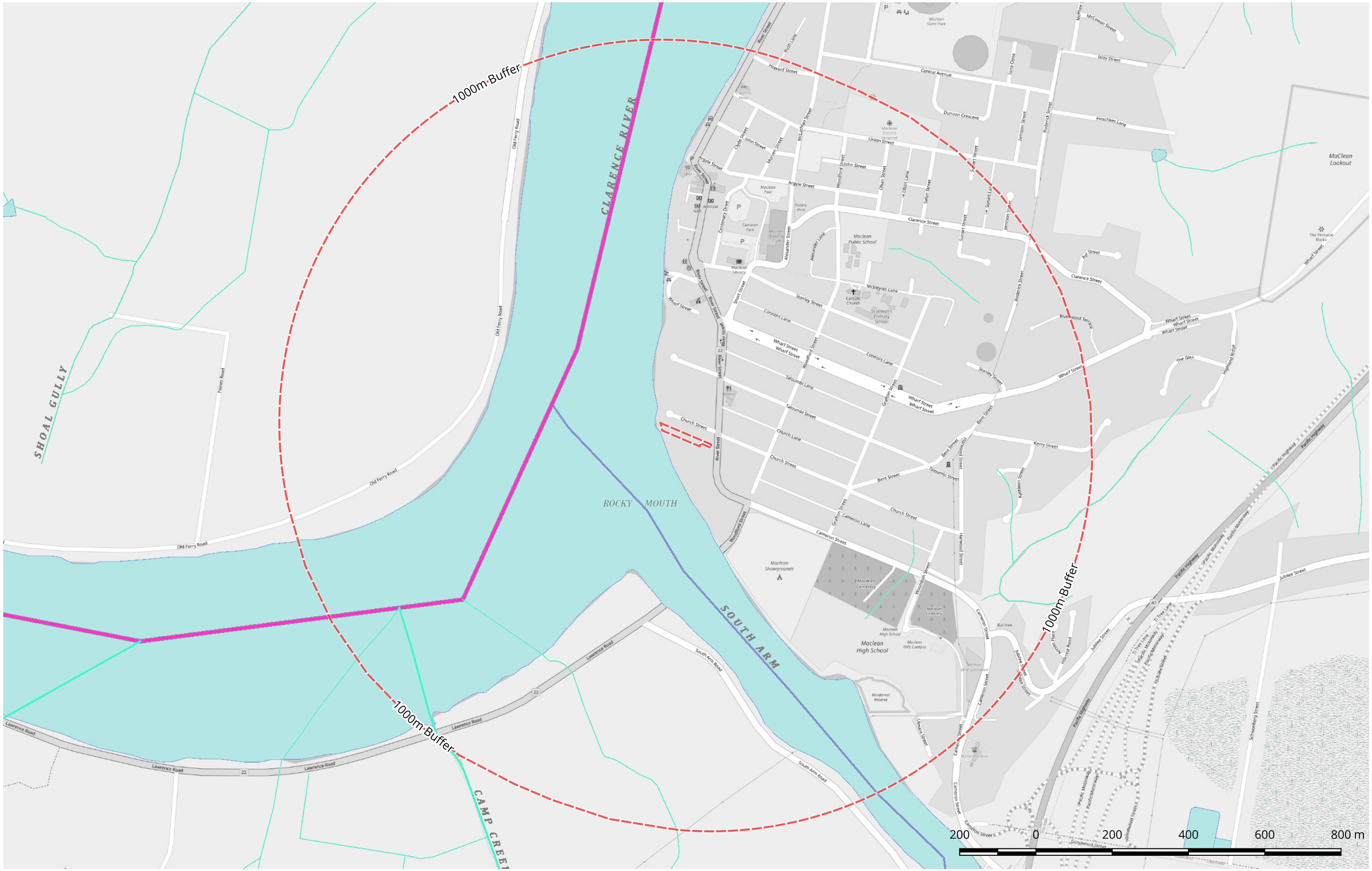

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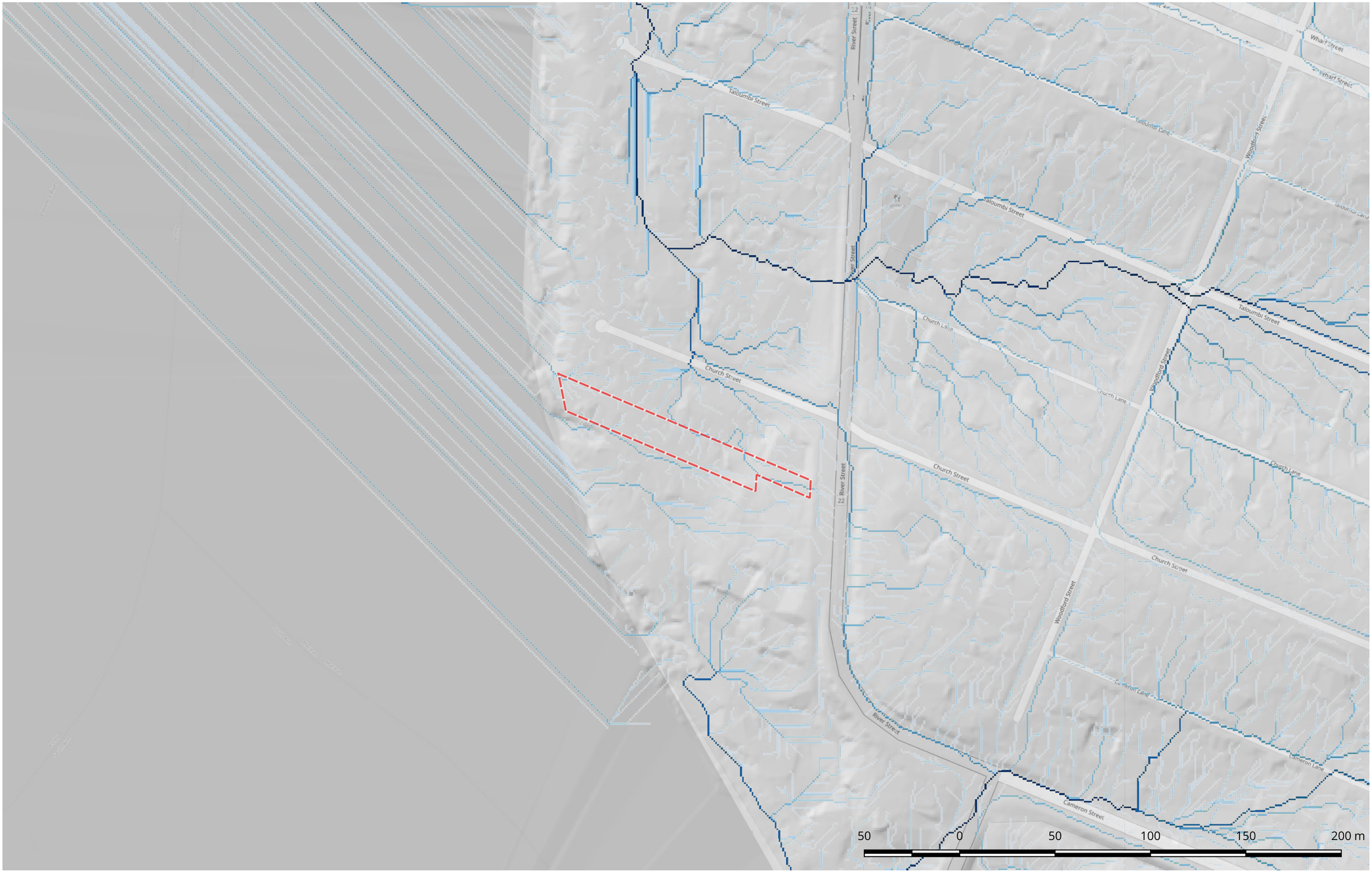
Client Cavvanba Consulting Pty Ltd	**Map** Watercourses and Hydrology
Location 74 River Street, Maclean NSW	**LGA** CLARENCE VALLEY COUNCIL

Data Source
Department of Finance, Services & Innovation| Obtained on 19.10.2018

Base map
Open Street Maps | Obtained on 19.10.2018

Scale 1:10000	
Project 216	



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Client Cavvanba Consulting Pty Ltd	**Map** Rainfall Overland Flow Paths
Location 74 River Street, Maclean NSW	**LGA** CLARENCE VALLEY COUNCIL

Data Source
Derived from LiDAR Data | Geoscience Australia | Obtained on 18.07.2018
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Base map
Open Street Maps | Obtained on 19.10.2018
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Scale
1:2000

Project
216

HydroCode	Depth	Strata Description	Bore Data
20410164.1.1			Ref Elevation: 6.07 AHD Purpose: Unknown
GW011124.1.1	0m - 7.62m 7.62m - 9.14m 9.14m - 39.62m	Alluvium Sand water supply Sandstone rock	Date Drilled: 1800/01/01 Ref Elevation: 6.7 AHD Drill Depth: 39.6m Purpose: Water Supply
GW065622.1.1	0m - 2m 2m - 10m 10m - 14m 14m - 23m	Sand Soft sandstone Hard sandstone Black shale	Date Drilled: 14/02/1989 Ref Elevation: 18.01 AHD Drill Depth: 23m Purpose: Water Supply
GW303634.1.1			Date Drilled: 16/04/2003 Ref Elevation: 21.38 AHD Purpose: Water Supply
GW304298.1.1	0m - 3m 3m - 12m 12m - 42m	Sandy soil Dec sandstone Sandstone	Date Drilled: 03/09/2003 Ref Elevation: 11.19 AHD Drill Depth: 42m Purpose: Water Supply

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Client
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Location
74 River Street, Maclean NSW

Map
Groundwater Bores

LGA
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Scale
1:8000

Project
216

ID	Date	Hazard	Synopsis	Impact Comments
1967	30-03-2017	Landslide	Intense, short period rainfall brought by Ex Tropical Cyclone Debbie was the probable cause of a landslide in the river bank that reduced the road to one lane. It probably happened on 30 or 31 March 2017. Motorists were requested to give way to alternating traffic.	River bank landslide reduced road to one lane.

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Client
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Location
74 River Street, Maclean NSW

Map
Recorded Landslides

LGA
CLARENCE VALLEY COUNCIL

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Scale
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Project
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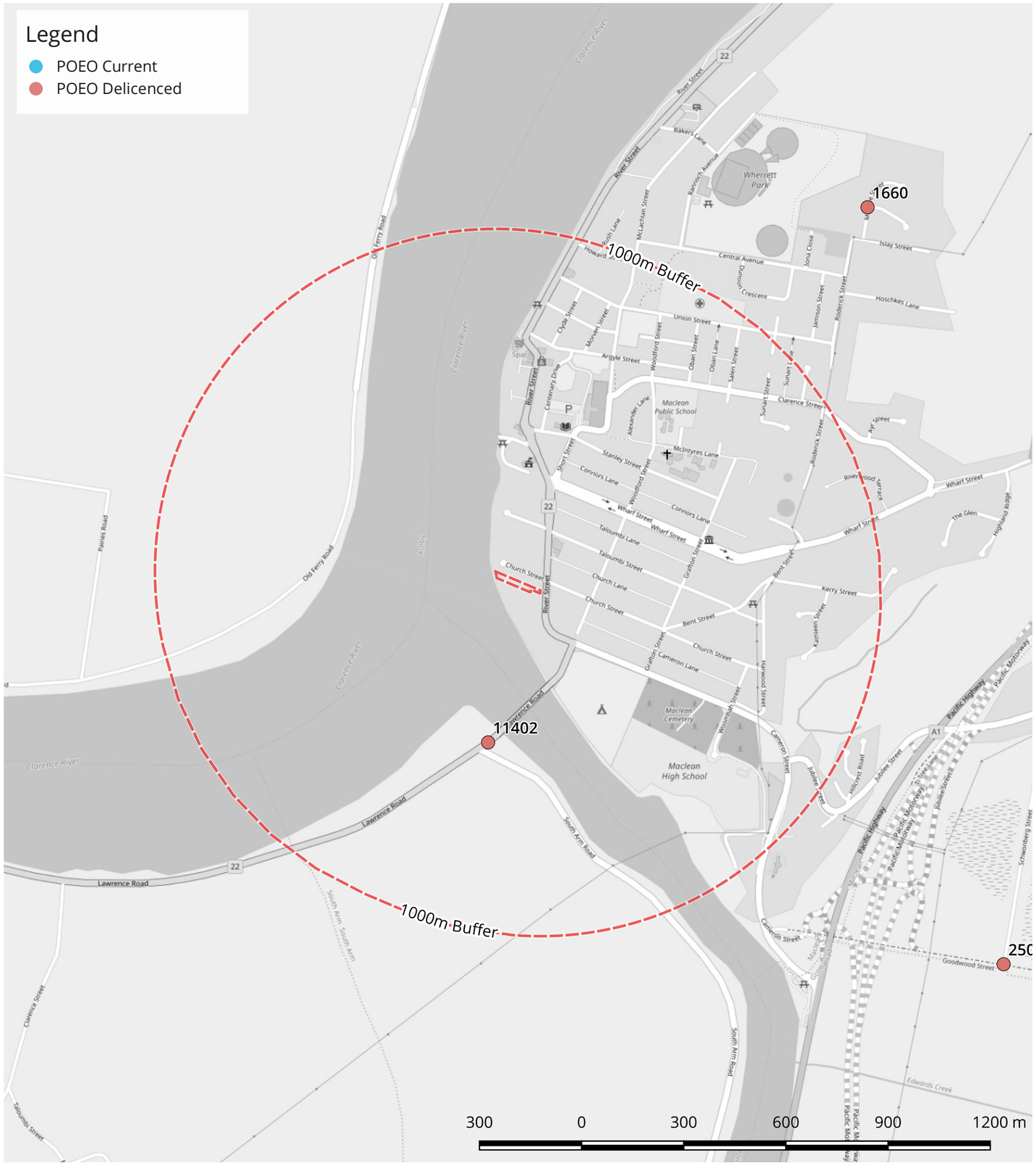

POEO Registered Schedule 1 Sites

EPL	Organisation Name	Fee-Based Activity	Geocode Reference	Quality
No data in mapped area.				

POEO Delicenced Premises

EPL	Organisation Name	Status	Geocode Reference	Quality
2507	CLARENCE VALLEY COUNCIL	Surrendered	CNR SCHWONBERG & GOODWOOD STREETS, MACLEAN, NSW 2463	Geometric centre
1660	CLARENCE VALLEY COUNCIL	Surrendered	MCPHEE STREET, MACLEAN, NSW 2463	Geometric centre
11402	ROADS & TRAFFIC AUTHORITY OF NEW SOUTH WALES	Surrendered	LAWRENCE ROAD, MACLEAN, NSW 2463	Geometric centre

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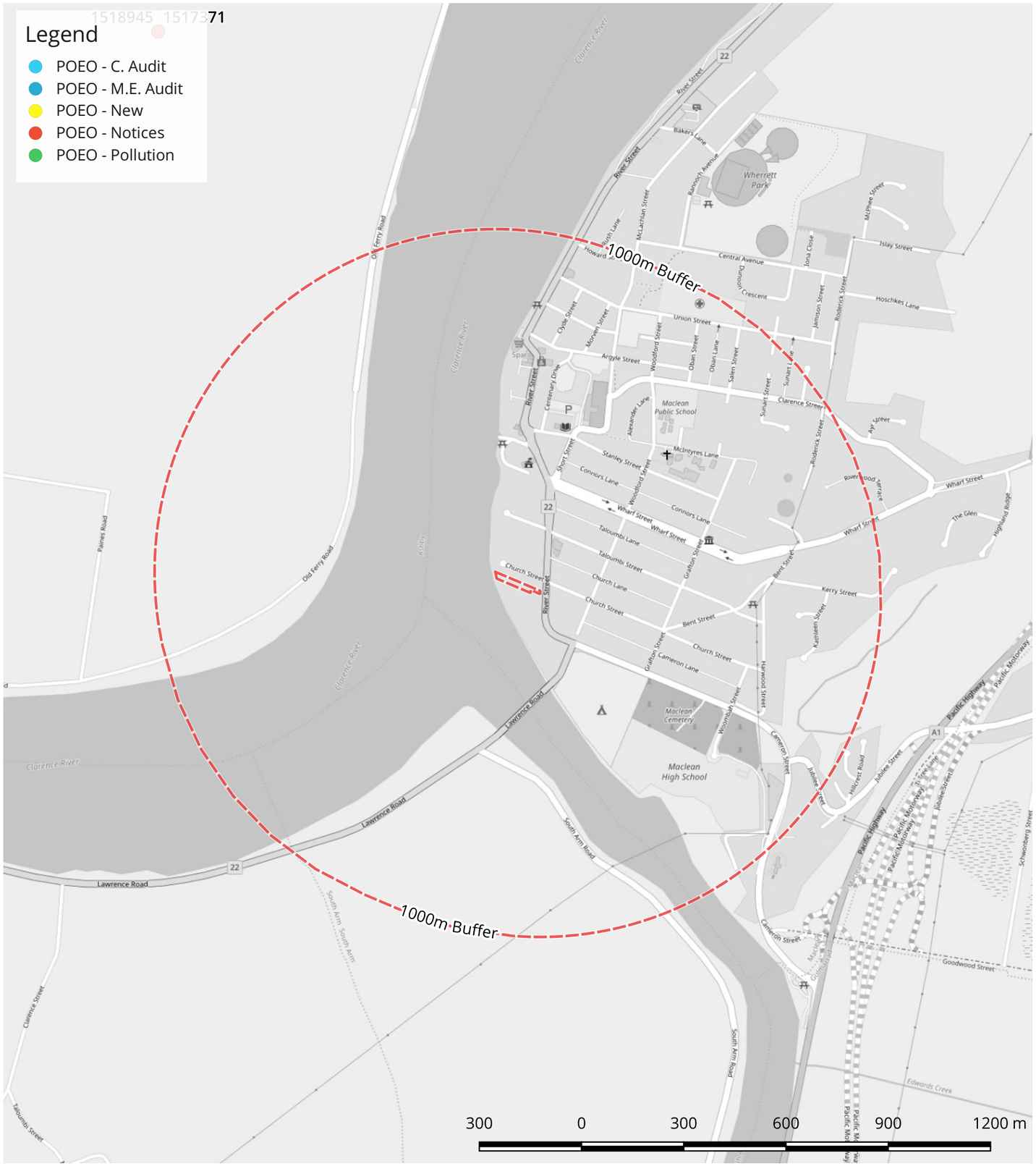
Client Cavvanba Consulting Pty Ltd	**Map** EPA POEO Licences
Location 74 River Street, Maclean NSW	**LGA** CLARENCE VALLEY COUNCIL

Data Source
NSW Environment Protection Authority | Obtained on 12.09.2018

Base map
Open Street Maps | Obtained on 19.10.2018

Scale 1:15000

Project 216



POEO Compliance Audit

EPL	Organisation Name	Status	Geocode Address	Quality
No data in mapped area.				

POEO Mandatory Environmental Audit

EPL	Organisation name	Status	Geocode Address	Quality
No data in mapped area.				

POEO New Licences

EPL	Organisation Name	Type	Status	Geocode Address	Quality
No data in mapped area.					

POEO Notices

EPL	Organisation Name	Type	Status	Geocode Address	Quality
151737	M Camilleri and P Camilleri	s.91 Clean Up Notice	Issued	Ashby Piggery	Approximate
151894	M Camilleri and P Camilleri	s.91 Clean Up Notice	Issued	Ashby Piggery	Approximate

POEO Pollution

EPL	Organisation Name	Type	Geocoded Address	Quality
No data in mapped area.				

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Client
Cavvanba Consulting Pty Ltd

Location
74 River Street, Maclean NSW

Map
EPA POEO Registers

LGA
CLARENCE VALLEY COUNCIL

Data Source
NSW Environment Protection Authority | Obtained on 12.09.2018

Base map
Open Street Maps | Obtained on 19.10.2018

Scale
1:15000

Project
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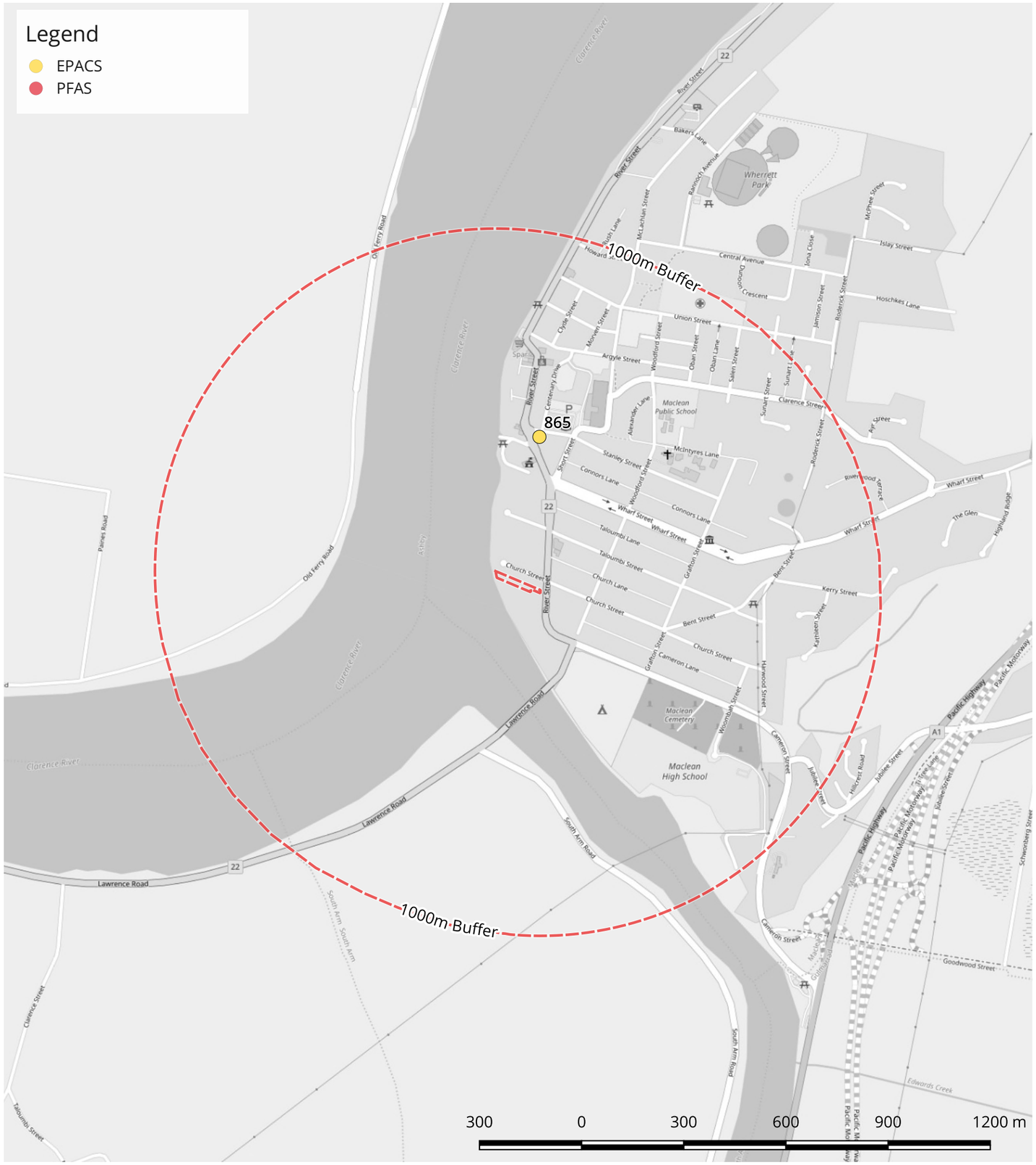

EPACS - Contaminated sites notified to EPA

Organisation Name	Address	Type	EPA Management Class
MacLean Outdoors	255 River STREET, MACLEAN	Service Station	Regulation under CLM Act not required

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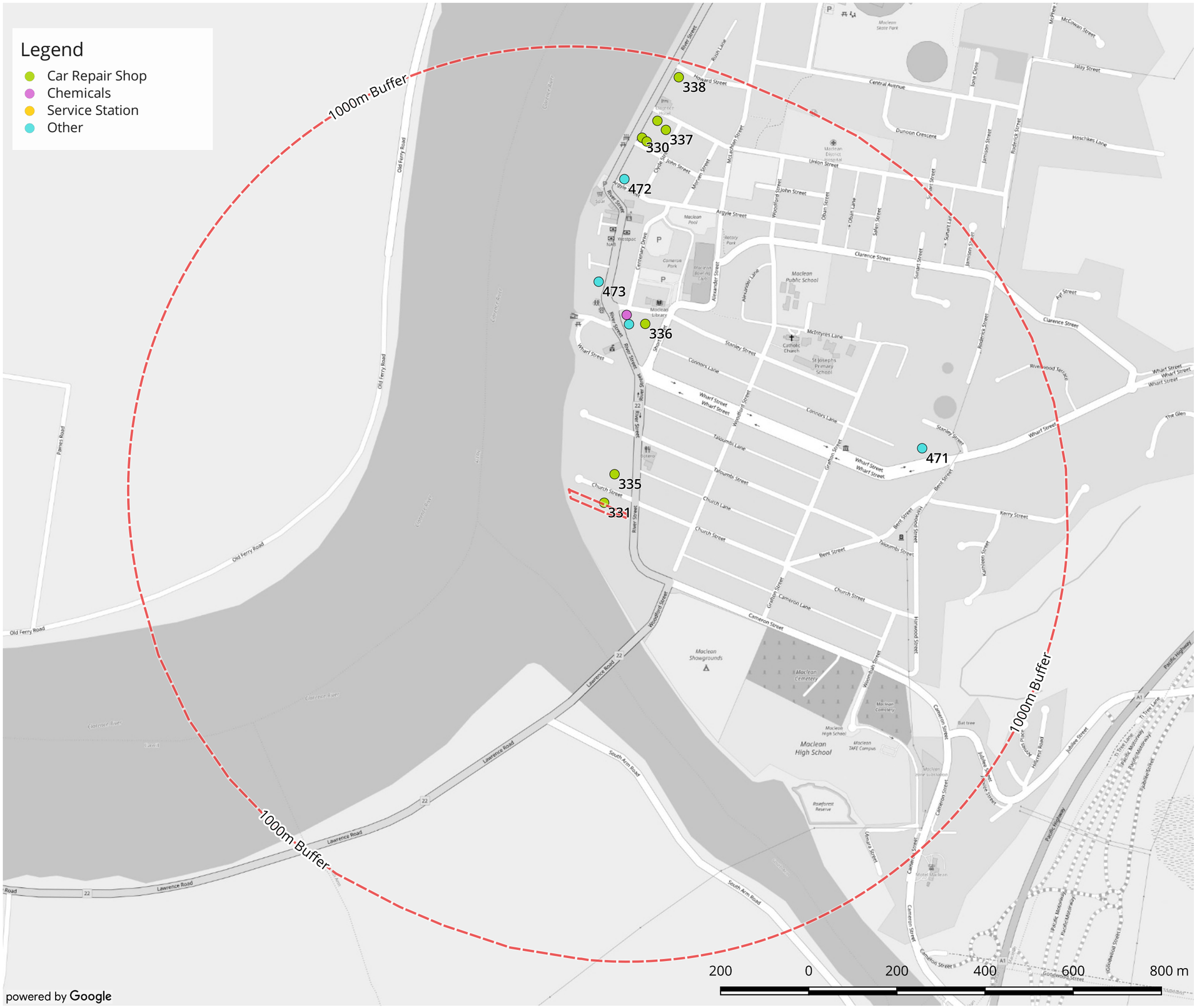
Client	Cavvanba Consulting Pty Ltd
Location	74 River Street, Maclean NSW
Map	Other Contaminated Sites
LGA	CLARENCE VALLEY COUNCIL

Data Source
NSW Environment Protection Authority | Obtained on 12.09.2018

Base map
Open Street Maps | Obtained on 19.10.2018

Scale
1:15000

Project
216



ID	Name	Address
330	Maclean Motors	181 River Street, MacLean
331	Maclean Tyrepower	4 Church Street, MacLean
332	O'Halloran Motors	175 River Street, MacLean
333	Chesterfield Australia	181 River Street, MacLean
335	Morans Service Centre	68-72 River Street, MacLean
336	John Snape Motors	4 Stanley Street, MacLean
337	Maclean Body Works	11 Clyde Street, MacLean
338	Moran's Service Centre & Nrma Road	171 River Street, MacLean
471	Australian Woodwork	45B Wharf St, MacLean
472	Maclean Cellars	199 River St, MacLean
473	Home Timber & Hardware Maclean Home Timber & Hardware	34-36 River St, MacLean
474	The Salvation Army Family Store	3/249 River St, MacLean
544	Maclean Outdoors	255 River St, MacLean

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Client
Cavvanba Consulting Pty Ltd

Location
74 River Street, Maclean NSW

Map
Additional Sites for Consideration

LGA
CLARENCE VALLEY COUNCIL

Data Source
Google | Obtained on 19.10.2018

Base map
Open Street Maps | Obtained on 19.10.2018

Scale
1:10000

Project
216

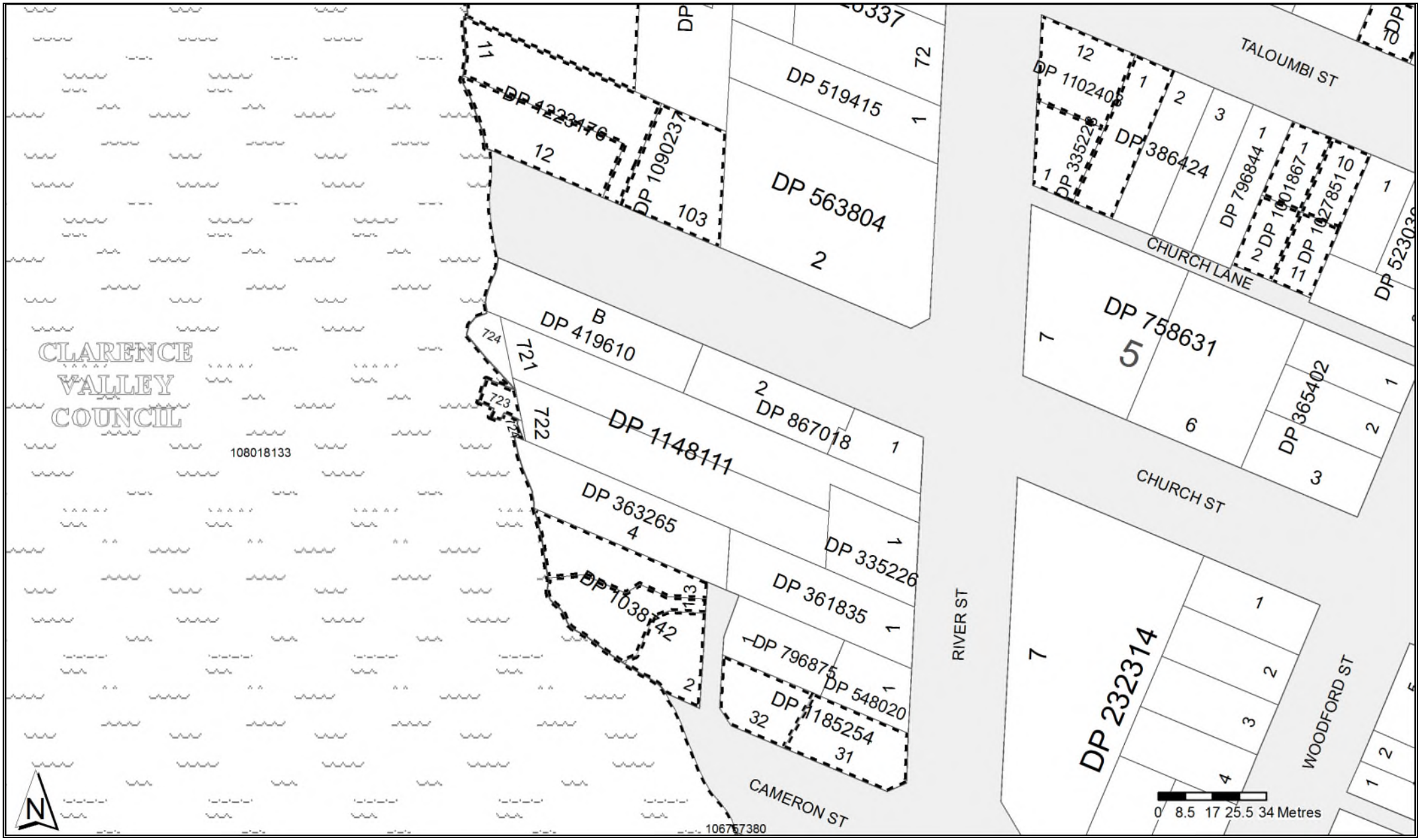
Appendix B

Historical Title Search

Cadastral Records Enquiry Report : Lot 721 DP 1148111

Ref : NOUSER

Locality : MACLEAN
Parish : TALOUMBI
LGA : CLARENCE VALLEY
County : CLARENCE



This information is provided as a searching aid only.Whilst every endeavour is made to ensure that current map, plan and titling information is accurately reflected, the Registrar General cannot guarantee the information provided. For ALL ACTIVITY PRIOR TO SEPTEMBER 2002 you must refer to the RGs Charting and Reference Maps

	Status	Surv/Comp	Purpose
DP335228			
Lot(s): 1			
DP1102408	REGISTERED	SURVEY	REDEFINITION
DP386424			
Lot(s): 1			
DP1102408	REGISTERED	SURVEY	REDEFINITION
DP1001867			
Lot(s): 1, 2			
DP328368	HISTORICAL	COMPILATION	UNRESEARCHED
DP1027851			
Lot(s): 10, 11			
DP328367	HISTORICAL	COMPILATION	UNRESEARCHED
DP1038742			
Lot(s): 1, 2, 3			
DP804439	HISTORICAL	SURVEY	SUBDIVISION
DP1090237			
Lot(s): 103			
DP591624	HISTORICAL	COMPILATION	SUBDIVISION
DP1102408			
Lot(s): 12			
DP335228	HISTORICAL	COMPILATION	UNRESEARCHED
DP1148111			
Lot(s): 723			
DP727288	HISTORICAL	COMPILATION	CROWN FOLIO CREATION
DP1148213			
Lot(s): 2			
DP596190	HISTORICAL	SURVEY	SUBDIVISION
DP1155388			
Lot(s): 10, 11			
DP331538	HISTORICAL	SURVEY	UNRESEARCHED
DP1185254			
Lot(s): 31, 32			
DP361835	HISTORICAL	SURVEY	UNRESEARCHED
DP1223176			
Lot(s): 11, 12			
DP591624	HISTORICAL	COMPILATION	SUBDIVISION
DP1090237	HISTORICAL	SURVEY	SUBDIVISION
DP1103138	HISTORICAL	SURVEY	REDEFINITION

Plan	Surv/Comp	Purpose
DP232314	SURVEY	SUBDIVISION
DP335226	COMPILATION	UNRESEARCHED
DP335228	COMPILATION	UNRESEARCHED
DP361835	SURVEY	UNRESEARCHED
DP363265	SURVEY	UNRESEARCHED
DP365402	SURVEY	UNRESEARCHED
DP385647	SURVEY	UNRESEARCHED
DP386424	SURVEY	UNRESEARCHED
DP392650	SURVEY	UNRESEARCHED
DP414924	SURVEY	UNRESEARCHED
DP419610	SURVEY	UNRESEARCHED
DP511002	SURVEY	SUBDIVISION
DP519415	SURVEY	SUBDIVISION
DP523030	SURVEY	SUBDIVISION
DP548020	SURVEY	SUBDIVISION
DP563804	SURVEY	SUBDIVISION
DP596190	SURVEY	SUBDIVISION
DP626337	SURVEY	SUBDIVISION
DP758631	COMPILATION	CROWN ADMIN NO.
DP796844	COMPILATION	DEPARTMENTAL
DP796875	COMPILATION	DEPARTMENTAL
DP867018	SURVEY	SUBDIVISION
DP912461	COMPILATION	UNRESEARCHED
DP1001867	SURVEY	SUBDIVISION
DP1027851	SURVEY	SUBDIVISION
DP1038742	SURVEY	SUBDIVISION
DP1090237	SURVEY	SUBDIVISION
DP1102408	SURVEY	REDEFINITION
DP1148111	SURVEY	REDEFINITION
DP1148213	SURVEY	SUBDIVISION
DP1155388	SURVEY	SUBDIVISION
DP1185254	SURVEY	SUBDIVISION
DP1223176	SURVEY	SUBDIVISION
SP49781	COMPILATION	STRATA PLAN

1 DP 1103138 | 103 DP 1090237 | 2 DP 563804

RMGIP FD 2°47'-1.24 DP 1103138 — 3.675 — MHWM DP 1103138 ADOPTED PRESENT — 292° — 78.08 — 40' — RMGIP FD 3°04'30"-0.5 DP 563804 — RMDH&W FD 2°09'-10.7 DP 1040237

TO SSM 64303 — 101°46'52" - 136.663 SCIMS SURVEY — 101°45'15" - 135.661

CHURCH

MHWM DP 419610 (1959) ADOPTED — 172° 13' 50" - 35.08 — SHORE LINE — 13° 58' 15" — FORMER MHWM 17.365

112° — 69.605 — (5.6) — 22° 37' 55" 30.21 — GI NAIL IN POST FD RM CNR CONC WALL FD 354°49'-8.63 DP 867018

(VARIABLE WIDTH)

227°17'-4.31 DP 867018 — SSM 64302 FD ESTAB. 'A' — 191° 03' 18.225 — 183° 21.512 — (F0.32) RMs PEG FD & REPLACED RMDH&W FD 341°49'-6.78 DP 867018

STREET — 103° 34' 48" - 136.864 SCIMS & SURVEY — 32.035 — 55" — 103.685 — PM 9659 FD ESTAB. 'B' — 205°25' - 25.48 DP 867018

B DP 419610 — 2 DP 867018 — 1 DP 867018

MHWM DP 419610 (1959) ADOPTED — RMGIP 304°54'-9.23 — 112° — (7.59) — 66.99 — IRREG PAL. & CORRUG. IRON FENCE — (WALL 0.94) — (WALL 1.12) — 22° 37' 55" 17.17 PAL. FENCE — (F0.24) 37' — 148.41 NO FENCE — 49.5 — RM CNR CONC WALL & WING FD 22°01'-0.18 DP 867018 — 37' 23.57 — 31.92 — 55" — MANPROOF FENCE — (F0.1) — 9.47 — (WALL 0.11)

CLARENCE RIVER

POSITION OF FORMER MHWM BY AGREEMENT

Pt 724 (203.5m²) (A) — 347° 20.98 — PRESENT GI POST SHORE — (F1.12) — RMDH&W 292°57'-8.075 — 292° — 112.12 — M/PROOF NO FENCE — 37' — 55" — GI POST — (F0.09) — CONC BLK BUILDING — RM CNR CONC WALL FD 290°44'-4.04 DP 867018

721 2255m²

RM CNR CONC WALL & WING FD 187°32'-0.195 BY ME — SPIKE IN BITUMEN — 292° — 37' 30.48 — 55" — 183° 8.81 NO FENCE — 00' (0.39) 18.305 FENCE — (0.42) — 45" — 63.765 — 30.48 — 55" FENCE — (F0.11) — DWARF CONC 27.115 — 00' BLK WALL — (F0.11) — PAL 18.81 FENCE — 45"

Pt 724 (12.1m²) — SEE DIAG 1 — 723 — MANPROOF — GI POST — (F2.25) — (A) — 30' LINE — 292° — W/B & IRON BUILDING — 106.31 — W/B & IRON BUILDING — CORRUGATED IRON SHED — NO FENCE — 37' PALING — 73.025 — (WALL 0.67) — (WALL 0.63) — (WALL 0.58) — (WALL 0.26) — (WALL 0.47)

722 1883m² — W/B & IRON GARAGE DP 335226 — W/B IRON LAUNDRY

RMDH&W 20°17'40"-6.595 FORMER MHWM DP 363265 ADOPTED (1948) — 339° STONE SEA WALL — 13° 05" — 25.09 — MHWM DP 1038742 (2001) ADOPTED — 4 DP 363265 — 182° 19.21 — RM GONE DP 47400 — GI NAIL IN TOP RAIL — 1 DP 361835

LOT 724
TOTAL AREA 215.6m²

112° — 27' 55.925 — 05" — RMDH&W FD 111°26'-1.24 DP 1038742 — 7.005 — PEG FD FORMER MHWM DP 1038742 — 3 — RM GONE DP 1038742 — 6.485 — 292° 63.455 — 21' — 05" — RMGIP FD 292°21'-0.485 DP 548020

