
PRELIMINARY CONTAMINATION ASSESSMENT

Bangalow Public School Redevelopment

Byron Street, Bangalow NSW

For:
FK Gardener and Sons Pty Ltd (FKG)

By:
ENV Solutions

Date:
May 2021

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Scope of Engagement and Limitations:

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List of Acronyms:

AEC	Area of environmental concern
AHD	Australian height datum
COC	Chain of custody
COPC	Chemical of potential concern
CSM	Conceptual site model
EIL	Ecological investigation level
ESL	Ecological screening level
ENV	ENV Solutions Pty Ltd
HIL	Health investigation level
HSL	Health screening level
NEPC	National Environment Protection Council
NEPM	National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013)
NSW EPA	New South Wales Environment Protection Authority
OCP	Organo-chlorine pesticide
PID	Photo Ionisation Detector
TRH	Total recoverable hydrocarbons
QA/QC	Quality assurance and quality control

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Executive Summary

ENV Solutions has undertaken a Preliminary Contamination Assessment to assist with redevelopment of the Bangalow Public School, situated on Byron Street in Bangalow, NSW (the 'site'). ENV understands this assessment is not for regulatory or development approval purposes; rather, it has been conducted to assist FKG in identifying the potential for contaminated soils to exist in areas where selected buildings will be demolished and new buildings constructed, and therefore soils which may require management during the redevelopment program.

The assessment included an initial desktop assessment to evaluate past land uses and identify potentially contaminating activities which may have occurred on the land. The desktop assessment indicated the land may have been used for historical agricultural purposes (prior to development of the land as a school). Such uses may have involved the application of pesticides and fertilisers to soils. It is also possible that fill material was imported to site to construct the school buildings and associated amenities. Imported fill may contain chemicals, depending on its source(s). Where lead-based paint is applied to exterior building surfaces, it may flake off or the lead may leach out of the paint following rainfall exposure and as the paint weathers; and deposit onto surficial soils around the perimeter of the buildings.

On the basis of this information, and the proposed school redevelopment, a field soil sampling program was completed which included the collection of shallow soil samples from eight (8) discrete sampling locations, as follows:

- One (1) beneath each of three demountable buildings to be demolished.
- Three (3) beneath three additional buildings to be demolished.
- Two (2) within an area where a new building will be constructed.

Each of the samples was collected from surficial soils in the top 0.2 m of the soil profile, beneath and near the edges of buildings. An inspection of the sampling areas was conducted concurrently with sampling, and did not indicate the presence of any visible contamination within or adjacent to the sampling locations.

The samples were dispatched to laboratories accredited by the National Association of Testing Authorities (NATA) for analysis of a metals suite (including lead), and persistent organochlorine pesticides (OCPs) which may be associated with the potentially contaminating activities identified at the site. Laboratory analysis results reported concentrations of metals and OCPs either less than laboratory detection limits, or less than the assessment criteria adopted for sensitive land uses (including schools).

Based on the information presented in this report, and with reference to the risk of potential soil contamination, the investigation areas are considered suitable for ongoing school purposes. The soils sampled in these areas are not considered to pose a health risk to future demolition or construction contractors, or to school users.

1 Introduction

1.1 Overview

ENV Solutions has undertaken a Preliminary Contamination Assessment to assist with redevelopment of the Bangalow Public School, situated on Byron Street in Bangalow, NSW (the 'site'). ENV understands this assessment is not for regulatory or development approval purposes; rather, it has been conducted to assist FKG in identifying the potential for contaminated soils to exist in areas where selected buildings will be demolished and new buildings constructed, and therefore soils which may require management during the redevelopment program.

The site covers an area of approximately 1.22 ha and is situated within the township of Bangalow. The school redevelopment will include removal of selected existing buildings and construction of new buildings and associated hardstand areas. For the purposes of the preliminary contamination assessment, the investigation areas were defined as soils in close proximity to the buildings which will be demolished and soils beneath the area where new buildings will be constructed.

The assessment was conducted in general accordance with the requirements of State Environment Planning Policy No 55 – *Remediation of Land (SEPP 55)* and the NSW EPA (2020) document entitled *Consultants Reporting on Contaminated Land (Contaminated Land Guidelines)*; noting that it is a preliminary assessment only, conducted to assist FKG with planning for the redevelopment program.

1.2 Objective

The primary objective of the preliminary assessment is to assess the potential for contamination to exist in soils within the investigation areas, as defined above. Contamination may exist in these soils as a result of historical or current land uses.

1.3 Scope of Work

The assessment included the following components:

- A review of the site conditions, history and surrounding environment;
- Identification of past and present potentially contaminating activities and chemicals of potential concern;
- An inspection of the site and adjacent areas of land;
- Preparation of a preliminary conceptual site model (CSM) based on the desktop study and site inspection;
- Collection of discrete surface soil samples from the various investigation areas (refer to Figure 2, Appendix A);
- Assessment of the soil analytical results against relevant screening and investigation levels provided in the *National Environment Protection (Assessment of Site Contamination) Measure (NEPM) 1999, as amended 2013* (NEPC, 2013);
- Assessment of the environmental suitability of the investigation areas for the redevelopment; and
- Identification of management measures for soils prior to and during their disturbance, should contamination be identified.

1.4 Technical and Regulatory Framework

The following technical and regulatory framework has been considered in preparing this assessment:

- Contaminated Land Management Act 1997;
- Environmental Planning and Assessment Act 1979;
- *Managing Land Contamination Planning Guidelines SEPP 55 – Remediation of Land* (Department of Urban Affairs and Planning & NSW EPA, 1998);
- *Sampling Design Guidelines* (NSW EPA, 1995);
- *National Environment Protection (Assessment of Site Contamination) Measure (NEPM) 1999, as amended 2013* (NEPC, 2013);
- *Consultants Reporting on Contaminated Land (Contaminated Land Guidelines)* (NSW EPA, 2020);
- *AS 4482.1-2005 Guide to the sampling and investigation of potentially contaminated soil – Non-volatile and semi-volatile compounds* (Standards Australia, 2005); and
- *Regional Policy for the Management of Contaminated Land* (Northern Rivers Regional Councils, 2007).

2 Site Information & Desktop Review

2.1 Site Identification Details

Table 1 provides information pertaining to the site and investigation area, including site identification details, features and surrounding environment. The site location and investigation areas are depicted in Figure 1 and Figure 2, Appendix A.

Table 1: Site Identification Details

Site Address	Byron Street, Bangalow, NSW
Real Property Description	Lot 1 DP 782555
Site Area	1.22 ha (approx.)
Local Government Area	Byron Shire Council (BSC)
Zoning	(BSC LEP, 2014)
Site Features	The site is currently used as a school, and contains several buildings, hardstand areas, carparking areas and recreational areas (oval).
Elevation	The highest elevation is located in the northern portion of the site (53 m Australian Height Datum (AHD)). The general site gradient is from north to south. Site elevation data was retrieved from Google Earth Imagery.
Surrounding Environment	Immediate land use surrounding the site to the north, west and south is zoned B2 (Local Centre). Land to the east is zoned R2 (Low Density Residential).

2.2 Soils

The site is situated within the Ewingsdale (ew) soil landscape. The Ewingsdale soil landscape is described (eSPADE, v2.1) as very low to low undulating hills and rises on Lismore Basalts, with slopes up to 10%. The landscape is extensively cleared closed forest, now generally sod grassland. Soils of the Ewingsdale landscape include deep (100-300 cm), well-drained, red-brown Krasnozems.

2.3 Flooding

The site is not situated in a flood prone area and hence is not subject to any flood planning requirements, as detailed in the BCS LEP (2014).

2.4 Acid Sulfate Soils

The site does not contain soils with any acid sulfate soil (ASS) risk (BSC LEP, 2014).

2.5 Surface Water

Byron Creek is located approximately 140 m east of the site at its closest point, and runs approximately north-south in this part of Bangalow.

2.6 Sensitive Receptors of Soil Contamination

On-site sensitive receptors include future school students, teachers and visitors to the site; as well as sub-surface and construction workers.

