

APPENDIX 8

January 2026

Wingham Urban Release Area 1



CONTAMINATION - DETAILED SITE INVESTIGATION

MPT Farms Pty Ltd

Detailed Site Investigation - Contamination Assessment

Proposed Residential Subdivision

Lot 92 DP1285477 Wingham Road, Wingham

Report No. RGS03311.1-AG

29 January 2025



RGS03311.1-AG

29 January 2025

MPT Farms Pty Ltd
C/O Hampstead Property
PO Box 358
KIAMA NSW 2533

Attention: Tim Colless

Dear Tim

**RE: Proposed Residential Subdivision – Lot 92 DP1285477 Wingham Road, Wingham
Detailed Site Investigation - Contamination Assessment**

As requested, Regional Geotechnical Solutions Pty Ltd (RGS) has undertaken a Detailed Site Investigation Contamination Assessment for the proposed residential subdivision at Lot 92 DP1285477, Wingham Road, Wingham, NSW.

Based on the results obtained in this investigation, it is considered that the subject site is suitable for future residential land use in its current state with regard to the presence of soil contamination, provided the recommendations and advice of this report are adopted, and site preparation works are conducted in accordance with appropriate site management protocols and legislative requirements. The work presented herein was reviewed by Dr David Tully CEnvP SC. A copy of Dr Tully's letter pertaining to the review is appended to the report.

If you have any questions regarding this project, or require any additional consultations, please contact the undersigned.

For and on behalf of

Regional Geotechnical Solutions Pty Ltd

Prepared by



Andrew Hills

Associate Environmental Engineer

Reviewed by



Steve Morton

Principal Geotechnical Engineer



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1 INTRODUCTION and BACKGROUND

1.1 General

Regional Geotechnical Solutions Pty Ltd (RGS) has undertaken a Detailed Site Investigation Contamination Assessment (DSI) for the proposed residential subdivision at Lot 92 DP1285477 Wingham Road, Wingham, NSW. The site location is shown on Figure 1. An indicative subdivision layout plan is shown on Figure 2 which is understood to be subject to change during the planning process. The portion of the property proposed to accommodate residential development is approximately 28.1 hectares.

The site is currently zoned RU1 Primary Production under the Greater Taree Local Environment Plan (LEP). Recent "Midcoast Urban Release Areas Report, July 2021" identified the subject area as potential low density urban residential land use". It is understood that the Client is seeking to have the land re-zoned for residential development under the Council planning arrangement for future land use.

An indicative plan provided by the Client indicates that residential subdivision will involve multiple stages.

RGS has undertaken a Preliminary Site Investigation Contamination Assessment (PSI) at the site, the results of which are presented in report RGS03311.1-AE, dated 22 February 2024. The findings of the RGS PSI report are summarised in Section 4.

Upon review of the PSI, Midcoast Council and the Department of Planning, Housing and Infrastructure (DPHI) have requested further investigation work including an assessment of groundwater and volatile vapour intrusion associated with the adjoining former service station site be undertaken, in order to support and progress the rezoning application.

In regard to contamination, Council's RFI states the following:

In order for Council to be satisfied the site is suitable for residential use and to appropriately consider Ministerial Direction 4.4, the provided Preliminary Site Investigation – Contamination Assessment prepared by Regional Geotechnical Solutions is required to be amended to include the following:

- 1) Additional groundwater and vapour testing is required to a level that identifies the extent of contamination (where present) and the suitability relevant to that extent, of the site for the proposed use. Please note based on the existing PSI, a DSI (including the previously mentioned testing to assess any groundwater and vapour impacts) should be undertaken on the areas where contamination is identified as a concern. Council does not expect the plan for testing to incorporate the entirety of the site and the provided DSI should include justification for the areas to be tested (e.g. those likely to be impacted by the former service station site).

The amendments should be completed in accordance with the following and where anything deviates from the below, justification needs to be provided:

- *Council's Contaminated Land Policy.*
- *Managing Land Contamination Planning Guidelines (1998).*
- *Relevant NSW EPA Guidelines, in particular NSW EPA Consultants reporting on contaminated land (2020).*
- *National Environment Protection (Assessment of Site Contamination) Measure (ASC NEPM, 1999 as amended 2013); and*
- *Vapour Intrusion: Technical Practice Note (2010).*



The purpose of the work documented herein is to assess the suitability of the site for future residential land use with respect to potentially contaminated groundwater and vapour intrusion as outlined in the Council RFI described above.

1.2 Objective

The objectives of the DSI were to:

- Characterise the nature and extent of groundwater contamination and potential health risks associated with vapour intrusion present on the site (if any);
- Assess the suitability of the site for future residential land use; and
- Provide recommendations for on-site management, the need and options for remediation and any further investigation and testing that is required.