D P 1038742 — 1 — 2 — ROAD (6.095 WIDE & VAR.) — 14.365 — 22° 26' — 40.225 — 16° 20' 58.45 — 05" — 1 DP 796875 — 1 DP 548020 — 45"

20.98 — 55" — 147° 29' 8.005 — PEG FD & RMGIP FD 349°51'-0.755 DP 474000 — 292°30' 11.375 — 297°44'20" 25.78 DP 1038742 — PM 120160 FD NOT ESTAB. — 3 DP 361835

SSM 64302 to PM 120160 206°23'05" - 113.905 (NOT INTERVISIBLE)

(A) - DENOTES RECLAIMED LANDS

SURVEYING REGULATION 2006 : CLAUSE 35 (1)(b) & CLAUSE 61(2)						
MARK	MGA EASTING	MGA NORTHING	CLASS	ORDER	METHOD	ORIGIN
SSM 64302	519116.955	6740846.395	A	1		SCIMS
SSM 64303	519142.321	6740979.609	B	2		SCIMS
PM 9659	519249.940	6740814.272	B	2		SCIMS
PM 120160	519066.356	6740744.396	C		CADASTRAL TRAV	SURVEY
COMBINED SEA LEVEL AND SCALE FACTOR 0.999603 ZONE 56						
M.G.A COORDINATES ADOPTED FROM SCIMS AS AT 12 JUNE 2009 NOTE: ALL DISTANCES SHOWN ARE GROUND DISTANCES						

Surveyor : GREIG SUTHERLAND Date of Survey : 22/06/09 Surveyor's Ref : 8357	PLAN OF REDEFINITION OF LOTS 1 & 2 DP 783972 & LOT 425 DP 727288 & RECLAIMED LAND.	LGA: CLARENCE VALLEY Locality : MACLEAN Subdivision No: ——— Lengths are in metres. Reduction Ratio 1: 500	Registered 22.7.2010	DP1148111 P

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

SCHEDULE OF SHORT BOUNDARIES

No.	BEARING	DISTANCE
1	292°37'55"	0.845
2	332°29'	6.295
3	1°46'	1.765
4	167°53'30"	7.140
5	311°30'00"	10.205
6	167°53'30"	4.015
7	317°26'	5.45
8	323°44'	9.03
9	18°55'	3.465
10	41°10'	3.38
11	67°27'	4.07
12	7°08'	0.765
13	112°37'55"	4.58

(A) - DENOTES RECLAIMED LANDS

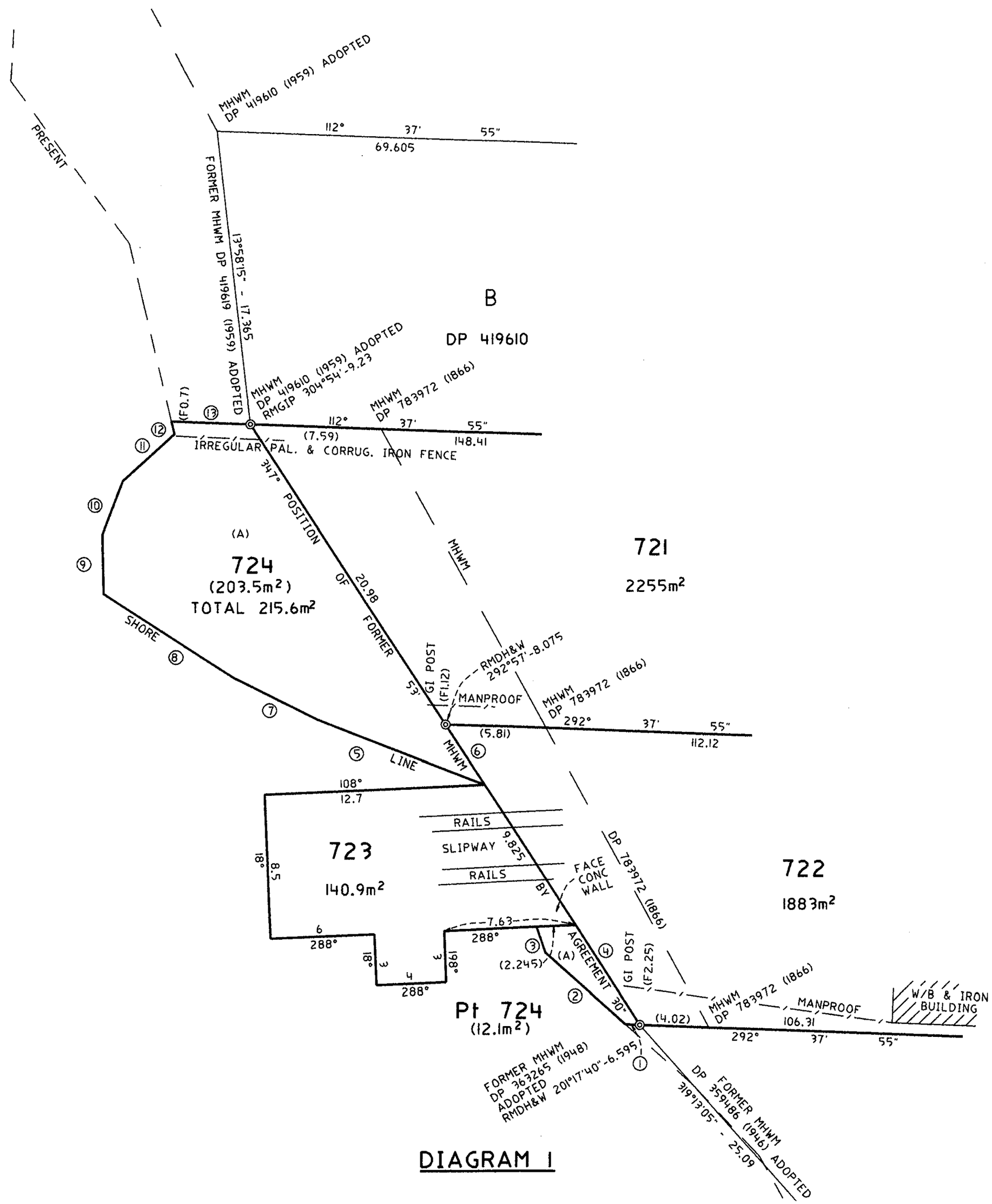


DIAGRAM 1

Surveyor : GREIG SUTHERLAND Date of Survey : 22/06/09 Surveyor's Ref : 8357	PLAN OF REDEFINITION OF LOTS 1 & 2 DP 783972 & LOT 425 DP 727288 & RECLAIMED LAND.	LGA: CLARENCE VALLEY Locality : MACLEAN Subdivision No: ——— Lengths are in metres. Reduction Ratio 1: 200	Registered 22.7.2010	DP1148111

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

6 **WARNING: Creasing or folding will lead to rejection**

DEPOSITED PLAN ADMINISTRATION SHEET

Sheet 1 of 1 sheet(s)

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

Steve Houlahan
Team Leader Land Administration
By delegation pursuant to s.180 Crown Lands Act 1989 and with authority under s.13L Real Property Act 1900 from the Minister Administering The Crown Lands Act 1989 on behalf of the State of New South Wales

The Minister for Lands, in accordance with Part 2 Division 5 of the Surveying Regulation 2006, and clause 55N of the Coastal Protection Act 1979 as amended, approves the determination of the Mean High Water Mark as shown hereon.
Department of Lands file 09/09657 on 2/11/09

.....
for Minister for Lands

* agree

STUART MCPHERSON
GENERAL MANAGER
REGISTERED PROPRIETOR LOTS 1 & 2 DP 783972
CLARENCE VALLEY COUNCIL
LOCKED BAG 23
GRAFTON NSW 2460
for additional certificates, signatures, seals and statements

Crown Lands NSW/Western Lands Office Approval

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

Signature: .....
Date: 28 October 2009
File Number: 09/09657
Office: GRAFTON

Subdivision Certificate

I certify that the provisions of s.109J of the Environmental Planning and Assessment Act 1979 have been satisfied in relation to:

the proposed..... set out herein
(insert 'subdivision' or 'new road')

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

Consent Authority: .....
Date of Endorsement: .....
Accreditation no: .....
Subdivision Certificate no: .....
File no: .....

* Delete whichever is inapplicable.

*

DP1148111 S

*

Registered: 22.7.2010

Title System: TORRENS

Purpose: REDEFINITION

PLAN OF REDEFINITION OF LOTS 1 & 2 DP 783972 & LOT 425 DP 727288 & RECLAIMED LAND

LGA:	CLARENCE VALLEY
Locality:	MACLEAN
Parish:	TALOUMBI
County:	CLARENCE

Surveying Regulation, 2006

I, GREIG SUTHERLAND
of A FLETCHER & ASSOCIATES PTY. LTD.
a surveyor registered under the *Surveying Act, 2002*, certify that the survey represented in this plan is accurate, has been made in accordance with the *Surveying Regulation, 2006* and was completed on: 22 JUNE 2009

The survey relates to
LOTS 721, 722 , 723 & 724
.....
(specify the land actually surveyed or specify any land shown in the plan that is not the subject of the survey)

Signature ..... *Dated:* 16/11/09
Surveyor registered under the Surveying Act, 2002

Datum Line: 'A'–'B'
Type: Urban

Plans used in the preparation of survey/compilation

DP 232314	DP 548020	DP 1090237
DP 335226	DP 727288	DP 1103138
DP 359486	DP 783972	Sp. L. 1961/49
DP 361835	DP 796875	
DP 363265	DP 867018	
DP419610	DP 1038742	

(if insufficient space use Plan Form 6A annexure sheet)

SURVEYOR'S REFERENCE: 8357

* OFFICE USE ONLY

ADMINISTRATION SHEET AMENDED IN LPI AT SURVEYORS REQUEST.

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

DEPOSITED PLAN ADMINISTRATION SHEET

PLAN OF REDEFINITION OF LOTS 1 & 2 DP 783972 & LOT425 DP 727288 & RECLAIMED LAND

*

DP1148111

*

Registered: 22.7.2010

Subdivision Certificate No:

Date of Endorsement:

SURVEYOR'S REFERENCE: 8357

* OFFICE USE ONLY

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
5/11/2018 10:52AM

FOLIO: AUTO CONSOL 4921-17

Recorded	Number	Type of Instrument	C.T. Issue
14/12/1992		CONSOL HISTORY RECORD CREATED FOR AUTO CONSOL 4921-17 PARCELS IN CONSOL ARE: 1-2/783972.	
16/12/1992	E944075	LEASE	EDITION 1
5/8/1998	5175318	LEASE	EDITION 2
10/5/2007	AD96414	CHANGE OF NAME	EDITION 3
22/7/2010	DP1148111	DEPOSITED PLAN	FOLIO CANCELLED

*** END OF SEARCH ***

advlegs PRINTED ON 5/11/2018

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 721/1148111

SEARCH DATE	TIME	EDITION NO	DATE
5/11/2018	10:44 AM	1	22/7/2010

LAND

LOT 721 IN DEPOSITED PLAN 1148111
AT MACLEAN
LOCAL GOVERNMENT AREA CLARENCE VALLEY
PARISH OF TALOUMBI COUNTY OF CLARENCE
TITLE DIAGRAM DP1148111

FIRST SCHEDULE

CLARENCE VALLEY COUNCIL

SECOND SCHEDULE (1 NOTIFICATION)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)

NOTATIONS

NOTE: THIS FOLIO MAY BE ASSOCIATED WITH A CROWN TENURE WHICH IS SUBJECT TO PAYMENT OF AN ANNUAL RENT. FOR FURTHER DETAILS CONTACT THE LOCAL CROWN LANDS OFFICE AT GRAFTON

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

advlegs PRINTED ON 5/11/2018

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 722/1148111

SEARCH DATE	TIME	EDITION NO	DATE
5/11/2018	10:45 AM	1	22/7/2010

LAND

LOT 722 IN DEPOSITED PLAN 1148111
AT MACLEAN
LOCAL GOVERNMENT AREA CLARENCE VALLEY
PARISH OF TALOUMBI COUNTY OF CLARENCE
TITLE DIAGRAM DP1148111

FIRST SCHEDULE

CLARENCE VALLEY COUNCIL

SECOND SCHEDULE (1 NOTIFICATION)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)

NOTATIONS

NOTE: THIS FOLIO MAY BE ASSOCIATED WITH A CROWN TENURE WHICH IS SUBJECT TO PAYMENT OF AN ANNUAL RENT. FOR FURTHER DETAILS CONTACT THE LOCAL CROWN LANDS OFFICE AT GRAFTON

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

advlegs PRINTED ON 5/11/2018

ADVANCE LEGAL SEARCHERS PTY LTD

(ACN 147 943 842)
ABN 82 147 943 842

18/36 Osborne Road,
Manly NSW 2095

Telephone: +612 9977 6713
Mobile: 0412 169 809
Email: search@alsearchers.com.au

05th November 2018

Cavvanba Consulting Pty Ltd
PO Box 2191
BYRON BAY, NSW 2481

Attention: Glen Chisnall

RE: **74 River Street,**
Maclean

Note 1:	**Lot 721**	**DP 1148111**	(page 1)
Note 2:	**Lot 722**	**DP 1148111**	(page 4)

Note 1:

Current Search

Folio Identifier 721/1148111 (title attached)
DP 1148111 (plan attached)
Dated 05th November 2018
Registered Proprietor:
CLARENCE VALLEY COUNCIL

Title Tree
Lot 721 DP 1148111

Folio Identifier 721/1148111

Auto Consol 4921-17

Certificate of Title Volume 4921 Folio 17

Certificate of Title Volume 478 Folio 63

****

Summary of Proprietor(s)
Lot 721 DP 1148111

Year	Proprietor(s)
	(Lot 721 DP 1148111)
2010 – todate	Clarence Valley Council
	(Lots 1 & 2 DP 783972 – A/C 4921-17)
2007 – 2010	Clarence Valley Council
1992 – 2007	The Council of the Shire of Harwood
(1992 – 2010)	*(various leases shown on Historical Auto Consol 4921-17)*
	(Part Allotment 2 & 3 Section 3 Town Maclean – Area 3 Roods 33 ¾ Perches – CTVol 4921 Fol 17)
1940 – 1992	The Council of the Shire of Harwood
(1987 – 1992)	*(lease to Clarence River Fishermans Co-operative Limited of part)*
(1982 – 1987)	*(lease to Clarence River Fishermans Co-operative Limited of part)*
1938 – 1940	Henry Claude Towner, motor mechanic
	(Allotment 2 Section 3 Town Maclean – Area 2 Roods 13 Perches – CTVol 478 Fol 63)
1938 – 1938	Henry Claude Towner, motor mechanic
1931 – 1938	Helen Schwonberg, widow
1910 – 1931	Francis Henry Schwonberg, marine engineer
1879 – 1910	Joachim Nicolaus Schwonberg, shipbuilder

****

Note 2:

Current Search

Folio Identifier 722/1148111 (title attached)
DP 1148111 (plan attached)
Dated 05th November 2018
Registered Proprietor:
CLARENCE VALLEY COUNCIL

Title Tree
Lot 722 DP 1148111

Folio Identifier 722/1148111

Auto Consol 4921-17

Certificate of Title Volume 4921 Folio 17

Certificate of Title Volume 39 Folio 61

****

Summary of Proprietor(s)
Lot 722 DP 1148111

Year	Proprietor(s)
	(Lot 722 DP 1148111)
2010 – todate	Clarence Valley Council
	(Lots 1 & 2 DP 783972 – A/C 4921-17)
2007 – 2010	Clarence Valley Council
1992 – 2007	The Council of the Shire of Harwood
(1992 – 2010)	*(various leases shown on Historical Auto Consol 4921-17)*
	(Part Allotment 2 & 3 Section 3 Town Maclean – Area 3 Roods 33 ¾ Perches – CTVol 4921 Fol 17)
1940 – 1992	The Council of the Shire of Harwood
(1987 – 1992)	*(lease to Clarence River Fishermans Co-operative Limited of part)*
(1982 – 1987)	*(lease to Clarence River Fishermans Co-operative Limited of part)*
1938 – 1940	Henry Claude Towner, motor mechanic
	(Allotment 3 Section 3 Town Maclean – Area 2 Roods 11 Perches – CTVol 39 Fol 61)
1938 – 1938	Henry Claude Towner, motor mechanic
1931 – 1938	Helen Schwonberg, widow
1910 – 1931	Francis Henry Schwonberg, marine engineer
1867 – 1910	Joachim Nicolas Schwonberg, boat builder

****

Appendix C

Historical Aerial Photographs

Figure C1: Historical Aerial 1958

Site: 74 River Street
Location: Maclean, NSW
Details: Detailed Site Investigation

Client: Clarence Valley Council
Drawn: GC
Source: Department of Lands

CAVVANBA consulting

Figure C2: Historical Aerial 1964

Site: Clarence Valley Council
Location: 74 River Street, Maclean, NSW

Client: Clarence Valley Council
Drawn: GC
Source: Department of Lands

CAVVANBA consulting

Figure C3: Historical Aerial 1977

Site: Clarence Valley Council
Location: 74 River Street, Maclean, NSW

Client: Clarence Valley Council
Drawn: GC
Source: Department of Lands

CAVVANBA consulting

Figure C4: Historical Aerial 1989

Site: Clarence Valley Council
Location: 74 River Street, Maclean, NSW

Client: Clarence Valley Council
Drawn: GC
Source: Department of Lands

CAVVANBA consulting

Figure C5: Historical Aerial 1993

Site: Clarence Valley Council
Location: 74 River Street, Maclean, NSW

Client: Clarence Valley Council
Drawn: GC
Source: Department of Lands

CAVVANBA consulting

Figure C6: Historical Aerial 2004

Site: Clarence Valley Council
Location: 74 River Street, Maclean, NSW

Client: Clarence Valley Council
Drawn: GC
Source: Department of Lands

CAVVANBA consulting

Appendix D

Planning Certificate

clarence
VALLEY COUNCIL

G Chisnall
1/66 Centennial Circuit
BYRON BAY NSW 2481

Date of Issue 31 October 2018
Your Ref. 18058
Certificate No. PLAN2018/2927
Receipt Details
785709 29/10/2018 $138.00

Property Number: 131359
Property Address: River Street MACLEAN NSW 2463
Legal Description: Lot 722 DP 1148111
Owner: Clarence Valley Council &
Land And Property Management Authority (Crown Lands Division)

PLANNING CERTIFICATE

Issued under Section 10.7(2) of the Environmental Planning and Assessment Act, 1979

Note: the information provided in sections 1 to 19 below is provided under section 10.7(2) of the Environmental Planning and Assessment Act 1979

1. Relevant planning instruments and development control plans

Text and zoning maps for the relevant local environmental plan/s and development control plan/s can be downloaded from Councils website – www.clarence.nsw.gov.au. Text for the relevant local environmental plan/s can be downloaded from the NSW Government website – www.legislation.nsw.gov.au.

A. Local Environmental Plans

Clarence Valley Local Environmental Plan 2011 applies to the land.

Zone IN4 Working Waterfront

1 Objectives of zone

- To retain and encourage waterfront industrial and maritime activities.
- To identify sites for maritime purposes and for activities that require direct waterfront access.
- To ensure that development does not have an adverse impact on the environmental and visual qualities of the foreshore.
- To encourage employment opportunities.
- To minimise any adverse effect of development on land uses in other zones.
- To enable light industries where they are related to the waterfront industrial and maritime activities permitted in the zone.
- To ensure that development does not detract from the maritime character of small

commercial fishing and port facilities on the Clarence River.

2 Permitted without consent

Home occupations; Home occupations (sex services).

3 Permitted with consent

Boat building and repair facilities; Boat launching ramps; Jetties; Light industries; Neighbourhood shops; Roads; Take away food and drink premises; Waste or resource transfer stations; Any other development not specified in item 2 or 4.

4 Prohibited

Agriculture; Air transport facilities; Airstrips; Amusement centres; Animal boarding or training establishments; Biosolids treatment facilities; Camping grounds; Caravan parks; Cemeteries; Child care centres; Commercial premises; Community facilities; Correctional centres; Crematoria; Eco-tourist facilities; Educational establishments; Entertainment facilities; Environmental facilities; Exhibition homes; Exhibition villages; Farm buildings; Forestry; Function centres; Health services facilities; Helipads; Highway service centres; Information and education facilities; Mooring pens; Mortuaries; Passenger transport facilities; Places of public worship; Public administration buildings; Recreation facilities (indoor); Recreation facilities (major); Recreation facilities (outdoor); Registered clubs; Residential accommodation; Respite day care centres; Restricted premises; Sewage treatment plants; Sex services premises; Tourist and visitor accommodation; Vehicle body repair workshops; Vehicle repair stations; Veterinary hospitals; Waste or resource management facilities; Water storage facilities; Water treatment facilities.

B. Proposed local environmental planning instruments

No proposed local environmental planning instrument applies to the land that has been placed on public exhibition under the *Environmental Planning and Assessment Act 1979*. The subject land IS affected by a planning proposal for a proposed environmental planning instrument (Local Environmental Plan or LEP) that aims to reclassify the land from community to operational. Interested persons are advised to contact Councils Environment, Development and Strategic Planning Section on phone (02) 66430200 for details of how this Draft Plan applies to the subject land.

C. Development Control Plan

The Clarence Valley Development Control Plan - Development in Environmental Protection, Open Space and Special Use Zones applies to the carrying out of development on the land.

D. State Environmental Planning Policies (SEPP)

Text for the relevant state environmental planning policies can be downloaded from the NSW Government website – www.legislation.nsw.gov.au.

The land is affected by State Environmental Planning Policies No 21, 30, 33, 36, 44, 50, 55, 62, 64, 65, Housing for Seniors or People with a Disability 2004, Building Sustainability Index (BASIX) 2004, Infrastructure 2007, Mining, Petroleum Production and Extractive Industries 2007, Miscellaneous Consent Provisions 2007, Exempt and Complying Development Codes 2008, Rural Lands 2008, Affordable Rental Housing 2009, State and Regional Development 2011, Integration and Repeals 2016 and Educational Establishments and Child Care Facilities 2017.

The land is affected by State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017.

The State Environmental Planning Policy (Coastal Management) 2018 applies to the subject land. The Policy expands the area of the coastal zone and introduces four (4) coastal management areas that will comprise the coastal zone, as well as repeal SEPP No 14 (Coastal Wetlands), SEPP No 26 (Littoral Rainforests), SEPP No 71 (Coastal Protection) and parts of the SEPP (Infrastructure) 2007. The Policy contains development controls for assessment of development applications and other provisions related to management of the coastal zone. Details of the Policy and how it applies to the subject land can be accessed at the NSW Legislation website, www.legislation.nsw.gov.

E. Proposed state environmental planning instruments

There are NO proposed State environmental planning policies that apply to the land that is or has been the subject of community consultation or public exhibition, unless otherwise stated within this certificate.

2. Other relevant local environmental planning provisions

Note: The following advice is relevant to the local environmental plan/s identified in Section 1A of this Certificate.

A. Minimum land dimensions for erection of dwelling house

There is no minimum lot size for dwelling purposes. Other development standards may apply.

B. Critical habitat

The subject land is NOT known to include or comprise critical habitat as defined in the *Threatened Species Conservation Act 1995* or Part 7A of the *Fisheries Management Act 1994*.

C. Heritage conservation area

The land IS located within a heritage conservation area (however described) under the local environmental planning instrument.

D. Item of environmental heritage

The land does NOT have located on it an item of environmental heritage (however described) under the local environmental planning instrument.

3. Complying development

Note: Text for the State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 can be downloaded from the NSW Government website – www.legislation.nsw.gov.au.

Notwithstanding the advice in Parts 3A to 3I (inclusive) below, for complying development to occur it must comply with all relevant requirements and other development standards of *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008*.

Where advice regarding whether or not complying development can occur, under relevant Codes listed at Parts 3A to 3I (inclusive) below, indicates that complying development cannot occur on any part of the subject land then such advice takes precedence over any other advice in the same Part that indicates complying development may be able to occur on part of the subject land.

A. General Housing Code

Complying development under this Code may not be carried out on any part of this land. The land is wholly affected as being within a heritage conservation area or within a draft heritage conservation area. Despite this, development that is a detached outbuilding or swimming pool may be carried out.

B. Rural Housing Code

Complying development under this Code may not be carried out on any part of this land. The land is wholly affected as being within a heritage conservation area or within a draft heritage conservation area. Despite this, development that is a detached outbuilding or swimming pool may be carried out.

C. Housing Alterations Code

Complying development under this Code may be carried out on the whole of this land.

D. General Development Code

Complying development under this Code may be carried out on the whole of this land.

E. Commercial and Industrial Alterations Code

Complying development under this Code may be carried out on the whole of this land.

F. Commercial and Industrial (New Buildings and Additions) Code

Complying development under this Code may not be carried out on any part of this land. The land is wholly affected as being within a heritage conservation area or within a draft heritage conservation area.

G. Subdivisions Code

Complying development under this Code may be carried out on the whole of this land.

H. Demolition Code

Complying development under this Code may be carried out on the whole of this land.

I. Fire Safety Code

Complying development under this Code may be carried out on the whole of this land.

4 Annual charges for coastal protection services under Local Government Act 1993

The owner (or any previous owner) of the land has NOT consented in writing to the land being subject to annual charges under section 496B of the *Local Government Act 1993* for coastal protection services that relate to existing coastal protection works (within the meaning of section 553B of that Act).

[Note. "Existing coastal protection works" are works to reduce the impact of coastal hazards on land (such as seawalls, revetments, groynes and beach nourishment) that existed before the commencement of section 553B of the Local Government Act 1993.]

5. Mine subsidence

The land is NOT proclaimed to be within a mine subsidence district within the meaning of section 15 of the *Mines Subsidence Compensation Act, 1961.*

6. Road widening and road realignment

The land is NOT affected by any road widening or road re-alignment under Division 2 of Part 3 of the *Roads Act 1993*, any environmental planning instrument, or any resolution of Council, unless otherwise stated within this certificate.

7. Council and other public authority policies on hazard risk restrictions

Hazard Risk Restrictions (generally)
The subject land is NOT affected by a policy adopted by the Council, or by any other public authority and notified to the Council, that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding), unless otherwise stated within this certificate.

Acid Sulfate Soil
The subject land IS mapped AS BEING potentially affected by Acid Sulfate soils, as indicated on the Acid Sulfate Soils Planning Map held by Council.

Any Other Risk - Contaminated Land
Council has adopted a policy on contaminated land. This policy will restrict development of land which is affected by contamination, which has been used for certain purposes, in respect of which there is not sufficient information about contamination, which is proposed to be used for certain purposes, or in other circumstances outlined in the policy.

8. Flood related development controls

A. Flood controls on certain residential development

The land is considered to be located below the flood planning level. Hence, development on the land for the purposes of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors housing) is subject to flood related development controls. Details are contained in the local environmental planning instrument and relevant development control plan/s.

B. Flood controls on other development

The land is considered to be located below the flood planning level. Hence, development on the land for any purpose (other than development referred to in item 8A above) is subject to flood related development controls. Details are contained in the relevant local environmental planning instrument/s and relevant development control plan/s.

9. Land Reserved for Acquisition

No environmental planning instrument or proposed environmental planning instrument referred to in item 1A, 1B, 1D or 1E of this certificate applies to this land that provides for the acquisition of the land by a public authority as referred to in Section 3.15 of the *Environmental Planning and Assessment Act 1979*, unless otherwise stated within this certificate.

10. Contributions plans

The Clarence Valley Contributions Plan 2011 applies to the land. It identifies contributions for open space and community facilities applicable to residential development and a Section 7.12 levy for all other development.

The Section 94 Contribution Plan for Street Trees in Urban Subdivisions applies to the land.

In accordance with the above Contributions Plan/s, Council may require, as a condition of consent for certain developments, that works be carried out or contributions be paid towards the provision of works, services or amenities. Applicants intending to carry out developments should make their own enquiries regarding such possible contributions. In some cases, the Council may not be able to determine the exact requirements for works or contributions until a development application has been lodged and assessed.

11. Biodiversity Certified Land

The land is NOT biodiversity certified land under Part 8 of the *Biodiversity Conservation Act 2016*, unless otherwise stated in this certificate.

12. Biodiversity stewardship sites

The land is NOT a biodiversity stewardship site under a biodiversity stewardship agreement under Part 5 of the *Biodiversity Conservation Act 2016*, unless otherwise stated in this certificate.

12A. Native Vegetation Clearing Set Asides

The land is NOT a set aside area under section 60ZC of the *Local Land Services Act 2013*, unless otherwise stated in this certificate.

13. Matters arising under the Contaminated Land Management Act 1997 (CLM Act)

Note: The following advice is by section 59 (2) of the Contaminated Land Management Act 1997 as additional matters to be specified in a planning certificate.

The land is NOT within land declared to be significantly contaminated land, subject to a management order, subject of an approved voluntary management proposal, subject of an ongoing maintenance order or subject to a site audit statement within the meaning of the Contaminated Land Management Act 1997, unless otherwise stated within this certificate.

14. Bushfire prone land

The subject land is indicated on Council's bushfire prone land map as NOT being bush fire prone land.

15. Property vegetation plans

Council HAS NOT been notified that a property vegetation plan (PVP) approved under Part 4 of the *Native Vegetation Act 2003* (and that continues in force) applies to the land.

16. Orders under Tree (Disputes Between Neighbours) Act 2006

Council has NOT been notified of an order made under the *Trees (Disputes Between Neighbours) Act 2006* to carry out work in relation to a tree on the land.

17. Directions under Part 3A

There is NO direction, issued by the Minister for Planning, in force under the now repealed section 75P(2)(c1) of the Act to the effect that a provision of an environmental planning instrument prohibiting or restricting the carrying out of a project or a stage of a project on the land under Part 4 of the *Environmental Planning and Assessment Act 1979* does not have effect.

18. Site compatibility certificates and conditions for seniors housing

Note: Text for the *State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004* can be downloaded from the NSW Government website – www.legislation.nsw.gov.au.

A. Site Compatibility Certificate

There is NO current site compatibility certificate issued under clause 25 of *State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004* in respect of proposed development on the land, unless otherwise stated within this certificate.

B. Conditions for seniors housing

No condition of a consent to a development application granted after 11 October 2007 in respect of the land has been granted containing a statement setting out any terms of a kind referred to in clause 18(2) of *State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004*, unless otherwise stated within this certificate.

19. Site compatibility certificates for infrastructure

Note: Text for the *State Environmental Planning Policy (Infrastructure) 2007* can be downloaded from the NSW Government website – www.legislation.nsw.gov.au.

There is NO current site compatibility certificate issued under clause 19 of *State Environmental Planning Policy (Infrastructure) 2007* in respect of proposed development on the land, unless otherwise stated within this certificate.

20. Site compatibility certificates and conditions for affordable rental housing

Note: Text for the *State Environmental Planning Policy (Affordable Rental Housing) 2009* can be downloaded from the NSW Government website – www.legislation.nsw.gov.au.

A. Site Compatibility Certificate

There is NO current site compatibility certificate (affordable rental housing) issued under *State Environmental Planning Policy (Affordable Rental Housing) 2009* in respect of proposed development on the land, unless otherwise stated within this certificate.

B. Conditions for affordable rental housing

No condition of consent to a development application in respect of the land has been granted containing a statement setting out any terms of a kind referred to in clause 17(1) or 37(1) of *State Environmental Planning Policy (Affordable Rental Housing) 2009*, unless otherwise stated within this certificate.

21. Paper subdivision information

The land is NOT subject of any development plan adopted by a relevant authority that applies to the land or that is proposed to be subject to a consent ballot pursuant to Part 16C of the *Environmental Planning and Assessment Regulation 2000.*

22. Site verification certificates

The land is NOT subject of a current site verification certificate that sets out the Director-General's opinion as to whether the land concerned is or is not biophysical strategic agricultural land or critical industry cluster land—see Division 3 of Part 4AA of *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007*, unless otherwise stated within this certificate.

23. Loose–fill asbestos insulation

The land is NOT occupied by any residential premises (within the meaning of Division 1A of Part 8 of the Home Building Act 1989) that is listed on the register that is required to be maintained under that Division.

24. Affected building notices and building product rectification orders

Council is NOT aware of any affected building notice (within the meaning of the Building Products (Safety) Act 2017) or building product rectification order that is in force in respect of the land.

25. Other Advice Issued by Council

The following additional advices are issued by Council in good faith pursuant to Section 10.7(5) of the Environmental Planning and Assessment Act, 1979

Development Servicing Plans
Council's Development Servicing Plans for Water Supply and Sewerage Services apply in those areas serviced by a Council water supply scheme and sewerage scheme respectively. Enquiries as to whether the land the subject to this certificate is within a water supply or sewerage scheme area should be directed to Council's Water Cycle Section.

Water and Sewer Connection
Properties which consist of more than one lot for ratings purposes, and pay a single sewer and/or water access charge, are entitled to a single water and/or sewer connection. If additional water and/or sewer connections are required (for example when lots are sold separately) then the appropriate fee in Council's Fees and Charges, including a capital contribution, is applicable for any new connections.
If the property is a vacant lot, or is charged a water vacant and/or sewer vacant charge, please contact Council's Water Cycle section to determine the appropriate connection fee.

Copies of relevant documents referred to in this Certificate may be available on request from Council, or by visiting its website at www.clarence.nsw.gov.au. Text for legislation referred to in this Certificate can be downloaded from the NSW Government website – www.legislation.nsw.gov.au.

SECTION 10.7(5)

THIS CERTIFICATE IS DIRECTED TO THE FOLLOWING RELEVANT MATTERS AFFECTING THE LAND PURSUANT TO SECTION 10.7(5)

A. Tree Preservation Order

Council has NO Tree Preservation Order applying to the land.

B. Development Consents

A development consent/s has been issued on the land within the last five years. A copy of the relevant document/s is attached. Interested persons should make their own further inquiries or contact Council's Environment, Development & Strategic Planning.

DA2018/0628 – Demolition of sheds and slipway structure removal.

A copy of the development consent/s referred to in this advice may be obtained through Council's Open Access Information process by completing and submitting Council's *GIPA Informal Access Request Form*. A link to the *GIPA Informal Access Request Form* on Council's website is provided – https://www.clarence.nsw.gov.au/cp_themes/metro/page.asp?p=DOC-BBF-87-11-12

C. Contaminated Land (additional information)

Council records indicate that the land in question is potentially or actually contaminated. Consideration of Council's adopted policy on Contaminated Land and the provisions of relevant State legislation is warranted. Interested persons should make their own enquiries regarding the extent of any actual contamination of the land.

D. North Coast Regional Plan 2036

The *North Coast Regional Plan 2036* applies to all land within the Clarence Valley Local Government Area. The Regional Plan is the NSW Government's strategy for guiding land use planning priorities for the North Coast region to 2036. It comprises a vision as well as four goals, 25 directions and 80 actions.
Other main elements/features of the plan include:

1. Local government narratives for each council area within the region, which set out priorities for each council area as well as containing the urban growth area maps for each council;
2. Identification of a hierarchy of cities, towns and other centres within the region including 4 "regional cities" (Tweed Heads, Lismore, Coffs Harbour and Port Macquarie) which in turn are supported by 2 "strategic centres" (Grafton and Ballina) and a number of "important centres"; and
3. A separate implementation plan - *North Coast Regional Plan 2036 – Implementation Plan 2017-2019*.

There are actions within the plan that have implications for the rezoning of land and other proposals that require an amendment to Council's local environmental plan.

NOTE: When information pursuant to Section 10.7(5) is requested the Council is under no obligation to furnish any of the information supplied herein pursuant to that Section. Council draws your attention to Section 10.7(6) which states that a Council shall not incur any liability in respect of any advice provided in good faith pursuant to sub-Section (5). The absence of any reference to any matter affecting the land shall not imply that the land is not affected by any matter not referred to in this certificate.

PLEASE NOTE:

The Environmental Planning and Assessment Amendment Act 1997 commenced operation on 1 July 1998. As a consequence of this Act the information contained in this certificate needs to be read in conjunction with the provisions of the Environmental Planning and Assessment (Amendment) Regulation 1998, Environmental Planning and Assessment (Further Amendment) Regulation 1998 and Environmental Planning and Assessment (Savings and Transitional) Regulation 1998.

Disclaimer
This certificate contains information provided to Clarence Valley Council by third parties and is as current as the latest information available to Council at the time of production of this document. Council does not warrant the accuracy of the information contained within the information provided by third parties and has not independently verified the information. Please contact Council staff on 6643 0200 should you wish to obtain a listing of the information provided by third parties that has been relied upon in the production of this document. It is strongly recommended that you contact the relevant third parties to confirm the accuracy of the information.

……..
For and on behalf of the
GENERAL MANAGER

clarence
VALLEY COUNCIL

G Chisnall
1/66 Centennial Circuit
BYRON BAY NSW 2481

Date of Issue 31 October 2018
Your Ref. 18058
Certificate No. PLAN2018/2928
Receipt Details
785709 29/10/2018 $138.00

Property Number: 131359
Property Address: River Street MACLEAN NSW 2463
Legal Description: Lot 721 DP 1148111
Owner: Clarence Valley Council &
Land And Property Management Authority (Crown Lands Division)

PLANNING CERTIFICATE

Issued under Section 10.7(2) of the Environmental Planning and Assessment Act, 1979

Note: the information provided in sections 1 to 19 below is provided under section 10.7(2) of the Environmental Planning and Assessment Act 1979

1. Relevant planning instruments and development control plans

Text and zoning maps for the relevant local environmental plan/s and development control plan/s can be downloaded from Councils website – www.clarence.nsw.gov.au. Text for the relevant local environmental plan/s can be downloaded from the NSW Government website – www.legislation.nsw.gov.au.

A. Local Environmental Plans

Clarence Valley Local Environmental Plan 2011 applies to the land.

Zone IN4 Working Waterfront

1 Objectives of zone

- To retain and encourage waterfront industrial and maritime activities.
- To identify sites for maritime purposes and for activities that require direct waterfront access.
- To ensure that development does not have an adverse impact on the environmental and visual qualities of the foreshore.
- To encourage employment opportunities.
- To minimise any adverse effect of development on land uses in other zones.
- To enable light industries where they are related to the waterfront industrial and maritime activities permitted in the zone.
- To ensure that development does not detract from the maritime character of small

commercial fishing and port facilities on the Clarence River.

2 Permitted without consent

Home occupations; Home occupations (sex services).

3 Permitted with consent

Boat building and repair facilities; Boat launching ramps; Jetties; Light industries; Neighbourhood shops; Roads; Take away food and drink premises; Waste or resource transfer stations; Any other development not specified in item 2 or 4.

4 Prohibited

Agriculture; Air transport facilities; Airstrips; Amusement centres; Animal boarding or training establishments; Biosolids treatment facilities; Camping grounds; Caravan parks; Cemeteries; Child care centres; Commercial premises; Community facilities; Correctional centres; Crematoria; Eco-tourist facilities; Educational establishments; Entertainment facilities; Environmental facilities; Exhibition homes; Exhibition villages; Farm buildings; Forestry; Function centres; Health services facilities; Helipads; Highway service centres; Information and education facilities; Mooring pens; Mortuaries; Passenger transport facilities; Places of public worship; Public administration buildings; Recreation facilities (indoor); Recreation facilities (major); Recreation facilities (outdoor); Registered clubs; Residential accommodation; Respite day care centres; Restricted premises; Sewage treatment plants; Sex services premises; Tourist and visitor accommodation; Vehicle body repair workshops; Vehicle repair stations; Veterinary hospitals; Waste or resource management facilities; Water storage facilities; Water treatment facilities.

B. Proposed local environmental planning instruments

No proposed local environmental planning instrument applies to the land that has been placed on public exhibition under the *Environmental Planning and Assessment Act 1979*. The subject land IS affected by a planning proposal for a proposed environmental planning instrument (Local Environmental Plan or LEP) that aims to reclassify the land from community to operational. Interested persons are advised to contact Councils Environment, Development and Strategic Planning Section on phone (02) 66430200 for details of how this Draft Plan applies to the subject land.

C. Development Control Plan

The Clarence Valley Development Control Plan - Development in Environmental Protection, Open Space and Special Use Zones applies to the carrying out of development on the land.

D. State Environmental Planning Policies (SEPP)

Text for the relevant state environmental planning policies can be downloaded from the NSW Government website – www.legislation.nsw.gov.au.

The land is affected by State Environmental Planning Policies No 21, 30, 33, 36, 44, 50, 55, 62, 64, 65, Housing for Seniors or People with a Disability 2004, Building Sustainability Index (BASIX) 2004, Infrastructure 2007, Mining, Petroleum Production and Extractive Industries 2007, Miscellaneous Consent Provisions 2007, Exempt and Complying Development Codes 2008, Rural Lands 2008, Affordable Rental Housing 2009, State and Regional Development 2011, Integration and Repeals 2016 and Educational Establishments and Child Care Facilities 2017.