Sensitive receptors within 500 m of the site are nearby residents, workers at commercial businesses within the Bangalow township, utility/maintenance/construction workers and aquatic ecosystems associated with Byron Creek (east).

3 Site History

A brief desktop site history review was undertaken to evaluate the chronological history of site occupation and possible sources and locations of contamination. Information used to assist in the desktop site history review was collected and collated from the following sources:

- Review of historic aerial images from 1958, 1991, 1997, 2004 and 2020;
- Protection of Environment Operations Act 1997 (POEO Act) Public Register;
- NSW EPA's Contaminated Land – Record of Notices and Contaminated Land Record; and,
- NSW Department of Primary Industries (DPI) - Cattle dip site locator.

The findings of the desktop site history review are summarised in the following sub-sections.

3.1 Historic Aerial Photographs

Review of four aerial photographs (dated 1958, 1991, 1997, 2004 and 2020) was undertaken to assess changes in land use at the site. Aerial images were accessed through the NSW Historical Imagery Viewer (no date) and through Google Earth imagery. The findings are summarised in Table 2.

Table 2: Summary of Notable Observations from Historic Aerial Images

Photograph Date	Notable Observations
1958	The resolution of this image is poor, but appears to indicate that two large structures are present in the site's south-eastern portion. Other small structures appear to be located in the site's eastern and western portions. The structures are possibly school buildings.
1991	Additional buildings are visible in the site's eastern and northern portions. The central and southern portions appear vacant.
1997	Similar to 1991.
2004	Similar to 1997.
2020	Additional buildings are visible in the western and northern site portions; and the site appears similar to present day.

3.2 POEO Act Public Register Search

The NSW EPA POEO Act Public Register contains information about environment protection licences, licence applications, notices issued under the POEO Act and pollution studies and reduction programs.

The NSW EPA POEO Act Public Register was searched for the Bangalow area on 18 May 2021. No licences were identified for premises within 500 m of the site.

3.3 Contaminated Land Record

The NSW Contaminated Land Record was searched on 18 May 2021 for the Bangalow area. No sites in Bangalow were listed on the Record.

3.4 Contaminated Land – Record of Notices Search

The NSW EPA Contaminated Land Record of Notices was searched on 18 May 2021 for the Bangalow area. One record was listed on the database (NSW EPA, 2021), associated with an old (demolished) cattle dip on Ashton Street (south-east of the site).

3.5 Cattle Dip Site Locator

The NSW DPI's cattle dip site locator was accessed on 18 May 2021. A search of the Bangalow area indicated that there are four (4) former cattle dips in the area. The closest of these is described in Section 3.4 above. The risk of any contamination present at this location impacting on the chemical quality of shallow soils at the subject site is considered to be negligible.

4 Preliminary Conceptual Site Model (CSM)

A preliminary conceptual site model (CSM) pertaining to the site is described in the following sub-sections. The CSM describes potential contaminants that may be present in site soils, based on previous and current land uses, and human and ecological receptors that may be impacted by contaminants in the soils – should they be present.

4.1 Contamination Sources

The site may have been used for historical agricultural purposes (prior to development of the land as a school). Such uses may have involved the application of pesticides and fertilisers to soils.

Persistent chemicals such as organo-chlorine pesticides (OCPs) may have been used since the school was constructed as a means of controlling pests such as termites, by applying them under and around the school buildings.

It is also possible that fill material was imported to site to construct the school buildings and associated amenities. Imported fill may contain chemicals, depending on its source(s).

Where lead-based paint is applied to exterior building surfaces, it may flake off or the lead may leach out of the paint following rainfall exposure and as the paint weathers; and deposit onto surficial soils around the perimeter of the buildings.

4.2 Chemicals of Potential Concern

The identified chemicals of potential concern (COPC), associated with the potential contamination sources above, are:

- OCPs; and
- metals (including arsenic and lead).

4.3 Potentially Affected Environmental Media

Potentially affected environmental media considered for the preliminary assessment were limited to surface soils, to an approximate depth of 0.2 m below ground level (m bgl).

4.4 Potential Exposure Pathways and Receptors of Contamination

Potential exposure pathways for the identified COPC are:

- Incidental ingestion of soil, or intentional ingestion through pica behaviour (school students).
- Dermal absorption of chemicals following skin contact with the soil.
- Inhalation of dust particles.
- Absorption of chemicals once dissolved in surface water (ecological receptors).

Potential receptors of contamination include:

- Future site users – school teachers, students and visitors.
- Terrestrial ecosystems in shallow soils on the site.
- Since dust generation and stormwater run-off have the potential to move COPC off-site, off-site residents, visitors, workers and terrestrial ecosystems are also considered potential receptors of contamination.

5 Assessment Criteria

The assessment criteria adopted for the preliminary investigation are summarised in Table 3 below. The criteria were adopted from the Tier 1 investigation and screening levels outlined in *Schedule B(1) Guideline on Investigation Levels For Soil and Groundwater* (NEPC, 2013) and included:

- Health Investigation Levels (HILs): exposure setting A (HIL A) - Residential with gardens/accessible soil (home grown produce <10% fruit and vegetable intake; no poultry). Includes preschools and primary schools (such as the subject site).
- Ecological Investigation Levels (EILs) for urban residential and public open space. Urban residential/public open space is broadly equivalent to the HIL-A land use scenario (NEPM, 2013). For lead, the added contaminant limit (ACL) was used as the assessment criterion, which assumes a negligible background contribution to lead concentrations. Site-specific EILs were not calculated for this preliminary assessment. For generic EILs, any contamination was assumed to be aged (>2 years).

Table 3: Adopted Assessment Criteria based on HIL-A and EILs outlined in NEPC (2013)

Chemical	HIL A – Residential (mg/kg)	EIL – Urban Residential/Open Space (mg/kg)
Metals and Inorganics		
Arsenic	100	100
Cadmium	20	-
Chromium Cr III	-	-
Chromium (VI)	100	-
Copper	6000	-
Lead	300	1100 (ACL)
Mercury (inorganic)	40	-
Nickel	400	-
Zinc	7400	-
Organochlorine Pesticides		
DDT+DDE+DDD	240	180 (DDT only)
Aldrin	6	-
Chlordane (gamma)	50	-
Chlordane (alpha)	50	-
Dieldrin	6	-
Endosulfan	270	-
Endrin	10	-
Heptachlor	6	-
HCB	10	-
Methoxychlor	300	-
Mirex	10	-
Toxaphene	20	-

6 Methodology

6.1 Sampling Methodology

The site inspection and soil sampling were undertaken by experienced Senior Environmental Scientist, Craig Helbig, on 13 May 2021. The sampling procedure utilised was in accordance with AS4482.1 (2005).

A total of eight (8) soil samples were collected from selected areas of the school grounds. These included:

- Five (5) samples beneath five demountable buildings which will be removed from the school; two (2) were collected from beneath the administration building, owing to its length – total of 5 x samples.
- One (1) from directly adjacent to the slab beneath Building D (to be removed).
- Two (2) from the location of a proposed new building in the site's central western portion (where 3 x demountable buildings will be removed).

Soil samples were collected from the upper soil stratum (0 – 0.20 m BGL) at each location. The approximate sampling locations are depicted in Figure 2, Appendix A. Photographs taken during the sampling program are provided in Appendix B.

At each sample location, soil was loosened with a shovel and samples collected using a fresh pair of disposable nitrile gloves for each discrete sample. Organic matter such as leaves and twigs were removed from the sample prior to collection. All samples were sealed in new glass jars, supplied by the analytical laboratories. Each jar was filled such that it contained no headspace (minimising potential loss of semi-volatile compounds, e.g. OCPs).

Each of the samples were placed immediately into an insulated container chilled with ice and transported to the laboratory for analysis with accompanying chain of custody (COC) documentation. Samples collected were sent to Envirolab Services in Chatswood and Eurofins laboratory in Lane Cove for analysis. Envirolab and Eurofins are accredited by the National Association of Testing Authorities (NATA) for the required analysis.