1.3 Scope of Works

In accordance with the relevant sections of the *National Environment Protection (Assessment of Site Contamination) Measure 1999 (Amended 2013)*, as well as the other documents listed in Section 1.1 above, the assessment involved the following process:

- Review of the provided site audit report for the former service station located adjacent to the subject site;
- Review of the RGS PSI report;
- Drilling of two boreholes to 17.45m and 11.1m depth and installation of two groundwater monitoring wells to obtain groundwater samples;
- Collection of soil samples from the boreholes;
- Volatile gas/vapour measurement of the boreholes outlined above using a Photoionization Detector (PID);
- Purging and sampling of the groundwater wells;
- Analyses of soil and groundwater samples for a suite of potential contaminants associated with hydrocarbon storage; and
- Evaluate the results against industry accepted criteria for residential land use.

1.4 Site Identification

General site information is provided below in Table 1. The site location is shown in Figure 1.



Table 1: Summary of Site Details

Site location:	Wingham Road, Wingham, NSW
Approximate subject site area:	61.37 hectares (28.1 hectares proposed residential)
Title Identification Details:	Lot 92 DP 1285477
Zoning	RU1 – Primary Production
Current Landuse:	Farming / grazing land
Proposed Landuse:	Residential
Adjoining Site Uses:	• Cedar Party Creek, rural residential and farming / grazing land to the north and east; • Wingham Road to the south; • Residential, former service station and operating smash repairer to the south-west; and • Cedar Party Creek and residential to the west.
Government Area:	Midcoast Council

2 SITE DESCRIPTION

2.1 Topography and Drainage

The site is bound by Cedar Party Creek, rural residential and farming / grazing land to the north and east, by Wingham Road to the south, by residential properties, a former service station and an operating smash repairer to the south-west, and by Cedar Party Creek and residential properties to the west.

The topography of the site comprises gently to moderately undulating terrain and is situated on a north facing slope which grades down to a creek line in the central part of the site. The creek is a tributary of Cedar Party Creek which is located along the site's northern boundary.

Slope changes in the central part of the site, in the vicinity of the tributary creek, are of the order of 4° to 6°. Slope changes in the northern part of the site which are towards Cedar Party Creek are also of the order of 4° to 6°. Slope changes at the rear of the existing residences in the southern part of the site are of the order to 1° to 3° grading to 4° to 6° towards the north-western corner.

Drainage is anticipated to be via a combination of overland flow into the tributary creek and Cedar Party Creek. There was some scouring around the banks of the tributary creek.



Vegetation comprised long grass and pasture with small shrubs and stands of large Eucalyptus trees up to 25m in height mainly around the site perimeters with the exception of the southern part of the site which is bounded by the existing residences and commercial properties.

Trafficability was good via 4WD vehicle.

2.2 Geology

Based on the topographic conditions, the site has been divided into two terrain zones. Reference to the MinView website indicates that the underlying geology varies with each terrain as outlined below:

- Terrain Zone 1: The majority of the site is underlain by Devonian to Carboniferous sedimentary rocks belonging to the Tamworth Belt and soils derived from those rocks; and
- Terrain Zone 2: The western and north-western part of the site is underlain by Tertiary to Pleistocene high-level terrace deposits comprising silt, clay, gravel and fluvial sand.

The geology of the site is presented in Plate 1 below:

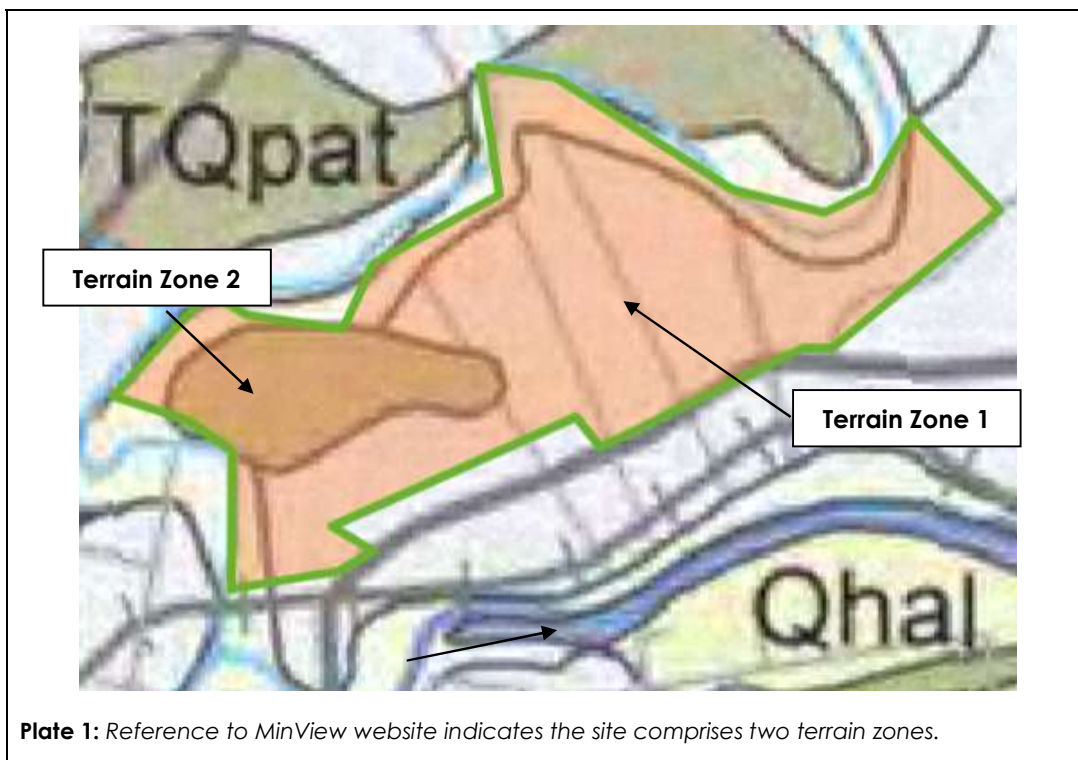


Plate 1: Reference to MinView website indicates the site comprises two terrain zones.

The materials encountered during the DSI are summarised in Table 2 and Table 3. Further details are presented on the attached engineering logs (Appendix A).



Table 2: Summary of Geological Units

Unit	Material	Material Description
UNIT 1	Topsoil	Silty CLAY, low plasticity, brown / dark brown, some gravel, coarse grained, some roots
UNIT 2	Slopewash	Silty Gravelly CLAY, low plasticity, brown, gravel, coarse grained, some roots
UNIT 3	Residual Soil	Silty CLAY, medium to high plasticity, brown / pale brown / dark brown / orange, trace roots
UNIT 4	Extremely Weathered to Fresh Siltstone	Silty CLAY, low plasticity, pale brown / pale grey / orange / white

Table 3: Summary of Subsurface Profile

Borehole	Depth of Material Layer (m)			
	UNIT 1 Topsoil	UNIT 2 Slopewash	UNIT 3 Residual Soil	UNIT 4 Extremely Weathered to Fresh Siltstone
MW101	0.0 – 0.15	0.15 – 0.5	0.5 – 0.95	0.95 – ≥17.45*
MW102	0.0 – 0.20	0.2 – 0.7	0.7 – 0.9	0.9 – ≥11.1*

Note: ≥ Indicates that base of material layer was not encountered

Groundwater inflow was encountered in borehole MW101 at 8.0m and MW102 at 7.7m below ground surface respectively during the limited time they remained open during the field investigations.

Groundwater levels fluctuate as a result of seasonal variations, temperature, rainfall and other similar factors, the influence of which may not have been apparent at the time of the assessment.

2.3 Hydrogeology

A groundwater bore search on the NSW Water Information website, <http://waterinfo.nsw.gov.au/gw/> indicates that there is a licenced groundwater bore located approximately 120m to north of the site as shown below:

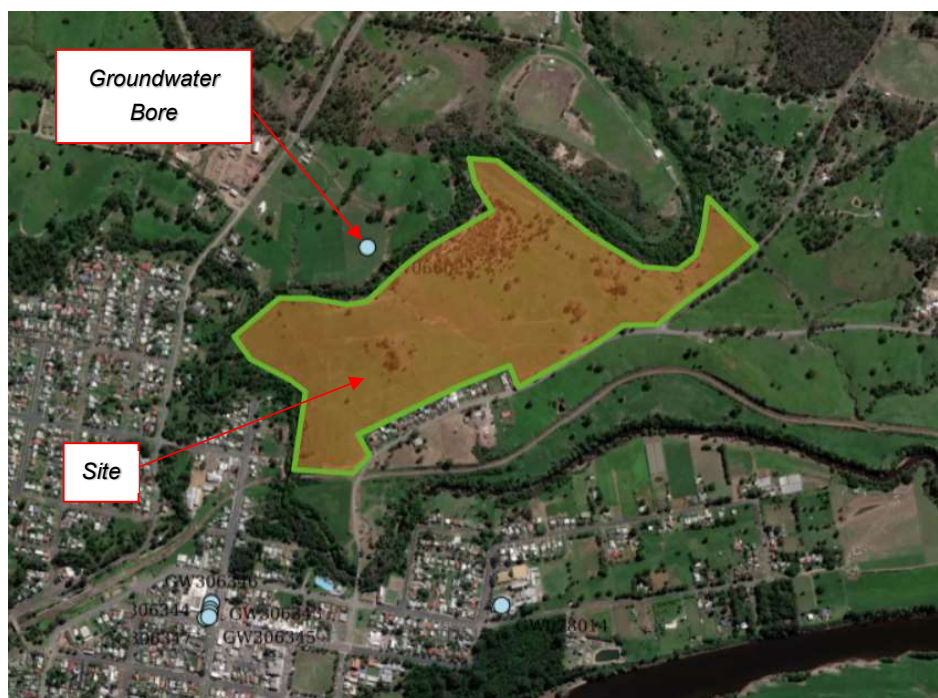


Plate 1: Approximate site boundary outlined in green. Nearest off-site licensed groundwater bore is located approximately 120m to the north of the site.

Groundwater bore GW066022 was drilled to a depth of 68.0 m on 1 January 1992, is licenced for industrial purposes and its licence status is unknown. No other information is provided.