The land is affected by State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017.

The State Environmental Planning Policy (Coastal Management) 2018 applies to the subject land. The Policy expands the area of the coastal zone and introduces four (4) coastal management areas that will comprise the coastal zone, as well as repeal SEPP No 14 (Coastal Wetlands), SEPP No 26 (Littoral Rainforests), SEPP No 71 (Coastal Protection) and parts of the SEPP (Infrastructure) 2007. The Policy contains development controls for assessment of development applications and other provisions related to management of the coastal zone. Details of the Policy and how it applies to the subject land can be accessed at the NSW Legislation website, www.legislation.nsw.gov.

E. Proposed state environmental planning instruments

There are NO proposed State environmental planning policies that apply to the land that is or has been the subject of community consultation or public exhibition, unless otherwise stated within this certificate.

2. Other relevant local environmental planning provisions

Note: The following advice is relevant to the local environmental plan/s identified in Section 1A of this Certificate.

A. Minimum land dimensions for erection of dwelling house

There is no minimum lot size for dwelling purposes. Other development standards may apply.

B. Critical habitat

The subject land is NOT known to include or comprise critical habitat as defined in the *Threatened Species Conservation Act 1995* or Part 7A of the *Fisheries Management Act 1994*.

C. Heritage conservation area

The land IS located within a heritage conservation area (however described) under the local environmental planning instrument.

D. Item of environmental heritage

The land does NOT have located on it an item of environmental heritage (however described) under the local environmental planning instrument.

3. Complying development

Note: Text for the State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 can be downloaded from the NSW Government website – www.legislation.nsw.gov.au.

Notwithstanding the advice in Parts 3A to 3I (inclusive) below, for complying development to occur it must comply with all relevant requirements and other development standards of *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008*.

Where advice regarding whether or not complying development can occur, under relevant Codes listed at Parts 3A to 3I (inclusive) below, indicates that complying development cannot occur on any part of the subject land then such advice takes precedence over any other advice in the same Part that indicates complying development may be able to occur on part of the subject land.

A. General Housing Code

Complying development under this Code may not be carried out on any part of this land. The land is wholly affected as being within a heritage conservation area or within a draft heritage conservation area. Despite this, development that is a detached outbuilding or swimming pool may be carried out.

B. Rural Housing Code

Complying development under this Code may not be carried out on any part of this land. The land is wholly affected as being within a heritage conservation area or within a draft heritage conservation area. Despite this, development that is a detached outbuilding or swimming pool may be carried out.

C. Housing Alterations Code

Complying development under this Code may be carried out on the whole of this land.

D. General Development Code

Complying development under this Code may be carried out on the whole of this land.

E. Commercial and Industrial Alterations Code

Complying development under this Code may be carried out on the whole of this land.

F. Commercial and Industrial (New Buildings and Additions) Code

Complying development under this Code may not be carried out on any part of this land. The land is wholly affected as being within a heritage conservation area or within a draft heritage conservation area.

G. Subdivisions Code

Complying development under this Code may be carried out on the whole of this land.

H. Demolition Code

Complying development under this Code may be carried out on the whole of this land.

I. Fire Safety Code

Complying development under this Code may be carried out on the whole of this land.

4 Annual charges for coastal protection services under Local Government Act 1993

The owner (or any previous owner) of the land has NOT consented in writing to the land being subject to annual charges under section 496B of the *Local Government Act 1993* for coastal protection services that relate to existing coastal protection works (within the meaning of section 553B of that Act).

[Note. "Existing coastal protection works" are works to reduce the impact of coastal hazards on land (such as seawalls, revetments, groynes and beach nourishment) that existed before the commencement of section 553B of the Local Government Act 1993.]

5. Mine subsidence

The land is NOT proclaimed to be within a mine subsidence district within the meaning of section 15 of the *Mines Subsidence Compensation Act, 1961.*

6. Road widening and road realignment

The land is NOT affected by any road widening or road re-alignment under Division 2 of Part 3 of the *Roads Act 1993*, any environmental planning instrument, or any resolution of Council, unless otherwise stated within this certificate.

7. Council and other public authority policies on hazard risk restrictions

Hazard Risk Restrictions (generally)
The subject land is NOT affected by a policy adopted by the Council, or by any other public authority and notified to the Council, that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding), unless otherwise stated within this certificate.

Acid Sulfate Soil
The subject land IS mapped AS BEING potentially affected by Acid Sulfate soils, as indicated on the Acid Sulfate Soils Planning Map held by Council.

Any Other Risk - Contaminated Land
Council has adopted a policy on contaminated land. This policy will restrict development of land which is affected by contamination, which has been used for certain purposes, in respect of which there is not sufficient information about contamination, which is proposed to be used for certain purposes, or in other circumstances outlined in the policy.

8. Flood related development controls

A. Flood controls on certain residential development

The land is considered to be located below the flood planning level. Hence, development on the land for the purposes of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors housing) is subject to flood related development controls. Details are contained in the local environmental planning instrument and relevant development control plan/s.

B. Flood controls on other development

The land is considered to be located below the flood planning level. Hence, development on the land for any purpose (other than development referred to in item 8A above) is subject to flood related development controls. Details are contained in the relevant local environmental planning instrument/s and relevant development control plan/s.

9. Land Reserved for Acquisition

No environmental planning instrument or proposed environmental planning instrument referred to in item 1A, 1B, 1D or 1E of this certificate applies to this land that provides for the acquisition of the land by a public authority as referred to in Section 3.15 of the *Environmental Planning and Assessment Act 1979*, unless otherwise stated within this certificate.

10. Contributions plans

The Clarence Valley Contributions Plan 2011 applies to the land. It identifies contributions for open space and community facilities applicable to residential development and a Section 7.12 levy for all other development.

The Section 94 Contribution Plan for Street Trees in Urban Subdivisions applies to the land.

In accordance with the above Contributions Plan/s, Council may require, as a condition of consent for certain developments, that works be carried out or contributions be paid towards the provision of works, services or amenities. Applicants intending to carry out developments should make their own enquiries regarding such possible contributions. In some cases, the Council may not be able to determine the exact requirements for works or contributions until a development application has been lodged and assessed.

11. Biodiversity Certified Land

The land is NOT biodiversity certified land under Part 8 of the *Biodiversity Conservation Act 2016*, unless otherwise stated in this certificate.

12. Biodiversity stewardship sites

The land is NOT a biodiversity stewardship site under a biodiversity stewardship agreement under Part 5 of the *Biodiversity Conservation Act 2016*, unless otherwise stated in this certificate.

12A. Native Vegetation Clearing Set Asides

The land is NOT a set aside area under section 60ZC of the *Local Land Services Act 2013*, unless otherwise stated in this certificate.

13. Matters arising under the Contaminated Land Management Act 1997 (CLM Act)

Note: The following advice is by section 59 (2) of the Contaminated Land Management Act 1997 as additional matters to be specified in a planning certificate.

The land is NOT within land declared to be significantly contaminated land, subject to a management order, subject of an approved voluntary management proposal, subject of an ongoing maintenance order or subject to a site audit statement within the meaning of the Contaminated Land Management Act 1997, unless otherwise stated within this certificate.

14. Bushfire prone land

The subject land is indicated on Council's bushfire prone land map as NOT being bush fire prone land.

15. Property vegetation plans

Council HAS NOT been notified that a property vegetation plan (PVP) approved under Part 4 of the *Native Vegetation Act 2003* (and that continues in force) applies to the land.

16. Orders under Tree (Disputes Between Neighbours) Act 2006

Council has NOT been notified of an order made under the *Trees (Disputes Between Neighbours) Act 2006* to carry out work in relation to a tree on the land.

17. Directions under Part 3A

There is NO direction, issued by the Minister for Planning, in force under the now repealed section 75P(2)(c1) of the Act to the effect that a provision of an environmental planning instrument prohibiting or restricting the carrying out of a project or a stage of a project on the land under Part 4 of the *Environmental Planning and Assessment Act 1979* does not have effect.

18. Site compatibility certificates and conditions for seniors housing

Note: Text for the *State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004* can be downloaded from the NSW Government website – www.legislation.nsw.gov.au.

A. Site Compatibility Certificate

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B. Conditions for seniors housing

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A. Site Compatibility Certificate

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B. Conditions for affordable rental housing

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THIS CERTIFICATE IS DIRECTED TO THE FOLLOWING RELEVANT MATTERS AFFECTING THE LAND PURSUANT TO SECTION 10.7(5)

A. Tree Preservation Order

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A development consent/s has been issued on the land within the last five years. A copy of the relevant document/s is attached. Interested persons should make their own further inquiries or contact Council's Environment, Development & Strategic Planning.

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There are actions within the plan that have implications for the rezoning of land and other proposals that require an amendment to Council's local environmental plan.

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PLEASE NOTE:

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……..
For and on behalf of the
GENERAL MANAGER

Appendix E

Safework NSW dangerous goods search results

NSW GOVERNMENT | SafeWork NSW

Locked Bag 2906, Lisarow NSW 2252
Customer Experience 13 10 50
ABN 81 913 830 179 | www.safework.nsw.gov.au

Our Ref: D18/216110

1 November 2018

Cavvanba Consulting Pty Ltd
Mr Glen Chisnall
1/66 Centennial Circuit
BYRON BAY NSW 2481

Dear Mr Chisnall

RE SITE: 74 River St, Maclean NSW 2463

I refer to your site search request received by SafeWork NSW on 23 October 2018 requesting information on Storage of Hazardous Chemicals for the above site.

A search of the records held by SafeWork NSW has not located any records pertaining to the above-mentioned premises.

For further information or if you have any questions, please call us on 13 10 50 or email licensing@safework.nsw.gov.au

Yours sincerely

Customer Service Officer
Customer Experience - Operations
SafeWork NSW

Appendix F

Licenses, permits and notices

Search results

Your search for:LGA: Clarence Valley Council

Matched 7 notices relating to 2 sites.

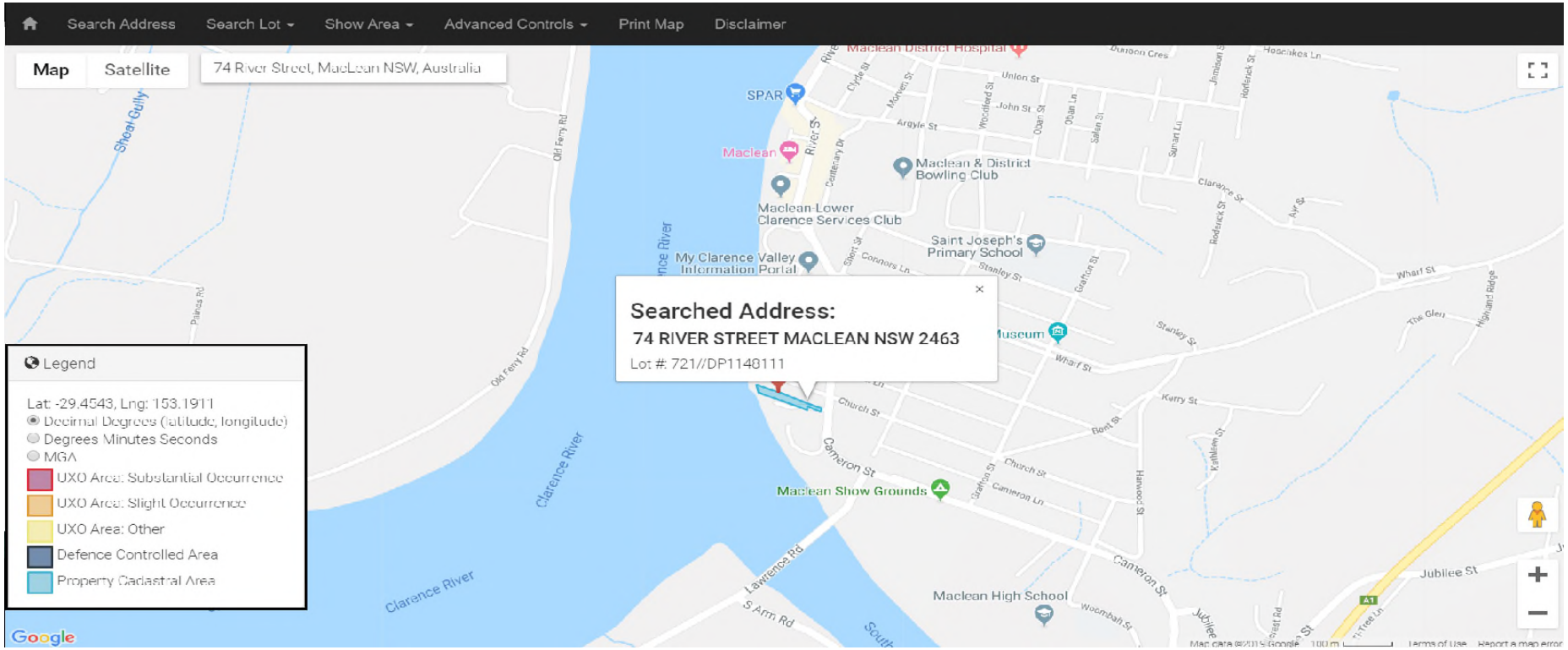
Search Again

Refine Search

Suburb	Address	Site Name	Notices related to this site
ASHBY	via Clarence STREET	Ashby Dry Dock	1 former
KOOLKHAN	Summerland WAY	Former Koolkhan Power Station	6 former

Page 1 of 1

9 January 2019


Search Address
Search Lot
Show Area
Advanced Controls
Print Map
Disclaimer
Map
Satellite
74 River Street, MacLean NSW, Australia
Searched Address:
74 RIVER STREET MACLEAN NSW 2463
Lot #: 721//DP1140111
Legend
Lat: -29.4543, Lng: 153.1911
Decimal Degrees (latitude, longitude)
Degrees Minutes Seconds
MGA
UXO Area: Substantial Occurrence
UXO Area: Slight Occurrence
UXO Area: Other
Defence Controlled Area
Property Cadastral Area
Maclean District Hospital
SPAR
Maclean
Maclean & District Bowling Club
Maclean Lower Clarence Services Club
My Clarence Valley Information Portal
Saint Joseph's Primary School
Maclean Show Grounds
Maclean High School
Clarence River
Shearl Gully
Old Ferry Rd
Palms Rd
Lawrence Rd
S Arm Rd
River St
Argyle St
Union St
John St
Clarence St
Wharf St
Stanley St
Kerry St
Church St
Cameron St
Jubilee St
Woombah St
Google

NSW GOVERNMENT | Department of Primary Industries

Cattle dip site locator

This search retrieved 3 dip sites.

For more information about each dip site, click on the name below.

Dip name	Road	Town/Locality
MACLEAN (https://www.dpi.nsw.gov.au/animals-and-livestock/beef-cattle/health-and-disease/parasitic-and-protozoal-diseases/ticks/cattle-dip-site-locator?sq_content_src=%2BdXJsPWh0dHAlM0ElMkYlMkZidGMuZHBpLm5zdy5nb3YuYXUlMkZEaXAlMkZEZXRhaWxzJTJGMTM1NSZhbGw9MQ%3D%3D)	CENTRAL AVE & IONA CL	MACLEAN
TALOUMBI (https://www.dpi.nsw.gov.au/animals-and-livestock/beef-cattle/health-and-disease/parasitic-and-protozoal-diseases/ticks/cattle-dip-site-locator?sq_content_src=%2BdXJsPWh0dHAlM0ElMkYlMkZidGMuZHBpLm5zdy5nb3YuYXUlMkZEaXAlMkZEZXRhaWxzJTJGMTM2NCZhbGw9MQ%3D%3D)	BROOMS HEAD ROAD	MACLEAN
WINDMILL (https://www.dpi.nsw.gov.au/animals-and-livestock/beef-cattle/health-and-disease/parasitic-and-protozoal-diseases/ticks/cattle-dip-site-locator?sq_content_src=%2BdXJsPWh0dHAlM0ElMkYlMkZidGMuZHBpLm5zdy5nb3YuYXUlMkZEaXAlMkZEZXRhaWxzJTJGMTY4MSZhbGw9MQ%3D%3D)	BROOMS HEAD ROAD	MACLEAN

Find dip sites

Dip name

Road

Town/Locality maclean

Council ---select all---

Search

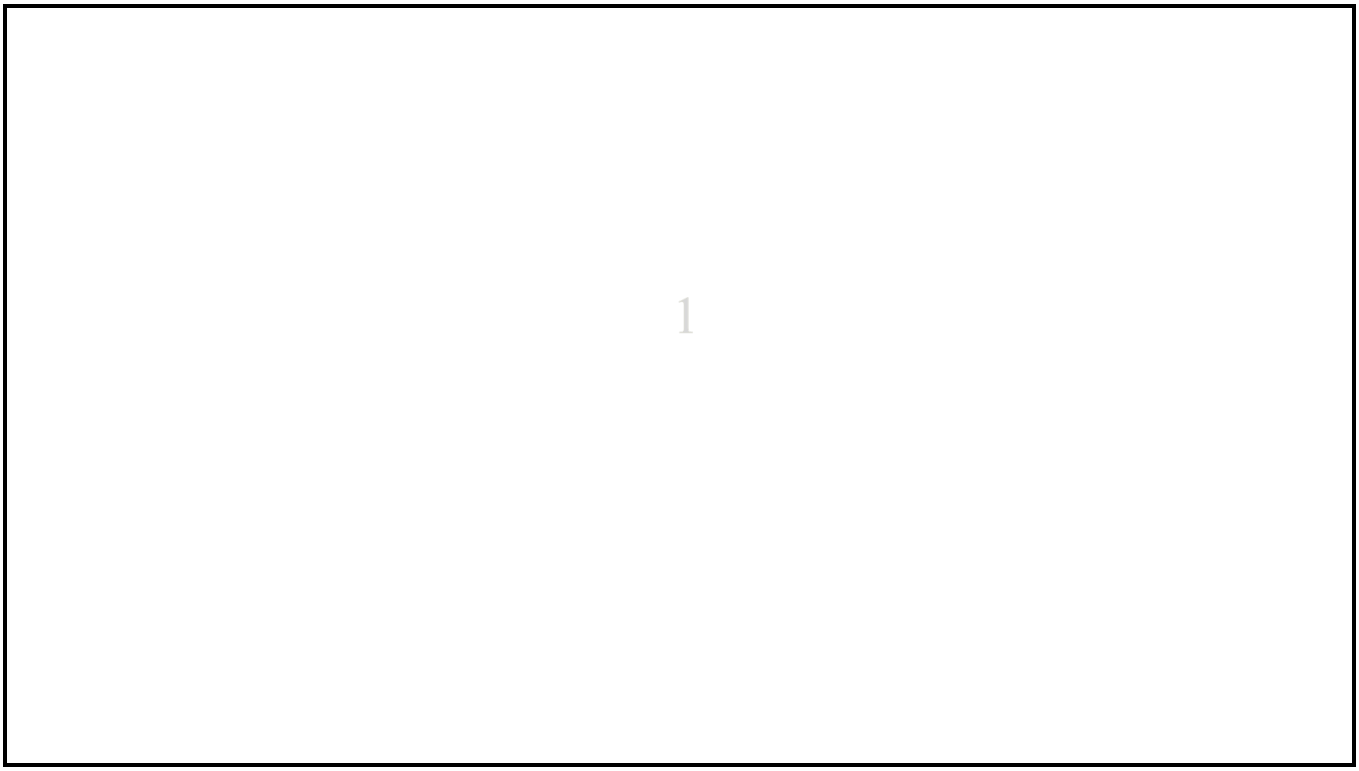
The information contained in this web page is based on knowledge and understanding at the time of writing. However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of Industry& Investment NSW or the user's independent adviser.

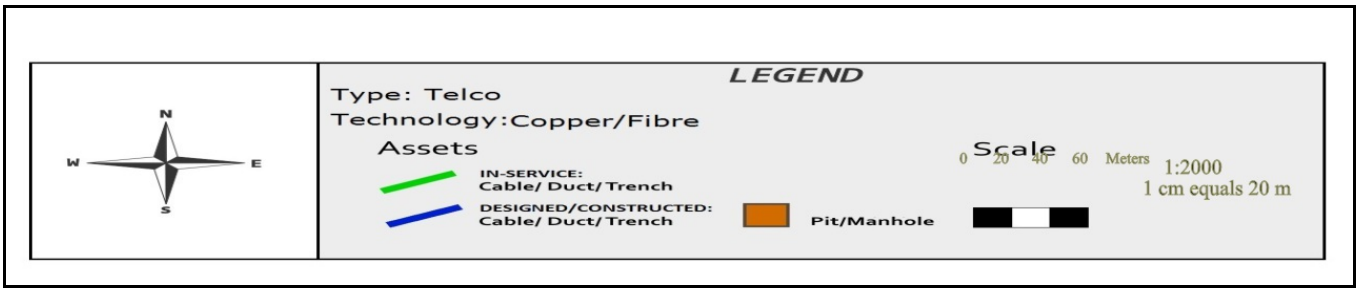
Appendix G

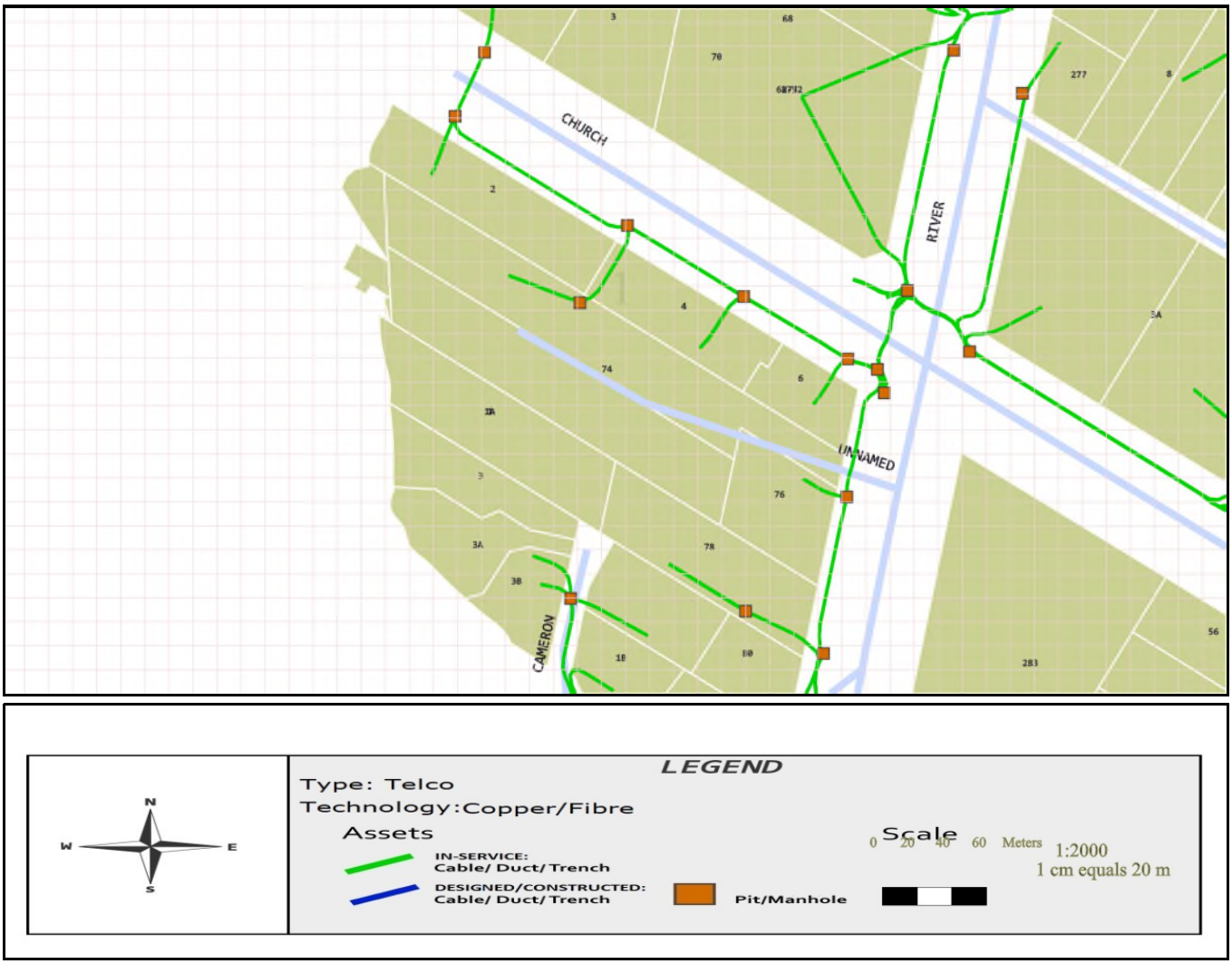
Underground service plans

Indicative Plans

Issue Date:	01/11/2018
Location:	74 River Street , MacLean , NSW , 2463







Emergency Contacts

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

Overhead wires not shown
LOOK UP & LIVE!

LEGEND

- LV Underground Cable
- HV Underground Cable
- Underground Pipe
- Underground Earth or Wires
- Ground Substation
- Pole
- Cubicle
- Pit
- Area of Interest

Critical Assets

Contact Essential Energy on 13 23 91

- Zone Substation
- Underground Cable
- Underground Fibre

Proposed Works

- Area of proposed works

Proposed assets are shown as orange symbols

THE INFORMATION ON THIS MAP MAY NOT BE ACCURATE.
If details are incorrect, please notify Essential Energy on 13 23 91 (or fax 1800 354 636)

ISSUE DATE: 01/11/2018

You must resubmit your request if you have not started work within 4 weeks of the 'Issue Date' above

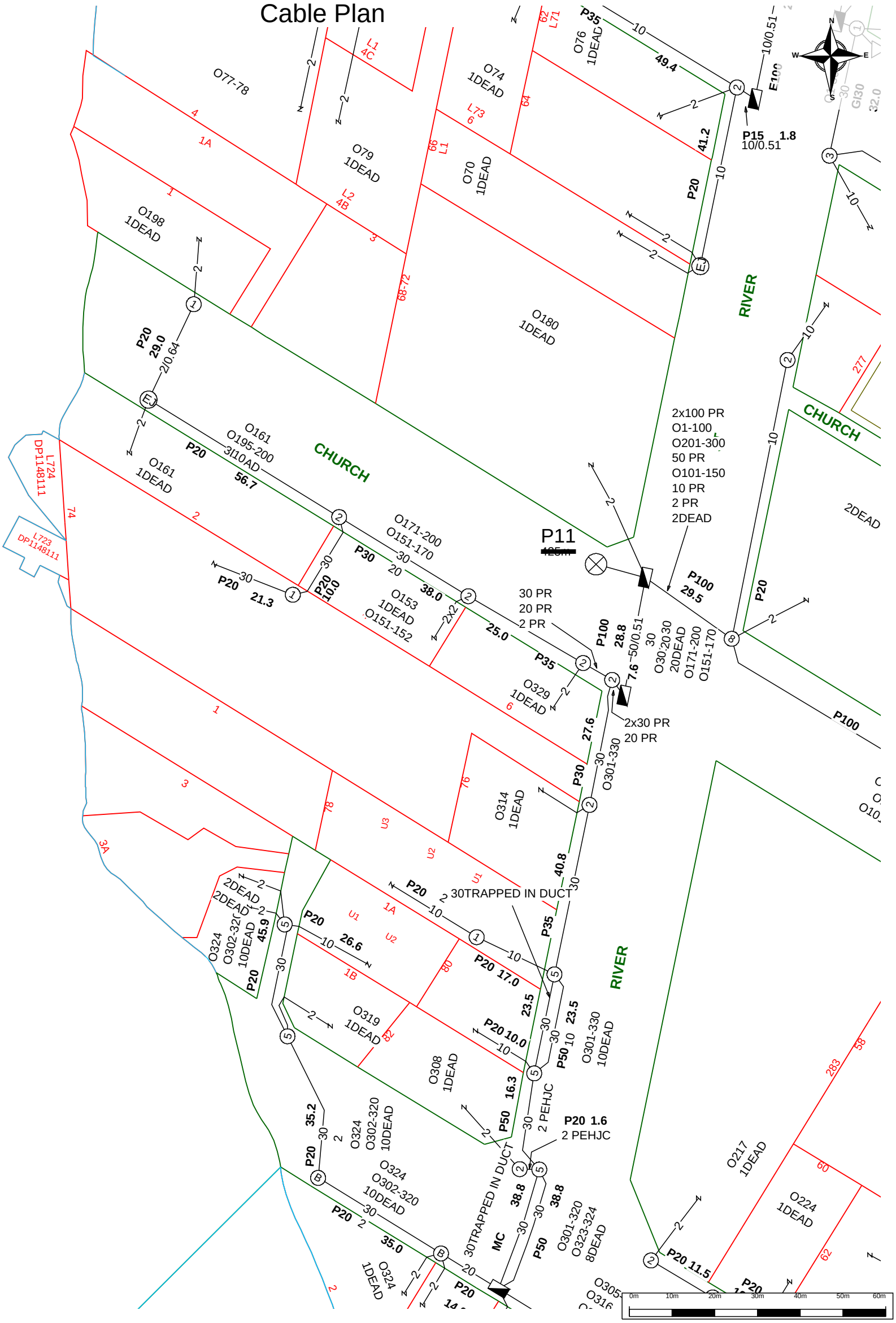
A4 | SCALE: 1:1515

Job Number: 15215678 Sequence number: 77115685 Job location: 74 River Street, MacLean

Map Centre: 153° 11' 47.2", -29° 27' 42.2"

essential energy

Cable Plan



Telstra	For all Telstra DBYD plan enquiries - email - Telstra.Plans@team.telstra.com For urgent onsite contact only - ph 1800 653 935 (bus hrs)
TELSTRA CORPORATION LIMITED A.C.N. 051 775 556	
Generated On 01/11/2018 12:00:43	Sequence Number: 77115686
	CAUTION: Fibre optic and/ or major network present in plot area. Please read the Duty of Care and contact Telstra Plan Services should you require any assistance.

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

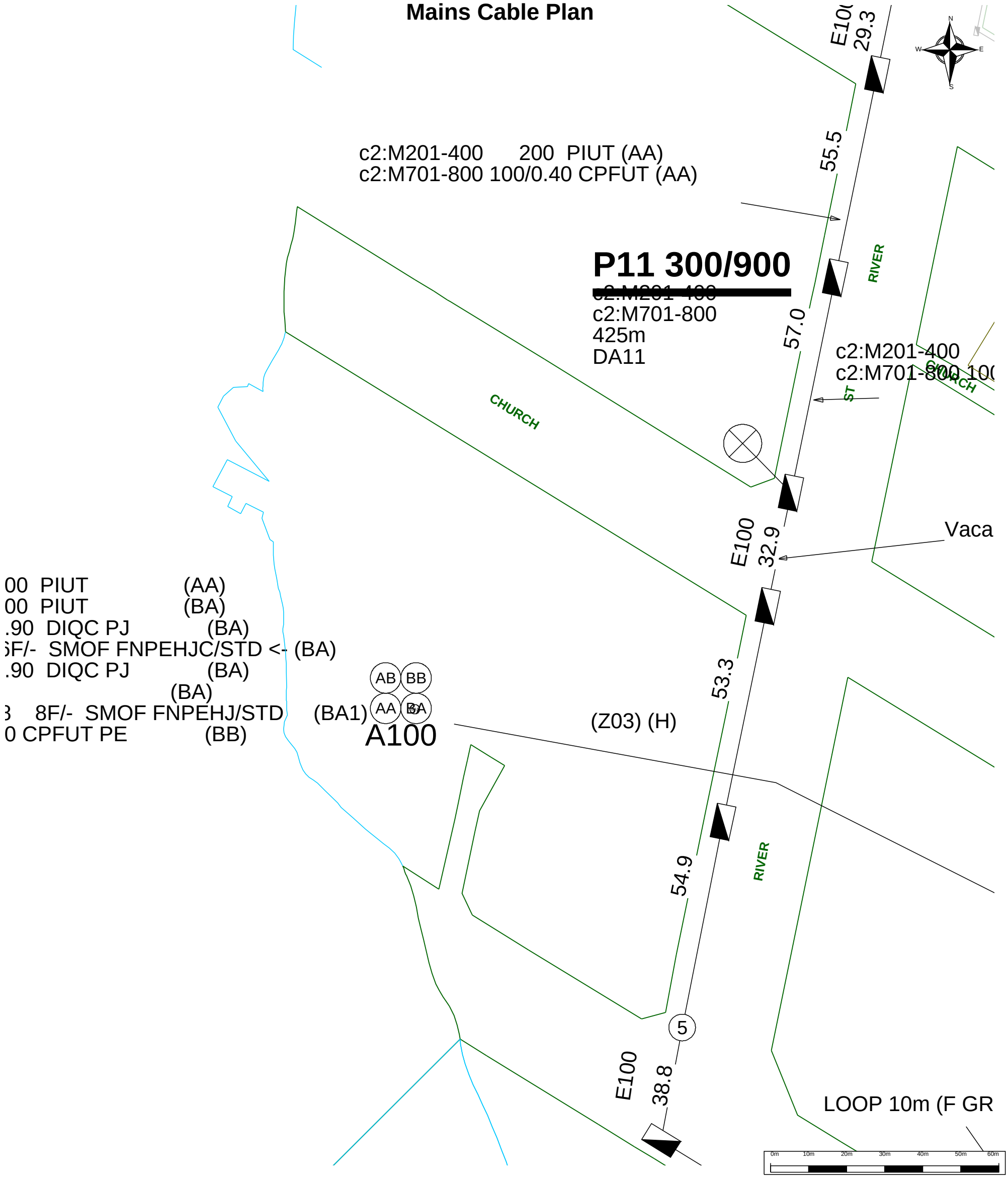
WARNING - Due to the nature of Telstra underground plant and the age of some cables and records, it is impossible to ascertain the precise location of all Telstra plant from Telstra's plans. The accuracy and/or completeness of the information supplied can not be guaranteed as property boundaries, depths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

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

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

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

Mains Cable Plan



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

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

Generated On 01/11/2018 12:00:44

Sequence Number: 77115686

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

Appendix H

Photographic log

Photograph 1.
View west over the former slip way area, followed by the Clarence River. All photographs taken on 7 and 8 November, 2018 unless otherwise noted.

Photograph 2.
View north-west of a stockpile located in the western portion of the site. The Clarence River is visible in the background.

Photograph 3.
View east along the northern boundary of the site. Potential lead paint flakes visible on ground surface from the edge of the building.

Photograph 4.
Potential ACM ventilation pipe located on the western edge of the toilet block.

Photograph 5.
Trailer mounted drill rig completing the soil boring for monitoring well MW03, located in the western portion of the site. The Clarence River is visible in the background.

Photograph 6.
Potential ACM sheeting used on the upper walls of the building located in the south western portion of the site.

Photograph 7.
Monitoring well MW01 installed and developed on 7 November.

Photograph 8.
Soil boring location SB07 with ~ 30mm of asphalt at the surface.

Photograph 9.
View west over the site, towards the Clarence River. Eastern portion of site is raised in comparison to remainder of site.

Photograph 10.
Potential ACM sheeting used on the walls of the shed located in the north eastern portion of the site.

Photograph 11.
Soil boring location SB13 with visible paint flakes at 0.1 m below ground surface.

Photograph 12.
View east across the former slipway area (refer to Photograph 14 for 2012 comparison).

Photograph 13.
Historical view of slipway, looking west (Source: CVC Letter to Department of Primary Industries, 2012)

Photograph 14.
Historical view of slipway, shed and water/oil separator, looking south-east (Source: CVC Letter to Department of Primary Industries, 2012)

Appendix I

PID and Groundwater Parameter Calibration Records

Photoionisation Detector Calibration Record

Job Ref. 18058 Location River street Personnel GC

Serial Number	Date	Time	Span gas conc' (e.g 100 ppm isobutylene)	Span gas reading	Fresh air Cal reading	Initials
	07/11/18	8.00am	100	98.6	0.0	GC

Equipment Calibration Report

Horiba Water Quality Meter U-5000G – Serial No. UOF5YK53

pH	☑ pH 4.01	Actual: 3.98
Conductivity	☑ 4.49 mS/cm	Actual: 4.62
Turbidity	☑ 0 NTU	Actual: 0.0
Dissolved oxygen	☑ 8.92 mg/L	Actual: 8.79

Temperature, (i.e. Room temperature): 21.64

Calibrated by: Glen Chisnall

Date tested: 06/11/18

Job Reference: 18058

Notes: —

Appendix J

Geological Logs

Monitoring Well Log

Project Name:	**Environmental Site Investigation**	Hole ID.	**MW01**
Location / Site:	**River Street, Maclean NSW**	Project Number:	**18058**
Client:		Hole Depth:	**2.60 m**
Drilling Company:	**ENV Solutions**		
Drill Method:	**Solid Flight Auger**	Rig Type:	**Trailer Mounted**
Date Started:	**7/11/2018**	Ground Level:	----------
Date Completed:	**7/11/2018**	Easting:	----------
Sheet:	**1 of 1**	Northing:	----------

CAVVANBA consulting

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests: PID ppm	Samples / Tests: ID No.	Observations / Comments	Well Details	Well Construction
							Surface: Grass						
SFA		0.10				Fill	**FILL** - TOPSOIL.				No observable contamination.		Bent. Gatic
							FILL - Silty SAND, light brown, loose.	dry	0.0	MW01_0.3	Steel, plastic.	0.20	
		0.50										0.40	
							FILL - Clayey Silty SAND, light brown, loose.	dry	0.0	MW01_0.5	Staining. Steel.	0.60	
		1.00											
		1.10					**FILL** - Silty Sandy CLAY, black, soft, low plasticity.	slightly moist	0.0	MW01_1.0	No observable contamination.		
					CL		**CLAY** - black, soft, medium plasticity.	moist			No observable contamination.		Gravel Pack
		1.50							0.0	MW01_1.5			
					SC	Natural	**Clayey SAND** - dark brown to black, loose, coarse grained.	moist			No observable contamination.		
		2.00							0.0	MW01_2.0			Screen
					SP		**SAND** - light brown / cream, medium dense, coarse grained.	sat'd			No observable contamination.		
		2.5											
		2.60					**End of Hole at 2.60 m** Refusal on bedrock?						
		3.0											
		3.5											
		4.0											
		4.5											
		5.0											

Additional Comments

Developed using bailer 7/11/18.

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Logged By: **Glen Chisnall** Date: **7/11/2018**
Checked By: Date:

Monitoring Well Log

Project Name:	**Environmental Site Investigation**	Hole ID.	**MW02**
Location / Site:	**River Street, Maclean NSW**	Project Number:	**18058**
Client:		Hole Depth:	**2.00 m**
Drilling Company:	**ENV Solutions**		
Drill Method:	**Solid Flight Auger**	Rig Type:	**Trailer Mounted**
Date Started:	**7/11/2018**	Ground Level:	----------
Date Completed:	**7/11/2018**	Easting:	----------
Sheet:	**1 of 1**	Northing:	----------

CAVVANBA consulting

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests: PID ppm	Samples / Tests: ID No.	Observations / Comments
							Surface: Grass				
SFA		0.10				Fill	**FILL** - TOPSOIL.	dry	0.0	MW02_0.1	No observable contamination.
		0.5					**FILL** - Gravelly SAND, light brown, very loose.				No observable contamination.
		0.90									
		1.00					**FILL** - Gravelly SAND, brown, very loose.	slightly moist	0.0	MW02_1.0	No observable contamination.
	▽	1.40					**FILL** - Silty CLAY, black & brown, soft.	moist			No observable contamination.
		1.5			SC	Natural	**Clayey SAND** - dark brown, loose, coarse grained.	wet			No observable contamination.
		1.80									
		2.00			SC		**Clayey SAND** - light brown, loose, coarse grained.	wet			No observable contamination.
							End of Hole at 2.00 m Refusal.				
		2.5									
		3.0									
		3.5									
		4.0									
		4.5									
		5.0									

Well Details: 0.40 Bentonite; 0.90; 1.00 Screen Gravel Pack; Gatic

Well Construction

Additional Comments

Developed using bailer 7/11/18.