6.2 Field Quality Assurance/Quality Control (QA/QC) Procedures

The following field quality assurance/quality control (QA/QC) procedures were implemented to ensure that soil samples were as representative as practicable of the actual site conditions:

- All samples were collected in the field by an appropriately qualified Senior Environmental Scientist from ENV.
- Disposable nitrile gloves were used for all discrete sampling events.
- All samples were sealed in new glass jars, supplied by the analytical laboratories. Each jar was filled such that it contained no headspace.
- Each sample was placed into a chilled esky with ice as soon as possible after collection, pending dispatch to the laboratory.
- Two duplicate samples were collected with one primary sample for quality control (QC) purposes, to assess the reproducibility of the analytical results.
- Reusable soil sampling equipment (e.g. shovel) was cleaned by washing with pressurised potable water between sampling locations.
- Field duplicates were collected and analysed in accordance with NEPC (2013) and Australian Standard (2005). Laboratory control samples were analysed as per the

laboratory's requirement according to their NATA certification (refer to laboratory certificate in Appendix C).

7 Laboratory Results

7.1 Primary Analysis Results

Laboratory analytical reports are provided in Appendix C. Tabulated results, with a comparison to the adopted assessment criteria, are provided in Appendix D.

Laboratory analysis results indicate that all metals and OCP concentrations were well-below the adopted assessment criteria at all sample locations.

Since the maximum observed chemical concentrations were less than the adopted assessment criteria, statistical analysis of the dataset was not required.

7.2 Field QA Results

During the soil sampling program, one intra-laboratory duplicate sample (QA1) and one inter-laboratory duplicate sample (QA1A) were collected with primary soil sample S7. Samples QA1 and QA1A were laboratory analysed for the same COPCs as the corresponding primary sample (metals and OCPs).

The ratio of field soil duplicate samples collected was 1 duplicate set per 8 primary soil samples analysed, which achieves the recommendations of 1 duplicate sample per 20 primary samples, or part thereof (NEPC, 2013 and Australian Standard, 2005).

The relative percent difference (RPD) was calculated between the primary sample and each of the corresponding duplicates (inter- and intra-laboratory field duplicates) to assess the reproducibility of the analytical results. RPDs were not calculated where one or both of the duplicate pair concentrations were less than the laboratory limit of reporting (LOR). An acceptable threshold of 50% was adopted for the calculated RPDs. The calculated RPDs are tabulated and presented in Appendix D.

Exceedences of the RPD threshold were noted for several metals. Of these exceptions, each of the reported exceedences were noted to relate to higher concentrations reported by the secondary laboratory, and are therefore likely to be attributable to differences in sample preparation and/or analytical methods. Notwithstanding, the elevated RPDs for these metals do not affect report interpretations because the majority of COPC concentrations were well-below the adopted assessment criteria. Subsequently, all reported laboratory data is considered to be suitable for the purpose of this investigation.

7.3 Laboratory QA Results

The primary analytical laboratory for the soil analyses, Envirolab Sydney, reported the following types of internal QA testing for the soil samples analysed:

- Method blank;
- Internal duplicate; and
- Laboratory (matrix) spike recovery.

A review of the results of the method blank analyses indicated that all concentrations were less than the laboratory LOR. This indicates that the potential for cross-contamination of the samples from reagents, glassware and analytical instruments in the laboratory was acceptably low.

A review of the internal duplicate analyses reported by the laboratory indicated that the calculated RPDs were within the laboratory specified limits (<5 x the LOR – any RPD is acceptable; >5 x LOR – RPD of 0 to 50% is acceptable) for all COPCs. This indicates that the level of internal reproducibility in results achieved by the laboratory was acceptable.

A review of the spike recovery results indicates that all recoveries were within acceptable ranges, as stipulated by the laboratory. This indicates that there is unlikely to be bias introduced to the primary dataset from the analytical testing.

Overall, the results of the quality assurance testing conducted by the analytical laboratories are considered suitable for the assessment and provide a sufficient level of confidence in the primary soil data set for interpretative purposes. No data has been excluded from the soil dataset for interpretation.

8 Discussion and Conclusions

The desktop review and site inspection undertaken by ENV on 13 May 2021 indicate the school may have been developed at the site as early as 1958. Previous site uses prior to this time are likely to have included either agricultural and/or residential land uses.

Subsequently, potential sources of contamination considered for this assessment were limited to metals associated with potential historical fertiliser use and lead paint on existing buildings; and OCPs associated with application beneath and around existing buildings to control termites.

The site inspection did not indicate the presence of any visible contamination within or adjacent to the sampling locations.

A total of 8 primary soil samples were collected from 8 discrete locations beneath and adjacent to buildings which are to be demolished (dismantables) and where a new building is to be constructed. The results reported for all samples were less than the assessment criteria adopted for development and ongoing use of the site for school purposes.

Based on the information presented in this report, and with reference to the risk of potential soil contamination, the investigation areas are considered suitable for ongoing school purposes. The soils sampled in these areas are not considered to pose a health risk to future demolition or construction contractors, or to school users.

9 General Notes

9.1 General

Geotechnical and environmental reports present the results of investigations carried out for a specific project and usually for a specific phase of the project (e.g. preliminary design). The report is based on specific criteria, such as the nature of the project, underground utilities or scope of service limitations imposed by the Client. The report may not be relevant for other phases of the project (e.g. construction), after some time or where project details and clients change.

9.2 Interpretation of Results

The discussion and conclusions in the accompanying report are based on extrapolation/interpolation from data obtained at discrete locations and other external sources and guidelines. The actual interface between the materials may be far more gradual or abrupt than indicated. Also, actual conditions in areas not sampled may differ from those predicted.

The report is based on significant background details that only the authors can be aware of, and therefore implementation of the recommendations by others may lead to misinterpretation and complications. Therefore, this company should be consulted to explain the reports implications to other involved parties.

Reporting relies on interpretation of often limited factual information based on judgment and opinion which has a level of uncertainty and ambiguity attached to it and is far less exact than other design disciplines. This should be considered by users of the report when assessing the implications of the recommendations.

9.3 Change in Conditions

Subsurface conditions can change with time and can vary between test locations. Construction operations at or adjacent to the site and natural events such as floods, earthquakes or groundwater fluctuations can also affect subsurface conditions.