3 FORMER SERVICE STATION SITE AUDIT REPORT

A Site Audit Report (SAR) prepared by Ramboll Australia Pty Ltd (Ramboll) for Caltex Australia Pty Ltd (Caltex) Ref. 318000089, dated October 2018 for the former service station located at 1036-1038 Wingham Road, Wingham which bounds the subject site to the south has been provided for review.

A summary of the key remarks and conclusions from the SAR with respect to the subject site are provided below:

- The SAR reviewed a number of reports prepared by Coffey Environments Australia Pty Ltd (Coffey). It is noted that RGS has not been provided with any of the subject Coffey reports;
- The SAR states that environmental investigations and remedial works at the former service station site were undertaken between 2007 and 2011 which included decommissioning and removal of fuel infrastructure;
- Additional remediation and validation works were required to render the site suitable for future residential land use;



- A Remedial Action Plan (RAP) was developed for the additional remediation and validation works in 2014 and the remedial works were completed between 2014 and 2015. Post remediation groundwater and soil vapour monitoring were undertaken in 2015, and with two further groundwater monitoring rounds completed in March 2017 and November 2017;
- Depth to groundwater as identified by Coffey ranged from approximately 8m below top of casing to 14m below casing in groundwater monitoring wells. Groundwater was inferred to be in fractured siltstone;
- Pre-remediation groundwater results indicated the presence of a petrol plume in groundwater. Based on these findings, a groundwater remediation system was installed to remove identified Phase Separated Hydrocarbons (PSH);
- Excavations of hydrocarbon impacted soil were completed to the extent practicable and it is stated that these were adequately validated;
- Groundwater remediation was attempted, however, the nature of the aquifer within fractured rock was a challenge for complete remediation of hydrocarbon impacted groundwater. Groundwater sampling in the years following remediation indicates that the dissolved phase plume remains on-site close to the former location of the main underground fuel storage tank group near the south-western corner of the former service station site;
- Oxygen concentrations recorded during vapour sampling indicate the soil overlying the groundwater contamination has a high potential for bioattenuation;
- The auditor considers that the conclusion of Coffey that residual impacts in groundwater have decreased significantly when compared to post-remediation concentrations is valid and that soil vapour sampling results are valid;
- Coffey concluded that the service station site is "considered suitable, with respect to land contamination, for possible development including residential dwellings with accessible garden beds";
- Based on the information presented in Coffey's reports and observations made on-site, the auditor concluded that the site is suitable for the purposes of "residential with gardens and accessible soil", noting that residual groundwater contamination remains on-site and has impacted the residential property to the west; and
- The EPA is involved in correspondence with the occupant of the residential property to the west where residual impact to groundwater may also remain.

4 PREVIOUS INVESTIGATION

4.1 Regional Geotechnical Solutions (2024) – Preliminary Site Investigation Contamination Assessment

With respect to site contamination, the RGS PSI (Ref: RGS03311.1-AE, dated 22 February 2024) made the following conclusions and recommendations:

- Identified Areas of Environmental Concern (AEC's) included the former service station and existing smash repairer bounding the southern part of the site, stockpiled waste materials at



the rear of 1058 Wingham Road, potential Asbestos Containing Material (ACM) in fencing at the rear of the residences in the southern part of the site, former and current agricultural activities, a cattle yard and livestock loading area in the eastern part of the site, disturbed terrain in the eastern part of the site, electricity lines transecting the central part of the site, vegetation stockpiles, unidentified stockpiles of fill and/or waste from illegal dumping;

- With regard to the former service station located at 1036-1038 Wingham Road which bounds the site to the south, it appears that it was decommissioned and remediated between 2007 and 2011. The former service station site was the subject of a SAR by Ramboll in 2018 which stated that the auditor concluded that the site is suitable for the purposes of "residential with gardens and accessible soil", noting that residual groundwater contamination remains on-site and has impacted the residential property to the west;
- PID readings taken within some of the boreholes drilled in the vicinity of the former service station and head space screening of some of the soil samples obtained indicated the potential presence of volatile organic compounds however, these were generally at low levels;
- Given the presence of predominantly clay soil and the depth to groundwater (reported to be approximately 8m below top of casing to 14m below casing in the former service station groundwater monitoring wells), the oxygen concentrations recorded during vapour sampling at the former service station which indicated that soil overlying groundwater contamination has a high potential for bioattenuation, and the auditor's opinion presented in the SAR, and provided groundwater extraction does not take place, the risk of groundwater contamination associated with the former service station having the potential to impact the proposed residential development is considered to be low;
- The existing smash repair business also adjoining the residences bounding the southern part of the site appears to have been present since at least 1985. Soil samples obtained from boreholes drilled in this area reported petroleum hydrocarbon concentrations below the laboratory limit of reporting and below the adopted investigation criteria;
- In summary, the results of laboratory analysis of soil samples collected from targeted locations (AEC's outlined above), revealed concentrations of the chemicals of concern were either below the laboratory detection limit, or below the adopted health investigation criteria for a Residential A site;
- No visual or olfactory evidence of widespread or gross hydrocarbon contamination was observed in the vicinity of the former service station or smash repairer in the southern part of the site or elsewhere across the site. Asbestos was not detected in the soil samples submitted for analysis;
- It is recommended that the waste materials including an old car bonnet, scrap metal, timber, concrete, vegetation, mattresses, timber, rope, plastic and domestic rubbish stockpiled at the rear of No. 1058 Wingham Road in the southern part of the site be appropriately disposed of to a waste management facility. In addition, the same should be undertaken for the cattle yard and livestock loading area located to the east of the smash repairer near the intersection with Youngs Road, if and when it is no longer actively used.
- Should it be proposed to remove the fences at the rear of the existing residences in the southern part of the site during development, an experienced occupational hygienist or environmental consultant should be sought to screen the fence materials for the presence