Log Drawn By:	Laurie White	Logged By:	**Glen Chisnall**	Date: **7/11/2018**
Contact:	laurie.white@reumad.com.au	Checked By:		Date:

Monitoring Well Log

Project Name:	**Environmental Site Investigation**	Hole ID.	**MW03**
Location / Site:	**River Street, Maclean NSW**	Project Number:	**18058**
Client:		Hole Depth:	**5.00 m**
Drilling Company:	**ENV Solutions**		
Drill Method:	**Solid Flight Auger**	Rig Type:	**Trailer Mounted**
Date Started:	**7/11/2018**	Ground Level:	----------
Date Completed:	**7/11/2018**	Easting:	----------
Sheet:	**1 of 1**	Northing:	----------

CAVVANBA consulting

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests: PID ppm	Samples / Tests: ID No.	Samples / Tests: DUP TRIP	Observations / Comments	Well Details	Well Construction
							Surface: Grass							
SFA	▽	0.10				Fill	**FILL** - TOPSOIL.		0.0	MW03_0.1	QS01 QS02	No observable contamination.		Gatic
		0.5					**FILL** - Silty SAND, light brown, loose.	dry				No observable contamination. Rocks, glass.	0.30	
		1.0												Bentonite
		1.5											1.50	
		1.80							0.0	MW03_1.8				
		2.0					**Clayey SAND** - dark brown / orange mottled, loose, coarse grained.	very moist				No observable contamination.	2.00	
		2.5						wet						
		3.0												Gravel Pack
		3.5			SC	Natural								
		4.0												Screen
		4.5												
		5.00					**End of Hole at 5.00 m**							

Additional Comments

Developed using bailer 7/11/18.

Log Drawn By:	Laurie White	Logged By:	**Glen Chisnall**	Date: **7/11/2018**
Contact:	laurie.white@reumad.com.au	Checked By:		Date:

Borehole Log

Project Name:	**Environmental Site Investigation**	Hole ID.	**SB01**
Location / Site:	**River Street, Maclean NSW**	Project Number:	**18058**
Client:		Hole Depth:	**1.60 m**
Drilling Company:	**ENV Solutions**		
Drill Method:	**Solid Flight Auger**	Rig Type:	**Trailer Mounted**
Date Started:	**7/11/2018**	Ground Level:	----------
Date Completed:	**7/11/2018**	Easting:	----------
Sheet:	**1 of 1**	Northing:	----------

CAVVANBA consulting

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests: PID ppm	Samples / Tests: ID No.	Observations / Comments
							Surface: Grass				
SFA		0.10				Fill	**FILL** - TOPSOIL.		0.0	SB01_0.1	No observable contamination.
		0.2					**FILL** - Silty SAND, light brown, loose.	dry			No observable contamination.
		0.4									
		0.6									
		0.8									
		1.00			SC	Natural	**Clayey SAND** - brown to light orange, loose, coarse grained.	slightly moist			No observable contamination.
	▽	1.2									
		1.4						wet			
		1.60					**End of Hole at 1.60 m** Refusal.		0.0	SB01_1.6	
		1.8									
		2.0									
		2.2									
		2.4									

Additional Comments

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Logged By: **Glen Chisnall** Date: **7/11/2018**
Checked By: Date:

Borehole Log

Project Name:	**Environmental Site Investigation**	Hole ID.	**SB02**
Location / Site:	**River Street, Maclean NSW**	Project Number:	**18058**
Client:		Hole Depth:	**1.70 m**
Drilling Company:	**ENV Solutions**		
Drill Method:	**Solid Flight Auger**	Rig Type:	**Trailer Mounted**
Date Started:	**7/11/2018**	Ground Level:	----------
Date Completed:	**7/11/2018**	Easting:	----------
Sheet:	**1 of 1**	Northing:	----------

CAVVANBA consulting

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests: PID ppm	Samples / Tests: ID No.	Observations / Comments
							Surface: Grass				
SFA		0.10				Fill	**FILL** - TOPSOIL.		0.0	SB02_0.1	No observable contamination.
		0.2					**FILL** - Silty SAND, dark brown, loose.	dry			No observable contamination. Charcoal inclusions.
		0.4									
		0.6									
		0.8									
		1.00							0.0	SB02_1.0	
		1.2					**FILL** - Silty Gravelly CLAY, dark brown / orange mottled, medium stiff.	slightly moist			No observable contamination.
		1.30					**FILL** - SAND, orange & yellow mottled, loose, coarse grained.	very moist			No observable contamination.
	▽	1.4						wet			
		1.6									
		1.70							0.0	SB02_1.7	
		1.8					**NATURAL: Silty SAND** - dark brown, loose. **End of Hole at 1.70 m**	sat'd			No observable contamination. Organic matter (wood).
		2.0									
		2.2									
		2.4									

Additional Comments

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Logged By: **Glen Chisnall** Date: **7/11/2018**
Checked By: Date:

Borehole Log

Project Name:	**Environmental Site Investigation**	Hole ID.	**SB03**
Location / Site:	**River Street, Maclean NSW**	Project Number:	**18058**
Client:		Hole Depth:	**1.50 m**
Drilling Company:	**ENV Solutions**		
Drill Method:	**Solid Flight Auger**	Rig Type:	**Trailer Mounted**
Date Started:	**7/11/2018**	Ground Level:	----------
Date Completed:	**7/11/2018**	Easting:	----------
Sheet:	**1 of 1**	Northing:	----------

CAVVANBA consulting

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests: PID ppm	Samples / Tests: ID No.	Observations / Comments
							Surface: Grass				
SFA		0.10				Fill	**FILL** - TOPSOIL.		0.0	SB03_0.1	No observable contamination.
		0.2					**FILL** - Silty SAND, light brown, loose.	dry			No observable contamination.
		0.4									
		0.50					**Clayey SAND** - brown / orange mottled, medium dense.	slightly moist			No observable contamination.
	▽	0.6			SC						
		0.8									
		1.0									
		1.2						wet			
		1.4									
		1.50					**NATURAL: Clayey SAND** - light brown, medium dense.	moist	0.0	SB03_1.5	
		1.6					**End of Hole at 1.50 m**				
		1.8									
		2.0									
		2.2									
		2.4									

Additional Comments

REUMAD	Log Drawn By: Laurie White	Logged By: **Glen Chisnall**	Date: **7/11/2018**	
	Contact: laurie.white@reumad.com.au	Checked By:	Date:	

Borehole Log

Project Name:	**Environmental Site Investigation**	Hole ID.	**SB04**
Location / Site:	**River Street, Maclean NSW**	Project Number:	**18058**
Client:		Hole Depth:	**1.30 m**
Drilling Company:	**ENV Solutions**		
Drill Method:	**Solid Flight Auger**	Rig Type:	**Trailer Mounted**
Date Started:	**7/11/2018**	Ground Level:	----------
Date Completed:	**7/11/2018**	Easting:	----------
Sheet:	**1 of 1**	Northing:	----------

CAVVANBA consulting

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests: PID ppm	Samples / Tests: ID No.	Observations / Comments
							Surface: Grass				
SFA	▽	0.10				Fill	**FILL** - TOPSOIL.		0.0	SB04_0.1	No observable contamination.
		0.15					**FILL** - Sandy GRAVEL, light grey, loose, subangular gravel greater than 2mm.	dry			No observable contamination.
		0.2						slightly moist			No observable contamination.
		0.30					**FILL** - Silty SAND, orange to grey, loose, subangular gravel greater than 2mm.				
		0.4					**FILL** - Silty SAND, dark brown, medium dense, subangular gravel greater than 2mm.	slightly moist			No observable contamination.
		0.6									
		0.8									
		1.00			SC	Natural	**Clayey SAND** - dark brown, dense.	very moist	0.0	SB04_1.0	No observable contamination.
		1.2									
		1.30					**End of Hole at 1.30 m**				
		1.4									
		1.6									
		1.8									
		2.0									
		2.2									
		2.4									

Additional Comments

REUMAD	Log Drawn By: Laurie White	Logged By: **Glen Chisnall**	Date: **7/11/2018**	
	Contact: laurie.white@reumad.com.au	Checked By:	Date:	

Borehole Log

Project Name:	**Environmental Site Investigation**	Hole ID.	**SB05**
Location / Site:	**River Street, Maclean NSW**	Project Number:	**18058**
Client:		Hole Depth:	**1.20 m**
Drilling Company:	**ENV Solutions**		
Drill Method:	**Solid Flight Auger**	Rig Type:	**Trailer Mounted**
Date Started:	**7/11/2018**	Ground Level:	----------
Date Completed:	**7/11/2018**	Easting:	----------
Sheet:	**1 of 1**	Northing:	----------

CAVVANBA consulting

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests: PID ppm	Samples / Tests: ID No.	Observations / Comments
							Surface: Grass				
SFA		0.10				Fill	**FILL** - TOPSOIL.		0.0	SB05_0.1	No observable contamination.
		0.2					**FILL** - Gravelly SAND, light brown, loose.	dry			No observable contamination. Glass, rocks.
		0.4									
		0.50							0.0	SB05_0.5	
		0.6			SC	Natural	**Clayey SAND** - light brown, medium dense.	moist			No observable contamination.
		0.8									
		1.00									
	▽	1.20			CL		**Sandy CLAY** - dark brown, medium stiff.	moist			No observable contamination.
							End of Hole at 1.20 m				
		1.4									
		1.6									
		1.8									
		2.0									
		2.2									
		2.4									

Additional Comments

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Logged By: **Glen Chisnall** Date: **7/11/2018**
Checked By: Date:

Borehole Log

Project Name:	**Environmental Site Investigation**	Hole ID.	**SB06**
Location / Site:	**River Street, Maclean NSW**	Project Number:	**18058**
Client:		Hole Depth:	**1.80 m**
Drilling Company:	**ENV Solutions**		
Drill Method:	**Solid Flight Auger**	Rig Type:	**Trailer Mounted**
Date Started:	**8/11/2018**	Ground Level:	----------
Date Completed:	**8/11/2018**	Easting:	----------
Sheet:	**1 of 1**	Northing:	----------

CAVVANBA consulting

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests: PID ppm	Samples / Tests: ID No.	Observations / Comments
							Surface: Bitumen				
SFA		0.03				Fill	**BITUMEN**.	dry	0.0	SB06_0.1	No observable contamination.
		0.2					**FILL** - Gravelly SAND, orange / grey, loose, subangular gravel greater than 2mm.				No observable contamination.
		0.4									
		0.50			SM	Natural	**Silty SAND** - dark brown, loose.	slightly moist	0.0	SB06_0.7	No observable contamination.
	▽	0.6									
		0.8									
		1.0									
		1.2									
		1.4						wet			
		1.6									
		1.80					**NATURAL: CLAY** - orange / grey mottled, stiff, high plasticity.	very moist			
		2.0					**End of Hole at 1.80 m**				
		2.2									
		2.4									

Additional Comments

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Logged By: **Glen Chisnall** Date: **8/11/2018**
Checked By: Date:

Borehole Log

Project Name:	**Environmental Site Investigation**	Hole ID.	**SB07**
Location / Site:	**River Street, Maclean NSW**	Project Number:	**18058**
Client:		Hole Depth:	**2.00 m**
Drilling Company:	**ENV Solutions**		
Drill Method:	**Solid Flight Auger**	Rig Type:	**Trailer Mounted**
Date Started:	**8/11/2018**	Ground Level:	----------
Date Completed:	**8/11/2018**	Easting:	----------
Sheet:	**1 of 1**	Northing:	----------

CAVVANBA consulting

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests: PID ppm	Samples / Tests: ID No.	Samples / Tests: DUP TRIP	Observations / Comments
							Surface: Bitumen					
SFA	▽	0.03				Fill	**BITUMEN**.					
							FILL - Gravelly SAND, orange / brown, loose.	dry		SB07_0.1		No observable contamination.
		1.00					**FILL** - Clayey Gravelly SAND, brown to grey, medium dense.	moist	40.7	SB07_1.0	QS03	Green staining. Hydrocarbon odour.
		1.50						wet	4.3	SB07_1.5		
					SC	Natural	**Clayey SAND** - light brown, medium dense.	very moist				No observable contamination.
		2.00					**SAND** - orange / brown, coarse grained. **End of Hole at 2.00 m**	very moist	2.1	SB07_2.0		

Additional Comments

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Logged By: **Glen Chisnall** Date: **8/11/2018**
Checked By: Date:

Borehole Log

Project Name:	**Environmental Site Investigation**	Hole ID.	**SB08**
Location / Site:	**River Street, Maclean NSW**	Project Number:	**18058**
Client:		Hole Depth:	**1.60 m**
Drilling Company:	**ENV Solutions**		
Drill Method:	**Solid Flight Auger**	Rig Type:	**Trailer Mounted**
Date Started:	**8/11/2018**	Ground Level:	----------
Date Completed:	**8/11/2018**	Easting:	----------
Sheet:	**1 of 1**	Northing:	----------

CAVVANBA consulting

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests: PID ppm	Samples / Tests: ID No.	Observations / Comments
							Surface: Grass				
SFA		0.10				Natural	**TOPSOIL**.		0.0	SB08_0.1	No observable contamination.
		0.20			SP		**SAND** - light grey, loose.	dry			No observable contamination.
		0.4			SM		**Silty SAND** - dark brown, loose.	slightly moist			No observable contamination.
		0.50							0.0	SB08_0.5	
		0.6			SM		**Silty SAND, minor Clay** - reddish brown, medium dense.	slightly moist			No observable contamination.
		0.8									
		1.0									
		1.2									
		1.4									
	▽	1.60									
		1.8					**End of Hole at 1.60 m**				
		2.0									
		2.2									
		2.4									

Additional Comments

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Logged By: **Glen Chisnall** Date: **8/11/2018**
Checked By: Date:

Borehole Log

Project Name:	**Environmental Site Investigation**	Hole ID.	**SB09**
Location / Site:	**River Street, Maclean NSW**	Project Number:	**18058**
Client:		Hole Depth:	**1.60 m**
Drilling Company:	**ENV Solutions**		
Drill Method:	**Solid Flight Auger**	Rig Type:	**Trailer Mounted**
Date Started:	**8/11/2018**	Ground Level:	----------
Date Completed:	**8/11/2018**	Easting:	----------
Sheet:	**1 of 1**	Northing:	----------

CAVVANBA consulting

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests: PID ppm	Samples / Tests: ID No.	Observations / Comments
							Surface: Gravel				
SFA		0.10				Fill	**FILL** - GRAVEL.		0.0	SB09_0.1	No observable contamination.
		0.2				Fill	**FILL** - Silty SAND, dark brown, loose.	slightly moist			No observable contamination. Glass inclusions.
		0.30									
		0.4			ML	Natural	**Clayey Silty SAND** - dark brown, medium dense.	slightly moist	0.0	SB09_0.5	No observable contamination.
		0.6									
		0.8									
		1.0									
		1.2									
		1.4									
		1.50									
	▽	1.60			CL		**Silty CLAY** - light brown, soft, low plasticity.	moist			No observable contamination.
							End of Hole at 1.60 m				
		1.8									
		2.0									
		2.2									
		2.4									

Additional Comments

Log Drawn By:	Laurie White	Logged By:	**Glen Chisnall**	Date: **8/11/2018**
Contact:	laurie.white@reumad.com.au	Checked By:		Date:

Borehole Log

Project Name:	**Environmental Site Investigation**	Hole ID.	**SB10**
Location / Site:	**River Street, Maclean NSW**	Project Number:	**18058**
Client:		Hole Depth:	**0.40 m**
Drilling Company:	**ENV Solutions**		
Drill Method:	**Hand Auger**		
Date Started:	**8/11/2018**	Ground Level:	----------
Date Completed:	**8/11/2018**	Easting:	----------
Sheet:	**1 of 1**	Northing:	----------

CAVVANBA consulting

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests: PID ppm	Samples / Tests: ID No.	Observations / Comments
							Surface: Grass				
HA		0.10				Fill	**FILL** - TOPSOIL.		0.0	SB10_0.1	No observable contamination.
		0.2					**FILL** - Silty SAND, dark brown, loose.	dry			Ash, glass, plastic.
		0.40					**FILL** - Sandy SILT, dark brown, medium dense. **End of Hole at 0.40 m**	slightly moist	0.0	SB10_0.4	Ash, glass, plastic.
		0.6									
		0.8									
		1.0									
		1.2									
		1.4									
		1.6									
		1.8									
		2.0									
		2.2									
		2.4									

Additional Comments

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Logged By: **Glen Chisnall** Date: **8/11/2018**
Checked By: Date:

Borehole Log

Project Name:	**Environmental Site Investigation**	Hole ID.	**SB11**
Location / Site:	**River Street, Maclean NSW**	Project Number:	**18058**
Client:		Hole Depth:	**0.40 m**
Drilling Company:	**ENV Solutions**		
Drill Method:	**Hand Auger**		
Date Started:	**8/11/2018**	Ground Level:	----------
Date Completed:	**8/11/2018**	Easting:	----------
Sheet:	**1 of 1**	Northing:	----------

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Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests: PID ppm	Samples / Tests: ID No.	Observations / Comments
							Surface: Grass				
HA		0.10				Fill	**FILL** - TOPSOIL.		0.0	SB11_0.1	No observable contamination.
		0.2					**FILL** - Silty SAND, dark brown, loose.	dry			Tiles, glass.
		0.40					**FILL** - Silty SAND, dark brown, medium dense. **End of Hole at 0.40 m**	slightly moist	0.0	SB11_0.4	Tiles, glass.
		0.6									
		0.8									
		1.0									
		1.2									
		1.4									
		1.6									
		1.8									
		2.0									
		2.2									
		2.4									

Additional Comments

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Logged By: **Glen Chisnall** Date: **8/11/2018**
Checked By: Date:

Borehole Log

Project Name:	**Environmental Site Investigation**	Hole ID.	**SB12**
Location / Site:	**River Street, Maclean NSW**	Project Number:	**18058**
Client:		Hole Depth:	**0.40 m**
Drilling Company:	**ENV Solutions**		
Drill Method:	**Hand Auger**		
Date Started:	**8/11/2018**	Ground Level:	----------
Date Completed:	**8/11/2018**	Easting:	----------
Sheet:	**1 of 1**	Northing:	----------

CAVVANBA consulting

Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests: PID ppm	Samples / Tests: ID No.	Samples / Tests: DUP TRIP	Observations / Comments
							Surface: Grass					
HA		0.10				Fill	**FILL** - TOPSOIL.		0.0	SB12_0.1	QS04	No observable contamination.
		0.2					**FILL** - SAND, light grey, very loose.	dry				Ash.
		0.40							0.0	SB12_0.4		
		0.6					**FILL** - Silty SAND, light brown, loose. **End of Hole at 0.40 m**	slightly moist				Ash, plastic.
		0.8										
		1.0										
		1.2										
		1.4										
		1.6										
		1.8										
		2.0										
		2.2										
		2.4										

Additional Comments

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Logged By: **Glen Chisnall** Date: **8/11/2018**
Checked By: Date:

Borehole Log

Project Name:	**Environmental Site Investigation**	Hole ID.	**SB13**
Location / Site:	**River Street, Maclean NSW**	Project Number:	**18058**
Client:		Hole Depth:	**0.40 m**
Drilling Company:	**ENV Solutions**		
Drill Method:	**Hand Auger**		
Date Started:	**8/11/2018**	Ground Level:	----------
Date Completed:	**8/11/2018**	Easting:	----------
Sheet:	**1 of 1**	Northing:	----------

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Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests: PID ppm	Samples / Tests: ID No.	Observations / Comments
							Surface: Grass				
SFA		0.10				Fill	**FILL** - TOPSOIL.		0.0	SB13_0.1	No observable contamination.
		0.2					**FILL** - Silty SAND, light brown, very loose.	dry			Paint flecks, plastic.
		0.40					**FILL** - Silty SAND, light brown, loose. **End of Hole at 0.40 m**	dry	0.0	SB13_0.4	Paint flecks, plastic.
		0.6									
		0.8									
		1.0									
		1.2									
		1.4									
		1.6									
		1.8									
		2.0									
		2.2									
		2.4									

Additional Comments

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Logged By: **Glen Chisnall** Date: **8/11/2018**
Checked By: Date:

Borehole Log

Project Name:	**Environmental Site Investigation**	Hole ID.	**SB14**
Location / Site:	**River Street, Maclean NSW**	Project Number:	**18058**
Client:		Hole Depth:	**0.40 m**
Drilling Company:	**ENV Solutions**		
Drill Method:	**Hand Auger**		
Date Started:	**8/11/2018**	Ground Level:	----------
Date Completed:	**8/11/2018**	Easting:	----------
Sheet:	**1 of 1**	Northing:	----------

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Method	Water Level	Depth (m)	RL (m)	Graphic Log	USCS Symbol	Material Type	Material Description	Moisture	Samples / Tests: PID ppm	Samples / Tests: ID No.	Observations / Comments
							Surface: Grass				
HA		0.10				Fill	**FILL** - TOPSOIL.		0.0	SB14_0.1	No observable contamination.
		0.2					**FILL** - Silty SAND, dark brown, loose.	dry			Ash, glas, paint flecks.
		0.40					**FILL** - Silty SAND, dark brown, loose. **End of Hole at 0.40 m**	dry	0.0	SB14_0.4	Ash, glas, paint flecks.
		0.6									
		0.8									
		1.0									
		1.2									
		1.4									
		1.6									
		1.8									
		2.0									
		2.2									
		2.4									

Additional Comments

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Logged By: **Glen Chisnall** Date: **8/11/2018**
Checked By: Date:

Appendix K

Groundwater Sampling Field Sheets

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Ground Water Sampling Sheet

Job Name: River Street, Maclean	Well No: MW01
Job Number: 18058	Well Type: ☒ Monitor ☐ Extractor ☐ Other
Recorded By: GC	Well Material: ☒ PVC ☐ SS ☐ Other
Date: 13/11/18	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): 2.520	☒ Pump – Type: ☐ Submersible ☒ Peristaltic ☐ Other
Water Level Depth WL in m BTOC): 1.735	**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 3.5 ACTUAL PURGE VOLUME_____

Start: Stop: Elapsed: Initial: Final:

FIELD PARAMETER MEASUREMENTS

Min since purge began	Volume Purged (L)	pH	Cond. (µS/cm)	Temp (°C)	DO (mg/L)	Redox (mV)	SWL (mBTOC)	Other (e.g. observations)	
10	1.5	5.67	0.349	24.84	2.71	196	2.481	Clear, non turbid	
15	2.5	5.71	0.332	25.16	2.58	179	2.490	Turbid, no sheen	
			*	sampled					

Observations during purging (well condition, turbidity, colour, odour, sheen):

Clear then turbid. No odour 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
	ml Amber		unpreserved		
	ml plastic		HNO_3		field filtered? Y / N
	ml VOA vials		HCl		

QUALITY CONTROL SAMPLES

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No
MW01	QS01				
MW01	QS02				

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Ground Water Sampling Sheet

Job Name: River Street, Maclean	Well No: MW02
Job Number: 18058	Well Type: ☒ Monitor ☐ Extractor ☐ Other
Recorded By: GC	Well Material: ☒ PVC ☐ SS ☐ Other
Date: 13/11/18	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): 1.920	☒ Pump – Type: ☐ Submersible ☒ Peristaltic ☐ Other
Water Level Depth WL in m BTOC): 1.351	**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_____ ACTUAL PURGE VOLUME_____

Start: Stop: Elapsed: Initial: Final:

FIELD PARAMETER MEASUREMENTS

Min since purge began	Volume Purged (L)	pH	Cond. (µS/cm)	Temp (°C)	DO (mg/L)	Redox (mV)	SWL (mBTOC)	Other (e.g. observations)	
15	1.5	4.17	0.048	31.01	3.02	340	1.845		
20	2.5	4.35	0.043	31.41	2.69	299	1.910		
			* Sampled *						

Observations during purging (well condition, turbidity, colour, odour, sheen):

Clear then turbid. No odour 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
	ml Amber		unpreserved		
	ml plastic		HNO_3		field filtered? Y / N
	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: River Street, Maclean	Well No: MW03
Job Number: 18058	Well Type: ☒ Monitor ☐ Extractor ☐ Other
Recorded By: AC	Well Material: ☒ PVC ☐ SS ☐ Other
Date: 13/11/18	Sample by: AC

PURGING

PURGE VOLUME

Well Diameter (D in mm): ☒ 50 ☐ 100 ☐ Other

Total Depth of Well (TD in m BTOC): 5.170

Water Level Depth WL in m BTOC): 2.140

Number of well volumes to be purged (# VOLS)

☐ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other

PURGE METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☒ Pump – Type: ☐ Submersible ☒ Peristaltic ☐ Other

PUMP INTAKE SETTING

Depth (m BTOC)

Screen Interval (m BTOC) – Top : Bottom:

PURGE TIME

PURGE TIME_____ PURGE RATE_____ ACTUAL PURGE VOLUME_____

Start: Stop: Elapsed: Initial: Final:

FIELD PARAMETER MEASUREMENTS

Min since purge began	Volume Purged (L)	pH	Cond. (µS/cm)	Temp (°C)	DO (mg/L)	Redox (mV)	SWL (mBTOC)	Other (e.g. observations)	
15	1.5	5.27	0.451	25.62	21.27	87	2.380		
20	2.5	5.72	0.425	23.77	8.66	64	2.591		
25	3.5	5.84	0.418	23.84	7.89	64	2.856		
			X Sample						

Observations during purging (well condition, turbidity, colour, odour, sheen):

Clear, No odour 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
	ml Amber		unpreserved		
	ml plastic		HNO_3		field filtered? Y / N
	ml VOA vials		HCl		

QUALITY CONTROL SAMPLES

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No

Appendix L

Data usability and an introduction to data usability

Data Usability Summary Assessment

A background to data usability is provided in this attachment. All site work was completed in accordance with standard Cavvanba sampling protocols, including a quality assurance/quality control (QA/QC) programme and standard operating procedures.

A data usability assessment was performed for the soil and Groundwater data collected by Cavvanba, as summarised in the following tables:
- Table 1.1, field QC samples summary,
- Table 1.2, summary of field QA/QC, and
- Table 1.3, summary of laboratory QA/QC.

It should be noted that the data usability has been conducted on the whole data set, consisting of the following laboratory batches:
- ES1833933;
- ES1835515;
- ES1835625; and
- ES1834199.

Table 1.1: Field QC samples summary

	Total samples	Field duplicates [1]	Inter-lab duplicates [1]	Trip spike	Trip blank	Rinsate
Soil						
BTEXN	18	2 (11%)	2 (11%)	1	1	-
TRHs C6 – C9	18	2 (11%)	2 (11%)	1	1	-
TRHs C10 – C9	18	2 (11%)	2 (11%)	-	-	-
PAHs	20	2 (10%)	2 (10%)	-	-	-
Metals[2]	17	2 (11.7%)	2 (11.7%)	-	-	-
Lead	19	2 (10.5%)	2 (10.5%)	-	-	-
TBT	8	0 (0%)	0 (0%)	-	-	-
SVOC/VOC	1	0 (0%)	0 (0%)	-	-	-
Groundwater						
BTEXN	3	1 (33%)	1 (33%)	1	1	-
TRHs C6 – C9	3	1 (33%)	1 (33%)	1	1	-
TRHs C10 – C40	3	1 (33%)	1 (33%)	-	-	-
PAHs	3	1 (33%)	1 (33%)	-	-	-
Metals[2]	3	1 (33%)	1 (33%)	-	-	-

Notes:
1. Shows number of duplicate samples collected and the percentage of total samples analysed.
2. Arsenic, cadmium, chromium, copper, lead, nickel, zinc and mercury.
   – = not applicable, as trip spike/blank analysed for volatile compounds only.

Table 1.2: Summary of field QA/QC

Parameter	Complies	Comments [1]
Precision		
Standard operating procedures (SOPs) appropriate and complied with	Yes	Sampling was conducted in accordance with Cavvanba standard field operating procedures. The sampling methods generally complied with industry standards and guidelines.
Field duplicates	Partial	RPD[2] criteria < 30% – 50%, frequency ≥ 5%. *Soil* RPD exceedances have been reported for heavy metals consisting of chromium, copper, lead, nickel and zinc. The frequency of field duplicates was within the acceptable range. *Groundwater* No RPD exceedances have been reported. The frequency of field duplicates was within the acceptable range.
Inter-laboratory duplicates	Partial	RPD[2] criteria < 30% – 50%, frequency ≥ 5%. *Soil* RPD exceedances have been reported for heavy metals consisting of chromium, copper, lead, nickel, zinc and mercury. The frequency of inter-laboratory duplicates was within the acceptable range. *Groundwater* RPD exceedances have been reported for copper. The frequency of inter-laboratory duplicates was within the acceptable range.
Accuracy		
Matrix spikes samples appropriate	Partial	≥ 1/media type. Some matrix spikes were conducted on anonymous samples.
Representativeness		
Sample collection - preservation	Yes	All samples were collected directly into laboratory supplied jars/bottles with no headspace.
Sample collection - sample splitting	Yes	-

Parameter	Complies	Comments [1]
Field equipment calibrated	Yes	PID and Groundwater parameter calibration records have been included in Appendix I within the DSI report.
Decontamination procedures	Yes	Soil samples were collected using a new pair of disposable nitrile gloves between each soil boring location. Augar rods were rinsed and cleaned off between with each soil boring location. Decontamination of the interface probe was conducted between each monitoring well. No other re-usable sampling equipment was used. Single use disposable tubing was used to sample groundwater.
Rinsate samples	No	Required ≥ 1/field batch, < LORs. No rinsate samples were collected during the investigation.
Trip blanks	Yes	≥ 1/field batch (volatiles), < LORs. *Soil* One trip blank was collected/analysed for the soil samples, and analytical results were below the LORs. *Groundwater* One trip blank was collected/analysed for the Groundwater samples, and analytical results were below the LORs.
Trip spikes	Yes	≥ 1/field batch (volatiles), 70 - 130%, (recovery) or ≤ 30 - 50% (RPDs). *Soil* One trip spike was collected/analysed for the soil samples, and RPDs were within acceptable limits. *Groundwater* One trip spike was collected/analysed for the Groundwater samples, and RPDs were within acceptable limits.
Comparability		
Consistent sampling staff	Yes	All field work was conducted by Glen Chisnall of Cavvanba Consulting.
Consistent weather/field conditions	Partial	No information is provided regarding weather/field conditions.
Completeness		
Sample logs and field data	Yes	Standard field sampling sheets were used during the investigation.

Parameter	Complies	Comments [1]
Chain of Custody	Yes	-

Notes:
1. For QC samples, specified frequency and acceptance criteria shown.
2. RPD = relative percentage difference.

Table 1.3: Summary of laboratory QA/QC

Parameter	Complies	Notes [1]
Precision		
Laboratory duplicates	Partial	laboratory specified RPD range, frequency ≥ 10%. *Soil* Laboratory duplicate recovery outliers have been reported for moisture content. The frequency of laboratory duplicates was within the acceptable range. *Groundwater* Laboratory duplicate recovery outliers have been reported for PAH/phenols and TRHs. The frequency of laboratory duplicates was within the acceptable range.
Accuracy		
Surrogate spikes	Partial	Organics by GC, RPD criteria of 70% - 130%. *Soil* Surrogate recovery outliers exist for tripropyltin. The frequency of surrogate spikes was within the acceptable range. *Groundwater* No surrogate recovery outliers exist. The frequency of surrogate spikes was within the acceptable range.
Matrix spikes analysis appropriate	Partial	RPD criteria of ≥ 70% - 130%. *Soil* Matrix spike outliers have been reported for PAH/phenols and TRHs. The frequency of matrix spike analysis was within the acceptable range. *Groundwater* No matrix spike outliers occurred. The frequency of matrix spike analysis was within the acceptable range.

Parameter	Complies	Notes [1]
Laboratory control samples (LCSs)	Yes	RPD criteria of 70% - 130%, frequency of ≥ 1/lab batch *Soil* Laboratory control sample recoveries were within the laboratory specified global acceptance criteria. The frequency of laboratory control samples was within the acceptable range. *Groundwater* Laboratory control sample recoveries were within the laboratory specified global acceptance criteria. The frequency of laboratory control samples was within the acceptable range.
Certified reference material (CRM)	n/a	-
Representativeness		
Sample condition	Yes	-
Holding times	Partial	*Soil* Holding time outliers have been reported for PAHs, TRHs, BTEXN and a range of VOCs. *Groundwater* No holding time outliers have been reported.
Laboratory blanks	Yes	≥ 1/lab batch, < LORs.
Comparability		
NATA accredited laboratory	Yes	ALS is a NATA accredited laboratory (825). The secondary laboratory is Envirolab, which is also NATA accredited (2901).
NEPM methods or similar	Yes	ALS and Envirolab follow methods in accordance with the requirements of NEPC (amended 2013).
Limits of reporting (LORs) consistent and appropriate	Yes	-
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 - Soil

Outliers were reported for field and interlaboratory duplicate RPD recoveries with respect to chromium, copper, lead, nickel, zinc and mercury. This is likely due to the inherent variability associated with metal concentrations in the soil matrix and is not considered to significantly detract from the data sets precision.

Laboratory duplicate outliers have been reported for moisture content. This is considered acceptable as the moisture content within the soil is not important to the interpretation of the results.

Precision - Groundwater

Outliers have been reported for interlaboratory duplicate RPD recoveries with respect to copper. This is considered acceptable and does detract to the data sets precision as concentrations of copper were well below the adopted (conservative) site criteria of 1.3 Ug/L.

Laboratory duplicate outliers have been reported for PAH/phenols and TRHs. This is considered acceptable and is not considered to significantly detract from the data sets precision as concentrations of all these analytes were reported below the laboratory LORs and/or the adopted site criteria.

Accuracy - Soil

The accuracy of the analysis is confirmed by the laboratory control sample recoveries within the acceptance criteria. Matrix spike outliers have been reported for PAH/phenols and TRHs. This is considered and not significantly detract from the data sets accuracy as concentrations of all these analytes were reported below the laboratory LORs.

Accuracy - Groundwater

The accuracy of the analysis is confirmed by the matrix spike and laboratory control sample recoveries within the acceptance criteria.

Representativeness – Soil

Trip spike recoveries were within the specified RPDs and trip blank recoveries were below the laboratory LORs.

Holding time exceedances were recorded for a range of VOCs. This is considered acceptable as all VOC concentrations for sample SB07_1.0 were reported below the laboratory LORs.

Representativeness – Groundwater

No outliers have been reported for QC samples collected to assist in the qualification of representativeness.

Trip spike recoveries were within the specified RPDs and trip blank recoveries were below the laboratory LORs.

No rinsate samples were collected during the investigation. This is considered acceptable because single use sampling equipment was used.

Comparability
The data is considered to be acceptable, with experienced sampling staff used, NATA accredited laboratories used and all LORs below the relevant criteria.

Completeness
Laboratory and field documentation is considered to be complete.

Background to Data Usability

1.0 Introduction

Information generated from environmental investigations requires some statement in regard to the usability of the data[1], 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 as amended 2013). 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 as amended 2013, 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.*

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 parameters[2]. Field QA/QC and laboratory QC is described below within the PARCC framework.

[1] To avoid confusion with the data quality objectives (DQOs) process, the term data usability is used rather than data quality.

[2] The PARCC parameters are sometimes referred to as data quality indicators (DQIs).

2.1 Precision

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:

$$RPD = (P-D)/(P+D/2) \times 100$$

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; and
- laboratory duplicates are used to measure the precision of the analytical process.

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 a 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 spikes

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

Representativeness refers to the degree to which the samples reflect the site specific conditions. It is primarily dependent on the design and implementation of the sampling program, with representativeness of the data being partially ensured by the avoidance of cross-contamination, adherence to sample handling and analytical methods, use of field duplicates, ensuring that samples do not exceed holding times prior to analysis, use of chain-of-custody forms and other appropriate documentation.

There are a number of QC samples which can be collected to assist in the qualification of representativeness, including:

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 reference 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 1999* (as amended April 2013). National Environment Protection Council, Canberra.

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.