10 References

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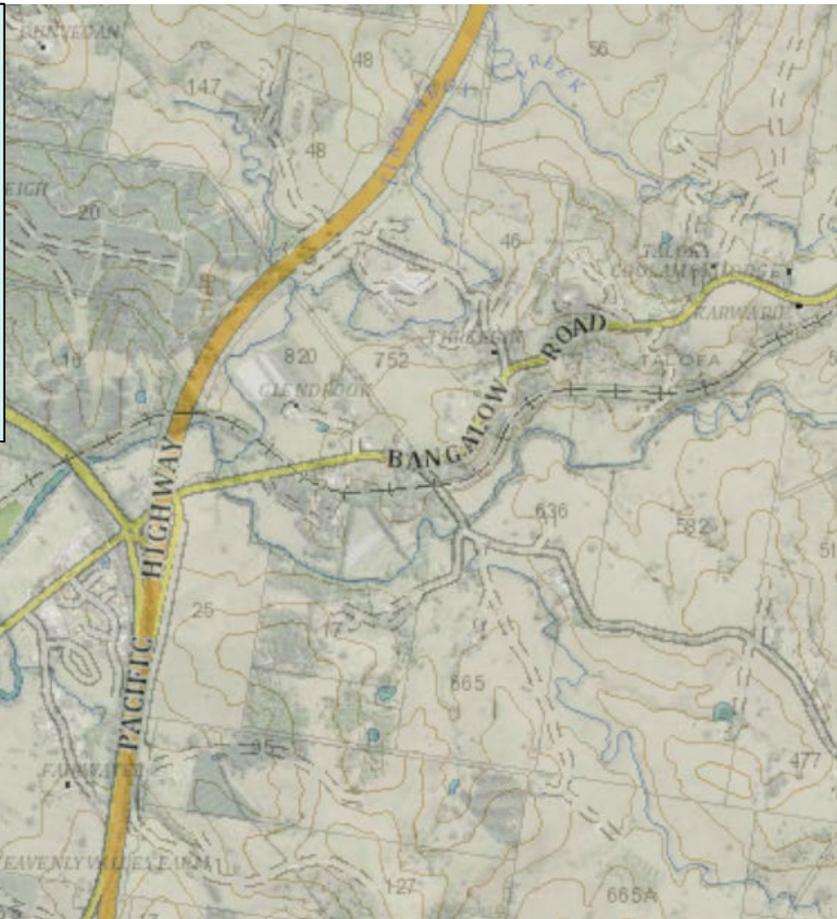
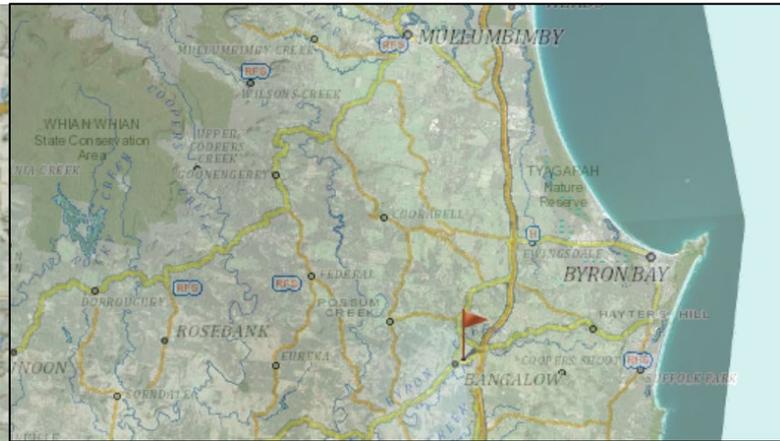
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11 Appendices

Appendix A	Figures
Appendix B	Site Photographs
Appendix C	Laboratory Documentation
Appendix D	Tabulated Analytical Results

Appendix A – Figures



Site Area (approximate)



Figure 1 - Site Location
Bangalow Public School: Byron Road, Bangalow, NSW

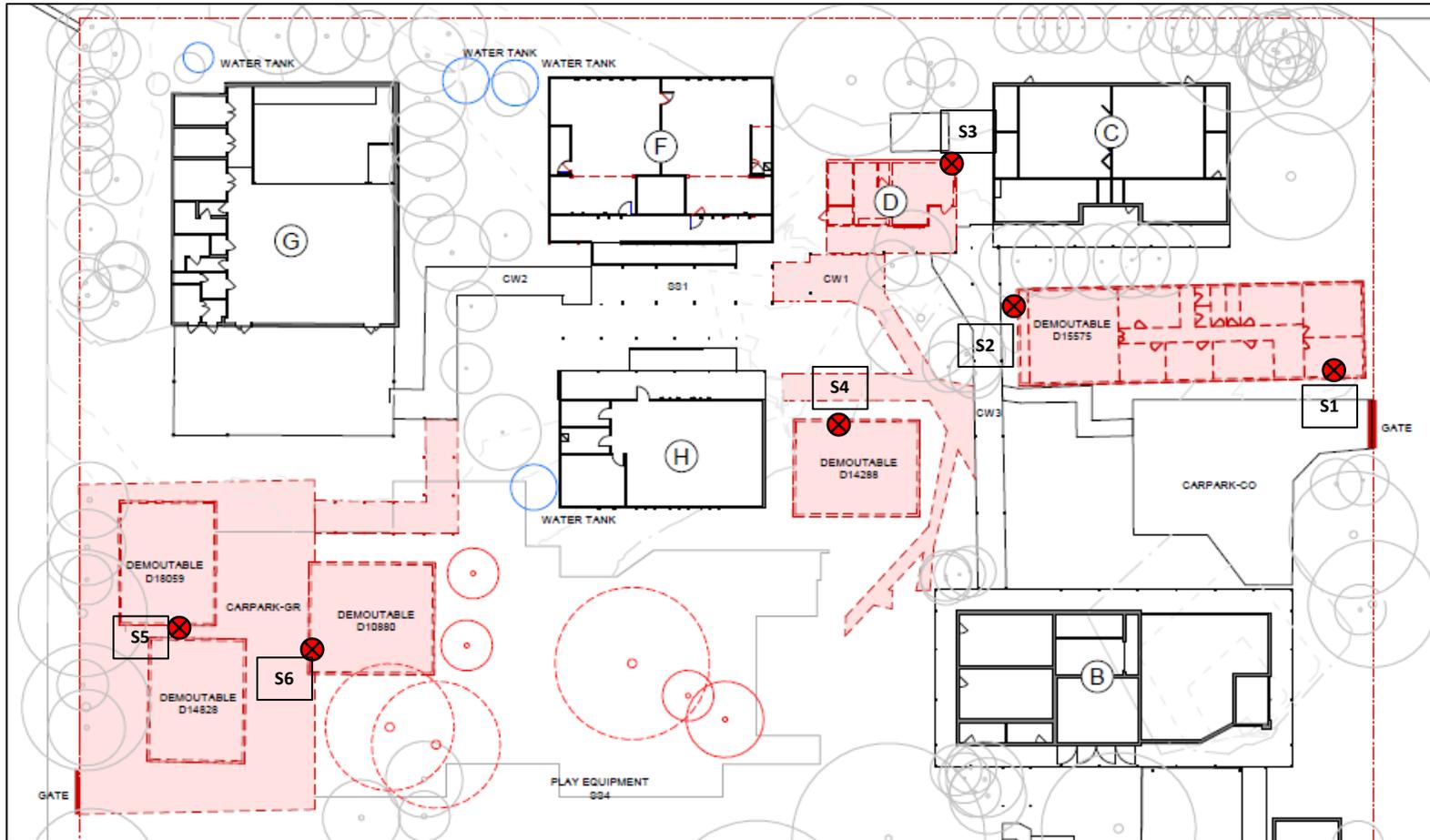
Client: FKG
Project: Preliminary Contamination Assessment
Job No: 21247



Site Area (approximate)



Figure 2 - Sampling Locations (Entire School)
Bangalow Public School: Byron Road, Bangalow, NSW



Building to be Demolished



Sample Location (approximate)