of ACM. It is noted no fragments of these materials were observed on the ground surface at the time of investigation;

- Residual hydrocarbon impacts to groundwater are likely to be present near the southern boundary as a result of off-site activities (the former service station and existing smash repair business). On the basis of the findings of this investigation it is considered unlikely that these impacts, which will further attenuate over time, will pose an unacceptable risk to future site users from vapour inhalation. However, should extraction of groundwater for any use be considered, then an appropriate assessment of these impacts should be undertaken prior to use to make a suitability for use evaluation; and
- Based on the results obtained in the investigation, it is considered that the site is suitable in its current state for future residential land use with regard to the presence of soil contamination, provided the recommendations and advice of the report are adopted, and site preparation works are conducted in accordance with appropriate site management protocols and legislative requirements.

5 FIELD and LABORATORY INVESTIGATIONS

5.1 Sampling Plan

Based on the results and conclusions of the PSI, which did not reveal indication of current or previous potentially contaminating activities that might have resulted in site wide contamination, and comments from Council set out in Section 1.1 above, two sampling locations were selected using a judgemental approach to address potential groundwater contamination and vapour intrusion associated with the former service station to the south of the site (AEC1).

The MW101 groundwater well and sampling location was selected such that should a contaminated groundwater plume be present, it would be detected from both the service station site itself as well as the adjoining property to the west which is understood to previously have had residual groundwater impacts beneath the residence. MW101 was located down gradient from both of the above-mentioned sites.

The MW102 groundwater well and sampling location was located further down gradient to the north of the service station site adjacent to an ephemeral creek line such that it could be utilised to assess the extent of a groundwater plume which may have potentially migrated beneath the subject site to potentially impact the creek (if any).

The remaining AEC's in addition to AEC1 identified by the PSI were considered to have been sufficiently addressed by the PSI with further sampling for these being unwarranted. Midcoast Council's RFI is reflective of this position (refer Section 1.1 above).

On this basis, the sampling program was designed to target potential groundwater contamination and vapour intrusion from the former service station site. As such, two groundwater wells (MW101 and MW102) were installed, purged and sampled. In addition, two soil samples were collected from each borehole and submitted for laboratory analysis. PID screening of the boreholes and soil samples was undertaken.



5.2 Field Work

Field work for the assessment was undertaken on 12 December 2024 and 15 January 2025 by an Environmental Engineer from RGS and included:

- Drilling of two boreholes to depths of 17.45m and 11.10m below ground surface using a track-mounted drill rig;
- Soil sampling from the boreholes;
- Installation of groundwater monitoring wells into the boreholes; and
- Purging and sampling of the groundwater monitoring wells.

The locations of the sampling points are shown on Figure 5. They were obtained on site and located by measurement relative to existing site features.

Construction of the groundwater monitoring wells comprised the following:

- 12m length of slotted pipe with push-on end cap from the bottom of the borehole that was joined to 6m of cased pipe (M101);
- 9m length of slotted pipe with push-on end cap from the bottom of the borehole that was joined to 3m of cased pipe (M102);
- The well casing finished at about 0.6m (MW101), 0.7m and (MW102) above the ground surface respectively;
- The annulus around the slotted and cased pipe was backfilled with a 5mm aggregate gravel pack to about 500mm below ground surface;
- A bentonite clay seal was added on top the gravel pack to 100mm to 200mm below ground surface followed by grout to just below ground surface level;
- A screw-on end cap was placed inside the well casing; and
- Temporary fencing was placed around the well casing to prevent damage from grazing cattle.

Screening of each of the soil samples and within the boreholes for vapours associated with the presence of hydrocarbons was undertaken using a PID. Vapour screening within the boreholes was conducted by leaving them open whilst onsite and measuring the levels before and after installation of the monitoring wells at the completion of the field investigations.

Soil samples were taken from natural soils using disposable gloves. Drill augers and hand tools used for sample collection were decontaminated between sampling points using Decon90 detergent and deionised water. The soil samples were collected in acid-rinsed 250mL glass jars and placed in an ice-chilled cooler box.

Groundwater samples were obtained using disposable bailers and gloves. Sampling equipment was decontaminated between sampling each monitoring well using Decon90 detergent and deionised water. The samples were collected in dedicated sample bottles and vials with appropriate preservatives for each of the selected contaminants. Samples were placed in an ice-chilled cooler box.