Appendix M

Laboratory analytical reports

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1833933**	Page	: 1 of 24
Client	: **CAVVANBA CONSULTING**	Laboratory	: Environmental Division Sydney
Contact	: MR BEN WACKETT	Contact	: Brenda Hong
Address	: PO BOX 2191 BYRON BAY NSW 2481	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 6685 7811	Telephone	: +61 2 8784 8555
Project	: 18058	Date Samples Received	: 13-Nov-2018 11:00
Order number	: 18058	Date Analysis Commenced	: 15-Nov-2018
C-O-C number	: ----	Issue Date	: 23-Nov-2018 15:33
Sampler	: GLEN CHISNALL		
Site	: ----		
Quote number	: SYBQ/409/18		
No. of samples received	: 49		
No. of samples analysed	: 23		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Alex Rossi	Organic Chemist	Sydney Inorganics, Smithfield, NSW
Diana Mesa	2IC Organic Chemist	Brisbane Organics, Stafford, QLD
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP090 Organotin: Particular samples showed poor surrogate recovery due to matrix interference. Confirmed by re-extraction and re-analysis.
- EP071: Results of samples QS01 and QS03 have been confirmed by re-extraction and re-analysis.
- EP080: The trip spike and its control have been analysed for volatile TPH and BTEX only. The trip spike and control were prepared in the lab using reagent grade sand spiked with petrol. The spike was dispatched from the lab and the control retained.
- EP075(SIM): Particular samples required dilution prior to extraction due to matrix interferences. LOR values have been adjusted accordingly.
- EP075: 'Sum of PAH' is the sum of the USEPA 16 priority PAHs
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	MW01_0.1	MW02_0.1	MW03_0.1	SB01_0.1	SB02_0.1
			Client sampling date / time	07-Nov-2018 00:00	07-Nov-2018 00:00	07-Nov-2018 00:00	07-Nov-2018 00:00	07-Nov-2018 00:00
Compound	CAS Number	LOR	Unit	ES1833933-001	ES1833933-006	ES1833933-008	ES1833933-010	ES1833933-012
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	27.1	6.6	9.2	12.9	14.1
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	7	<5	8
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	4
Chromium	7440-47-3	2	mg/kg	14	8	19	9	24
Copper	7440-50-8	5	mg/kg	50	10	240	16	62
Lead	7439-92-1	5	mg/kg	93	26	289	42	217
Nickel	7440-02-0	2	mg/kg	4	<2	26	<2	20
Zinc	7440-66-6	5	mg/kg	158	29	402	38	4860
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.3	<0.1	0.2
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	2.1
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	0.7
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	2.5	<0.5	13.8
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.6	<0.5	4.8
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	5.0	<0.5	59.4
Pyrene	129-00-0	0.5	mg/kg	0.5	0.7	4.8	<0.5	57.4
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	1.7	<0.5	36.7
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	1.6	<0.5	35.4
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	2.3	<0.5	45.2
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.9	<0.5	16.8
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	2.1	<0.5	37.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	1.2	<0.5	16.6
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	4.2
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	1.6	<0.5	18.3
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	0.5	0.7	24.3	<0.5	349
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	2.7	<0.5	53.8
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	0.6	3.0	0.6	53.8
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	1.2	3.2	1.2	53.8
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	MW01_0.1	MW02_0.1	MW03_0.1	SB01_0.1	SB02_0.1
				Client sampling date / time	07-Nov-2018 00:00	07-Nov-2018 00:00	07-Nov-2018 00:00	07-Nov-2018 00:00	07-Nov-2018 00:00
Compound	CAS Number	LOR	Unit		ES1833933-001	ES1833933-006	ES1833933-008	ES1833933-010	ES1833933-012
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued									
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		<100	<100	**110**	<100	**1000**
C29 - C36 Fraction	----	100	mg/kg		**120**	<100	**140**	<100	**840**
^ C10 - C36 Fraction (sum)	----	50	mg/kg		**120**	<50	**250**	<50	**1840**
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		**160**	**100**	**210**	<100	**1580**
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	**540**
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		**160**	**100**	**210**	<50	**2120**
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP090: Organotin Compounds									
Tributyltin	56573-85-4	0.5	µgSn/kg		----	----	**8.8**	----	<0.5
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**81.8**	**79.9**	**77.5**	**79.0**	**80.7**
2-Chlorophenol-D4	93951-73-6	0.5	%		**79.5**	**78.2**	**76.4**	**76.9**	**77.6**
2.4.6-Tribromophenol	118-79-6	0.5	%		**57.4**	**54.0**	**54.9**	**53.8**	**58.1**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**79.7**	**78.3**	**76.8**	**76.7**	**79.9**
Anthracene-d10	1719-06-8	0.5	%		**81.8**	**79.8**	**76.6**	**77.4**	**76.2**
4-Terphenyl-d14	1718-51-0	0.5	%		**76.5**	**73.6**	**71.9**	**73.1**	**77.0**
EP080S: TPH(V)/BTEX Surrogates									

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	MW01_0.1	MW02_0.1	MW03_0.1	SB01_0.1	SB02_0.1
				Client sampling date / time	07-Nov-2018 00:00	07-Nov-2018 00:00	07-Nov-2018 00:00	07-Nov-2018 00:00	07-Nov-2018 00:00
Compound	CAS Number	LOR	Unit		ES1833933-001	ES1833933-006	ES1833933-008	ES1833933-010	ES1833933-012
					Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates - Continued									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		99.0	100	105	102	104
Toluene-D8	2037-26-5	0.2	%		101	102	109	104	105
4-Bromofluorobenzene	460-00-4	0.2	%		103	104	108	108	105
EP090S: Organotin Surrogate									
Tripropyltin	----	0.5	%		----	----	44.1	----	45.3

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	SB02_1.0	SB03_0.1	SB04_0.1	SB05_0.1	SB06_0.1
			Client sampling date / time	07-Nov-2018 00:00	07-Nov-2018 00:00	07-Nov-2018 00:00	07-Nov-2018 00:00	07-Nov-2018 00:00
Compound	CAS Number	LOR	Unit	ES1833933-013	ES1833933-015	ES1833933-017	ES1833933-019	ES1833933-021
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	21.8	8.8	6.9	5.3	7.9
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	5	<5	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	16	12	4	7	16
Copper	7440-50-8	5	mg/kg	16	74	<5	1200	<5
Lead	7439-92-1	5	mg/kg	66	150	6	115	6
Nickel	7440-02-0	2	mg/kg	13	9	3	4	<2
Zinc	7440-66-6	5	mg/kg	165	112	21	116	<5
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	0.5	0.8	<0.5	1.2	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	0.8	2.4	<0.5	2.4	<0.5
Pyrene	129-00-0	0.5	mg/kg	0.8	2.8	<0.5	2.4	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	1.3	<0.5	1.1	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	1.3	<0.5	1.0	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	0.5	1.8	<0.5	1.4	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	0.6	<0.5	0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	1.7	<0.5	1.2	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	0.8	<0.5	0.6	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	1.0	<0.5	0.7	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	2.6	14.5	<0.5	12.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	2.2	<0.5	1.6	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	2.4	0.6	1.8	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	2.7	1.2	2.1	1.2
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB02_1.0	SB03_0.1	SB04_0.1	SB05_0.1	SB06_0.1
				Client sampling date / time	07-Nov-2018 00:00	07-Nov-2018 00:00	07-Nov-2018 00:00	07-Nov-2018 00:00	07-Nov-2018 00:00
Compound	CAS Number	LOR	Unit		ES1833933-013	ES1833933-015	ES1833933-017	ES1833933-019	ES1833933-021
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued									
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		<100	120	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg		<100	150	<100	110	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	270	<50	110	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	230	<100	160	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	110	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	340	<50	160	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP090: Organotin Compounds									
Tributyltin	56573-85-4	0.5	µgSn/kg		<0.5	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		82.0	84.7	88.6	81.8	80.1
2-Chlorophenol-D4	93951-73-6	0.5	%		80.3	82.0	85.7	79.3	77.1
2.4.6-Tribromophenol	118-79-6	0.5	%		53.7	59.3	60.0	58.3	52.5
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		80.5	81.9	85.2	79.6	77.2
Anthracene-d10	1719-06-8	0.5	%		81.9	83.2	87.9	80.6	80.1
4-Terphenyl-d14	1718-51-0	0.5	%		76.7	76.2	82.6	74.1	75.2
EP080S: TPH(V)/BTEX Surrogates									

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB02_1.0	SB03_0.1	SB04_0.1	SB05_0.1	SB06_0.1
				Client sampling date / time	07-Nov-2018 00:00	07-Nov-2018 00:00	07-Nov-2018 00:00	07-Nov-2018 00:00	07-Nov-2018 00:00
Compound	CAS Number	LOR	Unit		ES1833933-013	ES1833933-015	ES1833933-017	ES1833933-019	ES1833933-021
					Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates - Continued									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		93.9	105	103	109	107
Toluene-D8	2037-26-5	0.2	%		93.9	106	105	110	108
4-Bromofluorobenzene	460-00-4	0.2	%		95.5	107	110	114	110
EP090S: Organotin Surrogate									
Tripropyltin	----	0.5	%		48.1	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	SB07_1.0	SB08_0.1	SB10_0.1	SB11_0.1	SB12_0.1
			Client sampling date / time	08-Nov-2018 00:00	08-Nov-2018 00:00	08-Nov-2018 00:00	08-Nov-2018 00:00	08-Nov-2018 00:00
Compound	CAS Number	LOR	Unit	ES1833933-024	ES1833933-027	ES1833933-031	ES1833933-033	ES1833933-035
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	18.1	4.4	9.8	21.9	28.4
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	5	<5	16	25	16
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	5	<1
Chromium	7440-47-3	2	mg/kg	16	3	9	23	31
Copper	7440-50-8	5	mg/kg	30	<5	552	1540	2110
Lead	7439-92-1	5	mg/kg	132	6	333	3970	844
Nickel	7440-02-0	2	mg/kg	8	<2	7	26	17
Zinc	7440-66-6	5	mg/kg	89	13	699	4660	2730
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.6	3.4	0.7
EP074A: Monocyclic Aromatic Hydrocarbons								
Toluene	108-88-3	0.5	mg/kg	<0.5	----	----	----	----
Styrene	100-42-5	0.5	mg/kg	<0.5	----	----	----	----
Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	----	----	----	----
n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	----	----	----	----
1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	----	----	----	----
sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	----	----	----	----
1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	----	----	----	----
tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	----	----	----	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	----	----	----	----
n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	----	----	----	----
EP074B: Oxygenated Compounds								
Vinyl Acetate	108-05-4	5	mg/kg	<5	----	----	----	----
2-Butanone (MEK)	78-93-3	5	mg/kg	<5	----	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	----	----	----	----
2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	----	----	----	----
EP074C: Sulfonated Compounds								
Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	----	----	----	----
EP074D: Fumigants								
2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	----	----	----	----
1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	----	----	----	----
cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	----	----	----	----
trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB07_1.0	SB08_0.1	SB10_0.1	SB11_0.1	SB12_0.1
				Client sampling date / time	08-Nov-2018 00:00	08-Nov-2018 00:00	08-Nov-2018 00:00	08-Nov-2018 00:00	08-Nov-2018 00:00
Compound	CAS Number	LOR	Unit		ES1833933-024	ES1833933-027	ES1833933-031	ES1833933-033	ES1833933-035
					Result	Result	Result	Result	Result
EP074D: Fumigants - Continued									
1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg		<0.5	----	----	----	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	5	mg/kg		<5	----	----	----	----
Chloromethane	74-87-3	5	mg/kg		<5	----	----	----	----
Vinyl chloride	75-01-4	5	mg/kg		<5	----	----	----	----
Bromomethane	74-83-9	5	mg/kg		<5	----	----	----	----
Chloroethane	75-00-3	5	mg/kg		<5	----	----	----	----
Trichlorofluoromethane	75-69-4	5	mg/kg		<5	----	----	----	----
1.1-Dichloroethene	75-35-4	0.5	mg/kg		<0.5	----	----	----	----
Iodomethane	74-88-4	0.5	mg/kg		<0.5	----	----	----	----
trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg		<0.5	----	----	----	----
1.1-Dichloroethane	75-34-3	0.5	mg/kg		<0.5	----	----	----	----
cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg		<0.5	----	----	----	----
1.1.1-Trichloroethane	71-55-6	0.5	mg/kg		<0.5	----	----	----	----
1.1-Dichloropropylene	563-58-6	0.5	mg/kg		<0.5	----	----	----	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg		<0.5	----	----	----	----
1.2-Dichloroethane	107-06-2	0.5	mg/kg		<0.5	----	----	----	----
Trichloroethene	79-01-6	0.5	mg/kg		<0.5	----	----	----	----
Dibromomethane	74-95-3	0.5	mg/kg		<0.5	----	----	----	----
1.1.2-Trichloroethane	79-00-5	0.5	mg/kg		<0.5	----	----	----	----
1.3-Dichloropropane	142-28-9	0.5	mg/kg		<0.5	----	----	----	----
Tetrachloroethene	127-18-4	0.5	mg/kg		<0.5	----	----	----	----
1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg		<0.5	----	----	----	----
trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg		<0.5	----	----	----	----
cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg		<0.5	----	----	----	----
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg		<0.5	----	----	----	----
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg		<0.5	----	----	----	----
Pentachloroethane	76-01-7	0.5	mg/kg		<0.5	----	----	----	----
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg		<0.5	----	----	----	----
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	0.5	mg/kg		<0.5	----	----	----	----
Bromobenzene	108-86-1	0.5	mg/kg		<0.5	----	----	----	----
2-Chlorotoluene	95-49-8	0.5	mg/kg		<0.5	----	----	----	----
4-Chlorotoluene	106-43-4	0.5	mg/kg		<0.5	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	SB07_1.0	SB08_0.1	SB10_0.1	SB11_0.1	SB12_0.1
			Client sampling date / time	08-Nov-2018 00:00	08-Nov-2018 00:00	08-Nov-2018 00:00	08-Nov-2018 00:00	08-Nov-2018 00:00
Compound	CAS Number	LOR	Unit	ES1833933-024	ES1833933-027	ES1833933-031	ES1833933-033	ES1833933-035
				Result	Result	Result	Result	Result
EP074F: Halogenated Aromatic Compounds - Continued								
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	----	----	----	----
EP074G: Trihalomethanes								
Chloroform	67-66-3	0.5	mg/kg	<0.5	----	----	----	----
Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	----	----	----	----
Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	----	----	----	----
Bromoform	75-25-2	0.5	mg/kg	<0.5	----	----	----	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	----	----	<4.0	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg	----	----	<4.0	----	----
2-Methylphenol	95-48-7	0.5	mg/kg	----	----	<4.0	----	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg	----	----	<8	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg	----	----	<4.0	----	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	----	----	<4.0	----	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	----	----	<4.0	----	----
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	----	----	<4.0	----	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	----	----	<4.0	----	----
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	----	----	<4.0	----	----
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	----	----	<4.0	----	----
Pentachlorophenol	87-86-5	2	mg/kg	----	----	<8	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	**5.6**	**1.6**	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	**32.2**	**6.3**	**1.6**
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<4.0	**0.5**	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	**12.2**	**2.1**	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	**2.7**	<0.5	**190**	**35.5**	**7.1**
Anthracene	120-12-7	0.5	mg/kg	**0.7**	<0.5	**66.4**	**7.6**	**1.7**
Fluoranthene	206-44-0	0.5	mg/kg	**5.2**	<0.5	**363**	**56.4**	**14.0**
Pyrene	129-00-0	0.5	mg/kg	**5.1**	<0.5	**402**	**57.9**	**13.8**
Benz(a)anthracene	56-55-3	0.5	mg/kg	**2.3**	<0.5	**199**	**26.6**	**7.0**
Chrysene	218-01-9	0.5	mg/kg	**2.2**	<0.5	**177**	**27.1**	**7.2**
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	**2.6**	<0.5	**214**	**34.9**	**10.5**
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	**1.1**	<0.5	**66.8**	**11.3**	**3.4**
Benzo(a)pyrene	50-32-8	0.5	mg/kg	**2.1**	<0.5	**188**	**28.8**	**8.2**
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	**1.2**	<0.5	**87.2**	**12.8**	**4.0**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB07_1.0	SB08_0.1	SB10_0.1	SB11_0.1	SB12_0.1
				Client sampling date / time	08-Nov-2018 00:00	08-Nov-2018 00:00	08-Nov-2018 00:00	08-Nov-2018 00:00	08-Nov-2018 00:00
Compound	CAS Number	LOR	Unit		ES1833933-024	ES1833933-027	ES1833933-031	ES1833933-033	ES1833933-035
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	**24.2**	**3.2**	**1.1**
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		**1.5**	<0.5	**111**	**14.2**	**4.8**
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		**26.7**	<0.5	**2140**	**327**	**84.4**
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		**2.8**	<0.5	**272**	**41.0**	**11.9**
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**3.1**	**0.6**	**272**	**41.0**	**11.9**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**3.4**	**1.2**	**272**	**41.0**	**11.9**
EP075A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		<0.5	----	----	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg		<0.5	----	----	----	----
2-Methylphenol	95-48-7	0.5	mg/kg		<0.5	----	----	----	----
3- & 4-Methylphenol	1319-77-3	0.5	mg/kg		<0.5	----	----	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg		<0.5	----	----	----	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg		<0.5	----	----	----	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg		<0.5	----	----	----	----
2.6-Dichlorophenol	87-65-0	0.5	mg/kg		<0.5	----	----	----	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg		<0.5	----	----	----	----
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg		<0.5	----	----	----	----
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg		<0.5	----	----	----	----
Pentachlorophenol	87-86-5	1	mg/kg		<1	----	----	----	----
EP075B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	----	----	----	----
2-Methylnaphthalene	91-57-6	0.5	mg/kg		<0.5	----	----	----	----
2-Chloronaphthalene	91-58-7	0.5	mg/kg		<0.5	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg		**2.5**	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg		**0.5**	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg		**4.5**	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg		**5.0**	----	----	----	----
N-2-Fluorenyl Acetamide	53-96-3	0.5	mg/kg		<0.5	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		**2.3**	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg		**2.2**	----	----	----	----
Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	1	mg/kg		**3**	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB07_1.0	SB08_0.1	SB10_0.1	SB11_0.1	SB12_0.1
				Client sampling date / time	08-Nov-2018 00:00	08-Nov-2018 00:00	08-Nov-2018 00:00	08-Nov-2018 00:00	08-Nov-2018 00:00
Compound	CAS Number	LOR	Unit		ES1833933-024	ES1833933-027	ES1833933-031	ES1833933-033	ES1833933-035
					Result	Result	Result	Result	Result
EP075B: Polynuclear Aromatic Hydrocarbons - Continued									
7.12-Dimethylbenz(a)anthracene	57-97-6	0.5	mg/kg		<0.5	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		**2.5**	----	----	----	----
3-Methylcholanthrene	56-49-5	0.5	mg/kg		<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		**1.1**	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		**1.4**	----	----	----	----
^ Sum of PAHs	----	0.5	mg/kg		**25.0**	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		**3.2**	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**3.4**	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**3.7**	----	----	----	----
EP075C: Phthalate Esters									
Dimethyl phthalate	131-11-3	0.5	mg/kg		<0.5	----	----	----	----
Diethyl phthalate	84-66-2	0.5	mg/kg		<0.5	----	----	----	----
Di-n-butyl phthalate	84-74-2	0.5	mg/kg		<0.5	----	----	----	----
Butyl benzyl phthalate	85-68-7	0.5	mg/kg		<0.5	----	----	----	----
bis(2-ethylhexyl) phthalate	117-81-7	5.0	mg/kg		<5.0	----	----	----	----
Di-n-octylphthalate	117-84-0	0.5	mg/kg		<0.5	----	----	----	----
EP075D: Nitrosamines									
N-Nitrosomethylethylamine	10595-95-6	0.5	mg/kg		<0.5	----	----	----	----
N-Nitrosodiethylamine	55-18-5	0.5	mg/kg		<0.5	----	----	----	----
N-Nitrosopyrrolidine	930-55-2	1.0	mg/kg		<1.0	----	----	----	----
N-Nitrosomorpholine	59-89-2	0.5	mg/kg		<0.5	----	----	----	----
N-Nitrosodi-n-propylamine	621-64-7	0.5	mg/kg		<0.5	----	----	----	----
N-Nitrosopiperidine	100-75-4	0.5	mg/kg		<0.5	----	----	----	----
N-Nitrosodibutylamine	924-16-3	0.5	mg/kg		<0.5	----	----	----	----
N-Nitrosodiphenyl & Diphenylamine	86-30-6 122-39-4	1.0	mg/kg		<1.0	----	----	----	----
Methapyrilene	91-80-5	0.5	mg/kg		<0.5	----	----	----	----
EP075E: Nitroaromatics and Ketones									
2-Picoline	109-06-8	0.5	mg/kg		<0.5	----	----	----	----
Acetophenone	98-86-2	0.5	mg/kg		<0.5	----	----	----	----
Nitrobenzene	98-95-3	0.5	mg/kg		<0.5	----	----	----	----
Isophorone	78-59-1	0.5	mg/kg		<0.5	----	----	----	----
2.6-Dinitrotoluene	606-20-2	1.0	mg/kg		<1.0	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB07_1.0	SB08_0.1	SB10_0.1	SB11_0.1	SB12_0.1
				Client sampling date / time	08-Nov-2018 00:00	08-Nov-2018 00:00	08-Nov-2018 00:00	08-Nov-2018 00:00	08-Nov-2018 00:00
Compound	CAS Number	LOR	Unit		ES1833933-024	ES1833933-027	ES1833933-031	ES1833933-033	ES1833933-035
					Result	Result	Result	Result	Result
EP075E: Nitroaromatics and Ketones - Continued									
2.4-Dinitrotoluene	121-14-2	1.0	mg/kg		<1.0	----	----	----	----
1-Naphthylamine	134-32-7	0.5	mg/kg		<0.5	----	----	----	----
4-Nitroquinoline-N-oxide	56-57-5	0.5	mg/kg		<0.5	----	----	----	----
5-Nitro-o-toluidine	99-55-8	0.5	mg/kg		<0.5	----	----	----	----
Azobenzene	103-33-3	1	mg/kg		<1	----	----	----	----
1.3.5-Trinitrobenzene	99-35-4	0.5	mg/kg		<0.5	----	----	----	----
Phenacetin	62-44-2	0.5	mg/kg		<0.5	----	----	----	----
4-Aminobiphenyl	92-67-1	0.5	mg/kg		<0.5	----	----	----	----
Pentachloronitrobenzene	82-68-8	0.5	mg/kg		<0.5	----	----	----	----
Pronamide	23950-58-5	0.5	mg/kg		<0.5	----	----	----	----
Dimethylaminoazobenzene	60-11-7	0.5	mg/kg		<0.5	----	----	----	----
Chlorobenzilate	510-15-6	0.5	mg/kg		<0.5	----	----	----	----
EP075F: Haloethers									
Bis(2-chloroethyl) ether	111-44-4	0.5	mg/kg		<0.5	----	----	----	----
Bis(2-chloroethoxy) methane	111-91-1	0.5	mg/kg		<0.5	----	----	----	----
4-Chlorophenyl phenyl ether	7005-72-3	0.5	mg/kg		<0.5	----	----	----	----
4-Bromophenyl phenyl ether	101-55-3	0.5	mg/kg		<0.5	----	----	----	----
EP075G: Chlorinated Hydrocarbons									
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg		<0.5	----	----	----	----
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg		<0.5	----	----	----	----
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg		<0.5	----	----	----	----
Hexachloroethane	67-72-1	0.5	mg/kg		<0.5	----	----	----	----
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg		<0.5	----	----	----	----
Hexachloropropylene	1888-71-7	0.5	mg/kg		<0.5	----	----	----	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg		<0.5	----	----	----	----
Hexachlorocyclopentadiene	77-47-4	2.5	mg/kg		<2.5	----	----	----	----
Pentachlorobenzene	608-93-5	0.5	mg/kg		<0.5	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	1.0	mg/kg		<1.0	----	----	----	----
EP075H: Anilines and Benzidines									
Aniline	62-53-3	0.5	mg/kg		<0.5	----	----	----	----
4-Chloroaniline	106-47-8	0.5	mg/kg		<0.5	----	----	----	----
2-Nitroaniline	88-74-4	1.0	mg/kg		<1.0	----	----	----	----
3-Nitroaniline	99-09-2	1.0	mg/kg		<1.0	----	----	----	----
Dibenzofuran	132-64-9	0.5	mg/kg		<0.5	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB07_1.0	SB08_0.1	SB10_0.1	SB11_0.1	SB12_0.1
				Client sampling date / time	08-Nov-2018 00:00	08-Nov-2018 00:00	08-Nov-2018 00:00	08-Nov-2018 00:00	08-Nov-2018 00:00
Compound	CAS Number	LOR	Unit		ES1833933-024	ES1833933-027	ES1833933-031	ES1833933-033	ES1833933-035
					Result	Result	Result	Result	Result
EP075H: Anilines and Benzidines - Continued									
4-Nitroaniline	100-01-8	0.5	mg/kg		<0.5	----	----	----	----
Carbazole	86-74-8	0.5	mg/kg		<0.5	----	----	----	----
3.3`-Dichlorobenzidine	91-94-1	0.5	mg/kg		<0.5	----	----	----	----
EP075I: Organochlorine Pesticides									
alpha-BHC	319-84-6	0.5	mg/kg		<0.5	----	----	----	----
beta-BHC	319-85-7	0.5	mg/kg		<0.5	----	----	----	----
gamma-BHC	58-89-9	0.5	mg/kg		<0.5	----	----	----	----
delta-BHC	319-86-8	0.5	mg/kg		<0.5	----	----	----	----
Heptachlor	76-44-8	0.5	mg/kg		<0.5	----	----	----	----
Aldrin	309-00-2	0.5	mg/kg		<0.5	----	----	----	----
Heptachlor epoxide	1024-57-3	0.5	mg/kg		<0.5	----	----	----	----
alpha-Endosulfan	959-98-8	0.5	mg/kg		<0.5	----	----	----	----
4.4`-DDE	72-55-9	0.5	mg/kg		<0.5	----	----	----	----
Dieldrin	60-57-1	0.5	mg/kg		<0.5	----	----	----	----
Endrin	72-20-8	0.5	mg/kg		<0.5	----	----	----	----
beta-Endosulfan	33213-65-9	0.5	mg/kg		<0.5	----	----	----	----
4.4`-DDD	72-54-8	0.5	mg/kg		<0.5	----	----	----	----
Endosulfan sulfate	1031-07-8	0.5	mg/kg		<0.5	----	----	----	----
4.4`-DDT	50-29-3	1.0	mg/kg		<1.0	----	----	----	----
EP075J: Organophosphorus Pesticides									
Dichlorvos	62-73-7	0.5	mg/kg		<0.5	----	----	----	----
Dimethoate	60-51-5	0.5	mg/kg		<0.5	----	----	----	----
Diazinon	333-41-5	0.5	mg/kg		<0.5	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.5	mg/kg		<0.5	----	----	----	----
Malathion	121-75-5	0.5	mg/kg		<0.5	----	----	----	----
Fenthion	55-38-9	0.5	mg/kg		<0.5	----	----	----	----
Chlorpyrifos	2921-88-2	0.5	mg/kg		<0.5	----	----	----	----
Pirimphos-ethyl	23505-41-1	0.5	mg/kg		<0.5	----	----	----	----
Chlorfenvinphos	470-90-6	0.5	mg/kg		<0.5	----	----	----	----
Prothiofos	34643-46-4	0.5	mg/kg		<0.5	----	----	----	----
Ethion	563-12-2	0.5	mg/kg		<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB07_1.0	SB08_0.1	SB10_0.1	SB11_0.1	SB12_0.1
				Client sampling date / time	08-Nov-2018 00:00	08-Nov-2018 00:00	08-Nov-2018 00:00	08-Nov-2018 00:00	08-Nov-2018 00:00
Compound	CAS Number	LOR	Unit		ES1833933-024	ES1833933-027	ES1833933-031	ES1833933-033	ES1833933-035
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued									
C15 - C28 Fraction	----	100	mg/kg		<100	<100	**8630**	**1360**	**480**
C29 - C36 Fraction	----	100	mg/kg		<100	<100	**5210**	**980**	**510**
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	**13800**	**2340**	**990**
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	**240**	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	**12000**	**2010**	**770**
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	**2920**	**650**	**380**
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	**15200**	**2660**	**1150**
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	**240**	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP090: Organotin Compounds									
Tributyltin	56573-85-4	0.5	µgSn/kg		----	----	**10.9**	<0.5	**20.3**
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.5	%		**91.6**	----	----	----	----
Toluene-D8	2037-26-5	0.5	%		**100**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.5	%		**101**	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**89.3**	**88.2**	**76.1**	**82.4**	**79.9**
2-Chlorophenol-D4	93951-73-6	0.5	%		**83.1**	**83.9**	**71.0**	**81.0**	**78.2**
2.4.6-Tribromophenol	118-79-6	0.5	%		**86.0**	**55.3**	**55.9**	**67.8**	**63.2**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**81.0**	**83.6**	**83.5**	**86.4**	**79.6**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB07_1.0	SB08_0.1	SB10_0.1	SB11_0.1	SB12_0.1
				Client sampling date / time	08-Nov-2018 00:00	08-Nov-2018 00:00	08-Nov-2018 00:00	08-Nov-2018 00:00	08-Nov-2018 00:00
Compound	CAS Number	LOR	Unit		ES1833933-024	ES1833933-027	ES1833933-031	ES1833933-033	ES1833933-035
					Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates - Continued									
Anthracene-d10	1719-06-8	0.5	%		82.0	86.0	78.2	77.9	77.9
4-Terphenyl-d14	1718-51-0	0.5	%		85.4	81.7	87.6	79.7	73.0
EP075S: Acid Extractable Surrogates									
2-Fluorophenol	367-12-4	0.5	%		79.2	----	----	----	----
Phenol-d6	13127-88-3	0.5	%		79.4	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		84.6	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		55.4	----	----	----	----
EP075T: Base/Neutral Extractable Surrogates									
Nitrobenzene-D5	4165-60-0	0.5	%		82.7	----	----	----	----
1.2-Dichlorobenzene-D4	2199-69-1	0.5	%		82.2	----	----	----	----
2-Fluorobiphenyl	321-60-8	0.5	%		80.6	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%		81.8	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		95.6	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		101	111	109	105	98.1
Toluene-D8	2037-26-5	0.2	%		104	115	106	102	100.0
4-Bromofluorobenzene	460-00-4	0.2	%		97.4	105	97.9	92.1	89.0
EP090S: Organotin Surrogate									
Tripropyltin	----	0.5	%		----	----	5.33	2.55	3.73

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	SB13_0.1	SB14_0.1	QS01	QS03	Trip Spike
			Client sampling date / time	08-Nov-2018 00:00	08-Nov-2018 00:00	07-Nov-2018 00:00	08-Nov-2018 00:00	05-Nov-2018 00:00
Compound	CAS Number	LOR	Unit	ES1833933-037	ES1833933-039	ES1833933-041	ES1833933-042	ES1833933-043
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	29.9	21.8	10.2	20.6	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	10	9	<5	6	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	----
Chromium	7440-47-3	2	mg/kg	26	36	26	14	----
Copper	7440-50-8	5	mg/kg	389	4600	228	46	----
Lead	7439-92-1	5	mg/kg	108	127	255	225	----
Nickel	7440-02-0	2	mg/kg	15	19	25	6	----
Zinc	7440-66-6	5	mg/kg	320	2280	386	91	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	0.9	0.3	0.3	0.2	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	0.7	<0.5	<0.5	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Phenanthrene	85-01-8	0.5	mg/kg	1.6	7.1	<0.5	1.3	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	1.0	<0.5	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg	3.7	12.1	0.8	2.4	----
Pyrene	129-00-0	0.5	mg/kg	3.9	9.8	0.9	2.3	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	1.8	5.3	<0.5	1.0	----
Chrysene	218-01-9	0.5	mg/kg	1.8	5.2	<0.5	1.0	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	2.5	5.9	0.6	1.2	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	1.0	1.9	<0.5	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	2.2	3.7	0.6	1.2	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	1.0	1.5	<0.5	<0.5	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	1.1	1.6	<0.5	<0.5	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	20.6	55.8	2.9	10.4	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	2.8	5.2	0.7	1.4	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	3.1	5.5	1.0	1.7	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	3.4	5.7	1.3	2.0	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	29

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB13_0.1	SB14_0.1	QS01	QS03	Trip Spike
				Client sampling date / time	08-Nov-2018 00:00	08-Nov-2018 00:00	07-Nov-2018 00:00	08-Nov-2018 00:00	05-Nov-2018 00:00
Compound	CAS Number	LOR	Unit		ES1833933-037	ES1833933-039	ES1833933-041	ES1833933-042	ES1833933-043
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued									
C10 - C14 Fraction	----	50	mg/kg		<50	60	<50	<50	----
C15 - C28 Fraction	----	100	mg/kg		220	2590	<100	120	----
C29 - C36 Fraction	----	100	mg/kg		240	730	130	130	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		460	3380	130	250	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	38
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	21
>C10 - C16 Fraction	----	50	mg/kg		<50	70	<50	<50	----
>C16 - C34 Fraction	----	100	mg/kg		360	2980	170	190	----
>C34 - C40 Fraction	----	100	mg/kg		220	500	120	120	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		580	3550	290	310	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	70	<50	<50	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	0.3	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	7.4
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	1.2
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	6.0
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	2.4
^ Sum of BTEX	----	0.2	mg/kg		<0.2	0.3	<0.2	<0.2	17.0
^ Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	8.4
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP090: Organotin Compounds									
Tributyltin	56573-85-4	0.5	µgSn/kg		<0.5	15.9	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		81.1	79.5	81.8	81.4	----
2-Chlorophenol-D4	93951-73-6	0.5	%		79.2	76.3	79.5	78.7	----
2.4.6-Tribromophenol	118-79-6	0.5	%		60.0	54.2	60.4	58.0	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		81.7	77.9	79.8	78.8	----
Anthracene-d10	1719-06-8	0.5	%		80.9	76.2	81.1	79.8	----
4-Terphenyl-d14	1718-51-0	0.5	%		75.1	66.1	75.1	74.5	----
EP080S: TPH(V)/BTEX Surrogates									

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB13_0.1	SB14_0.1	QS01	QS03	Trip Spike
				Client sampling date / time	08-Nov-2018 00:00	08-Nov-2018 00:00	07-Nov-2018 00:00	08-Nov-2018 00:00	05-Nov-2018 00:00
Compound	CAS Number	LOR	Unit		ES1833933-037	ES1833933-039	ES1833933-041	ES1833933-042	ES1833933-043
					Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates - Continued									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**101**	**108**	**110**	**101**	**107**
Toluene-D8	2037-26-5	0.2	%		**98.0**	**105**	**111**	**105**	**106**
4-Bromofluorobenzene	460-00-4	0.2	%		**90.3**	**96.0**	**98.0**	**98.8**	**96.8**
EP090S: Organotin Surrogate									
Tripropyltin	----	0.5	%		**85.7**	**41.9**	**----**	**----**	**----**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	Trip blank	Trip Spike Control	SB09_0.1	----	----
			Client sampling date / time	05-Nov-2018 00:00	05-Nov-2018 00:00	07-Nov-2018 00:00	----	----
Compound	CAS Number	LOR	Unit	ES1833933-044	ES1833933-048	ES1833933-049	--------	--------
				Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	----	----	18.4	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	----	----	5	----	----
Cadmium	7440-43-9	1	mg/kg	----	----	<1	----	----
Chromium	7440-47-3	2	mg/kg	----	----	14	----	----
Copper	7440-50-8	5	mg/kg	----	----	52	----	----
Lead	7439-92-1	5	mg/kg	----	----	194	----	----
Nickel	7440-02-0	2	mg/kg	----	----	8	----	----
Zinc	7440-66-6	5	mg/kg	----	----	426	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	----	----	0.1	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	----	----	<0.5	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	----	----	0.9	----	----
Acenaphthene	83-32-9	0.5	mg/kg	----	----	<0.5	----	----
Fluorene	86-73-7	0.5	mg/kg	----	----	0.7	----	----
Phenanthrene	85-01-8	0.5	mg/kg	----	----	6.5	----	----
Anthracene	120-12-7	0.5	mg/kg	----	----	2.2	----	----
Fluoranthene	206-44-0	0.5	mg/kg	----	----	11.1	----	----
Pyrene	129-00-0	0.5	mg/kg	----	----	11.2	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	----	----	5.1	----	----
Chrysene	218-01-9	0.5	mg/kg	----	----	4.5	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	----	----	5.3	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	----	2.0	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	----	----	4.9	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	----	----	2.1	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	----	----	0.6	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	----	----	2.6	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	----	----	59.7	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	----	----	7.0	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	----	----	7.0	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	----	----	7.0	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	26	<10	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	Trip blank	Trip Spike Control	SB09_0.1	----	----
			Client sampling date / time	05-Nov-2018 00:00	05-Nov-2018 00:00	07-Nov-2018 00:00	----	----
Compound	CAS Number	LOR	Unit	ES1833933-044	ES1833933-048	ES1833933-049	--------	--------
				Result	Result	Result	----	----
EP080/071: Total Petroleum Hydrocarbons - Continued								
C10 - C14 Fraction	----	50	mg/kg	----	----	<50	----	----
C15 - C28 Fraction	----	100	mg/kg	----	----	**200**	----	----
C29 - C36 Fraction	----	100	mg/kg	----	----	**130**	----	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg	----	----	**330**	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	**33**	<10	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg	<10	**13**	<10	----	----
>C10 - C16 Fraction	----	50	mg/kg	----	----	<50	----	----
>C16 - C34 Fraction	----	100	mg/kg	----	----	**290**	----	----
>C34 - C40 Fraction	----	100	mg/kg	----	----	<100	----	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg	----	----	**290**	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg	----	----	<50	----	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	**9.0**	<0.5	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	**1.3**	<0.5	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	**6.9**	<0.5	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	**2.9**	<0.5	----	----
^ **Sum of BTEX**	----	0.2	mg/kg	<0.2	**20.1**	<0.2	----	----
^ **Total Xylenes**	----	0.5	mg/kg	<0.5	**9.8**	<0.5	----	----
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	----	----
EP090: Organotin Compounds								
Tributyltin	56573-85-4	0.5	µgSn/kg	----	----	<0.5	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	----	----	**75.7**	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	----	----	**82.8**	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%	----	----	**64.8**	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	----	----	**89.8**	----	----
Anthracene-d10	1719-06-8	0.5	%	----	----	**86.6**	----	----
4-Terphenyl-d14	1718-51-0	0.5	%	----	----	**84.0**	----	----
EP080S: TPH(V)/BTEX Surrogates								

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	Trip blank	Trip Spike Control	SB09_0.1	----	----
				Client sampling date / time	05-Nov-2018 00:00	05-Nov-2018 00:00	07-Nov-2018 00:00	----	----
Compound	CAS Number	LOR	Unit		ES1833933-044	ES1833933-048	ES1833933-049	--------	--------
					Result	Result	Result	----	----
EP080S: TPH(V)/BTEX Surrogates - Continued									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**104**	**96.1**	**82.4**	**----**	**----**
Toluene-D8	2037-26-5	0.2	%		**108**	**101**	**89.1**	**----**	**----**
4-Bromofluorobenzene	460-00-4	0.2	%		**105**	**97.8**	**89.4**	**----**	**----**
EP090S: Organotin Surrogate									
Tripropyltin	----	0.5	%		**----**	**----**	**21.3**	**----**	**----**

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP074S: VOC Surrogates			
1.2-Dichloroethane-D4	17060-07-0	64	130
Toluene-D8	2037-26-5	66	136
4-Bromofluorobenzene	460-00-4	60	122
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP075S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	29	149
Phenol-d6	13127-88-3	32	128
2-Chlorophenol-D4	93951-73-6	32	128
2.4.6-Tribromophenol	118-79-6	13	121
EP075T: Base/Neutral Extractable Surrogates			
Nitrobenzene-D5	4165-60-0	33	125
1.2-Dichlorobenzene-D4	2199-69-1	34	108
2-Fluorobiphenyl	321-60-8	35	121
Anthracene-d10	1719-06-8	35	123
4-Terphenyl-d14	1718-51-0	33	125
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130
EP090S: Organotin Surrogate			
Tripropyltin	----	35	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES1833933**	Page	: 1 of 10
Client	: **CAVVANBA CONSULTING**	Laboratory	: Environmental Division Sydney
Contact	: MR BEN WACKETT	Telephone	: +61 2 8784 8555
Project	: 18058	Date Samples Received	: 13-Nov-2018
Site	: ----	Issue Date	: 23-Nov-2018
Sampler	: GLEN CHISNALL	No. of samples received	: 49
Order number	: 18058	No. of samples analysed	: 23

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **Surrogate recovery outliers exist for all regular sample matrices - please see following pages for full details.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Regular Sample Surrogates

Sub-Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP090S: Organotin Surrogate	ES1833933-031	SB10_0.1	**Tripropyltin**	----	5.33 %	35-130 %	**Recovery less than lower data quality objective**
EP090S: Organotin Surrogate	ES1833933-033	SB11_0.1	**Tripropyltin**	----	2.55 %	35-130 %	**Recovery less than lower data quality objective**
EP090S: Organotin Surrogate	ES1833933-035	SB12_0.1	**Tripropyltin**	----	3.73 %	35-130 %	**Recovery less than lower data quality objective**
EP090S: Organotin Surrogate	ES1833933-049	SB09_0.1	**Tripropyltin**	----	21.3 %	35-130 %	**Recovery less than lower data quality objective**

Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EP074A: Monocyclic Aromatic Hydrocarbons						
Soil Glass Jar - Unpreserved						
SB07_1.0	16-Nov-2018	15-Nov-2018	**1**	16-Nov-2018	15-Nov-2018	**1**
EP074B: Oxygenated Compounds						
Soil Glass Jar - Unpreserved						
SB07_1.0	16-Nov-2018	15-Nov-2018	**1**	16-Nov-2018	15-Nov-2018	**1**
EP074C: Sulfonated Compounds						
Soil Glass Jar - Unpreserved						
SB07_1.0	16-Nov-2018	15-Nov-2018	**1**	16-Nov-2018	15-Nov-2018	**1**
EP074D: Fumigants						
Soil Glass Jar - Unpreserved						
SB07_1.0	16-Nov-2018	15-Nov-2018	**1**	16-Nov-2018	15-Nov-2018	**1**
EP074E: Halogenated Aliphatic Compounds						
Soil Glass Jar - Unpreserved						
SB07_1.0	16-Nov-2018	15-Nov-2018	**1**	16-Nov-2018	15-Nov-2018	**1**
EP074F: Halogenated Aromatic Compounds						
Soil Glass Jar - Unpreserved						
SB07_1.0	16-Nov-2018	15-Nov-2018	**1**	16-Nov-2018	15-Nov-2018	**1**
EP074G: Trihalomethanes						
Soil Glass Jar - Unpreserved						
SB07_1.0	16-Nov-2018	15-Nov-2018	**1**	16-Nov-2018	15-Nov-2018	**1**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)								
Soil Glass Jar - Unpreserved (EA055)								
MW01_0.1,	MW02_0.1,	**07-Nov-2018**	**----**	----	----	**16-Nov-2018**	21-Nov-2018	✓
MW03_0.1,	SB01_0.1,							
SB02_0.1,	SB02_1.0,							
SB03_0.1,	SB04_0.1,							
SB05_0.1,	SB06_0.1,							
QS01,	SB09_0.1							
Soil Glass Jar - Unpreserved (EA055)								
SB07_1.0,	SB08_0.1,	**08-Nov-2018**	**----**	----	----	**16-Nov-2018**	22-Nov-2018	✓
SB10_0.1,	SB11_0.1,							
SB12_0.1,	SB13_0.1,							
SB14_0.1,	QS03							
EG005T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved (EG005T)								
MW01_0.1,	MW02_0.1,	**07-Nov-2018**	**17-Nov-2018**	06-May-2019	✓	**19-Nov-2018**	06-May-2019	✓
MW03_0.1,	SB01_0.1,							
SB02_0.1,	SB02_1.0,							
SB03_0.1,	SB04_0.1,							
SB05_0.1,	SB06_0.1,							
QS01,	SB09_0.1							
Soil Glass Jar - Unpreserved (EG005T)								
SB07_1.0,	SB08_0.1,	**08-Nov-2018**	**17-Nov-2018**	07-May-2019	✓	**19-Nov-2018**	07-May-2019	✓
SB10_0.1,	SB11_0.1,							
SB12_0.1,	SB13_0.1,							
SB14_0.1,	QS03							