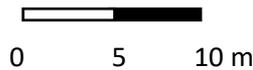
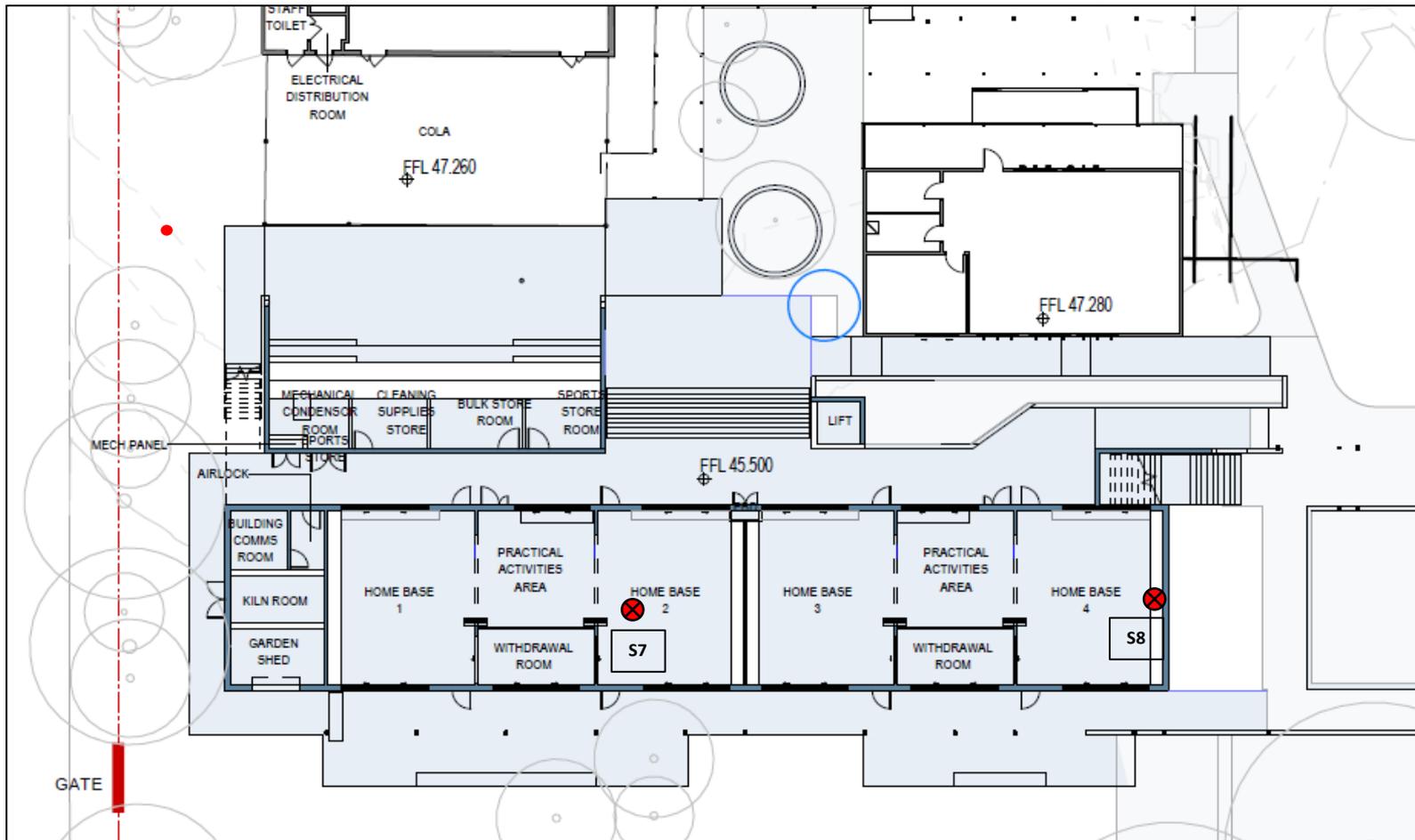


Figure 3 - Sample Locations (Demolition)
Bangalow Public School: Byron Road, Bangalow, NSW

Client: FKG
Project: Preliminary Contamination Assessment
Job No: 21247



Building to be Constructed (shaded blue)



Sample Location (approximate)



Figure 4 - Sample Locations (New Buildings)
 Bangalow Public School: Byron Road, Bangalow, NSW

Appendix B – Photographs

Client Name FKG	Site Location Bangalow Public School – Byron Road, Bangalow, NSW	Project Preliminary Contamination Assessment
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Photo No. 1	Date 13/05/2021	
Description Looking north at the base of the existing administration building (to be demolished). This was the location of sample S1.		

Photo No. 2	Date 13/05/2021	
Description Looking south beneath one of the demountable buildings to be demolished. This was the location of sample S4.		

Client Name FKG	Site Location Bangalow Public School – Byron Road, Bangalow, NSW	Project Preliminary Contamination Assessment
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Photo No. 3	Date 13/05/2021	
Description Looking west between two of three demountable buildings to be demolished in the site's central west portion. Sample S5 was collected from beneath the edge of the building on the right.		

Photo No. 4	Date 13/05/2021	
Description Looking north-west across the area where a new building will be constructed in the site's central portion. Sample S7 was collected from this area.		

Appendix C – Laboratory Documentation



CHAIN OF CUSTODY - Client

ENVIROLAB GROUP - National phone number 1300 42 43 44

Sydney Lab - Envirolab Services
12 Ashley St, Chatswood, NSW 2067
Ph 02 9910 6200 / sydney@envirolab.com.au

Perth Lab - MPL Laboratories
16-18 Hayden Crt Myaree, WA 6154
Ph 08 9317 2505 / lab@mpl.com.au

Melbourne Lab - Envirolab Services
1A Dalmore Drive Scoresby VIC 3179
Ph 03 9763 2500 / melbourne@envirolab.com.au

Brisbane Office - Envirolab Services
20a, 10-20 Depot St, Banyo, QLD 4014
Ph 07 3266 9532 / brisbane@envirolab.com.au

Adelaide Office - Envirolab Services
7a The Parade, Norwood, SA 5067
Ph 0406 350 706 / adelaide@envirolab.com.au

Client: ENV Solutions
Contact Person: Craig Helbig (CAH)
Project Mgr: CAH
Sampler: CAH
Address: 313 River Street, Ballina, NSW, 2478
Mob: 0455 151 426

Client Project Name / Number / Site etc (ie report title):
21247 - Bangalow
PO No.:
Envirolab Quote No. :
Date results required:
Or choose: standard
Note: Inform lab in advance if urgent turnaround is required - surcharges apply
Report format: esdat

Email: craig@envsolutions.com.au

Lab Comments:

Sample information						Tests Required										Comments						
Envirolab Sample ID	Client Sample ID or information	Depth (m)	Date sampled	Type of sample	OCPs and metals																Provide as much information about the sample as you can	
1	S1	0-0.2	13/05/2021	Soil	x																	
2	S2	0-0.2	13/05/2021	Soil	x																	
3	S3	0-0.2	13/05/2021	Soil	x																	
4	S4	0-0.2	13/05/2021	Soil	x																	
5	S5	0-0.2	13/05/2021	Soil	x																	
6	S6	0-0.2	13/05/2021	Soil	x																	
7	S7	0-0.2	13/05/2021	Soil	x																	
8	S8	0-0.2	13/05/2021	Soil	x																	
9	QA1	-	13/05/2021	Soil	x																	
10	QA1A	-	13/05/2021	Soil		Pls forward to Eurofins SYD for analysis of: OCPs and 13 metals																

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 269041
Date Received: 14/5/2021
Time Received: 1030
Received By: S
Temp: Cool Ambient
Cooling: Call pack
Security: Intact/Broken/None

Relinquished by (Company): ENV Solutions
Print Name: Craig Helbig
Date & Time: 13/05/2021
Signature: [Signature]

Received by (Company): Eurofins
Print Name: [Signature]
Date & Time: 14/5/2021 1030
Signature: [Signature]

Lab use only:
Samples Received: Cool Ambient (circle one)
Temperature Received at: 4 (if applicable)
Transported by: Hand delivered / courier

White - Lab copy / Blue - Client copy / Pink - Retain in Book Page No:

SAMPLE RECEIPT ADVICE

Client Details

Client	ENV Solutions Pty Ltd
Attention	Craig helbig

Sample Login Details

Your reference	21247 - Bangalow
Envirolab Reference	269041
Date Sample Received	14/05/2021
Date Instructions Received	14/05/2021
Date Results Expected to be Reported	21/05/2021

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	9 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	4
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie

Phone: 02 9910 6200
Fax: 02 9910 6201
Email: ahie@envirolab.com.au

Jacinta Hurst

Phone: 02 9910 6200
Fax: 02 9910 6201
Email: jhurst@envirolab.com.au

Analysis Underway, details on the following page:



Sample ID	Organochlorine Pesticides in soil	Acid Extractable metals in soil
S1-0-0.2	✓	✓
S2-0-0.2	✓	✓
S3-0-0.2	✓	✓
S4-0-0.2	✓	✓
S5-0-0.2	✓	✓
S6-0-0.2	✓	✓
S7-0-0.2	✓	✓
S8-0-0.2	✓	✓
QA1	✓	✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.

TAT for Micro is dependent on incubation. This varies from 3 to 6 days.



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 269041

Client Details

Client	ENV Solutions Pty Ltd
Attention	Craig helbig
Address	313 River St, Ballina, NSW, 2478

Sample Details

Your Reference	<u>21247 - Bangalow</u>
Number of Samples	9 Soil
Date samples received	14/05/2021
Date completed instructions received	14/05/2021

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 21/05/2021

Date of Issue 21/05/2021

NATA Accreditation Number 2901. This document shall not be reproduced except in full.

Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By

Dragana Tomas, Senior Chemist

Hannah Nguyen, Senior Chemist

Manju Dewendrage, Chemist

Authorised By

Nancy Zhang, Laboratory Manager

Client Reference: 21247 - Bangalow

Organochlorine Pesticides in soil						
Our Reference		269041-1	269041-2	269041-3	269041-4	269041-5
Your Reference	UNITS	S1	S2	S3	S4	S5
Depth		0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
Date Sampled		13/05/2021	13/05/2021	13/05/2021	13/05/2021	13/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	17/05/2021	17/05/2021	17/05/2021	17/05/2021	17/05/2021
Date analysed	-	17/05/2021	17/05/2021	17/05/2021	17/05/2021	17/05/2021
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	105	108	108	99	99

Organochlorine Pesticides in soil					
Our Reference		269041-6	269041-7	269041-8	269041-9
Your Reference	UNITS	S6	S7	S8	QA1
Depth		0-0.2	0-0.2	0-0.2	-
Date Sampled		13/05/2021	13/05/2021	13/05/2021	13/05/2021
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	17/05/2021	17/05/2021	17/05/2021	17/05/2021
Date analysed	-	17/05/2021	17/05/2021	17/05/2021	17/05/2021
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	104	104	108	105

Client Reference: 21247 - Bangalow

Acid Extractable metals in soil						
Our Reference		269041-1	269041-2	269041-3	269041-4	269041-5
Your Reference	UNITS	S1	S2	S3	S4	S5
Depth		0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
Date Sampled		13/05/2021	13/05/2021	13/05/2021	13/05/2021	13/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/05/2021	20/05/2021	20/05/2021	20/05/2021	20/05/2021
Date analysed	-	20/05/2021	20/05/2021	20/05/2021	20/05/2021	20/05/2021
Arsenic	mg/kg	<4	4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	56	52	52	9	36
Copper	mg/kg	36	16	17	11	12
Lead	mg/kg	46	13	27	20	11
Mercury	mg/kg	0.1	<0.1	<0.1	<0.1	0.1
Nickel	mg/kg	10	14	12	5	10
Zinc	mg/kg	70	64	90	110	39

Acid Extractable metals in soil					
Our Reference		269041-6	269041-7	269041-8	269041-9
Your Reference	UNITS	S6	S7	S8	QA1
Depth		0-0.2	0-0.2	0-0.2	-
Date Sampled		13/05/2021	13/05/2021	13/05/2021	13/05/2021
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	20/05/2021	20/05/2021	20/05/2021	20/05/2021
Date analysed	-	20/05/2021	20/05/2021	20/05/2021	20/05/2021
Arsenic	mg/kg	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	41	59	40	62
Copper	mg/kg	4,400	8	11	8
Lead	mg/kg	17	10	18	9
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	10	8	9	8
Zinc	mg/kg	56	35	42	32

Client Reference: 21247 - Bangalow

Moisture						
Our Reference		269041-1	269041-2	269041-3	269041-4	269041-5
Your Reference	UNITS	S1	S2	S3	S4	S5
Depth		0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
Date Sampled		13/05/2021	13/05/2021	13/05/2021	13/05/2021	13/05/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	17/05/2021	17/05/2021	17/05/2021	17/05/2021	17/05/2021
Date analysed	-	18/05/2021	18/05/2021	18/05/2021	18/05/2021	18/05/2021
Moisture	%	22	23	21	6.1	14

Moisture					
Our Reference		269041-6	269041-7	269041-8	269041-9
Your Reference	UNITS	S6	S7	S8	QA1
Depth		0-0.2	0-0.2	0-0.2	-
Date Sampled		13/05/2021	13/05/2021	13/05/2021	13/05/2021
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	17/05/2021	17/05/2021	17/05/2021	17/05/2021
Date analysed	-	18/05/2021	18/05/2021	18/05/2021	18/05/2021
Moisture	%	18	22	30	24

Client Reference: 21247 - Bangalow

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-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.

Client Reference: 21247 - Bangalow

QUALITY CONTROL: Organochlorine Pesticides in soil				Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	[NT]
Date extracted	-			17/05/2021	1	17/05/2021	17/05/2021		17/05/2021	[NT]
Date analysed	-			17/05/2021	1	17/05/2021	17/05/2021		17/05/2021	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	99	[NT]
HCB	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	94	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	93	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	106	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	103	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	108	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	103	[NT]
Endrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	88	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	86	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	88	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	103	1	105	106	1	101	[NT]

Client Reference: 21247 - Bangalov

QUALITY CONTROL: Acid Extractable metals in soil				Duplicate			Spike Recovery %			
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	[NT]
Date prepared	-			20/05/2021	1	20/05/2021	20/05/2021		20/05/2021	[NT]
Date analysed	-			20/05/2021	1	20/05/2021	20/05/2021		20/05/2021	[NT]
Arsenic	mg/kg	4	Metals-020	<4	1	<4	<4	0	95	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	96	[NT]
Chromium	mg/kg	1	Metals-020	<1	1	56	51	9	101	[NT]
Copper	mg/kg	1	Metals-020	<1	1	36	35	3	98	[NT]
Lead	mg/kg	1	Metals-020	<1	1	46	45	2	100	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	1	0.1	0.1	0	98	[NT]
Nickel	mg/kg	1	Metals-020	<1	1	10	10	0	97	[NT]
Zinc	mg/kg	1	Metals-020	<1	1	70	66	6	99	[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.	
The recommended maximums for analytes in urine are taken from "2018 TLVs and BEIs", as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.	
Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2	

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 (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.



CHAIN OF CUSTODY - Client

ENVIROLAB GROUP - National phone number 1300 42 43 44

Sydney Lab - Envirolab Services
12 Ashley St, Chatswood, NSW 2067
Ph 02 9910 6200 / sydney@envirolab.com.au

Perth Lab - MPL Laboratories
16-18 Hayden Crt Myaree, WA 6154
Ph 08 9317 2505 / lab@mpl.com.au

Melbourne Lab - Envirolab Services
1A Dalmore Drive Scoresby VIC 3179
Ph 03 9763 2500 / melbourne@envirolab.com.au

Brisbane Office - Envirolab Services
20a, 10-20 Depot St, Banyo, QLD 4014
Ph 07 3266 9532 / brisbane@envirolab.com.au

Adelaide Office - Envirolab Services
7a The Parade, Norwood, SA 5067
Ph 0406 350 706 / adelaide@envirolab.com.au

Client: ENV Solutions
Contact Person: Craig Helbig (CAH)
Project Mgr: CAH
Sampler: CAH
Address: 313 River Street, Ballina, NSW, 2478

Client Project Name / Number / Site etc (ie report title):

21247 - Bangalow

PO No.:

Envirolab Quote No. :

Date results required:

Or choose: standard

Note: Inform lab in advance if urgent turnaround is required - surcharges apply

Report format: esdat

Lab Comments:

Mob: 0455 151 426

craig@envsolutions.com.au

Email:

Sample information

Tests Required

Comments

Envirolab Sample ID	Client Sample ID or information	Depth (m)	Date sampled	Type of sample	OCPs and metals															Provide as much information about the sample as you can
	S1	0-0.2	13/05/2021	Soil	x															
1	S2	0-0.2	13/05/2021	Soil	x															
2	S3	0-0.2	13/05/2021	Soil	x															
3	S4	0-0.2	13/05/2021	Soil	x															
4	S5	0-0.2	13/05/2021	Soil	x															
5	S6	0-0.2	13/05/2021	Soil	x															
6	S7	0-0.2	13/05/2021	Soil	x															
7	S8	0-0.2	13/05/2021	Soil	x															
8	QA1	-	13/05/2021	Soil	x															
9	QA1A	-	13/05/2021	Soil	x															
1						Pls forward to Eurofins SYD for analysis of: OCPs and 13 metals														



Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 269041
Date Received: 14/5/2021
Time Received: 1030
Received By: [Signature]
Temp: Cool/Ambient
Cooling: Ice/No pack
Security: Intact/Broken

Relinquished by (Company): ENV Solutions / ELS Sydney
Print Name: Craig Helbig / C. Mullen
Date & Time: 13/05/2021 / 14/5/2021 1230
Signature: [Signature] / [Signature]

Received by (Company): Eurofins
Print Name: [Signature]
Date & Time: 14/5/2021 1030
Signature: [Signature]

Lab use only:
Samples Received: Cool or Ambient (circle one)
Temperature Received at: 4 (if applicable)
Transported by: Hand delivered / courier

White - Lab copy / Blue - Client copy / Pink - Retain in Book Page No:

Eurofins NE 14/5/2021 2:40PM 13.2 795546

Australia

Melbourne

6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney

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Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane

1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth

46-48 Banksia Road
Welshpool WA 6106
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Newcastle

4/52 Industrial Drive
Mayfield East NSW 2304
PO Box 60 Wickham 2293
Phone : +61 2 4968 8448
NATA # 1261 Site # 25079

New Zealand

Auckland

35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch

43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Sample Receipt Advice

Company name: ENV Solutions Pty Ltd
Contact name: Craig Helbig
Project name: BANGALOW
Project ID: 21247
Turnaround time: 5 Day
Date/Time received: May 14, 2021 2:40 PM
Eurofins reference: 795546

Sample Information

- ✓ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ✓ All samples have been received as described on the above COC.
- ✓ COC has been completed correctly.
- ✓ Attempt to chill was evident.
- ✓ Appropriately preserved sample containers have been used.
- ✓ All samples were received in good condition.
- ✓ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ✓ Appropriate sample containers have been used.
- ✓ Sample containers for volatile analysis received with zero headspace.
- ✗ Split sample sent to requested external lab.
- ✗ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Elvis Dsouza on phone : or by email: ElvisDsouza@eurofins.com

Results will be delivered electronically via email to Craig Helbig - craig@envsolutions.com.au.

Note: A copy of these results will also be delivered to the general ENV Solutions Pty Ltd email address.

ENV Solutions Pty Ltd
1/35 North Creek Road
Ballina
NSW 2478



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition
Arrangement for the mutual recognition of the
equivalence of testing, medical testing, calibration,
inspection and proficiency testing scheme providers
reports.

Attention: **Craig Helbig**

Report **795546-S**
Project name **BANGALOW**
Project ID **21247**
Received Date **May 14, 2021**

Client Sample ID			QA1A
Sample Matrix			Soil
Eurofins Sample No.			S21-My30323
Date Sampled			May 13, 2021
Test/Reference	LOR	Unit	
Organochlorine Pesticides			
Chlordanes - Total	0.1	mg/kg	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05
a-BHC	0.05	mg/kg	< 0.05
Aldrin	0.05	mg/kg	< 0.05
b-BHC	0.05	mg/kg	< 0.05
d-BHC	0.05	mg/kg	< 0.05
Dieldrin	0.05	mg/kg	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05
Endrin	0.05	mg/kg	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05
Heptachlor	0.05	mg/kg	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2
Toxaphene	0.1	mg/kg	< 0.1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2
Dibutylchloroendate (surr.)	1	%	114
Tetrachloro-m-xylene (surr.)	1	%	103
Chromium (hexavalent)			
	1	mg/kg	< 1
% Moisture			
	1	%	25
Heavy Metals			
Arsenic	2	mg/kg	4.8
Beryllium	2	mg/kg	< 2
Boron	10	mg/kg	< 10
Cadmium	0.4	mg/kg	< 0.4

Client Sample ID			QA1A
Sample Matrix			Soil
Eurofins Sample No.			S21-My30323
Date Sampled			May 13, 2021
Test/Reference	LOR	Unit	
Heavy Metals			
Cobalt	5	mg/kg	6.6
Copper	5	mg/kg	15
Lead	5	mg/kg	22
Manganese	5	mg/kg	320
Mercury	0.1	mg/kg	< 0.1
Nickel	5	mg/kg	29
Selenium	2	mg/kg	< 2
Zinc	5	mg/kg	81

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Organochlorine Pesticides - Method: LTM-ORG-2220 OCP & PCB in Soil and Water	Sydney	May 18, 2021	14 Days
Chromium (hexavalent) - Method: In-house method E057.2	Sydney	May 18, 2021	28 Days
Heavy Metals - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Sydney	May 18, 2021	180 Days
% Moisture - Method: LTM-GEN-7080 Moisture	Sydney	May 17, 2021	14 Days

Australia

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Site # 1254 & 14271

Sydney
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Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
46-48 Banksia Road
Welshpool WA 6106
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

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Mayfield East NSW 2304
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Phone : +61 2 4968 8448
NATA # 1261 Site # 25079

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Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Company Name:	ENV Solutions Pty Ltd	Order No.:		Received:	May 14, 2021 2:40 PM
Address:	1/35 North Creek Road Ballina NSW 2478	Report #:	795546	Due:	May 21, 2021
Project Name:	BANGALOW	Phone:	0421 519 354	Priority:	5 Day
Project ID:	21247	Fax:		Contact Name:	Craig Helbig
Eurofins Analytical Services Manager : Elvis Dsouza					

Sample Detail						Organochlorine Pesticides	NEPM 2013 Metals : Metals M13	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
Mayfield Laboratory - NATA Site # 25079								
External Laboratory								
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID			
1	QA1A	May 13, 2021		Soil	S21-My30323	X	X	X
Test Counts						1	1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 0.1			0.1	Pass	
Method Blank							
Chromium (hexavalent)	mg/kg	< 1			1	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Beryllium	mg/kg	< 2			2	Pass	
Boron	mg/kg	< 10			10	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Cobalt	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Manganese	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Selenium	mg/kg	< 2			2	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	71			70-130	Pass	
4.4'-DDD	%	78			70-130	Pass	
4.4'-DDE	%	82			70-130	Pass	
4.4'-DDT	%	72			70-130	Pass	
a-BHC	%	91			70-130	Pass	
Aldrin	%	71			70-130	Pass	
b-BHC	%	124			70-130	Pass	
d-BHC	%	87			70-130	Pass	
Dieldrin	%	88			70-130	Pass	
Endosulfan I	%	81			70-130	Pass	
Endosulfan II	%	88			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code	
Endosulfan sulphate	%	88			70-130	Pass		
Endrin	%	79			70-130	Pass		
Endrin aldehyde	%	85			70-130	Pass		
Endrin ketone	%	83			70-130	Pass		
g-BHC (Lindane)	%	99			70-130	Pass		
Heptachlor	%	74			70-130	Pass		
Heptachlor epoxide	%	86			70-130	Pass		
Hexachlorobenzene	%	73			70-130	Pass		
Methoxychlor	%	72			70-130	Pass		
LCS - % Recovery								
Chromium (hexavalent)	%	105			70-130	Pass		
LCS - % Recovery								
Heavy Metals								
Arsenic	%	108			80-120	Pass		
Beryllium	%	100			80-120	Pass		
Boron	%	109			80-120	Pass		
Cadmium	%	108			80-120	Pass		
Cobalt	%	106			80-120	Pass		
Copper	%	108			80-120	Pass		
Lead	%	107			80-120	Pass		
Manganese	%	109			80-120	Pass		
Mercury	%	111			80-120	Pass		
Nickel	%	109			80-120	Pass		
Selenium	%	101			80-120	Pass		
Zinc	%	105			80-120	Pass		
Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery								
Heavy Metals								
				Result 1				
Arsenic	N21-My32626	NCP	%	94		75-125	Pass	
Beryllium	N21-My32626	NCP	%	86		75-125	Pass	
Boron	N21-My32626	NCP	%	87		75-125	Pass	
Cadmium	N21-My32626	NCP	%	100		75-125	Pass	
Cobalt	N21-My32626	NCP	%	94		75-125	Pass	
Copper	N21-My32626	NCP	%	97		75-125	Pass	
Lead	N21-My32626	NCP	%	101		75-125	Pass	
Manganese	N21-My32626	NCP	%	97		75-125	Pass	
Mercury	N21-My32626	NCP	%	103		75-125	Pass	
Nickel	N21-My32626	NCP	%	97		75-125	Pass	
Selenium	N21-My32626	NCP	%	99		75-125	Pass	
Zinc	N21-My32626	NCP	%	79		75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Duplicate								
Organochlorine Pesticides								
				Result 1	Result 2	RPD		
Chlordanes - Total	S21-My41063	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
4,4'-DDD	S21-My41063	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
4,4'-DDE	S21-My41063	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
4,4'-DDT	S21-My41063	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
a-BHC	S21-My41063	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Aldrin	S21-My41063	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
b-BHC	S21-My41063	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
d-BHC	S21-My41063	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Dieldrin	S21-My41063	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan I	S21-My41063	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Endosulfan II	S21-My41063	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S21-My41063	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S21-My41063	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S21-My41063	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S21-My41063	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S21-My41063	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S21-My41063	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S21-My41063	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S21-My41063	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S21-My41063	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Chromium (hexavalent)	S21-My36126	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
% Moisture	S21-My30186	NCP	%	10	10	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S21-My25435	NCP	mg/kg	4.4	7.7	54	30%	Fail	Q15
Beryllium	S21-My25435	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Boron	S21-My25435	NCP	mg/kg	< 10	< 10	<1	30%	Pass	
Cadmium	S21-My25435	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Cobalt	S21-My25435	NCP	mg/kg	12	36	100	30%	Fail	Q15
Copper	S21-My25435	NCP	mg/kg	140	200	34	30%	Fail	Q02
Lead	S21-My25435	NCP	mg/kg	73	320	130	30%	Fail	Q02
Manganese	S21-My25435	NCP	mg/kg	900	1100	21	30%	Pass	
Mercury	S21-My25435	NCP	mg/kg	0.3	0.1	87	30%	Fail	Q15
Nickel	S21-My25435	NCP	mg/kg	7.6	11	37	30%	Fail	Q15
Selenium	S21-My25435	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Zinc	S21-My25435	NCP	mg/kg	79	110	35	30%	Fail	Q02