Field measurements of extracted groundwater including temperature and pH, and physical observations were undertaken at the time of the groundwater sampling. A handheld HANNA water quality probe was used to measure temperature and pH in the field.



5.3 Laboratory Analysis

5.3.1 Soil

Samples were transported under chain-of-custody conditions to ALS Laboratory Group, a NATA accredited specialist chemical testing laboratory, to be analysed for the following suite of potential contaminants associated with hydrocarbon storage:

- Polycyclic Aromatic Hydrocarbons (PAH);
- Total Recoverable Hydrocarbons (TRH);
- Benzene, Toluene, Ethyl-benzene, Xylenes (BTEX); and
- Heavy metals (arsenic, cadmium, chromium, cobalt, copper, lead, mercury, and zinc);

The results are presented in Appendix B.

5.3.2 Groundwater

Samples were transported under chain-of-custody conditions to ALS Laboratory Group, a NATA accredited specialist chemical testing laboratory, to be analysed for the following suite of potential contaminants associated with hydrocarbon storage:

- Polycyclic Aromatic Hydrocarbons (PAH);
- Total Recoverable Hydrocarbons (TRH);
- Benzene, Toluene, Ethyl-benzene, Xylenes (BTEX);
- Lead; and
- Physical parameters (pH, Electrical Conductivity & Dissolved Oxygen)

The results are presented in Appendix B.

5.4 Data Quality Objectives

The Data Quality Objectives (DQOs) are presented in Table 4.

Table 4 – Data Quality Objectives

DQO	Details of Process
State the Problem	A DSI is required to assess the suitability of the site for the proposed future residential land use from a contamination perspective, and to satisfy the requirements outlined in Midcoast Council's RFI.
Identify the Decision	The principal study questions that are: • What is the nature and extent of soil, groundwater and vapour intrusion contamination on the subject land (if any)?; and



DQO	Details of Process
	Is the land likely to be suitable for the proposed rezoning and future residential development from a contamination viewpoint?
Identify Inputs to the Decision	The primary inputs are: - Review of SAR for the adjacent former service station site; - Review of the RGS PSI report; - Installation of two groundwater monitoring wells; - Chemical analysis of selected soil and groundwater samples; - PID screening of soil samples and within boreholes for the presence of hydrocarbon vapours; and - Results summary.
Define the Boundary of the Assessment	- The spatial boundaries are limited to the property boundaries of the subject site as shown on Figure 1 and Figure 2; - The investigation and screening levels for a Residential A land use scenario.
Develop a Decision Rule	The decision rules for the investigation are: - If concentrations of contaminants in soil exceed the adopted investigation and screening levels for a Residential A land use scenario, then further assessment may be required; and - If concentrations of contaminants in groundwater exceed the adopted investigation and screening levels for vapour intrusion, the protection of 95% of species for freshwater aquatic ecosystems and guidelines for managing risks in recreational water criteria, then further assessment may be required. Decision criteria for QA/QC measures are defined in Section 5.6. A decision on the acceptance of analytical data will be made on the basis of the data quality indicators (DQIs) in the context of precision, accuracy, representativeness, completeness and comparability (PARCC) parameter– as follows: Precision - NATA registered laboratories were used following NATA accredited systems and industry standard test methods. An appropriate number of intra-laboratory samples were collected and analysed (following ASC NEPM guidance), the results of which are considered to be satisfactory; Accuracy - The laboratory limit or reporting (LOR) was appropriate for the screening criteria utilised. NATA registered laboratories were used following industry standard methods including appropriate method blanks, laboratory control samples, laboratory spikes and duplicates the results of which are considered to be satisfactory. Representativeness – The samples were received by the laboratories in good condition. The data obtained is considered to be representative of the soils present on site;



DQO	Details of Process
	• Completeness – Experienced field staff were utilised to undertake the sampling and keep appropriate documentation. Samples were in proper custody between the field and reaching the laboratory. The laboratories performed the tests requested. The data obtained from the field investigations is considered to be relevant and usable; and • Comparability – Sample holding times were met and samples were properly and adequately preserved. Field sampling and handling procedures were followed. The data collected is considered to be comparable.
Specify Acceptable Limits on Decision Errors	• Acceptable limits for QA/QC measures are defined in Section 5.6; • Acceptable investigation and screening levels are those for a Residential A land use scenario; and • Specific limits are in accordance with the appropriate NSW EPA guidelines including indicators of data quality and standard procedures for field sampling and handling.
Optimise the Design for Obtaining Data	Based on the above steps of the DQO process. The design for obtaining the required data (i.e. proposed field and laboratory investigations) is presented in Section 5.1.

5.5 Guidelines and Assessment Criteria

5.5.1 Soil

Assessment as outlined in NSW EPA *Guidelines for Consultants Reporting on Contaminated Land (2020)*.