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T)							
MW01_0.1, MW02_0.1, MW03_0.1, SB01_0.1, SB02_0.1, SB02_1.0, SB03_0.1, SB04_0.1, SB05_0.1, SB06_0.1, QS01, SB09_0.1	**07-Nov-2018**	**17-Nov-2018**	05-Dec-2018	✓	**19-Nov-2018**	05-Dec-2018	✓
Soil Glass Jar - Unpreserved (EG035T)							
SB07_1.0, SB08_0.1, SB10_0.1, SB11_0.1, SB12_0.1, SB13_0.1, SB14_0.1, QS03	**08-Nov-2018**	**17-Nov-2018**	06-Dec-2018	✓	**19-Nov-2018**	06-Dec-2018	✓
EP074A: Monocyclic Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP074)							
SB07_1.0	**08-Nov-2018**	**16-Nov-2018**	15-Nov-2018	×	**16-Nov-2018**	15-Nov-2018	×
EP074B: Oxygenated Compounds							
Soil Glass Jar - Unpreserved (EP074)							
SB07_1.0	**08-Nov-2018**	**16-Nov-2018**	15-Nov-2018	×	**16-Nov-2018**	15-Nov-2018	×
EP074C: Sulfonated Compounds							
Soil Glass Jar - Unpreserved (EP074)							
SB07_1.0	**08-Nov-2018**	**16-Nov-2018**	15-Nov-2018	×	**16-Nov-2018**	15-Nov-2018	×
EP074D: Fumigants							
Soil Glass Jar - Unpreserved (EP074)							
SB07_1.0	**08-Nov-2018**	**16-Nov-2018**	15-Nov-2018	×	**16-Nov-2018**	15-Nov-2018	×
EP074E: Halogenated Aliphatic Compounds							
Soil Glass Jar - Unpreserved (EP074)							
SB07_1.0	**08-Nov-2018**	**16-Nov-2018**	15-Nov-2018	×	**16-Nov-2018**	15-Nov-2018	×
EP074F: Halogenated Aromatic Compounds							
Soil Glass Jar - Unpreserved (EP074)							
SB07_1.0	**08-Nov-2018**	**16-Nov-2018**	15-Nov-2018	×	**16-Nov-2018**	15-Nov-2018	×
EP074G: Trihalomethanes							
Soil Glass Jar - Unpreserved (EP074)							
SB07_1.0	**08-Nov-2018**	**16-Nov-2018**	15-Nov-2018	×	**16-Nov-2018**	15-Nov-2018	×
EP075(SIM)A: Phenolic Compounds							
Soil Glass Jar - Unpreserved (EP075(SIM))							
SB10_0.1	**08-Nov-2018**	**16-Nov-2018**	22-Nov-2018	✓	**19-Nov-2018**	26-Dec-2018	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))							
SB09_0.1	**07-Nov-2018**	**16-Nov-2018**	21-Nov-2018	✓	**16-Nov-2018**	26-Dec-2018	✓
Soil Glass Jar - Unpreserved (EP075(SIM))							
MW01_0.1, MW02_0.1, MW03_0.1, SB01_0.1, SB02_0.1, SB02_1.0, SB03_0.1, SB04_0.1, SB05_0.1, SB06_0.1, QS01	**07-Nov-2018**	**16-Nov-2018**	21-Nov-2018	✓	**19-Nov-2018**	26-Dec-2018	✓
Soil Glass Jar - Unpreserved (EP075(SIM))							
SB07_1.0, SB08_0.1, SB10_0.1, SB11_0.1, SB12_0.1, SB13_0.1, SB14_0.1, QS03	**08-Nov-2018**	**16-Nov-2018**	22-Nov-2018	✓	**19-Nov-2018**	26-Dec-2018	✓
EP075A: Phenolic Compounds							
Soil Glass Jar - Unpreserved (EP075)							
SB07_1.0	**08-Nov-2018**	**16-Nov-2018**	22-Nov-2018	✓	**19-Nov-2018**	26-Dec-2018	✓
EP075B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075)							
SB07_1.0	**08-Nov-2018**	**16-Nov-2018**	22-Nov-2018	✓	**19-Nov-2018**	26-Dec-2018	✓
EP075C: Phthalate Esters							
Soil Glass Jar - Unpreserved (EP075)							
SB07_1.0	**08-Nov-2018**	**16-Nov-2018**	22-Nov-2018	✓	**19-Nov-2018**	26-Dec-2018	✓
EP075D: Nitrosamines							
Soil Glass Jar - Unpreserved (EP075)							
SB07_1.0	**08-Nov-2018**	**16-Nov-2018**	22-Nov-2018	✓	**19-Nov-2018**	26-Dec-2018	✓
EP075E: Nitroaromatics and Ketones							
Soil Glass Jar - Unpreserved (EP075)							
SB07_1.0	**08-Nov-2018**	**16-Nov-2018**	22-Nov-2018	✓	**19-Nov-2018**	26-Dec-2018	✓
EP075F: Haloethers							
Soil Glass Jar - Unpreserved (EP075)							
SB07_1.0	**08-Nov-2018**	**16-Nov-2018**	22-Nov-2018	✓	**19-Nov-2018**	26-Dec-2018	✓
EP075G: Chlorinated Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075)							
SB07_1.0	**08-Nov-2018**	**16-Nov-2018**	22-Nov-2018	✓	**19-Nov-2018**	26-Dec-2018	✓
EP075H: Anilines and Benzidines							
Soil Glass Jar - Unpreserved (EP075)							
SB07_1.0	**08-Nov-2018**	**16-Nov-2018**	22-Nov-2018	✓	**19-Nov-2018**	26-Dec-2018	✓
EP075I: Organochlorine Pesticides							
Soil Glass Jar - Unpreserved (EP075)							
SB07_1.0	**08-Nov-2018**	**16-Nov-2018**	22-Nov-2018	✓	**19-Nov-2018**	26-Dec-2018	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP075J: Organophosphorus Pesticides								
Soil Glass Jar - Unpreserved (EP075)								
SB07_1.0		**08-Nov-2018**	**16-Nov-2018**	22-Nov-2018	✓	**19-Nov-2018**	26-Dec-2018	✓
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved (EP080)								
Trip blank,	Trip Spike Control	**05-Nov-2018**	**15-Nov-2018**	19-Nov-2018	✓	**19-Nov-2018**	19-Nov-2018	✓
Soil Glass Jar - Unpreserved (EP080)								
Trip Spike		**05-Nov-2018**	**16-Nov-2018**	19-Nov-2018	✓	**19-Nov-2018**	19-Nov-2018	✓
Soil Glass Jar - Unpreserved (EP071)								
SB09_0.1		**07-Nov-2018**	**16-Nov-2018**	21-Nov-2018	✓	**16-Nov-2018**	26-Dec-2018	✓
Soil Glass Jar - Unpreserved (EP080)								
MW01_0.1,	MW02_0.1,	**07-Nov-2018**	**16-Nov-2018**	21-Nov-2018	✓	**19-Nov-2018**	21-Nov-2018	✓
MW03_0.1,	SB01_0.1,							
SB02_0.1,	SB02_1.0,							
SB03_0.1,	SB04_0.1,							
SB05_0.1,	SB06_0.1,							
QS01,	SB09_0.1							
Soil Glass Jar - Unpreserved (EP080)								
SB07_1.0,	SB08_0.1,	**08-Nov-2018**	**16-Nov-2018**	22-Nov-2018	✓	**19-Nov-2018**	22-Nov-2018	✓
SB10_0.1,	SB11_0.1,							
SB12_0.1,	SB13_0.1,							
SB14_0.1,	QS03							
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Soil Glass Jar - Unpreserved (EP080)								
Trip blank,	Trip Spike Control	**05-Nov-2018**	**15-Nov-2018**	19-Nov-2018	✓	**19-Nov-2018**	19-Nov-2018	✓
Soil Glass Jar - Unpreserved (EP080)								
Trip Spike		**05-Nov-2018**	**16-Nov-2018**	19-Nov-2018	✓	**19-Nov-2018**	19-Nov-2018	✓
Soil Glass Jar - Unpreserved (EP071)								
SB09_0.1		**07-Nov-2018**	**16-Nov-2018**	21-Nov-2018	✓	**16-Nov-2018**	26-Dec-2018	✓
Soil Glass Jar - Unpreserved (EP080)								
MW01_0.1,	MW02_0.1,	**07-Nov-2018**	**16-Nov-2018**	21-Nov-2018	✓	**19-Nov-2018**	21-Nov-2018	✓
MW03_0.1,	SB01_0.1,							
SB02_0.1,	SB02_1.0,							
SB03_0.1,	SB04_0.1,							
SB05_0.1,	SB06_0.1,							
QS01,	SB09_0.1							
Soil Glass Jar - Unpreserved (EP080)								
SB07_1.0,	SB08_0.1,	**08-Nov-2018**	**16-Nov-2018**	22-Nov-2018	✓	**19-Nov-2018**	22-Nov-2018	✓
SB10_0.1,	SB11_0.1,							
SB12_0.1,	SB13_0.1,							
SB14_0.1,	QS03							

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080: BTEXN								
Soil Glass Jar - Unpreserved (EP080)								
Trip blank,	Trip Spike Control	**05-Nov-2018**	**15-Nov-2018**	19-Nov-2018	✓	**19-Nov-2018**	19-Nov-2018	✓
Soil Glass Jar - Unpreserved (EP080)								
Trip Spike		**05-Nov-2018**	**16-Nov-2018**	19-Nov-2018	✓	**19-Nov-2018**	19-Nov-2018	✓
Soil Glass Jar - Unpreserved (EP080)								
MW01_0.1,	MW02_0.1,	**07-Nov-2018**	**16-Nov-2018**	21-Nov-2018	✓	**19-Nov-2018**	21-Nov-2018	✓
MW03_0.1,	SB01_0.1,							
SB02_0.1,	SB02_1.0,							
SB03_0.1,	SB04_0.1,							
SB05_0.1,	SB06_0.1,							
QS01,	SB09_0.1							
Soil Glass Jar - Unpreserved (EP080)								
SB07_1.0,	SB08_0.1,	**08-Nov-2018**	**16-Nov-2018**	22-Nov-2018	✓	**19-Nov-2018**	22-Nov-2018	✓
SB10_0.1,	SB11_0.1,							
SB12_0.1,	SB13_0.1,							
SB14_0.1,	QS03							
EP090: Organotin Compounds								
Soil Glass Jar - Unpreserved (EP090)								
MW03_0.1,	SB02_0.1,	**07-Nov-2018**	**20-Nov-2018**	21-Nov-2018	✓	**21-Nov-2018**	30-Dec-2018	✓
SB02_1.0,	SB09_0.1							
Soil Glass Jar - Unpreserved (EP090)								
SB10_0.1,	SB11_0.1,	**08-Nov-2018**	**20-Nov-2018**	22-Nov-2018	✓	**21-Nov-2018**	30-Dec-2018	✓
SB12_0.1,	SB13_0.1,							
SB14_0.1								

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Organotin Analysis	EP090	1	9	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	4	30	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds	EP075	1	1	**100.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	4	30	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	6	59	**10.17**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Organotin Analysis	EP090	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds	EP075	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	3	59	**5.08**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Organotin Analysis	EP090	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds	EP075	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	3	59	**5.08**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Organotin Analysis	EP090	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Organic Compounds	EP075	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	3	59	**5.08**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM amended 2013.
Volatile Organic Compounds	EP074	SOIL	In house: Referenced to USEPA SW 846 - 8260B Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)
Semivolatile Organic Compounds	EP075	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (2013) Schedule B(3) (Method 502)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260B. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM amended 2013.
Organotin Analysis	EP090	SOIL	In house: Referenced to USEPA SW 846 - 8270D Prepared sample extracts are analysed by GC/MS coupled with high volume injection, and quanitified against an established calibration curve.

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.

Preparation Methods	Method	Matrix	Method Descriptions
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
Organotin Sample Preparation	ORG35	SOIL	In house: 20g sample is spiked with surrogate and leached in a methanol:acetic acid:UHP water mix and vacuum filtered. Reagents and solvents are added to the sample and the mixture tumbled. The butyltin compounds are simultaneously derivatised and extracted. The extract is further extracted with petroleum ether. The resultant extracts are combined and concentrated for analysis.

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES1833933**	Page	: 1 of 26
Client	: **CAVVANBA CONSULTING**	Laboratory	: Environmental Division Sydney
Contact	: MR BEN WACKETT	Contact	: Brenda Hong
Address	: PO BOX 2191 BYRON BAY NSW 2481	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 6685 7811	Telephone	: +61 2 8784 8555
Project	: 18058	Date Samples Received	: 13-Nov-2018
Order number	: 18058	Date Analysis Commenced	: 15-Nov-2018
C-O-C number	: ----	Issue Date	: 23-Nov-2018
Sampler	: GLEN CHISNALL		
Site	: ----		
Quote number	: SYBQ/409/18		
No. of samples received	: 49		
No. of samples analysed	: 23		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Alex Rossi	Organic Chemist	Sydney Inorganics, Smithfield, NSW
Diana Mesa	2IC Organic Chemist	Brisbane Organics, Stafford, QLD
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 2040544)									
ES1833873-003	Anonymous	EA055: Moisture Content	----	0.1	%	32.1	32.7	1.92	0% - 20%
ES1833882-009	Anonymous	EA055: Moisture Content	----	0.1	%	24.1	26.2	8.45	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 2040545)									
ES1833933-015	SB03_0.1	EA055: Moisture Content	----	0.1	%	8.8	7.8	12.4	No Limit
ES1833933-041	QS01	EA055: Moisture Content	----	0.1	%	10.2	10.4	2.14	0% - 50%
EG005T: Total Metals by ICP-AES (QC Lot: 2042717)									
ES1833933-001	MW01_0.1	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	14	11	26.4	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	4	4	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	50	36	31.1	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	93	82	13.4	0% - 50%
		EG005T: Zinc	7440-66-6	5	mg/kg	158	138	13.6	0% - 20%
ES1833933-024	SB07_1.0	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	16	17	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	8	8	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	5	5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	30	25	20.8	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	132	142	7.17	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	89	64	32.8	0% - 50%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2042718)									
ES1833933-001	MW01_0.1	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES1833933-024	SB07_1.0	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 2040494)									

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 2040494) - continued									
ES1834217-001	Anonymous	EP074: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES1834223-001	Anonymous	EP074: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074B: Oxygenated Compounds (QC Lot: 2040494)									
ES1834217-001	Anonymous	EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.00	No Limit
ES1834223-001	Anonymous	EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.00	No Limit
EP074C: Sulfonated Compounds (QC Lot: 2040494)									
ES1834217-001	Anonymous	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES1834223-001	Anonymous	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074D: Fumigants (QC Lot: 2040494)									
ES1834217-001	Anonymous	EP074: 2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES1834223-001	Anonymous	EP074: 2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP074D: Fumigants (QC Lot: 2040494) - continued									
ES1834223-001	Anonymous	EP074: cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074E: Halogenated Aliphatic Compounds (QC Lot: 2040494)									
ES1834217-001	Anonymous	EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.00	No Limit
ES1834223-001	Anonymous	EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP074E: Halogenated Aliphatic Compounds (QC Lot: 2040494) - continued									
ES1834223-001	Anonymous	EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.00	No Limit
EP074F: Halogenated Aromatic Compounds (QC Lot: 2040494)									
ES1834217-001	Anonymous	EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES1834223-001	Anonymous	EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074G: Trihalomethanes (QC Lot: 2040494)									
ES1834217-001	Anonymous	EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES1834223-001	Anonymous	EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM)A: Phenolic Compounds (QC Lot: 2036467)									
ES1833933-001	MW01_0.1	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)A: Phenolic Compounds (QC Lot: 2036467) - continued									
ES1833933-001	MW01_0.1	EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.00	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.00	No Limit
ES1833933-024	SB07_1.0	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.00	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.00	No Limit
EP075(SIM)A: Phenolic Compounds (QC Lot: 2039481)									
ES1834135-010	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.00	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.00	No Limit
ES1834135-001	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)A: Phenolic Compounds (QC Lot: 2039481) - continued									
ES1834135-001	Anonymous	EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.00	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2036467)									
ES1833933-001	MW01_0.1	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	0.5	0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	0.5	0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES1833933-024	SB07_1.0	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	2.7	2.6	4.18	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	0.7	0.6	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	5.2	5.0	5.60	0% - 50%
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	5.1	4.9	5.00	0% - 50%
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	2.3	2.0	13.5	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	2.2	2.0	11.7	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2036467) - continued									
ES1833933-024	SB07_1.0	EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	2.6	2.5	4.98	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	1.1	1.0	14.9	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	2.1	2.1	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	1.2	1.1	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	1.5	1.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	26.7	25.3	5.38	0% - 20%
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	2.8	2.8	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2039481)									
ES1834135-010	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES1834135-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2039481) - continued									
ES1834135-001	Anonymous	EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075A: Phenolic Compounds (QC Lot: 2038959)									
ES1833933-024	SB07_1.0	EP075: Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 3- & 4-Methylphenol	1319-77-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Pentachlorophenol	87-86-5	1	mg/kg	<1	<1	0.00	No Limit
EP075B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2038959)									
ES1833933-024	SB07_1.0	EP075: Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 2-Methylnaphthalene	91-57-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 2-Chloronaphthalene	91-58-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Phenanthrene	85-01-8	0.5	mg/kg	2.5	2.0	22.5	No Limit
		EP075: Anthracene	120-12-7	0.5	mg/kg	0.5	<0.5	0.00	No Limit
		EP075: Fluoranthene	206-44-0	0.5	mg/kg	4.5	3.6	22.5	No Limit
		EP075: Pyrene	129-00-0	0.5	mg/kg	5.0	3.6	31.5	0% - 50%
		EP075: N-2-Fluorenyl Acetamide	53-96-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Benz(a)anthracene	56-55-3	0.5	mg/kg	2.3	1.6	35.3	No Limit
		EP075: Chrysene	218-01-9	0.5	mg/kg	2.2	1.6	31.2	No Limit
		EP075: 7.12-Dimethylbenz(a)anthracene	57-97-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Benzo(a)pyrene	50-32-8	0.5	mg/kg	2.5	1.8	35.8	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2038959) - continued									
ES1833933-024	SB07_1.0	EP075: 3-Methylcholanthrene	56-49-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	1.1	0.8	31.7	No Limit
		EP075: Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	1.4	1.0	35.9	No Limit
		EP075: Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	1	mg/kg	3	2	36.5	No Limit
EP075C: Phthalate Esters (QC Lot: 2038959)									
ES1833933-024	SB07_1.0	EP075: Dimethyl phthalate	131-11-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Diethyl phthalate	84-66-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Di-n-butyl phthalate	84-74-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Butyl benzyl phthalate	85-68-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Di-n-octylphthalate	117-84-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075D: Nitrosamines (QC Lot: 2038959)									
ES1833933-024	SB07_1.0	EP075: N-Nitrosomethylethylamine	10595-95-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: N-Nitrosodiethylamine	55-18-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: N-Nitrosopyrrolidine	930-55-2	0.5	mg/kg	<1.0	<1.0	0.00	No Limit
		EP075: N-Nitrosomorpholine	59-89-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: N-Nitrosodi-n-propylamine	621-64-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: N-Nitrosopiperidine	100-75-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: N-Nitrosodibutylamine	924-16-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: N-Nitrosodiphenyl & Diphenylamine	86-30-6 122-39-4	0.5	mg/kg	<1.0	<1.0	0.00	No Limit
		EP075: Methapyrilene	91-80-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075E: Nitroaromatics and Ketones (QC Lot: 2038959)									
ES1833933-024	SB07_1.0	EP075: 2-Picoline	109-06-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Acetophenone	98-86-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Nitrobenzene	98-95-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Isophorone	78-59-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 2.6-Dinitrotoluene	606-20-2	0.5	mg/kg	<1.0	<1.0	0.00	No Limit
		EP075: 2.4-Dinitrotoluene	121-14-2	0.5	mg/kg	<1.0	<1.0	0.00	No Limit
		EP075: 1-Naphthylamine	134-32-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 4-Nitroquinoline-N-oxide	56-57-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 5-Nitro-o-toluidine	99-55-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 1.3.5-Trinitrobenzene	99-35-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Phenacetin	62-44-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 4-Aminobiphenyl	92-67-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Pentachloronitrobenzene	82-68-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Pronamide	23950-58-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Dimethylaminoazobenzene	60-11-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Chlorobenzilate	510-15-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075E: Nitroaromatics and Ketones (QC Lot: 2038959) - continued									
ES1833933-024	SB07_1.0	EP075: Azobenzene	103-33-3	1	mg/kg	<1	<1	0.00	No Limit
EP075F: Haloethers (QC Lot: 2038959)									
ES1833933-024	SB07_1.0	EP075: Bis(2-chloroethyl) ether	111-44-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Bis(2-chloroethoxy) methane	111-91-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 4-Chlorophenyl phenyl ether	7005-72-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 4-Bromophenyl phenyl ether	101-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075G: Chlorinated Hydrocarbons (QC Lot: 2038959)									
ES1833933-024	SB07_1.0	EP075: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Hexachloroethane	67-72-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Hexachloropropylene	1888-71-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Pentachlorobenzene	608-93-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Hexachlorobenzene (HCB)	118-74-1	0.5	mg/kg	<1.0	<1.0	0.00	No Limit
		EP075: Hexachlorocyclopentadiene	77-47-4	2.5	mg/kg	<2.5	<2.5	0.00	No Limit
EP075H: Anilines and Benzidines (QC Lot: 2038959)									
ES1833933-024	SB07_1.0	EP075: Aniline	62-53-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 4-Chloroaniline	106-47-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 2-Nitroaniline	88-74-4	0.5	mg/kg	<1.0	<1.0	0.00	No Limit
		EP075: 3-Nitroaniline	99-09-2	0.5	mg/kg	<1.0	<1.0	0.00	No Limit
		EP075: Dibenzofuran	132-64-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 4-Nitroaniline	100-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Carbazole	86-74-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 3.3`-Dichlorobenzidine	91-94-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075I: Organochlorine Pesticides (QC Lot: 2038959)									
ES1833933-024	SB07_1.0	EP075: alpha-BHC	319-84-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: beta-BHC	319-85-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: gamma-BHC	58-89-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: delta-BHC	319-86-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Heptachlor	76-44-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Aldrin	309-00-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Heptachlor epoxide	1024-57-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: alpha-Endosulfan	959-98-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 4.4`-DDE	72-55-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Dieldrin	60-57-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Endrin	72-20-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: beta-Endosulfan	33213-65-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075I: Organochlorine Pesticides (QC Lot: 2038959) - continued									
ES1833933-024	SB07_1.0	EP075: 4.4`-DDD	72-54-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Endosulfan sulfate	1031-07-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: 4.4`-DDT	50-29-3	0.5	mg/kg	<1.0	<1.0	0.00	No Limit
EP075J: Organophosphorus Pesticides (QC Lot: 2038959)									
ES1833933-024	SB07_1.0	EP075: Dichlorvos	62-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Dimethoate	60-51-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Diazinon	333-41-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Chlorpyrifos-methyl	5598-13-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Malathion	121-75-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Fenthion	55-38-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Chlorpyrifos	2921-88-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Pirimphos-ethyl	23505-41-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Chlorfenvinphos	470-90-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Prothiofos	34643-46-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075: Ethion	563-12-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2036468)									
ES1833933-001	MW01_0.1	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	120	130	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES1833933-024	SB07_1.0	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2037893)									
ES1833933-001	MW01_0.1	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
ES1833933-024	SB07_1.0	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2037897)									
ES1834083-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EW1804741-002	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2039484)									
ES1834135-010	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES1834135-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2040514)									
ES1834061-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
ES1834229-002	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2036468)									

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2036468) - continued									
ES1833933-001	MW01_0.1	EP071: >C16 - C34 Fraction	----	100	mg/kg	160	150	9.57	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES1833933-024	SB07_1.0	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2037893)									
ES1833933-001	MW01_0.1	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
ES1833933-024	SB07_1.0	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2037897)									
ES1834083-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EW1804741-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2039484)									
ES1834135-010	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES1834135-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2040514)									
ES1834061-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
ES1834229-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080: BTEXN (QC Lot: 2037893)									
ES1833933-001	MW01_0.1	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
ES1833933-024	SB07_1.0	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
EP080: BTEXN (QC Lot: 2037897)									
ES1834083-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080: BTEXN (QC Lot: 2037897) - continued									
ES1834083-001	Anonymous	EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
EW1804741-002	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
EP080: BTEXN (QC Lot: 2040514)									
ES1834061-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
ES1834229-002	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	0.3	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	1	0.00	No Limit
EP090: Organotin Compounds (QC Lot: 2047100)									
ES1833933-008	MW03_0.1	EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	8.8	8.3	5.73	0% - 50%

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 2042717)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	94.8	86	126
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	87.7	83	113
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	83.2	76	128
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	86.0	86	120
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	87.9	80	114
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	90.6	87	123
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	87.2	80	122
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2042718)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	82.6	70	105
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 2040494)								
EP074: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	91.5	65	131
EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	1 mg/kg	85.6	67	113
EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	1 mg/kg	89.2	65	117
EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	1 mg/kg	84.3	66	122
EP074: 1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	1 mg/kg	84.8	68	118
EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	1 mg/kg	85.7	69	119
EP074: 1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	1 mg/kg	85.4	69	117
EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	1 mg/kg	83.8	69	115
EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	1 mg/kg	85.0	66	118
EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	1 mg/kg	85.2	59	125
EP074B: Oxygenated Compounds (QCLot: 2040494)								
EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	10 mg/kg	81.4	30	156
EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	10 mg/kg	102	58	136
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	10 mg/kg	89.8	62	132
EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	10 mg/kg	90.8	54	136
EP074C: Sulfonated Compounds (QCLot: 2040494)								
EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	1 mg/kg	73.8	54	126
EP074D: Fumigants (QCLot: 2040494)								
EP074: 2.2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	1 mg/kg	87.6	60	126
EP074: 1.2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	1 mg/kg	91.1	68	124
EP074: cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	1 mg/kg	84.2	51	119
EP074: trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	1 mg/kg	83.3	52	114
EP074: 1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	1 mg/kg	90.6	63	115
EP074E: Halogenated Aliphatic Compounds (QCLot: 2040494)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP074E: Halogenated Aliphatic Compounds (QCLot: 2040494) - continued								
EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	10 mg/kg	92.8	30	148
EP074: Chloromethane	74-87-3	5	mg/kg	<5	10 mg/kg	94.2	41	141
EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	10 mg/kg	98.0	43	147
EP074: Bromomethane	74-83-9	5	mg/kg	<5	10 mg/kg	93.8	47	141
EP074: Chloroethane	75-00-3	5	mg/kg	<5	10 mg/kg	92.9	49	143
EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	10 mg/kg	96.1	49	135
EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	1 mg/kg	86.1	54	126
EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	1 mg/kg	72.9	43	129
EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	1 mg/kg	81.9	64	120
EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	1 mg/kg	89.0	67	125
EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	1 mg/kg	90.8	69	121
EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	1 mg/kg	86.8	65	117
EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	1 mg/kg	89.5	65	123
EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	1 mg/kg	84.2	59	125
EP074: 1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	1 mg/kg	85.2	65	125
EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	1 mg/kg	89.4	70	118
EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	1 mg/kg	87.0	68	118
EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	1 mg/kg	92.1	64	126
EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	1 mg/kg	92.5	68	122
EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	1 mg/kg	94.5	67	143
EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	1 mg/kg	83.1	62	122
EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	1 mg/kg	68.5	54	128
EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	1 mg/kg	84.0	55	129
EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	1 mg/kg	88.4	65	121
EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	1 mg/kg	85.0	61	125
EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	1 mg/kg	75.2	20	134
EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	1 mg/kg	67.1	53	129
EP074F: Halogenated Aromatic Compounds (QCLot: 2040494)								
EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	1 mg/kg	91.2	68	116
EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	1 mg/kg	88.2	70	114
EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	1 mg/kg	83.7	68	122
EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	1 mg/kg	83.8	67	123
EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	1 mg/kg	84.3	52	122
EP074G: Trihalomethanes (QCLot: 2040494)								
EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	1 mg/kg	89.5	66	124
EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	1 mg/kg	80.1	61	121
EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	1 mg/kg	79.1	63	121
EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	1 mg/kg	74.9	60	126

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)A: Phenolic Compounds (QCLot: 2036467)								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	6 mg/kg	97.6	71	125
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	6 mg/kg	91.2	72	124
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	6 mg/kg	92.5	71	123
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	12 mg/kg	93.4	67	127
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	6 mg/kg	61.7	54	114
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	6 mg/kg	89.1	68	126
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	6 mg/kg	84.4	66	120
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	6 mg/kg	86.5	70	120
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	6 mg/kg	87.0	70	116
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	6 mg/kg	80.6	54	114
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	6 mg/kg	82.1	60	114
EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	12 mg/kg	20.4	10	57
EP075(SIM)A: Phenolic Compounds (QCLot: 2039481)								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	6 mg/kg	97.3	71	125
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	6 mg/kg	109	72	124
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	6 mg/kg	101	71	123
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	12 mg/kg	107	67	127
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	6 mg/kg	88.2	54	114
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	6 mg/kg	108	68	126
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	6 mg/kg	108	66	120
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	6 mg/kg	113	70	120
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	6 mg/kg	103	70	116
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	6 mg/kg	97.8	54	114
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	6 mg/kg	97.2	60	114
EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	12 mg/kg	38.1	10	57
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2036467)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	93.8	77	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	103	72	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	87.7	73	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	97.0	72	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	93.8	75	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	83.2	77	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	98.7	73	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	97.7	74	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	91.7	69	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	86.7	75	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	89.9	68	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	84.0	74	126

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2036467) - continued								
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	90.5	70	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	75.4	61	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	76.5	62	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	74.8	63	121
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2039481)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	115	77	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	112	72	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	105	73	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	112	72	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	113	75	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	99.7	77	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	116	73	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	117	74	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	98.1	69	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	107	75	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	96.8	68	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	103	74	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	95.3	70	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	87.3	61	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	88.8	62	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	84.5	63	121
EP075A: Phenolic Compounds (QCLot: 2038959)								
EP075: Phenol	108-95-2	0.5	mg/kg	<0.5	1.5 mg/kg	93.2	64	114
EP075: 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	1.5 mg/kg	96.8	57	115
EP075: 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	1.5 mg/kg	91.0	55	117
EP075: 3- & 4-Methylphenol	1319-77-3	0.5	mg/kg	<0.5	1.5 mg/kg	83.9	46	122
EP075: 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	1.5 mg/kg	78.0	47	117
EP075: 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	1.5 mg/kg	91.1	14	108
EP075: 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	1.5 mg/kg	73.2	47	105
EP075: 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	1.5 mg/kg	86.6	48	110
EP075: 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	1.5 mg/kg	85.2	57	113
EP075: 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	1.5 mg/kg	61.1	49	109
EP075: 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	1.5 mg/kg	70.0	49	107
EP075: Pentachlorophenol	87-86-5	1	mg/kg	<1	3 mg/kg	27.2	12	76
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 2038959)								
EP075: Naphthalene	91-20-3	0.5	mg/kg	<0.5	1.5 mg/kg	104	62	118
EP075: 2-Methylnaphthalene	91-57-6	0.5	mg/kg	<0.5	1.5 mg/kg	99.6	58	116

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 2038959) - continued								
EP075: 2-Chloronaphthalene	91-58-7	0.5	mg/kg	<0.5	1.5 mg/kg	87.5	54	112
EP075: Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	1.5 mg/kg	102	56	114
EP075: Acenaphthene	83-32-9	0.5	mg/kg	<0.5	1.5 mg/kg	99.8	62	112
EP075: Fluorene	86-73-7	0.5	mg/kg	<0.5	1.5 mg/kg	103	59	115
EP075: Phenanthrene	85-01-8	0.5	mg/kg	<0.5	1.5 mg/kg	97.2	63	113
EP075: Anthracene	120-12-7	0.5	mg/kg	<0.5	1.5 mg/kg	99.6	57	111
EP075: Fluoranthene	206-44-0	0.5	mg/kg	<0.5	1.5 mg/kg	96.2	58	114
EP075: Pyrene	129-00-0	0.5	mg/kg	<0.5	1.5 mg/kg	105	57	117
EP075: N-2-Fluorenyl Acetamide	53-96-3	0.5	mg/kg	<0.5	1.5 mg/kg	60.8	58	114
EP075: Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	1.5 mg/kg	96.8	59	115
EP075: Chrysene	218-01-9	0.5	mg/kg	<0.5	1.5 mg/kg	108	61	117
EP075: Benzo(b+j) & Benzo(k)fluoranthene	205-99-2 207-08-9	1	mg/kg	<1	3 mg/kg	91.3	57	119
EP075: 7.12-Dimethylbenz(a)anthracene	57-97-6	0.5	mg/kg	<0.5	1.5 mg/kg	92.9	48	106
EP075: Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	1.5 mg/kg	98.8	56	116
EP075: 3-Methylcholanthrene	56-49-5	0.5	mg/kg	<0.5	1.5 mg/kg	68.9	50	116
EP075: Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	1.5 mg/kg	74.9	55	117
EP075: Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	1.5 mg/kg	75.0	53	119
EP075: Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	1.5 mg/kg	75.7	56	120
EP075C: Phthalate Esters (QCLot: 2038959)								
EP075: Dimethyl phthalate	131-11-3	0.5	mg/kg	<0.5	1.5 mg/kg	101	60	118
EP075: Diethyl phthalate	84-66-2	0.5	mg/kg	<0.5	1.5 mg/kg	112	65	115
EP075: Di-n-butyl phthalate	84-74-2	0.5	mg/kg	<0.5	1.5 mg/kg	97.5	65	121
EP075: Butyl benzyl phthalate	85-68-7	0.5	mg/kg	<0.5	1.5 mg/kg	95.2	62	116
EP075: bis(2-ethylhexyl) phthalate	117-81-7	----	mg/kg	----	1.5 mg/kg	94.2	69	133
EP075: Di-n-octylphthalate	117-84-0	0.5	mg/kg	<0.5	1.5 mg/kg	77.6	62	124
EP075D: Nitrosamines (QCLot: 2038959)								
EP075: N-Nitrosomethylethylamine	10595-95-6	0.5	mg/kg	<0.5	1.5 mg/kg	88.9	39	124
EP075: N-Nitrosodiethylamine	55-18-5	0.5	mg/kg	<0.5	1.5 mg/kg	92.6	59	117
EP075: N-Nitrosopyrrolidine	930-55-2	0.5	mg/kg	<0.5	1.5 mg/kg	95.4	53	125
EP075: N-Nitrosomorpholine	59-89-2	0.5	mg/kg	<0.5	1.5 mg/kg	91.2	65	121
EP075: N-Nitrosodi-n-propylamine	621-64-7	0.5	mg/kg	<0.5	1.5 mg/kg	97.7	59	123
EP075: N-Nitrosopiperidine	100-75-4	0.5	mg/kg	<0.5	1.5 mg/kg	93.1	57	115
EP075: N-Nitrosodibutylamine	924-16-3	0.5	mg/kg	<0.5	1.5 mg/kg	82.5	57	119
EP075: N-Nitrosodiphenyl & Diphenylamine	86-30-6 122-39-4	0.5	mg/kg	<0.6	3 mg/kg	100	42	112
EP075: Methapyrilene	91-80-5	0.5	mg/kg	<0.5	1.5 mg/kg	114	16	123
EP075E: Nitroaromatics and Ketones (QCLot: 2038959)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075E: Nitroaromatics and Ketones (QCLot: 2038959) - continued								
EP075: 2-Picoline	109-06-8	0.5	mg/kg	<0.5	1.5 mg/kg	31.8	27	129
EP075: Acetophenone	98-86-2	0.5	mg/kg	<0.5	1.5 mg/kg	94.7	60	116
EP075: Nitrobenzene	98-95-3	0.5	mg/kg	<0.5	1.5 mg/kg	87.6	65	119
EP075: Isophorone	78-59-1	0.5	mg/kg	<0.5	1.5 mg/kg	92.8	62	116
EP075: 2.6-Dinitrotoluene	606-20-2	0.5	mg/kg	<0.5	1.5 mg/kg	96.5	58	118
EP075: 2.4-Dinitrotoluene	121-14-2	0.5	mg/kg	<0.5	1.5 mg/kg	91.3	59	115
EP075: 1-Naphthylamine	134-32-7	0.5	mg/kg	<0.5	1.5 mg/kg	105	18	112
EP075: 4-Nitroquinoline-N-oxide	56-57-5	0.5	mg/kg	<0.5	1.5 mg/kg	59.6	10	87
EP075: 5-Nitro-o-toluidine	99-55-8	0.5	mg/kg	<0.5	1.5 mg/kg	87.7	48	99
EP075: Azobenzene	103-33-3	1	mg/kg	<1	1.5 mg/kg	97.4	62	118
EP075: 1.3.5-Trinitrobenzene	99-35-4	0.5	mg/kg	<0.5	1.5 mg/kg	84.5	36	114
EP075: Phenacetin	62-44-2	0.5	mg/kg	<0.5	1.5 mg/kg	68.7	62	114
EP075: 4-Aminobiphenyl	92-67-1	0.5	mg/kg	<0.5	1.5 mg/kg	89.2	36	102
EP075: Pentachloronitrobenzene	82-68-8	0.5	mg/kg	<0.5	1.5 mg/kg	100	56	110
EP075: Pronamide	23950-58-5	0.5	mg/kg	<0.5	1.5 mg/kg	95.5	54	110
EP075: Dimethylaminoazobenzene	60-11-7	0.5	mg/kg	<0.5	1.5 mg/kg	96.7	48	108
EP075: Chlorobenzilate	510-15-6	0.5	mg/kg	<0.5	1.5 mg/kg	94.0	57	112
EP075F: Haloethers (QCLot: 2038959)								
EP075: Bis(2-chloroethyl) ether	111-44-4	0.5	mg/kg	<0.5	1.5 mg/kg	114	63	121
EP075: Bis(2-chloroethoxy) methane	111-91-1	0.5	mg/kg	<0.5	1.5 mg/kg	91.7	59	115
EP075: 4-Chlorophenyl phenyl ether	7005-72-3	0.5	mg/kg	<0.5	1.5 mg/kg	104	58	112
EP075: 4-Bromophenyl phenyl ether	101-55-3	0.5	mg/kg	<0.5	1.5 mg/kg	101	58	110
EP075G: Chlorinated Hydrocarbons (QCLot: 2038959)								
EP075: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	1.5 mg/kg	96.0	58	112
EP075: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	1.5 mg/kg	97.4	58	116
EP075: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	1.5 mg/kg	98.6	57	115
EP075: Hexachloroethane	67-72-1	0.5	mg/kg	<0.5	1.5 mg/kg	95.4	54	116
EP075: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	1.5 mg/kg	94.8	63	108
EP075: Hexachloropropylene	1888-71-7	0.5	mg/kg	<0.5	1.5 mg/kg	94.1	39	110
EP075: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	1.5 mg/kg	97.5	59	117
EP075: Hexachlorocyclopentadiene	77-47-4	2.5	mg/kg	<2.5	1.5 mg/kg	69.6	24	108
EP075: Pentachlorobenzene	608-93-5	0.5	mg/kg	<0.5	1.5 mg/kg	96.9	57	109
EP075: Hexachlorobenzene (HCB)	118-74-1	0.5	mg/kg	<0.5	1.5 mg/kg	101	59	111
EP075H: Anilines and Benzidines (QCLot: 2038959)								
EP075: Aniline	62-53-3	0.5	mg/kg	<0.5	1.5 mg/kg	76.8	13	108
EP075: 4-Chloroaniline	106-47-8	0.5	mg/kg	<0.5	1.5 mg/kg	71.4	21	99
EP075: 2-Nitroaniline	88-74-4	0.5	mg/kg	<0.5	1.5 mg/kg	90.7	52	112
EP075: 3-Nitroaniline	99-09-2	0.5	mg/kg	<0.5	1.5 mg/kg	77.1	32	94