Comments
Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
Q02	The duplicate %RPD is outside the recommended acceptance criteria. Further analysis indicates sample heterogeneity as the cause
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised by:

Elvis Dsouza	Analytical Services Manager
Andrew Sullivan	Senior Analyst-Organic (NSW)
Charl Du Preez	Senior Analyst-Inorganic (NSW)
John Nguyen	Senior Analyst-Metal (NSW)



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

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Appendix D – Tabulated Analytical Results

Table 1 - Laboratory Analysis Results: Soil Samples

	Metals								NA	Halogenated Benzenes	Organochlorine Pesticides (OCPs)								
	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	Moisture Content	Hexachlorobenzene	4,4-DDE	a-BHC	Aldrin	b-BHC	Chlordane (cis)	Chlordane (trans)	d-BHC		
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		
EQL	4	0.4	1	1	1	0.1	1	1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1		
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space	100				1100*														
NEPM 2013 Table 1A(1) HILs Res A Soil	100	20		6,000	300	40	400	7,400		10									
Lab Report Number	Field ID	Date	Depth (m)																
269041	QA1	13/05/2021		<4	<0.4	62	8	9	<0.1	8	32	24	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
269041	S1	13/05/2021	0 - 0.2	<4	<0.4	56	36	46	0.1	10	70	22	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
269041	S2	13/05/2021	0 - 0.2	4	<0.4	52	16	13	<0.1	14	64	23	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
269041	S3	13/05/2021	0 - 0.2	<4	<0.4	52	17	27	<0.1	12	90	21	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
269041	S4	13/05/2021	0 - 0.2	<4	<0.4	9	11	20	<0.1	5	110	6.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
269041	S5	13/05/2021	0 - 0.2	<4	<0.4	36	12	11	0.1	10	39	14	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
269041	S6	13/05/2021	0 - 0.2	<4	<0.4	41	4,400	17	<0.1	10	56	18	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
269041	S7	13/05/2021	0 - 0.2	<4	<0.4	59	8	10	<0.1	8	35	22	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
269041	S8	13/05/2021	0 - 0.2	<4	<0.4	40	11	18	<0.1	9	42	30	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Notes and Abbreviations:

*EIL presented is the added contaminant limit (ACL) - assumes a negligible background contribution.

NEPM - National Environmental Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013).

HIL - Health Investigation Level; EIL - Ecological Investigation Level

mg/kg- milligrams per kilogram

Table 1 - Laboratory Analysis Results: Soil Samples

				Organochlorine Pesticides (OCPs)													
				DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	γ-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Methoxychlor	
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
EQL				0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space					180												
NEPM 2013 Table 1A(1) HILs Res A Soil						240					10			6		300	
Lab Report Number	Field ID	Date	Depth (m)	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	γ-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Methoxychlor	
269041	QA1	13/05/2021		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
269041	S1	13/05/2021	0 - 0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
269041	S2	13/05/2021	0 - 0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
269041	S3	13/05/2021	0 - 0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
269041	S4	13/05/2021	0 - 0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
269041	S5	13/05/2021	0 - 0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
269041	S6	13/05/2021	0 - 0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
269041	S7	13/05/2021	0 - 0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
269041	S8	13/05/2021	0 - 0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	

Notes and Abbreviations:

*EIL presented is the added contaminant limit (ACL) - assumes a negligible background contribution.

NEPM - National Environmental Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013).

HIL - Health Investigation Level; EIL - Ecological Investigation Level

mg/kg- milligrams per kilogram

Table 2: Calculated Relative Percent Difference (RPD) Results

				Metals								NA	Halogenated Benzenes	Organochlorine Pesticides (OCPs)						
				Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	Moisture Content	Hexachlorobenzene	4,4-DDE	a-BHC	Aldrin	b-BHC	Chlordane (cis)	Chlordane (trans)	d-BHC
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				4	0.4	1	1	1	0.1	1	1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Lab Report Number	Field ID	Date	Matrix Type	<4	<0.4	59	8	10	<0.1	8	35	22	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
269041	S7	13/05/2021	soil	<4	<0.4	62	8	9	<0.1	8	32	24	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
269041	QA1	13/05/2021	soil	NA	NA	5	0	11	NA	0	9	9	NA	NA	NA	NA	NA	NA	NA	
RPD				NA	NA	5	0	11	NA	0	9	9	NA	NA	NA	NA	NA	NA	NA	
269041	S7	13/05/2021	soil	<4	<0.4	59	8	10	<0.1	8	35	22	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Inter-lab duplicate	QA1A	13/05/2021	soil	4.8	<0.4	-	15	22	<0.1	29	81	25	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
RPD				NA	NA	NA	61	75	NA	114	79	13	NA	NA	NA	NA	NA	NA	NA	

Notes/Abbreviations:

RPD - Relative Percent Difference

NA - RPD not calculated (one or both concentrations <LOR)

RPDs > acceptable threshold of 50% are shaded in grey and bolded

mg/kg - milligrams per kilogram

<LOR - less than limit of reporting (LOR)

Table 2: Calculated Relative Percent Difference (RPD) Results

				Organochlorine Pesticides (OCPs)												
				DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	γ-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Methoxychlor
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Lab Report Number	Field ID	Date	Matrix Type													
269041	S7	13/05/2021	soil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
269041	QA1	13/05/2021	soil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
RPD				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
269041	S7	13/05/2021	soil	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Inter-lab duplicate	QA1A	13/05/2021	soil	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
RPD				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes/Abbreviations:

RPD - Relative Percent Difference

NA - RPD not calculated (one or both concentrations <LOR)

RPDs > acceptable threshold of 50% are shaded in grey and bolded

mg/kg - milligrams per kilogram

<LOR - less than limit of reporting (LOR)