To evaluate results, and for guidance on assessment requirements, the assessment will adopt the guidelines provided in the *National Environment Protection (Assessment of Site Contamination) Measure (ASC NEPM 2013)*. The ASC NEPM document provides a range of guidelines for assessment of contaminants for various land use scenarios. It is understood that the future land use for the site is residential. As such, comparison with the ASC NEPM guideline Health Investigation Levels (HIL) for Residential A land use is considered appropriate for the site. In accordance with the NEPM guideline the following criteria will be adopted for this assessment:

- Health Investigation Levels (HILs) for residential 'A' land use (HIL-A) will be used to assess the potential human health impact of heavy metals and polycyclic aromatic hydrocarbons (PAHs);
- Health Screening Levels (HSLs) for coarse textured (sand) or fine textured (silt and clay) soils on a residential site will be adopted as appropriate for the soils encountered to assess the potential human health impact of petroleum hydrocarbons and benzene, toluene, ethylbenzene and xylene (BTEX) compounds;



- Ecological Investigation Levels (EILs) for residential land use will be used for evaluation of the potential ecological / environmental impact of heavy metals and naphthalene. Due to the preliminary nature of this investigation, soil specific EILs have not been calculated for chromium, copper, nickel and zinc and
- Ecological Screening Levels (ESLs) for coarse textured (sand) soils or fine textured (silt and clay) soils on a residential land use site will be adopted as appropriate for the soils encountered, to assess the potential ecological / environmental impact of petroleum hydrocarbons BTEX compounds and benzo(a)pyrene.

In accordance with NEPM 2013, exceedance of the respective criteria does not necessarily deem that remediation or clean-up is required but is a trigger for further assessment of the extent of contamination and associated risks.

5.5.2 Groundwater

The NEPM 2013 provides a series of Groundwater Investigation Levels (GILs) for the protection of drinking water or aquatic ecosystems, as appropriate based on down-gradient recipients of groundwater emanating from the site. For assessing groundwater quality therefore, it is first necessary to assess the beneficial uses or sensitive receptors of groundwater down-gradient of the site being assessed.

The most sensitive receptors in the likely direction of groundwater flow are the aquatic ecosystems of Cedar Party Creek which forms the northern and western boundaries of the site. It is therefore reasonable to adopt GIL's aimed at protecting the aquatic ecosystem. On this basis, the results of groundwater sampling and analyses were evaluated against ANZECC 2000 criteria for protection of 95% of species for freshwater ecosystems as published information indicates the upstream limit of tidal influence of Cedar Party Creek is slightly downstream of the Cedar Party bridge, situated downstream of the site boundaries. The guidelines apply to water entering an ecosystem and are therefore conservative values for assessment of groundwater. In addition, the results were evaluated against recreational human health screening criteria presented in Section 9 of the National Health and Medical Research Council (NHMRC) 2008, Guidelines for Managing Risks in Recreational Water.

Groundwater HSLs from the NEPM document have been utilised to assess potential risks associated with hydrocarbon vapour intrusion from the groundwater regime.

5.6 Quality Assurance / Quality Control

5.6.1 Soil

Samples were obtained using industry accepted protocols for sample treatment, preservation, and equipment decontamination. Sampling equipment was decontaminated between sample locations and a clean pair of nitrile gloves were used for the collection of each sample into laboratory supplied glass sampling jars.

Samples were placed on ice on-site and maintained on ice during transport to the testing laboratories. One duplicate soil sample identified as D1, duplicate of primary sample MW102 0.8 – 1.0m was submitted to the laboratory for analysis for quality control purposes. Comparison between the primary and duplicate samples are presented in the results summary tables in Appendix B.



The Relative Percent Differences (RPDs) were calculated for the duplicate sample and presented in the results summary table in Appendix B.

The duplicate RPDs were within the control limit of 40% indicating generally good correlation between the primary and duplicate sample.

One rinsate sample (RINSATE) was collected from the hand tools to assess the efficacy of the decontamination techniques. Analysis of the rinsate sample indicated that it was free of contaminants. In addition to the field quality control procedures, the laboratory conducted internal quality control testing including surrogates, blanks, and laboratory duplicate samples. The results are presented with the laboratory test results in Appendix B.

In addition to the field quality control procedures, the laboratory conducted internal quality control testing including surrogates, blanks, and laboratory duplicate samples. The results are presented with the laboratory test results in Appendix B.

All laboratory quality control data is within acceptable limits for the tests carried out. Therefore, on the basis of the results of the field and laboratory quality control procedures and testing, the data is considered to reasonably represent the concentrations of contaminants in the soils at the sample locations at the time of sampling and the results can be adopted for this assessment.

5.6.2 Groundwater

Samples were obtained using industry accepted protocols for sample treatment, preservation, and equipment decontamination. Sampling and monitoring equipment was decontaminated between sample locations and a clean pair of nitrile gloves and bailer used for the collection of each sample into laboratory supplied sample bottles.

Samples were placed on ice on-site and maintained on ice during transport to the testing laboratories.

One intra-laboratory duplicate sample identified as D101 (duplicate of primary sample MW101) was submitted to the laboratory for analysis for quality control purposes.

Comparison between the primary and duplicate samples are presented in the results summary tables in Appendix B.