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075H: Anilines and Benzidines (QCLot: 2038959) - continued								
EP075: Dibenzofuran	132-64-9	0.5	mg/kg	<0.5	1.5 mg/kg	99.7	60	110
EP075: 4-Nitroaniline	100-01-8	0.5	mg/kg	<0.5	1.5 mg/kg	80.0	42	112
EP075: Carbazole	86-74-8	0.5	mg/kg	<0.5	1.5 mg/kg	93.6	59	111
EP075: 3.3`-Dichlorobenzidine	91-94-1	0.5	mg/kg	<0.5	1.5 mg/kg	75.4	23	113
EP075I: Organochlorine Pesticides (QCLot: 2038959)								
EP075: alpha-BHC	319-84-6	0.5	mg/kg	<0.5	1.5 mg/kg	102	63	113
EP075: beta-BHC	319-85-7	0.5	mg/kg	<0.5	1.5 mg/kg	94.4	57	113
EP075: gamma-BHC	58-89-9	0.5	mg/kg	<0.5	1.5 mg/kg	101	61	117
EP075: delta-BHC	319-86-8	0.5	mg/kg	<0.5	1.5 mg/kg	94.0	64	118
EP075: Heptachlor	76-44-8	0.5	mg/kg	<0.5	1.5 mg/kg	97.2	55	115
EP075: Aldrin	309-00-2	0.5	mg/kg	<0.5	1.5 mg/kg	103	61	115
EP075: Heptachlor epoxide	1024-57-3	0.5	mg/kg	<0.5	1.5 mg/kg	95.9	56	118
EP075: alpha-Endosulfan	959-98-8	0.5	mg/kg	<0.5	1.5 mg/kg	106	65	125
EP075: 4.4`-DDE	72-55-9	0.5	mg/kg	<0.5	1.5 mg/kg	103	60	116
EP075: Dieldrin	60-57-1	0.5	mg/kg	<0.5	1.5 mg/kg	87.3	64	118
EP075: Endrin	72-20-8	0.5	mg/kg	<0.5	1.5 mg/kg	101	53	117
EP075: beta-Endosulfan	33213-65-9	0.5	mg/kg	<0.5	1.5 mg/kg	103	65	115
EP075: 4.4`-DDD	72-54-8	0.5	mg/kg	<0.5	1.5 mg/kg	102	62	118
EP075: Endosulfan sulfate	1031-07-8	0.5	mg/kg	<0.5	1.5 mg/kg	102	63	129
EP075: 4.4`-DDT	50-29-3	0.5	mg/kg	<0.5	1.5 mg/kg	100.0	46	122
EP075J: Organophosphorus Pesticides (QCLot: 2038959)								
EP075: Dichlorvos	62-73-7	0.5	mg/kg	<0.5	1.5 mg/kg	66.1	46	112
EP075: Dimethoate	60-51-5	0.5	mg/kg	<0.5	1.5 mg/kg	83.2	63	119
EP075: Diazinon	333-41-5	0.5	mg/kg	<0.5	1.5 mg/kg	96.1	68	134
EP075: Chlorpyrifos-methyl	5598-13-0	0.5	mg/kg	<0.5	1.5 mg/kg	93.1	60	130
EP075: Malathion	121-75-5	0.5	mg/kg	<0.5	1.5 mg/kg	112	65	127
EP075: Fenthion	55-38-9	0.5	mg/kg	<0.5	1.5 mg/kg	102	60	116
EP075: Chlorpyrifos	2921-88-2	0.5	mg/kg	<0.5	1.5 mg/kg	103	63	113
EP075: Pirimphos-ethyl	23505-41-1	0.5	mg/kg	<0.5	1.5 mg/kg	101	65	115
EP075: Chlorfenvinphos	470-90-6	0.5	mg/kg	<0.5	1.5 mg/kg	76.6	59	103
EP075: Prothiofos	34643-46-4	0.5	mg/kg	<0.5	1.5 mg/kg	108	59	119
EP075: Ethion	563-12-2	0.5	mg/kg	<0.5	1.5 mg/kg	109	62	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2036468)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	99.4	75	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	102	77	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	102	71	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2037893)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	122	68	128

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2037897)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	88.8	68	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2039484)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	101	75	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	100	77	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	97.4	71	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2040514)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	98.3	68	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2036468)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	99.8	77	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	102	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	114	63	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2037893)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	128	68	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2037897)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	89.1	68	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2039484)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	96.8	77	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	96.5	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	92.8	63	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2040514)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	102	68	128
EP080: BTEXN (QCLot: 2037893)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	114	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	121	67	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	115	65	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	116	66	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	116	68	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	111	63	119
EP080: BTEXN (QCLot: 2037897)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	101	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	99.2	67	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	95.9	65	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	94.4	66	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	98.1	68	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	99.7	63	119

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080: BTEXN (QCLot: 2040514)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	99.8	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	102	67	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	101	65	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	100	66	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	101	68	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	98.6	63	119
EP090: Organotin Compounds (QCLot: 2047100)								
EP090: Tributyltin	56573-85-4	0.5	µgSn/kg	<0.5	1.25 µgSn/kg	133	52	139

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EG005T: Total Metals by ICP-AES (QCLot: 2042717)							
ES1833933-001	MW01_0.1	EG005T: Arsenic	7440-38-2	50 mg/kg	93.1	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	98.7	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	91.1	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	91.4	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	92.9	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	96.8	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	82.0	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2042718)							
ES1833933-001	MW01_0.1	EG035T: Mercury	7439-97-6	5 mg/kg	112	70	130
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 2040494)							
ES1834217-001	Anonymous	EP074: Toluene	108-88-3	2.5 mg/kg	91.9	70	130
EP074E: Halogenated Aliphatic Compounds (QCLot: 2040494)							
ES1834217-001	Anonymous	EP074: 1.1-Dichloroethene	75-35-4	2.5 mg/kg	94.7	70	130
		EP074: Trichloroethene	79-01-6	2.5 mg/kg	90.2	70	130
EP074F: Halogenated Aromatic Compounds (QCLot: 2040494)							
ES1834217-001	Anonymous	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	91.6	70	130
EP075(SIM)A: Phenolic Compounds (QCLot: 2036467)							
ES1833933-001	MW01_0.1	EP075(SIM): Phenol	108-95-2	10 mg/kg	101	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	98.5	70	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP075(SIM)A: Phenolic Compounds (QCLot: 2036467) - continued							
ES1833933-001	MW01_0.1	EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	81.0	60	130
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	93.2	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	75.6	20	130
EP075(SIM)A: Phenolic Compounds (QCLot: 2039481)							
ES1834135-001	Anonymous	EP075(SIM): Phenol	108-95-2	10 mg/kg	100	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	112	70	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	104	60	130
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	111	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	69.8	20	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2036467)							
ES1833933-001	MW01_0.1	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	86.0	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	103	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2039481)							
ES1834135-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	107	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	124	70	130
EP075A: Phenolic Compounds (QCLot: 2038959)							
ES1833933-024	SB07_1.0	EP075: Phenol	108-95-2	10 mg/kg	89.9	60	130
		EP075: 2-Chlorophenol	95-57-8	10 mg/kg	88.6	60	130
		EP075: 2-Nitrophenol	88-75-5	10 mg/kg	89.6	50	130
		EP075: 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	89.2	50	130
		EP075: Pentachlorophenol	87-86-5	10 mg/kg	91.9	10	130
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 2038959)							
ES1833933-024	SB07_1.0	EP075: Acenaphthene	83-32-9	10 mg/kg	81.2	50	130
		EP075: Pyrene	129-00-0	10 mg/kg	55.0	50	130
EP075D: Nitrosamines (QCLot: 2038959)							
ES1833933-024	SB07_1.0	EP075: N-Nitrosodi-n-propylamine	621-64-7	10 mg/kg	87.8	50	130
EP075E: Nitroaromatics and Ketones (QCLot: 2038959)							
ES1833933-024	SB07_1.0	EP075: 2.4-Dinitrotoluene	121-14-2	10 mg/kg	87.9	40	130
EP075G: Chlorinated Hydrocarbons (QCLot: 2038959)							
ES1833933-024	SB07_1.0	EP075: 1.4-Dichlorobenzene	106-46-7	10 mg/kg	84.2	60	130
		EP075: 1.2.4-Trichlorobenzene	120-82-1	10 mg/kg	84.2	50	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2036468)							
ES1833933-001	MW01_0.1	EP071: C10 - C14 Fraction	----	523 mg/kg	84.5	73	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	102	53	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	116	52	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2037893)							

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2037893) - continued							
ES1833933-001	MW01_0.1	EP080: C6 - C9 Fraction	----	32.5 mg/kg	98.4	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2037897)							
ES1834083-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	73.8	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2039484)							
ES1834135-001	Anonymous	EP071: C10 - C14 Fraction	----	523 mg/kg	97.5	73	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	103	53	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	114	52	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2040514)							
ES1834061-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	77.4	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2036468)							
ES1833933-001	MW01_0.1	EP071: >C10 - C16 Fraction	----	860 mg/kg	105	73	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	115	53	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	120	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2037893)							
ES1833933-001	MW01_0.1	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	99.4	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2037897)							
ES1834083-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	75.8	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2039484)							
ES1834135-001	Anonymous	EP071: >C10 - C16 Fraction	----	860 mg/kg	103	73	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	110	53	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	108	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2040514)							
ES1834061-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	80.7	70	130
EP080: BTEXN (QCLot: 2037893)							
ES1833933-001	MW01_0.1	EP080: Benzene	71-43-2	2.5 mg/kg	96.9	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	103	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	103	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	103	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	103	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	95.1	70	130
EP080: BTEXN (QCLot: 2037897)							
ES1834083-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	78.3	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	80.3	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	81.0	70	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP080: BTEXN (QCLot: 2037897) - continued							
ES1834083-001	Anonymous	EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	78.8	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	82.9	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	91.0	70	130
EP080: BTEXN (QCLot: 2040514)							
ES1834061-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	78.0	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	76.6	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	77.3	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	75.9	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	77.8	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	78.8	70	130
EP090: Organotin Compounds (QCLot: 2047100)							
ES1833933-012	SB02_0.1	EP090: Tributyltin	56573-85-4	1.25 µgSn/kg	96.1	20	130

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES1833933**

Client	: **CAVVANBA CONSULTING**	Laboratory	: Environmental Division Sydney
Contact	: MR BEN WACKETT	Contact	: Brenda Hong
Address	: PO BOX 2191 BYRON BAY NSW 2481	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: ben@cavvanba.com	E-mail	: Brenda.Hong@ALSGlobal.com
Telephone	: +61 02 6685 7811	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 6685 5083	Facsimile	: +61-2-8784 8500
Project	: 18058	Page	: 1 of 4
Order number	: 18058	Quote number	: EB2017CAVCON0001 (EN/222)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: GLEN CHISNALL		

Dates

Date Samples Received	: 13-Nov-2018 11:00	Issue Date	: 15-Nov-2018
Client Requested Due Date	: 20-Nov-2018	Scheduled Reporting Date	: **20-Nov-2018**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 20.5 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 49 / 22

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- 15/11/18: This is an updated SRN which indicates amendments to the sample ID for SP09_1.0 to SB09_1.0 and the addition of SVOC/VOC analysis for sample SB07_1.0.
- **Samples QS02 and QS04 have been forwarded to Envirolab.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Tributyltin analysis to be conducted by ALS Brisbane.
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EP090 (solids) Organotins	SOIL - S-18 (NO MOIST) TRH(C6-C9)/BTEXN with No Moisture for TBs	SOIL - S-23 SVOC/VOC	SOIL - S-26 8 metals/TRH/BTEXN/PAH
ES1833933-001	07-Nov-2018 00:00	MW01_0.1		✓				✓
ES1833933-002	07-Nov-2018 00:00	MW01_0.5	✓					
ES1833933-003	07-Nov-2018 00:00	MW01_1.0	✓					
ES1833933-004	07-Nov-2018 00:00	MW01_1.5	✓					
ES1833933-005	07-Nov-2018 00:00	MW01_2.0	✓					
ES1833933-006	07-Nov-2018 00:00	MW02_0.1		✓				✓
ES1833933-007	07-Nov-2018 00:00	MW02_1.0	✓					
ES1833933-008	07-Nov-2018 00:00	MW03_0.1		✓	✓			✓
ES1833933-009	07-Nov-2018 00:00	MW03_1.8	✓					
ES1833933-010	07-Nov-2018 00:00	SB01_0.1		✓				✓
ES1833933-011	07-Nov-2018 00:00	SB01_1.6	✓					
ES1833933-012	07-Nov-2018 00:00	SB02_0.1		✓	✓			✓
ES1833933-013	07-Nov-2018 00:00	SB02_1.0		✓	✓			✓
ES1833933-014	07-Nov-2018 00:00	SB02_1.7	✓					
ES1833933-015	07-Nov-2018 00:00	SB03_0.1		✓				✓
ES1833933-016	07-Nov-2018 00:00	SB03_1.5	✓					
ES1833933-017	07-Nov-2018 00:00	SB04_0.1		✓				✓
ES1833933-018	07-Nov-2018 00:00	SB04_1.0	✓					
ES1833933-019	07-Nov-2018 00:00	SB05_0.1		✓				✓
ES1833933-020	07-Nov-2018 00:00	SB05_0.5	✓					
ES1833933-021	07-Nov-2018 00:00	SB06_0.1		✓				✓
ES1833933-022	07-Nov-2018 00:00	SB06_0.7	✓					
ES1833933-023	08-Nov-2018 00:00	SB07_0.1	✓					
ES1833933-024	08-Nov-2018 00:00	SB07_1.0		✓			✓	✓
ES1833933-025	08-Nov-2018 00:00	SB07_1.5	✓					
ES1833933-026	08-Nov-2018 00:00	SB07_2.0	✓					
ES1833933-027	08-Nov-2018 00:00	SB08_0.1		✓				✓
ES1833933-028	08-Nov-2018 00:00	SB08_0.5	✓					
ES1833933-030	08-Nov-2018 00:00	SB09_0.5	✓					
ES1833933-031	08-Nov-2018 00:00	SB10_0.1		✓	✓			✓
ES1833933-032	08-Nov-2018 00:00	SB10_0.4	✓					
ES1833933-033	08-Nov-2018 00:00	SB11_0.1		✓	✓			✓
ES1833933-034	08-Nov-2018 00:00	SB11_0.4	✓					
ES1833933-035	08-Nov-2018 00:00	SB12_0.1		✓	✓			✓
ES1833933-036	08-Nov-2018 00:00	SB12_0.4	✓					

			(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EP090 (solids) Organotins	SOIL - S-18 (NO MOIST) TRH(C6-C9)/BTEXN with No Moisture for TBs	SOIL - S-23 SVOC/VOC	SOIL - S-26 8 metals/TRH/BTEXN/PAH
ES1833933-037	08-Nov-2018 00:00	SB13_0.1		✓	✓			✓
ES1833933-038	08-Nov-2018 00:00	SB13_0.4	✓					
ES1833933-039	08-Nov-2018 00:00	SB14_0.1		✓	✓			✓
ES1833933-040	08-Nov-2018 00:00	SB14_0.4	✓					
ES1833933-041	07-Nov-2018 00:00	QS01		✓				✓
ES1833933-042	08-Nov-2018 00:00	QS03		✓				✓
ES1833933-043	05-Nov-2018 00:00	Trip Spike				✓		
ES1833933-044	05-Nov-2018 00:00	Trip blank				✓		
ES1833933-045	08-Nov-2018 00:00	SP01	✓					
ES1833933-046	08-Nov-2018 00:00	SP02	✓					
ES1833933-047	08-Nov-2018 00:00	SP03	✓					
ES1833933-048	05-Nov-2018 00:00	Trip Spike Control				✓		
ES1833933-049	07-Nov-2018 00:00	SB09_1.0	✓					
ES1833933-050	07-Nov-2018 00:00	MW01_1.1	✓					

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

ACCOUNTS PAYABLE		
- A4 - AU Tax Invoice (INV)	Email	inbox@cavvanba.com
BEN WACKETT		
- *AU Certificate of Analysis - NATA (COA)	Email	ben@cavvanba.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	ben@cavvanba.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	ben@cavvanba.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	ben@cavvanba.com
- Chain of Custody (CoC) (COC)	Email	ben@cavvanba.com
- EDI Format - ENMRG (ENMRG)	Email	ben@cavvanba.com
- EDI Format - ESDAT (ESDAT)	Email	ben@cavvanba.com
GLEN CHISNALL		
- *AU Certificate of Analysis - NATA (COA)	Email	glen@cavvanba.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	glen@cavvanba.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	glen@cavvanba.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	glen@cavvanba.com
- Chain of Custody (CoC) (COC)	Email	glen@cavvanba.com
- EDI Format - ENMRG (ENMRG)	Email	glen@cavvanba.com
- EDI Format - ESDAT (ESDAT)	Email	glen@cavvanba.com
ROB MCLELLAND		
- A4 - AU Tax Invoice (INV)	Email	rob@cavvanba.com
ROSS NICOLSON		
- *AU Certificate of Analysis - NATA (COA)	Email	ross@cavvanba.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	ross@cavvanba.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	ross@cavvanba.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	ross@cavvanba.com
- Chain of Custody (CoC) (COC)	Email	ross@cavvanba.com
- EDI Format - ENMRG (ENMRG)	Email	ross@cavvanba.com
- EDI Format - ESDAT (ESDAT)	Email	ross@cavvanba.com

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com

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NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com

NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com

PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com

SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com

TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com

WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: Cavvanba Consulting	TURNAROUND REQUIREMENTS : ☐ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)	
OFFICE: Byron Bay	(Standard TAT may be longer for some tests e.g. Ultra Trace Organics) ☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact?	Yes / No / N/A
PROJECT: 18058	ALS QUOTE NO.: BQ EN-222-17	Ice Bricks / Frozen Ice Bricks present upon receipt?	Yes / No / N/A
ORDER NUMBER: 18058	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: melted	°C
PROJECT MANAGER: Ben Wackett	CONTACT PH: 0488 225 692	Other comments: 20.5	
SAMPLER: Glen Chisnall	SAMPLER MOBILE: 0499401092		
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):		
Email Reports to (will default to PM if no other addresses are listed): glen@cavvanba.com, ross@cavvanba.com			
Email Invoice to (will default to PM if no other addresses are listed): rob@cavvanba.com			

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Ross Nicolson			MC
DATE/TIME: 12/11/2018	DATE/TIME:	DATE/TIME:	DATE/TIME: 13/11/18 11:00am

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Please include negative net acidity values

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).				Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-26: TRH/BTEXN/PAHs/8 metals	TBT			Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	MW01_0.1	7/11/2018	Soil	JAR	1	X				
2	MW01_0.5	7/11/2018	Soil	JAR	1	ON HOLD				
3	MW01_1.0	7/11/2018	Soil	JAR	1	ON HOLD				
4	MW01_1.5	7/11/2018	Soil	JAR	1	ON HOLD				
5	MW01_2.0	7/11/2018	Soil	JAR	1	ON HOLD				
6	MW02_0.1	7/11/2018	Soil	JAR	1	X				
7	MW02_1.0	7/11/2018	Soil	JAR	1	ON HOLD				
8	MW03_0.1	7/11/2018	Soil	JAR	1	X	X			
9	MW03_1.8	7/11/2018	Soil	JAR	1	ON HOLD				
10	SB01_0.1	7/11/2018	Soil	JAR	1	X				
11	SB01_1.6	7/11/2018	Soil	JAR	1	ON HOLD				
12	SB02_0.1	7/11/2018	Soil	JAR	1	X	X			
13	SB02_1.0	7/11/2018	Soil	JAR	1	X	X			
14	SB02_1.7	7/11/2018	Soil	JAR	1	ON HOLD				
				TOTAL						

Dispatch / Transport Lab / Date: ALS
Lab / Analysis: QS02 + QS04 →
Organised By / Date: Envirolab
Relinquished By / Date:
Courier: TBI → Brisbane
WO No:
Attach By PO / Internal Sheet:

Environmental Division Sydney
Work Order Reference
ES1833933

Telephone : + 61-2-8784 8555

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP =
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

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NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com

ORANGE 4/13 Geary Place North Orange NSW 2800 Ph: 02 6393 2063 E: orange@alsglobal.com

PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com

SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com

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WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: Cavvanba Consulting	TURNAROUND REQUIREMENTS : ☐ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: Byron Bay	(Standard TAT may be longer for some tests e.g. Ultra Trace Organics) ☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
PROJECT: 18058	ALS QUOTE NO.: BQ EN-222-17	Cooling Method? Yes No N/A (Free ice / frozen ice bricks present upon Receipt) metal
ORDER NUMBER: 18058	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: 20.5 °C
PROJECT MANAGER: Ben Wackett	CONTACT PH: 0488 225 692 OF: 1 2 3 4 5 6 7	Other comments:
SAMPLER: Glen Chisnall	SAMPLER MOBILE: 0499401092	
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	
Email Reports to (will default to PM if no other addresses are listed): glen@cavvanba.com, ross@cavvanba.com		
Email Invoice to (will default to PM if no other addresses are listed): rob@cavvanba.com		

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Ross Nicolson			MC
DATE/TIME: 12/11/2018	DATE/TIME:	DATE/TIME:	DATE/TIME: 13/11/18 11:00am

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Please include negative net acidity values

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-26: TRH/BTEXN/PAHs/8 metals	TBT							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
15	SB03_0.1	7/11/2018	Soil	JAR	1	X								
16	SB03_1.5	7/11/2018	Soil	JAR	1	ON HOLD								
17	SB04_0.1	7/11/2018	Soil	JAR	1	X								
18	SB04_1.0	7/11/2018	Soil	JAR	1	ON HOLD								
19	SB05_0.1	7/11/2018	Soil	JAR	1	X								
20	SB05_0.5	7/11/2018	Soil	JAR	1	ON HOLD								
21	SB06_0.1	7/11/2018	Soil	JAR	1	X								
22	SB06_0.7	7/11/2018	Soil	JAR	1	ON HOLD								
23	SB07_0.1	8/11/2018	Soil	JAR	1	ON HOLD								
24	SB07_1.0	8/11/2018	Soil	JAR	1	X								
25	SB07_1.5	8/11/2018	Soil	JAR	1	ON HOLD								
26	SB07_2.0	8/11/2018	Soil	JAR	1	ON HOLD								
27	SB08_0.1	8/11/2018	Soil	JAR	1	X								
28	SB08_0.5	8/11/2018	Soil	JAR	1	ON HOLD								
				TOTAL										

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

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ALS Laboratory: please tick →

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☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: Cavvanba Consulting	**TURNAROUND REQUIREMENTS :** ☐ Standard TAT (List due date):	**FOR LABORATORY USE ONLY (Circle)**	
OFFICE: Byron Bay	(Standard TAT may be longer for some tests e.g., Ultra Trace Organics) ☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact?	Yes / No / N/A
PROJECT: 18058	**ALS QUOTE NO.:** BQ EN-222-17	Free ice / frozen icebacks present upon receipt?	Yes / No / N/A
ORDER NUMBER: 18058	**COC SEQUENCE NUMBER (Circle)** COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: 20.5 °C	
PROJECT MANAGER: Ben Wackett	**CONTACT PH:** 0488 225 692 OF: 1 2 3 4 5 6 7	Other comments:	
SAMPLER: Glen Chisnall	**SAMPLER MOBILE:** 0499401092		
COC emailed to ALS? (YES / NO)	**EDD FORMAT (or default):**		
Email Reports to (will default to PM if no other addresses are listed): glen@cavvanba.com, ross@cavvanba.com			
Email Invoice to (will default to PM if no other addresses are listed): rob@cavvanba.com			

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Ross Nicolson			MC
DATE/TIME: 12/11/2018	DATE/TIME:	DATE/TIME:	DATE/TIME: 8/11/18 11:00am

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Please include negative net acidity values

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-26: TRH/BTEXN/PAHs/8 metals	TBT							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
29	SB09_0.1	8/11/2018	Soil	JAR	1	X	X							
30	SB09_0.5	8/11/2018	Soil	JAR	1	ON HOLD								
31	SB10_0.1	8/11/2018	Soil	JAR	1	X	X							
32	SB10_0.4	8/11/2018	Soil	JAR	1	ON HOLD								
33	SB11_0.1	8/11/2018	Soil	JAR	1	X	X							
34	SB11_0.4	8/11/2018	Soil	JAR	1	ON HOLD								
35	SB12_0.1	8/11/2018	Soil	JAR	1	X	X							
36	SB12_0.4	8/11/2018	Soil	JAR	1	ON HOLD								
37	SB13_0.1	8/11/2018	Soil	JAR	1	X	X							
38	SB13_0.4	8/11/2018	Soil	JAR	1	ON HOLD								
39	SB14_0.1	8/11/2018	Soil	JAR	1	X	X							
40	SB14_0.4	8/11/2018	Soil	JAR	1	ON HOLD								
41	QS01	7/11/2018	Soil	JAR	1	X								
—	QS02	7/11/2018	Soil	JAR	Please forward analysis to envirolab for TRH/BTEXN/PAHs/8 metals									
				TOTAL										

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

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ALS Laboratory: please tick →

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☐MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com
☐NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
☐NOWRA 4/19 Geary Place North Nowra NSW 2541 Ph: 02 4423 2063 E: nowra@alsglobal.com
☐PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com
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☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: Cavvanba Consulting	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☐ Standard TAT (List due date):	**FOR LABORATORY USE ONLY (Circle)**
OFFICE: Byron Bay		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes / No / (N/A)
PROJECT: 18058	**ALS QUOTE NO.:** BQ EN-222-17	**COC SEQUENCE NUMBER (Circle)**	Cooler/ frozen ice bricks present upon receipt? (Yes) / No / N/A
ORDER NUMBER: 18058		COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: 20.5 °C
PROJECT MANAGER: Ben Wackett	**CONTACT PH:** 0488 225 692	OF: 1 2 3 4 5 6 7	Other comment:

SAMPLER: Glen Chisnall	**SAMPLER MOBILE:** 0499401092	**RELINQUISHED BY:**	**RECEIVED BY:**
COC emailed to ALS? (YES / NO)	**EDD FORMAT (or default):**	*Ross Nicolson*	
Email Reports to (will default to PM if no other addresses are listed): glen@cavvanba.com, ross@cavvanba.com		DATE/TIME: 12/11/2018	DATE/TIME:
Email Invoice to (will default to PM if no other addresses are listed): rob@cavvanba.com			

RELINQUISHED BY:	**RECEIVED BY:**	**RELINQUISHED BY:**	**RECEIVED BY:** MC
DATE/TIME:	DATE/TIME:	DATE/TIME:	DATE/TIME: 13/11/18 11:00am

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL.: Please include negative net acidity values

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	S-26: TRH/BTEXN/PAHs/8 metals	TBT	TRH C6-C9/BTEXN						
42	QS03	8/11/2018	Soil	JAR	1	X			Envirolab					
—	QS04	8/11/2018	Soil	JAR	1	Please forward to Eurofins for TRH/BTEXN/PAHs/8 metals								QS discussed with Glen 14.11.18 AB
43	Trip spike	5/11/2018	Soil	JAR	1			X						
44	Trip blank	5/11/2018	Soil	JAR	1			X						
45	SP01	8/11/2018	Soil	JAR	1	ON HOLD								
46	SP02	8/11/2018	Soil	JAR	1	ON HOLD								
47	SP03	8/11/2018	Soil	JAR	1	ON HOLD								
48	SB09_1-0													
49	MW01_1-1													
				TOTAL										

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1835515**	Page	: 1 of 5
Client	: **CAVVANBA CONSULTING**	Laboratory	: Environmental Division Sydney
Contact	: MR BEN WACKETT	Contact	: Brenda Hong
Address	: PO BOX 2191 BYRON BAY NSW 2481	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 6685 7811	Telephone	: +61 2 8784 8555
Project	: 18058	Date Samples Received	: 27-Nov-2018 09:00
Order number	: ----	Date Analysis Commenced	: 29-Nov-2018
C-O-C number	: ----	Issue Date	: 04-Dec-2018 15:28
Sampler	: Glen Chisnall		
Site	: ----		
Quote number	: SYBQ/409/18		
No. of samples received	: 3		
No. of samples analysed	: 3		

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Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Alex Rossi	Organic Chemist	Sydney Organics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW
Rassem Ayoubi	Senior Organic Chemist	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	SB2_1.0	SB10_0.4	SB11_0.4	----	----
			Client sampling date / time	07-Nov-2018 00:00	07-Nov-2018 00:00	07-Nov-2018 00:00	----	----
Compound	CAS Number	LOR	Unit	ES1835515-001	ES1835515-002	ES1835515-003	--------	--------
				Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	22.4	----	19.4	----	----
Moisture Content	----	1.0	%	----	14.0	----	----	----
EG005T: Total Metals by ICP-AES								
Lead	7439-92-1	5	mg/kg	----	----	163	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	2.1	0.9	<0.5	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	0.7	6.9	<0.5	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Fluorene	86-73-7	0.5	mg/kg	0.5	1.0	<0.5	----	----
Phenanthrene	85-01-8	0.5	mg/kg	4.8	12.8	<0.5	----	----
Anthracene	120-12-7	0.5	mg/kg	1.1	5.3	<0.5	----	----
Fluoranthene	206-44-0	0.5	mg/kg	6.1	34.6	0.7	----	----
Pyrene	129-00-0	0.5	mg/kg	6.1	39.1	0.8	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	3.3	23.7	<0.5	----	----
Chrysene	218-01-9	0.5	mg/kg	3.1	24.0	<0.5	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	3.1	32.6	<0.5	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	1.2	12.1	<0.5	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	2.8	29.6	<0.5	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	0.8	15.8	<0.5	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	4.5	<0.5	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	0.8	19.5	<0.5	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	36.5	262	1.5	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	3.7	43.0	<0.5	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	3.9	43.0	0.6	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	4.2	43.0	1.2	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	----	<10	----	----	----
C10 - C14 Fraction	----	50	mg/kg	----	<50	----	----	----
C15 - C28 Fraction	----	100	mg/kg	----	750	----	----	----
C29 - C36 Fraction	----	100	mg/kg	----	840	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	----	1590	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	----	<10	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SB2_1.0	SB10_0.4	SB11_0.4	----	----
				Client sampling date / time	07-Nov-2018 00:00	07-Nov-2018 00:00	07-Nov-2018 00:00	----	----
Compound	CAS Number	LOR	Unit		ES1835515-001	ES1835515-002	ES1835515-003	--------	--------
					Result	Result	Result	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		----	<10	----	----	----
>C10 - C16 Fraction	----	50	mg/kg		----	<50	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		----	1360	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		----	540	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		----	1900	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		----	<50	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		----	<0.2	----	----	----
Toluene	108-88-3	0.5	mg/kg		----	<0.5	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		----	<0.5	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		----	<0.5	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		----	<0.5	----	----	----
^ Sum of BTEX	----	0.2	mg/kg		----	<0.2	----	----	----
^ Total Xylenes	----	0.5	mg/kg		----	<0.5	----	----	----
Naphthalene	91-20-3	1	mg/kg		----	<1	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		88.9	74.3	94.0	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		76.3	75.2	83.7	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		84.7	62.6	90.7	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		76.1	76.0	79.3	----	----
Anthracene-d10	1719-06-8	0.5	%		78.1	77.5	87.1	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		74.5	76.6	81.9	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		----	104	----	----	----
Toluene-D8	2037-26-5	0.2	%		----	96.8	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		----	95.8	----	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES1835515**	Page	: 1 of 5
Client	: **CAVVANBA CONSULTING**	Laboratory	: Environmental Division Sydney
Contact	: MR BEN WACKETT	Telephone	: +61 2 8784 8555
Project	: 18058	Date Samples Received	: 27-Nov-2018
Site	: ----	Issue Date	: 04-Dec-2018
Sampler	: Glen Chisnall	No. of samples received	: 3
Order number	: ----	No. of samples analysed	: 3

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA055: Moisture Content (Dried @ 105-110°C)						
Soil Glass Jar - Unpreserved						
SB2_1.0, SB10_0.4, SB11_0.4	----	----	----	30-Nov-2018	21-Nov-2018	**9**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons						
Soil Glass Jar - Unpreserved						
SB2_1.0, SB10_0.4, SB11_0.4	29-Nov-2018	21-Nov-2018	**8**	----	----	----
EP080/071: Total Petroleum Hydrocarbons						
Soil Glass Jar - Unpreserved						
SB10_0.4	29-Nov-2018	21-Nov-2018	**8**	02-Dec-2018	21-Nov-2018	**11**
Soil Glass Jar - Unpreserved						
SB10_0.4	29-Nov-2018	21-Nov-2018	**8**	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions						
Soil Glass Jar - Unpreserved						
SB10_0.4	29-Nov-2018	21-Nov-2018	**8**	02-Dec-2018	21-Nov-2018	**11**
Soil Glass Jar - Unpreserved						
SB10_0.4	29-Nov-2018	21-Nov-2018	**8**	----	----	----
EP080: BTEXN						
Soil Glass Jar - Unpreserved						
SB10_0.4	29-Nov-2018	21-Nov-2018	**8**	02-Dec-2018	21-Nov-2018	**11**

Outliers : Frequency of Quality Control Samples

Matrix: **SOIL**

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Moisture Content	1	13	7.69	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055) SB2_1.0, SB10_0.4, SB11_0.4	**07-Nov-2018**	**----**	----	----	**30-Nov-2018**	21-Nov-2018	×
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) SB11_0.4	**07-Nov-2018**	**30-Nov-2018**	06-May-2019	✓	**30-Nov-2018**	06-May-2019	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM)) SB2_1.0, SB10_0.4, SB11_0.4	**07-Nov-2018**	**29-Nov-2018**	21-Nov-2018	×	**30-Nov-2018**	08-Jan-2019	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP071) SB10_0.4	**07-Nov-2018**	**29-Nov-2018**	21-Nov-2018	×	**30-Nov-2018**	08-Jan-2019	✓
Soil Glass Jar - Unpreserved (EP080) SB10_0.4	**07-Nov-2018**	**29-Nov-2018**	21-Nov-2018	×	**02-Dec-2018**	21-Nov-2018	×
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP071) SB10_0.4	**07-Nov-2018**	**29-Nov-2018**	21-Nov-2018	×	**30-Nov-2018**	08-Jan-2019	✓
Soil Glass Jar - Unpreserved (EP080) SB10_0.4	**07-Nov-2018**	**29-Nov-2018**	21-Nov-2018	×	**02-Dec-2018**	21-Nov-2018	×
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080) SB10_0.4	**07-Nov-2018**	**29-Nov-2018**	21-Nov-2018	×	**02-Dec-2018**	21-Nov-2018	×

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	1	13	**7.69**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM amended 2013.
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260B. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM amended 2013.

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

QUALITY CONTROL REPORT

Work Order	: **ES1835515**	Page	: 1 of 7
Client	: **CAVVANBA CONSULTING**	Laboratory	: Environmental Division Sydney
Contact	: MR BEN WACKETT	Contact	: Brenda Hong
Address	: PO BOX 2191 BYRON BAY NSW 2481	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 6685 7811	Telephone	: +61 2 8784 8555
Project	: 18058	Date Samples Received	: 27-Nov-2018
Order number	: ----	Date Analysis Commenced	: 29-Nov-2018
C-O-C number	: ----	Issue Date	: 04-Dec-2018
Sampler	: Glen Chisnall		
Site	: ----		
Quote number	: SYBQ/409/18		
No. of samples received	: 3		
No. of samples analysed	: 3		

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This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Alex Rossi	Organic Chemist	Sydney Organics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW
Rassem Ayoubi	Senior Organic Chemist	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 2066774)									
ES1835543-001	Anonymous	EA055: Moisture Content	----	0.1	%	18.7	17.0	9.56	0% - 50%
EG005T: Total Metals by ICP-AES (QC Lot: 2068032)									
ES1835350-001	Anonymous	EG005T: Lead	7439-92-1	5	mg/kg	258	303	16.2	0% - 20%
ES1835837-002	Anonymous	EG005T: Lead	7439-92-1	5	mg/kg	24	18	27.9	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2063604)									
ES1835515-002	SB10_0.4	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	0.9	0.9	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	6.9	5.9	15.8	0% - 50%
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	1.0	0.9	11.4	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	12.8	13.9	8.51	0% - 20%
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	5.3	5.0	5.98	0% - 50%
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	34.6	34.8	0.530	0% - 20%
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	39.1	37.9	3.01	0% - 20%
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	23.7	22.2	6.52	0% - 20%
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	24.0	21.8	9.17	0% - 20%
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	32.6	29.7	9.35	0% - 20%
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	12.1	11.2	8.04	0% - 20%
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	29.6	26.8	9.80	0% - 20%
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	15.8	14.2	11.2	0% - 20%
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	4.5	3.5	25.1	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	19.5	17.3	11.8	0% - 20%
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	262	246	6.25	0% - 20%
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	43.0	38.4	11.1	0% - 20%

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2063604) - continued									
ES1835427-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	6.4	6.5	0.00	0% - 50%
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	0.7	0.6	19.1	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	0.8	0.8	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	7.9	8.4	6.13	0% - 50%
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2063605)									
ES1835515-002	SB10_0.4	EP071: C15 - C28 Fraction	----	100	mg/kg	750	670	10.4	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	840	900	7.32	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES1835427-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	290	310	7.50	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2063964)									
ES1835431-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EW1804933-013	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2063605)									
ES1835515-002	SB10_0.4	EP071: >C16 - C34 Fraction	----	100	mg/kg	1360	1350	0.906	0% - 50%
		EP071: >C34 - C40 Fraction	----	100	mg/kg	540	590	9.64	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES1835427-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	230	240	7.14	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2063964)									
ES1835431-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EW1804933-013	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080: BTEXN (QC Lot: 2063964)									
ES1835431-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
EW1804933-013	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 2068032)								
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	105	80	114
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2063604)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	102	77	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	82.2	72	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	96.4	73	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	78.8	72	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	102	75	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	92.8	77	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	110	73	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	117	74	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	99.6	69	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	103	75	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	96.2	68	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	100	74	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	106	70	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	67.2	61	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	69.8	62	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	67.6	63	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2063605)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	100	75	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	102	77	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	94.3	71	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2063964)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	105	68	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2063605)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	98.3	77	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	101	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	91.6	63	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2063964)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	112	68	128
EP080: BTEXN (QCLot: 2063964)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	102	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	106	67	121

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080: BTEXN (QCLot: 2063964) - continued								
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	103	65	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	103	66	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	105	68	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	97.8	63	119

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EG005T: Total Metals by ICP-AES (QCLot: 2068032)							
ES1835350-001	Anonymous	EG005T: Lead	7439-92-1	250 mg/kg	123	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2063604)							
ES1835427-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	109	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	123	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2063605)							
ES1835427-001	Anonymous	EP071: C10 - C14 Fraction	----	523 mg/kg	104	73	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	117	53	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	129	52	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2063964)							
ES1835431-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	123	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2063605)							
ES1835427-001	Anonymous	EP071: >C10 - C16 Fraction	----	860 mg/kg	110	73	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	122	53	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	113	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2063964)							
ES1835431-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	129	70	130
EP080: BTEXN (QCLot: 2063964)							
ES1835431-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	118	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	109	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	108	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	107	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	110	70	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP080: BTEXN (QCLot: 2063964) - continued							
ES1835431-001	Anonymous	EP080: Naphthalene	91-20-3	2.5 mg/kg	105	70	130

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1835625**	Page	: 1 of 2
Client	: **CAVVANBA CONSULTING**	Laboratory	: Environmental Division Sydney
Contact	: MR BEN WACKETT	Contact	: Brenda Hong
Address	: PO BOX 2191 BYRON BAY NSW 2481	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 6685 7811	Telephone	: +61 2 8784 8555
Project	: 18058	Date Samples Received	: 28-Nov-2018 09:00
Order number	: 18058	Date Analysis Commenced	: 05-Dec-2018
C-O-C number	: ----	Issue Date	: 06-Dec-2018 11:46
Sampler	: GLEN CHISNALL		
Site	: ----		
Quote number	: SYBQ/409/18		
No. of samples received	: 1		
No. of samples analysed	: 1		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)				Client sample ID	**SB12_0.1**	**----**	**----**	**----**	**----**
				Client sampling date / time	08-Nov-2018 00:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*		**ES1835625-001**	**--------**	**--------**	**--------**	**--------**
					Result	----	----	----	----
EP003: Total Organic Carbon (TOC) in Soil									
Total Organic Carbon	----	0.02	%		**5.19**	**----**	**----**	**----**	**----**

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES1835625**	Page	: 1 of 4
Client	: **CAVVANBA CONSULTING**	Laboratory	: Environmental Division Sydney
Contact	: MR BEN WACKETT	Telephone	: +61 2 8784 8555
Project	: 18058	Date Samples Received	: 28-Nov-2018
Site	: ----	Issue Date	: 06-Dec-2018
Sampler	: GLEN CHISNALL	No. of samples received	: 1
Order number	: 18058	No. of samples analysed	: 1

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP003: Total Organic Carbon (TOC) in Soil							
Pulp Bag (EP003)							
SB12_0.1	**08-Nov-2018**	**05-Dec-2018**	06-Dec-2018	✓	**05-Dec-2018**	06-Dec-2018	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Total Organic Carbon	EP003	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Total Organic Carbon	EP003	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Total Organic Carbon	EP003	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Total Organic Carbon	EP003	SOIL	In house C-IR17. Dried and pulverised sample is reacted with acid to remove inorganic Carbonates, then combusted in a LECO furnace in the presence of strong oxidants / catalysts. The evolved (Organic) Carbon (as CO2) is automaticaly measured by infra-red detector.

Preparation Methods	Method	Matrix	Method Descriptions
Dry and Pulverise (up to 100g)	GEO30	SOIL	#

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES1835625**	Page	: 1 of 3
Client	: **CAVVANBA CONSULTING**	Laboratory	: Environmental Division Sydney
Contact	: MR BEN WACKETT	Contact	: Brenda Hong
Address	: PO BOX 2191 BYRON BAY NSW 2481	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 6685 7811	Telephone	: +61 2 8784 8555
Project	: 18058	Date Samples Received	: 28-Nov-2018
Order number	: 18058	Date Analysis Commenced	: 05-Dec-2018
C-O-C number	: ----	Issue Date	: 06-Dec-2018
Sampler	: GLEN CHISNALL		
Site	: ----		
Quote number	: SYBQ/409/18		
No. of samples received	: 1		
No. of samples analysed	: 1		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP003: Total Organic Carbon (TOC) in Soil (QC Lot: 2075497)									
EB1828654-001	Anonymous	EP003: Total Organic Carbon	----	0.02	%	0.13	0.12	11.1	No Limit
EB1828654-013	Anonymous	EP003: Total Organic Carbon	----	0.02	%	0.08	0.07	12.9	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP003: Total Organic Carbon (TOC) in Soil (QCLot: 2075497)								
EP003: Total Organic Carbon	----	0.02	%	<0.02	1.94 %	99.4	70	130

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1834199**	Page	: 1 of 6
Client	: **CAVVANBA CONSULTING**	Laboratory	: Environmental Division Sydney
Contact	: MR BEN WACKETT	Contact	: Brenda Hong
Address	: PO BOX 2191 BYRON BAY NSW 2481	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 6685 7811	Telephone	: +61 2 8784 8555
Project	: 18058	Date Samples Received	: 15-Nov-2018 11:20
Order number	: 18058	Date Analysis Commenced	: 16-Nov-2018
C-O-C number	: ----	Issue Date	: 21-Nov-2018 19:30
Sampler	: Glen Chisnall		
Site	:		
Quote number	: SYBQ/409/18		
No. of samples received	: 6		
No. of samples analysed	: 6		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP080: Sample TRIP SPIKE contains volatile compounds spiked into the sample containers prior to dispatch from the laboratory. BTEX compounds spiked at 20 ug/L.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	MW01	MW02	MW03	QS01	Trip Spike
			Client sampling date / time	13-Nov-2018 00:00	13-Nov-2018 00:00	13-Nov-2018 00:00	13-Nov-2018 00:00	12-Nov-2018 00:00
Compound	CAS Number	LOR	Unit	ES1834199-001	ES1834199-002	ES1834199-003	ES1834199-004	ES1834199-005
				Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	**0.004**	**0.012**	<0.001	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Copper	7440-50-8	0.001	mg/L	**0.001**	<0.001	<0.001	**0.001**	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Zinc	7440-66-6	0.005	mg/L	**0.027**	**0.031**	**0.034**	**0.028**	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	----
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	----
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	----
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	<50	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	MW01	MW02	MW03	QS01	Trip Spike
				Client sampling date / time	13-Nov-2018 00:00	13-Nov-2018 00:00	13-Nov-2018 00:00	13-Nov-2018 00:00	12-Nov-2018 00:00
Compound	CAS Number	LOR	Unit		ES1834199-001	ES1834199-002	ES1834199-003	ES1834199-004	ES1834199-005
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	<20	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L		<20	<20	<20	<20	----
>C10 - C16 Fraction	----	100	µg/L		<100	<100	<100	<100	----
>C16 - C34 Fraction	----	100	µg/L		<100	<100	<100	<100	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	<100	----
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L		<100	<100	<100	<100	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	100	µg/L		<100	<100	<100	<100	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	**15**
Toluene	108-88-3	2	µg/L		<2	<2	<2	<2	**19**
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	**16**
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	**16**
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	**14**
^ **Total Xylenes**	----	2	µg/L		<2	<2	<2	<2	**30**
^ **Sum of BTEX**	----	1	µg/L		<1	<1	<1	<1	**80**
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	<5	**17**
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%		**19.2**	**23.7**	**22.6**	**27.0**	----
2-Chlorophenol-D4	93951-73-6	1.0	%		**70.6**	**48.5**	**53.5**	**65.2**	----
2.4.6-Tribromophenol	118-79-6	1.0	%		**73.6**	**58.1**	**64.8**	**69.4**	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%		**64.1**	**74.6**	**65.5**	**73.5**	----
Anthracene-d10	1719-06-8	1.0	%		**86.2**	**86.2**	**91.6**	**91.7**	----
4-Terphenyl-d14	1718-51-0	1.0	%		**93.8**	**96.1**	**94.6**	**90.2**	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**91.7**	**87.4**	**91.6**	**79.7**	**96.0**
Toluene-D8	2037-26-5	2	%		**97.3**	**95.2**	**101**	**81.2**	**104**
4-Bromofluorobenzene	460-00-4	2	%		**96.1**	**95.9**	**98.5**	**81.1**	**99.8**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	Trip blank	----	----	----	----
			Client sampling date / time	12-Nov-2018 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1834199-006	--------	--------	--------	--------
				Result	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L	<20	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	----	----	----	----
Toluene	108-88-3	2	µg/L	<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----
^ **Total Xylenes**	----	2	µg/L	<2	----	----	----	----
^ **Sum of BTEX**	----	1	µg/L	<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**87.9**	----	----	----	----
Toluene-D8	2037-26-5	2	%	**85.6**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%	**87.9**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2.4.6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES1834199**	Page	: 1 of 5
Client	: **CAVVANBA CONSULTING**	Laboratory	: Environmental Division Sydney
Contact	: MR BEN WACKETT	Telephone	: +61 2 8784 8555
Project	: 18058	Date Samples Received	: 15-Nov-2018
Site	:	Issue Date	: 21-Nov-2018
Sampler	: Glen Chisnall	No. of samples received	: 6
Order number	: 18058	No. of samples analysed	: 6

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
PAH/Phenols (GC/MS - SIM)	0	7	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	11	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
PAH/Phenols (GC/MS - SIM)	0	7	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	11	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / *Container / Client Sample ID(s)*	*Sample Date*	*Extraction / Preparation* Date extracted	Due for extraction	Evaluation	*Analysis* Date analysed	Due for analysis	Evaluation
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)							
MW01, MW02, MW03, QS01	**13-Nov-2018**	**----**	----	----	**20-Nov-2018**	12-May-2019	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F)							
MW01, MW02, MW03, QS01	**13-Nov-2018**	**----**	----	----	**21-Nov-2018**	11-Dec-2018	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM))							
MW01, MW02, MW03, QS01	**13-Nov-2018**	**16-Nov-2018**	20-Nov-2018	✓	**20-Nov-2018**	26-Dec-2018	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
MW01, MW02, MW03, QS01	**13-Nov-2018**	**16-Nov-2018**	20-Nov-2018	✓	**20-Nov-2018**	26-Dec-2018	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
Trip blank	**12-Nov-2018**	**20-Nov-2018**	26-Nov-2018	✓	**20-Nov-2018**	26-Nov-2018	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
MW01, MW02, MW03, QS01	**13-Nov-2018**	**20-Nov-2018**	27-Nov-2018	✓	**20-Nov-2018**	27-Nov-2018	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071)							
MW01, MW02, MW03, QS01	**13-Nov-2018**	**16-Nov-2018**	20-Nov-2018	✓	**20-Nov-2018**	26-Dec-2018	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
Trip blank	**12-Nov-2018**	**20-Nov-2018**	26-Nov-2018	✓	**20-Nov-2018**	26-Nov-2018	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
MW01, MW02, MW03, QS01	**13-Nov-2018**	**20-Nov-2018**	27-Nov-2018	✓	**20-Nov-2018**	27-Nov-2018	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080)							
Trip Spike, Trip blank	**12-Nov-2018**	**20-Nov-2018**	26-Nov-2018	✓	**20-Nov-2018**	26-Nov-2018	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
MW01, MW02, MW03, QS01	**13-Nov-2018**	**20-Nov-2018**	27-Nov-2018	✓	**20-Nov-2018**	27-Nov-2018	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Dissolved Mercury by FIMS	EG035F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	7	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	11	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Dissolved Mercury by FIMS	EG035F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Dissolved Mercury by FIMS	EG035F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Dissolved Mercury by FIMS	EG035F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	7	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	11	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	In house: Referenced to USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES1834199**	Page	: 1 of 6
Client	: **CAVVANBA CONSULTING**	Laboratory	: Environmental Division Sydney
Contact	: MR BEN WACKETT	Contact	: Brenda Hong
Address	: PO BOX 2191 BYRON BAY NSW 2481	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 6685 7811	Telephone	: +61 2 8784 8555
Project	: 18058	Date Samples Received	: 15-Nov-2018
Order number	: 18058	Date Analysis Commenced	: 16-Nov-2018
C-O-C number	: ----	Issue Date	: 21-Nov-2018
Sampler	: Glen Chisnall		
Site	:		
Quote number	: SYBQ/409/18		
No. of samples received	: 6		
No. of samples analysed	: 6		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2045740)									
ES1833935-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
ES1834148-007	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.026	0.025	0.00	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 2045741)									
ES1833935-004	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
ES1834199-002	MW02	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2042149)									
ES1834012-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
ES1834208-002	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2042149)									
ES1834012-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
ES1834208-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080: BTEXN (QC Lot: 2042149)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080: BTEXN (QC Lot: 2042149) - continued									
ES1834012-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
ES1834208-002	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 2045740)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	97.4	85	114
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	95.6	84	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	96.3	85	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	92.8	81	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	93.3	83	111
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	94.1	82	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	94.5	81	117
EG035F: Dissolved Mercury by FIMS (QCLot: 2045741)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	84.1	83	105
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2041653)								
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	69.6	50	94
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	86.6	64	114
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	86.0	62	113
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	91.6	64	115
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	97.5	63	116
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	96.3	64	116
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	98.0	64	118
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	91.3	63	118
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	91.6	64	117
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	93.4	63	116
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	5 µg/L	94.0	62	119
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	88.3	63	115
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	81.0	63	117
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	85.3	60	118
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	78.9	61	117
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	83.2	59	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2041652)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	2000 µg/L	88.2	76	116
EP071: C15 - C28 Fraction	----	100	µg/L	<100	3000 µg/L	97.0	83	109
EP071: C29 - C36 Fraction	----	50	µg/L	<50	2000 µg/L	95.8	75	113
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2042149)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	82.7	75	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2041652)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2041652) - continued								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	2500 µg/L	92.0	76	114
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	3500 µg/L	98.4	81	111
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1500 µg/L	84.4	77	119
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2042149)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	83.1	75	127
EP080: BTEXN (QCLot: 2042149)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	86.4	70	122
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	92.7	69	123
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	89.5	70	120
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	90.9	69	121
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	96.5	72	122
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	98.8	70	120

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EG020F: Dissolved Metals by ICP-MS (QCLot: 2045740)							
ES1833935-003	Anonymous	EG020A-F: Arsenic	7440-38-2	2 mg/L	106	70	130
		EG020A-F: Cadmium	7440-43-9	0.5 mg/L	113	70	130
		EG020A-F: Chromium	7440-47-3	2 mg/L	116	70	130
		EG020A-F: Copper	7440-50-8	2 mg/L	111	70	130
		EG020A-F: Lead	7439-92-1	2 mg/L	114	70	130
		EG020A-F: Nickel	7440-02-0	2 mg/L	109	70	130
		EG020A-F: Zinc	7440-66-6	2 mg/L	113	70	130
EG035F: Dissolved Mercury by FIMS (QCLot: 2045741)							
ES1833935-002	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	82.3	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2042149)							
ES1834012-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	87.7	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2042149)							
ES1834012-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	88.8	70	130
EP080: BTEXN (QCLot: 2042149)							
ES1834012-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	89.2	70	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP080: BTEXN (QCLot: 2042149) - continued							
ES1834012-001	Anonymous	EP080: Toluene	108-88-3	25 µg/L	97.8	70	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	95.2	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	94.1	70	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	98.6	70	130
		EP080: Naphthalene	91-20-3	25 µg/L	92.9	70	130

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES1833933**

Client	: **CAVVANBA CONSULTING**	Laboratory	: Environmental Division Sydney
Contact	: MR BEN WACKETT	Contact	: Brenda Hong
Address	: PO BOX 2191 BYRON BAY NSW 2481	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: ben@cavvanba.com	E-mail	: Brenda.Hong@ALSGlobal.com
Telephone	: +61 02 6685 7811	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 6685 5083	Facsimile	: +61-2-8784 8500
Project	: 18058	Page	: 1 of 4
Order number	: 18058	Quote number	: EB2017CAVCON0001 (EN/222)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: GLEN CHISNALL		

Dates

Date Samples Received	: 13-Nov-2018 11:00	Issue Date	: 14-Nov-2018
Client Requested Due Date	: 20-Nov-2018	Scheduled Reporting Date	: **20-Nov-2018**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 20.5 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 49 / 22

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Sample SB09_0.1 was not received by ALS Sydney.**
- **Extra samples SP09_1.0 and MW01_1.1 received by ALS Sydney. These samples have been placed on hold.**
- **Samples QS02 and QS04 have been forwarded to Envirolab.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Tributyltin analysis to be conducted by ALS Brisbane.
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EP090 (solids) Organotins	SOIL - S-18 (NO MOIST) TRH(C6-C9)/BTEXN with No Moisture for TBs	SOIL - S-26 8 metals/TRH/BTEXN/PAH
ES1833933-001	07-Nov-2018 00:00	MW01_0.1		✓			✓
ES1833933-002	07-Nov-2018 00:00	MW01_0.5	✓				
ES1833933-003	07-Nov-2018 00:00	MW01_1.0	✓				
ES1833933-004	07-Nov-2018 00:00	MW01_1.5	✓				
ES1833933-005	07-Nov-2018 00:00	MW01_2.0	✓				
ES1833933-006	07-Nov-2018 00:00	MW02_0.1		✓			✓
ES1833933-007	07-Nov-2018 00:00	MW02_1.0	✓				
ES1833933-008	07-Nov-2018 00:00	MW03_0.1		✓	✓		✓
ES1833933-009	07-Nov-2018 00:00	MW03_1.8	✓				
ES1833933-010	07-Nov-2018 00:00	SB01_0.1		✓			✓
ES1833933-011	07-Nov-2018 00:00	SB01_1.6	✓				
ES1833933-012	07-Nov-2018 00:00	SB02_0.1		✓	✓		✓
ES1833933-013	07-Nov-2018 00:00	SB02_1.0		✓	✓		✓
ES1833933-014	07-Nov-2018 00:00	SB02_1.7	✓				
ES1833933-015	07-Nov-2018 00:00	SB03_0.1		✓			✓
ES1833933-016	07-Nov-2018 00:00	SB03_1.5	✓				
ES1833933-017	07-Nov-2018 00:00	SB04_0.1		✓			✓
ES1833933-018	07-Nov-2018 00:00	SB04_1.0	✓				
ES1833933-019	07-Nov-2018 00:00	SB05_0.1		✓			✓
ES1833933-020	07-Nov-2018 00:00	SB05_0.5	✓				
ES1833933-021	07-Nov-2018 00:00	SB06_0.1		✓			✓
ES1833933-022	07-Nov-2018 00:00	SB06_0.7	✓				
ES1833933-023	08-Nov-2018 00:00	SB07_0.1	✓				
ES1833933-024	08-Nov-2018 00:00	SB07_1.0		✓			✓
ES1833933-025	08-Nov-2018 00:00	SB07_1.5	✓				
ES1833933-026	08-Nov-2018 00:00	SB07_2.0	✓				
ES1833933-027	08-Nov-2018 00:00	SB08_0.1		✓			✓
ES1833933-028	08-Nov-2018 00:00	SB08_0.5	✓				
ES1833933-030	08-Nov-2018 00:00	SB09_0.5	✓				
ES1833933-031	08-Nov-2018 00:00	SB10_0.1		✓	✓		✓
ES1833933-032	08-Nov-2018 00:00	SB10_0.4	✓				
ES1833933-033	08-Nov-2018 00:00	SB11_0.1		✓	✓		✓
ES1833933-034	08-Nov-2018 00:00	SB11_0.4	✓				
ES1833933-035	08-Nov-2018 00:00	SB12_0.1		✓	✓		✓
ES1833933-036	08-Nov-2018 00:00	SB12_0.4	✓				

			(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EP090 (solids) Organotins	SOIL - S-18 (NO MOIST) TRH(C6-C9)/BTEXN with No Moisture for TBs	SOIL - S-26 8 metals/TRH/BTEXN/PAH
ES1833933-037	08-Nov-2018 00:00	SB13_0.1		✓	✓		✓
ES1833933-038	08-Nov-2018 00:00	SB13_0.4	✓				
ES1833933-039	08-Nov-2018 00:00	SB14_0.1		✓	✓		✓
ES1833933-040	08-Nov-2018 00:00	SB14_0.4	✓				
ES1833933-041	07-Nov-2018 00:00	QS01		✓			✓
ES1833933-042	08-Nov-2018 00:00	QS03		✓			✓
ES1833933-043	05-Nov-2018 00:00	Trip Spike				✓	
ES1833933-044	05-Nov-2018 00:00	Trip blank				✓	
ES1833933-045	08-Nov-2018 00:00	SP01	✓				
ES1833933-046	08-Nov-2018 00:00	SP02	✓				
ES1833933-047	08-Nov-2018 00:00	SP03	✓				
ES1833933-048	05-Nov-2018 00:00	Trip Spike Control				✓	
ES1833933-049	07-Nov-2018 00:00	SB09_1.0	✓				
ES1833933-050	07-Nov-2018 00:00	MW01_1.1	✓				

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

ACCOUNTS PAYABLE		
- A4 - AU Tax Invoice (INV)	Email	inbox@cavvanba.com
BEN WACKETT		
- *AU Certificate of Analysis - NATA (COA)	Email	ben@cavvanba.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	ben@cavvanba.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	ben@cavvanba.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	ben@cavvanba.com
- Chain of Custody (CoC) (COC)	Email	ben@cavvanba.com
- EDI Format - ENMRG (ENMRG)	Email	ben@cavvanba.com
- EDI Format - ESDAT (ESDAT)	Email	ben@cavvanba.com
GLEN CHISNALL		
- *AU Certificate of Analysis - NATA (COA)	Email	glen@cavvanba.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	glen@cavvanba.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	glen@cavvanba.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	glen@cavvanba.com
- Chain of Custody (CoC) (COC)	Email	glen@cavvanba.com
- EDI Format - ENMRG (ENMRG)	Email	glen@cavvanba.com
- EDI Format - ESDAT (ESDAT)	Email	glen@cavvanba.com
ROB MCLELLAND		
- A4 - AU Tax Invoice (INV)	Email	rob@cavvanba.com
ROSS NICOLSON		
- *AU Certificate of Analysis - NATA (COA)	Email	ross@cavvanba.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	ross@cavvanba.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	ross@cavvanba.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	ross@cavvanba.com
- Chain of Custody (CoC) (COC)	Email	ross@cavvanba.com
- EDI Format - ENMRG (ENMRG)	Email	ross@cavvanba.com
- EDI Format - ESDAT (ESDAT)	Email	ross@cavvanba.com

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

☐BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
☐ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com
☐MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com
☐MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
☐NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
☐SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
☐NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com
☐TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com
☐PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com
☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: Cavvanba Consulting	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☒ Standard TAT (List due date):
OFFICE: Byron Bay		☐ Non Standard or urgent TAT (List due date):
PROJECT: 18058	**ALS QUOTE NO.:** BQ EN-222-17	**COC SEQUENCE NUMBER (Circle)**
ORDER NUMBER: 18058		COC: 1 2 3 4 5 6 7
PROJECT MANAGER: Ben Wackett	**CONTACT PH:** 0488 225 692	OF: 1 2 3 4 5 6 7

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:	20.5 °C		
Other comments:			

SAMPLER: Glen Chisnall	**SAMPLER MOBILE:** 0499401092	**RELINQUISHED BY:**	**RECEIVED BY:**
COC emailed to ALS? (YES / NO)	**EDD FORMAT (or default):**	*Glen Chisnall*	
Email Reports to (will default to PM if no other addresses are listed): glen@cavvanba.com, ross@cavvanba.com		DATE/TIME:	DATE/TIME:
Email Invoice to (will default to PM if no other addresses are listed): rob@cavvanba.com		14/11/2018	

RELINQUISHED BY:	**RECEIVED BY:**	
	M L	
DATE/TIME:	DATE/TIME: 15/11/18 11:20am	

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	W-26 (TRH/BTEX N/PAHs/8 Metals)	W-18 (TRHs C6-C9/BTEXN)							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	MW01	13/11/2018	Water	Two vials, one amber, one plastic bottle	4	X								
2	MW02	13/11/2018	Water	Two vials, one amber, one plastic bottle	4	X								
3	MW03	13/11/2018	Water	Two vials, one amber, one plastic bottle	4	X								
4	QS01	13/11/2018	Water	Two vials, one amber, one plastic bottle	4	X								
—	QS02	13/11/2018	Water	Two vials, one amber, one plastic bottle	4	Please forward analysis to envirolab for TRH, BTEXN, PAHs and 8 Metals								
5	Trip spike	12/11/2018	Water	Two vials	2		X							
6	Trip blank	12/11/2018	Water	Two vials	2		X							
				TOTAL										

Environmental Division
Sydney
Work Order Reference
ES1834199

Telephone : + 61-2-8784 8555

Subcon / Terminal Lab / Split WO
Lab / Analyses: QS02 → Envirolab
Organised By / Date:
Relinquished By / Date:
Courier / Courier:
WO No:
Attach By PO / Internal Sheet:

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 205828

Client Details

Client	Cavvanba
Attention	Ben Wackett
Address	PO Box 2191, Byron Bay, NSW, 2481

Sample Details

Your Reference	**18058**
Number of Samples	1 water
Date samples received	16/11/2018
Date completed instructions received	16/11/2018

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	23/11/2018
Date of Issue	21/11/2018

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Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Jaimie Loa-Kum-Cheung, Senior Chemist
Steven Luong, Senior Chemist

Authorised By

Jacinta Hurst, Laboratory Manager

vTRH(C6-C10)/BTEXN in Water		
Our Reference		205828-1
Your Reference	UNITS	QS02
Date Sampled		13/11/2018
Type of sample		water
Date extracted	-	19/11/2018
Date analysed	-	20/11/2018
TRH C_6 - C_9	µg/L	<10
TRH C_6 - C_{10}	µg/L	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Surrogate Dibromofluoromethane	%	97
Surrogate toluene-d8	%	95
Surrogate 4-BFB	%	98

svTRH (C10-C40) in Water		
Our Reference	UNITS	205828-1
Your Reference		QS02
Date Sampled		13/11/2018
Type of sample		water
Date extracted	-	19/11/2018
Date analysed	-	20/11/2018
TRH C_{10} - C_{14}	µg/L	<50
TRH C_{15} - C_{28}	µg/L	<100
TRH C_{29} - C_{36}	µg/L	<100
TRH >C_{10} - C_{16}	µg/L	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50
TRH >C_{16} - C_{34}	µg/L	<100
TRH >C_{34} - C_{40}	µg/L	<100
Surrogate o-Terphenyl	%	108

PAHs in Water		
Our Reference		205828-1
Your Reference	UNITS	QS02
Date Sampled		13/11/2018
Type of sample		water
Date extracted	-	19/11/2018
Date analysed	-	21/11/2018
Naphthalene	µg/L	<1
Acenaphthylene	µg/L	<1
Acenaphthene	µg/L	<1
Fluorene	µg/L	<1
Phenanthrene	µg/L	<1
Anthracene	µg/L	<1
Fluoranthene	µg/L	<1
Pyrene	µg/L	<1
Benzo(a)anthracene	µg/L	<1
Chrysene	µg/L	<1
Benzo(b,j+k)fluoranthene	µg/L	<2
Benzo(a)pyrene	µg/L	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1
Dibenzo(a,h)anthracene	µg/L	<1
Benzo(g,h,i)perylene	µg/L	<1
Benzo(a)pyrene TEQ	µg/L	<5
Total +ve PAH's	µg/L	NIL (+)VE
Surrogate p-Terphenyl-d14	%	86

HM in water - dissolved		
Our Reference		205828-1
Your Reference	UNITS	QS02
Date Sampled		13/11/2018
Type of sample		water
Date prepared	-	19/11/2018
Date analysed	-	19/11/2018
Arsenic-Dissolved	µg/L	<1
Cadmium-Dissolved	µg/L	<0.1
Chromium-Dissolved	µg/L	<1
Copper-Dissolved	µg/L	2
Lead-Dissolved	µg/L	<1
Mercury-Dissolved	µg/L	<0.05
Nickel-Dissolved	µg/L	<1
Zinc-Dissolved	µg/L	37

Method ID	Methodology Summary
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-022	Determination of various metals by ICP-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-013	Water samples are analysed directly by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			19/11/2018	[NT]	[NT]	[NT]	[NT]	19/11/2018	[NT]
Date analysed	-			20/11/2018	[NT]	[NT]	[NT]	[NT]	20/11/2018	[NT]
TRH C_6 - C_9	µg/L	10	Org-016	<10	[NT]	[NT]	[NT]	[NT]	89	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-016	<10	[NT]	[NT]	[NT]	[NT]	89	[NT]
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	84	[NT]
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	86	[NT]
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	91	[NT]
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	92	[NT]
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	91	[NT]
Naphthalene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-016	97	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate toluene-d8	%		Org-016	92	[NT]	[NT]	[NT]	[NT]	98	[NT]
Surrogate 4-BFB	%		Org-016	97	[NT]	[NT]	[NT]	[NT]	100	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	[NT]
Date extracted	-			19/11/2018	[NT]	[NT]	[NT]	[NT]	19/11/2018	[NT]
Date analysed	-			19/11/2018	[NT]	[NT]	[NT]	[NT]	19/11/2018	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	92	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	83	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	104	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	92	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	83	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	104	[NT]
Surrogate o-Terphenyl	%		Org-003	98	[NT]	[NT]	[NT]	[NT]	87	[NT]

QUALITY CONTROL: PAHs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			19/11/2018	[NT]	[NT]	[NT]	[NT]	19/11/2018	[NT]
Date analysed	-			21/11/2018	[NT]	[NT]	[NT]	[NT]	21/11/2018	[NT]
Naphthalene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	65	[NT]
Acenaphthylene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	68	[NT]
Phenanthrene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	72	[NT]
Anthracene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	71	[NT]
Pyrene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	63	[NT]
Benzo(a)anthracene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	69	[NT]
Benzo(b,j+k)fluoranthene	µg/L	2	Org-012	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	72	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	84	[NT]	[NT]	[NT]	[NT]	72	[NT]

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			19/11/2018	[NT]	[NT]	[NT]	[NT]	19/11/2018	[NT]
Date analysed	-			19/11/2018	[NT]	[NT]	[NT]	[NT]	19/11/2018	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	[NT]	[NT]	[NT]	[NT]	95	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

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CERTIFICATE OF ANALYSIS 205703

Client Details

Client	Cavvanba
Attention	Ben Wackett
Address	PO Box 2191, Byron Bay, NSW, 2481

Sample Details

Your Reference	**18058**
Number of Samples	2 soil
Date samples received	15/11/2018
Date completed instructions received	15/11/2018

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	22/11/2018
Date of Issue	19/11/2018

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Results Approved By
Jeremy Faircloth, Organics Supervisor
Long Pham, Team Leader, Metals
Steven Luong, Senior Chemist

Authorised By

Jacinta Hurst, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil			
Our Reference		205703-1	205703-2
Your Reference	UNITS	QS02	QS04
Date Sampled		07/11/2018	07/11/2018
Type of sample		soil	soil
Date extracted	-	16/11/2018	16/11/2018
Date analysed	-	19/11/2018	19/11/2018
TRH C_6 - C_9	mg/kg	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25
Benzene	mg/kg	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1
m+p-xylene	mg/kg	<2	<2
o-Xylene	mg/kg	<1	<1
naphthalene	mg/kg	<1	<1
Total +ve Xylenes	mg/kg	<1	<1
Surrogate aaa-Trifluorotoluene	%	94	94

svTRH (C10-C40) in Soil			
Our Reference		205703-1	205703-2
Your Reference	UNITS	QS02	QS04
Date Sampled		07/11/2018	07/11/2018
Type of sample		soil	soil
Date extracted	-	16/11/2018	16/11/2018
Date analysed	-	17/11/2018	17/11/2018
TRH C_{10} - C_{14}	mg/kg	<50	<50
TRH C_{15} - C_{28}	mg/kg	150	300
TRH C_{29} - C_{36}	mg/kg	190	330
TRH >C_{10} -C_{16}	mg/kg	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50
TRH >C_{16} -C_{34}	mg/kg	300	560
TRH >C_{34} -C_{40}	mg/kg	150	240
Total +ve TRH (>C10-C40)	mg/kg	450	800
Surrogate o-Terphenyl	%	81	88

PAHs in Soil			
Our Reference	UNITS	205703-1	205703-2
Your Reference		QS02	QS04
Date Sampled		07/11/2018	07/11/2018
Type of sample		soil	soil
Date extracted	-	16/11/2018	16/11/2018
Date analysed	-	19/11/2018	19/11/2018
Naphthalene	mg/kg	<0.1	0.3
Acenaphthylene	mg/kg	0.2	1.2
Acenaphthene	mg/kg	<0.1	0.3
Fluorene	mg/kg	<0.1	0.4
Phenanthrene	mg/kg	0.4	8.5
Anthracene	mg/kg	0.4	1.3
Fluoranthene	mg/kg	1.2	17
Pyrene	mg/kg	1.2	16
Benzo(a)anthracene	mg/kg	0.8	9.3
Chrysene	mg/kg	0.7	9.1
Benzo(b,j+k)fluoranthene	mg/kg	1	17
Benzo(a)pyrene	mg/kg	1.0	11
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	5.2
Dibenzo(a,h)anthracene	mg/kg	<0.1	1.3
Benzo(g,h,i)perylene	mg/kg	0.6	6.4
Total +ve PAH's	mg/kg	8.3	100
Benzo(a)pyrene TEQ calc (zero)	mg/kg	1.3	15
Benzo(a)pyrene TEQ calc(half)	mg/kg	1.3	15
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	1.4	15
Surrogate p-Terphenyl-d14	%	104	103

Acid Extractable metals in soil			
Our Reference	UNITS	205703-1	205703-2
Your Reference		QS02	QS04
Date Sampled		07/11/2018	07/11/2018
Type of sample		soil	soil
Date prepared	-	16/11/2018	16/11/2018
Date analysed	-	16/11/2018	16/11/2018
Arsenic	mg/kg	<4	16
Cadmium	mg/kg	1	1
Chromium	mg/kg	22	530
Copper	mg/kg	200	5,900
Lead	mg/kg	190	960
Mercury	mg/kg	0.3	1.2
Nickel	mg/kg	22	760
Zinc	mg/kg	280	2,500

Moisture			
Our Reference		205703-1	205703-2
Your Reference	UNITS	QS02	QS04
Date Sampled		07/11/2018	07/11/2018
Type of sample		soil	soil
Date prepared	-	16/11/2018	16/11/2018
Date analysed	-	19/11/2018	19/11/2018
Moisture	%	18	20

Method ID	Methodology Summary
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

Method ID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			16/11/2018	1	16/11/2018	16/11/2018		16/11/2018	[NT]
Date analysed	-			19/11/2018	1	19/11/2018	19/11/2018		19/11/2018	[NT]
TRH C_6 - C_9	mg/kg	25	Org-016	<25	1	<25	<25	0	102	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-016	<25	1	<25	<25	0	102	[NT]
Benzene	mg/kg	0.2	Org-016	<0.2	1	<0.2	<0.2	0	99	[NT]
Toluene	mg/kg	0.5	Org-016	<0.5	1	<0.5	<0.5	0	99	[NT]
Ethylbenzene	mg/kg	1	Org-016	<1	1	<1	<1	0	105	[NT]
m+p-xylene	mg/kg	2	Org-016	<2	1	<2	<2	0	104	[NT]
o-Xylene	mg/kg	1	Org-016	<1	1	<1	<1	0	104	[NT]
naphthalene	mg/kg	1	Org-014	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	86	1	94	85	10	98	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			16/11/2018	1	16/11/2018	16/11/2018		16/11/2018	[NT]
Date analysed	-			16/11/2018	1	17/11/2018	17/11/2018		16/11/2018	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	1	<50	<50	0	116	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	1	150	140	7	113	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	1	190	240	23	111	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	1	<50	<50	0	116	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	1	300	330	10	113	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	1	150	150	0	111	[NT]
Surrogate o-Terphenyl	%		Org-003	86	1	81	84	4	91	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			16/11/2018	1	16/11/2018	16/11/2018		16/11/2018	[NT]
Date analysed	-			19/11/2018	1	19/11/2018	19/11/2018		19/11/2018	[NT]
Naphthalene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	114	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	1	0.2	0.2	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	119	[NT]
Phenanthrene	mg/kg	0.1	Org-012	<0.1	1	0.4	0.9	77	120	[NT]
Anthracene	mg/kg	0.1	Org-012	<0.1	1	0.4	0.2	67	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	1	1.2	2.3	63	117	[NT]
Pyrene	mg/kg	0.1	Org-012	<0.1	1	1.2	2.3	63	105	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	1	0.8	1.4	55	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	1	0.7	1.2	53	120	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	1	1	2.3	79	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	1	1.0	1.6	46	115	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	1	0.5	0.7	33	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	0.2	67	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	1	0.6	0.9	40	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	101	1	104	103	1	94	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			16/11/2018	1	16/11/2018	16/11/2018		16/11/2018	[NT]
Date analysed	-			16/11/2018	1	16/11/2018	16/11/2018		16/11/2018	[NT]
Arsenic	mg/kg	4	Metals-020	<4	1	<4	<4	0	118	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	1	1	0	110	[NT]
Chromium	mg/kg	1	Metals-020	<1	1	22	23	4	115	[NT]
Copper	mg/kg	1	Metals-020	<1	1	200	210	5	114	[NT]
Lead	mg/kg	1	Metals-020	<1	1	190	220	15	112	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	1	0.3	0.2	40	111	[NT]
Nickel	mg/kg	1	Metals-020	<1	1	22	27	20	114	[NT]
Zinc	mg/kg	1	Metals-020	<1	1	280	330	16	113	[NT]

Result Definitions

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>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
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Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

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Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Report Comments

PAHs in Soil - The RPD for duplicate results is accepted due to the non homogenous nature of the sample/s.

APPENDIX 8: report considered by Council on 21 August 2018

ITEM 14.091/18 PLANNING PROPOSAL – FORMER MACLEAN DEPOT/SES SITE, LOTS 721 & 722 DP1148111, RIVER STREET, MACLEAN

Meeting	Environment, Planning & Community Committee	14 August 2018
Directorate	Environment, Planning & Community	
Reviewed by	Director - Environment, Planning & Community (Des Schroder)	
Attachment	Nil	

SUMMARY

A review of the zoning for the former Maclean depot/SES site in River Street, Maclean has highlighted an historical anomaly that restricts potential future land use options for this site. A planning proposal to rezone the site to a more appropriate zone is proposed, bearing in mind that there will need to be community consultation during the planning proposal process.

OFFICER RECOMMENDATION

That Council:

1. Prepare a planning proposal to rezone Lots 721 and 722 DP1148111, River Street, Maclean from IN4 – Working Waterfront to B2 – Local Centre, under the Clarence Valley Local Environmental Plan 2011.

2. Undertake a detailed site investigation under State Environmental Planning Policy No. 55 (Contaminated Land) as part of the preparation of the planning proposal.

3. Allocate up to $30,000 from the Strategic Building Reserve to fund the costs of the planning proposal including site investigation.

COMMITTEE RECOMMENDATION

Simmons/Ellem

That the Officer Recommendation be adopted.

Voting recorded as follows:
For: Baker, Clancy, Ellem, Simmons, Williamson
Against: Nil

COUNCIL RESOLUTION – 14.091/18

Toms/Ellem

That Council:

1. **Prepare a planning proposal to rezone Lots 721 and 722 DP1148111, River Street, Maclean from IN4 – Working Waterfront to B2 – Local Centre, under the Clarence Valley Local Environmental Plan 2011.**

2. **Undertake a detailed site investigation under State Environmental Planning Policy No. 55 (Contaminated Land) as part of the preparation of the planning proposal.**

3. **Allocate up to $30,000 from the Strategic Building Reserve to fund the costs of the planning proposal including site investigation.**

Voting recorded as follows:
For: **Simmons, Kingsley, Baker, Ellem, Clancy, Novak, Williamson, Lysaught, Toms**
Against: **Nil**

LINKAGE TO OUR COMMUNITY PLAN

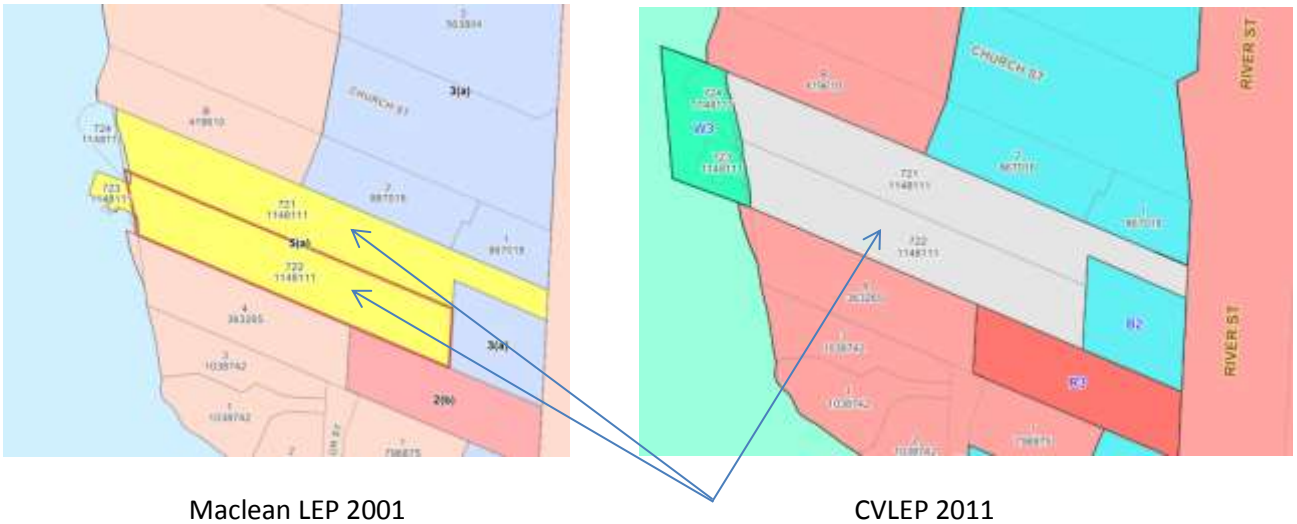
Theme 5 Leadership

Objective 5.1 We will have a strong, accountable and representative Government

Strategy 5.1.4 Ensure transparent and accountable decision making for our community

BACKGROUND

The site of the former Maclean depot (Lots 721 and 722 DP1148111), and now partially occupied by the State Emergency Services, is currently zoned IN4 – Working Waterfront, under the Clarence Valley Local Environmental Plan 2011 (CVLEP). This IN4 zone was adopted during the CVLEP process presumably due to the adjoining slipway and boat ramp facility and reflecting its previous zoning under the Maclean Local Environmental Plan 2001, that being 5(a) Special Uses – Slipway – see below:



Maclean LEP 2001 CVLEP 2011

Subject site

This site was presumed to have been classified as operational land however is now subject to a separate planning proposal to confirm that land classification.

KEY ISSUES

The current zoning effectively only allows marine based industrial uses. Given its location and that the previous slipway use no longer operates, this zoning is now inappropriate and restricts potential beneficial uses of the site. Marine industrial use of the site with commercial and residential zones surrounding is likely to create local amenity conflicts, has difficulties with industrial traffic access etc.

The site is also partially flood prone and Council records indicate that there is known contamination on the site from the previous uses.

In terms of future potential zoning for the site, it is considered that consistency with the adjoining B2 – Local Centre commercial zone is, on balance, the most logical. Whilst residential zones do adjoin the

western portion of the site, this is the area more susceptible to flood. Also, the site contamination is likely to require a high level of rehabilitation to make the site suitable for residential usage (subject to a detailed site assessment).

Notwithstanding, a commercial zone, which is consistent with the adjoining zones to the eastern portion of the site, would still require some site rehabilitation and future uses would still need, at development application stage, to address amenity impacts on adjoining lands. These issues can be explored further during the exhibition of a planning proposal should Council resolve to proceed down this path.

COUNCIL IMPLICATIONS

Budget/Financial
Given the known level of site contamination, a detailed site investigation under State Environmental Planning Policy No. 55 (Contaminated Land) would need to be prepared to support the planning proposal. It is likely that the cost of such a report would be in the order of $25,000. However, as owner of the land, Council ultimately has a responsibility to have the matter addressed at some stage irrespective of whether a change in zoning is contemplated.

Asset Management
N/A

Policy or Regulation
N/A

Consultation
N/A

Legal and Risk Management
N/A

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Attachment	Nil