The Relative Percent Differences (RPDs) were calculated for the duplicate sample and presented in the results summary table in Appendix B. The RPDs were within the control limit of 40% and indicated good correlation between the primary and duplicate samples.

In addition to the field quality control procedures, the laboratory conducted internal quality control testing including surrogates, blanks, and laboratory duplicate samples. The results are presented with the laboratory test results in Appendix B.

All laboratory quality control data is within acceptable limits for the tests carried out. Therefore, on the basis of the results of the field and laboratory quality control procedures and testing, the data is considered to reasonably represent the concentrations of contaminants in the groundwater at the sample locations at the time of sampling and the results can be adopted for this assessment.



6 SITE CONTAMINATION ASSESSMENT RESULTS

6.1 Subsurface Conditions

Notable hydrocarbon odours were absent from each borehole to the depth that it was terminated. No staining was observed on soil samples and no evidence of gross hydrocarbon contamination was identified during the field investigations.

Borehole MW101 was drilled in the vicinity of both the adjacent former service station and residence to the west where there is known to be a residual groundwater plume. Borehole MW102 was drilled down gradient from the former service station adjacent to an ephemeral creek line.

Both boreholes MW101 and MW102 were left open during the field investigations and screened prior to groundwater monitoring well installation. A PID was utilised to screen the air within the open boreholes and individual soil samples collected. The PID is primarily a semi-qualitative tool use for field screening purposes. For the purposes of this assessment, screening categories set out in Table 5 were adopted. It should be noted that a PID may give false positive readings for water vapor. Rain may also affect performance. High humidity can cause lamp fogging and decreased sensitivity. This can be significant when soil moisture levels are high. It is noted that the weather was hot and sunny on the day of the field investigations.

Table 5: PID Reading Screening Categories

PID Reading (ppm)	Description
0.0 – 5.0	Negligible vapour concentrations detected
> 5.0 – 10.0	Very low vapour concentrations detected
>10.0 – 50.0	Low vapour concentrations detected
>50.0 – 100	Low to moderate vapour concentrations detected
>100 – 200	Moderate vapour concentrations detected

PID readings from within the boreholes which were screened are outlined below:

- MW101 – 0.0 ppm (negligible vapour concentrations detected);
- MW102 – 0.0 ppm (negligible vapour concentrations detected);

PID readings from soil samples which were headspace screened are outlined below:

- MW101 – 0.0 – 1.9 ppm (negligible vapour concentrations detected);
- MW102 – 0.0 - 0.7 ppm (negligible vapour concentrations detected);

The calibration certificate (Worksheet No. 632321) for the PID is attached in Appendix D.

The soil types recorded in samples are summarised below in Table 6.



Table 6: Summary of Subsurface Conditions

Sample ID	Description
MW101 0.8 – 1.0m, MW102 0.8 – 1.0m	Residual Soil: Silty CLAY, medium to high plasticity, brown / pale brown / dark brown / orange, trace roots
MW102 1.8 – 2.0m, MW102 1.8 – 2.0m	Extremely Weathered to Fresh Siltstone: Silty Clay, low plasticity, pale brown / pale grey / orange / white

6.2 Field Observations – Groundwater

Qualitative observations of extracted groundwater quality were made in the field during groundwater sampling (including water colour, turbidity, odour and sheen, if any). Groundwater sampling was undertaken by an engineer from RGS on 15 January 2025.

A summary of the observations is outlined below. Further information on the groundwater qualitative observations is shown on the sampling field sheets in Appendix C.

- Depth to groundwater in the wells prior to purging and sampling was 7.9m and 7.5m below ground surface in wells MW101 and MW102 respectively;
- The groundwater was clear and became slightly turbid towards the end of purging in each well; and
- No hydrocarbon odour or other odour or sheening was observed on extracted groundwater from each well during purging and sampling.

6.3 Laboratory Results

6.3.1 Soil

An appraisal of the laboratory test results presented in Appendix B is provided below with reference to the adopted soil investigation and screening levels discussed in Section 5.5.1.

- Concentrations of heavy metals were either below the laboratory limit of reporting or below the adopted health investigation criteria for a Residential A site in each of the samples analysed and are considered indicative of natural background concentrations;
- Concentrations of arsenic and lead were below the adopted EILs. Due to the targeted nature of this investigation regarding the potential for contaminated groundwater and vapour intrusion, soil specific EILs have not been calculated for chromium, copper, nickel and zinc; and
- Concentrations of TRH, PAH and BTEX were below the laboratory limit of reporting in each of the soil samples analysed.



6.3.2 Groundwater

An appraisal of the groundwater laboratory test results presented in Appendix B is provided below with reference to the adopted groundwater investigation and screening levels discussed in Section 5.5.2:

- Concentrations of TRH, PAH, BTEX and Lead (dissolved) were below the laboratory limit of reporting in each of the samples analysed;
- pH was 6.82 and 7.24 in samples from MW101 and MW102 respectively;
- Electrical conductivity was 7,210 and 10,800µS/cm in samples MW101 and MW102 respectively; and
- Dissolved oxygen was 8.2 and 8.0mg/L in samples MW101 and MW102 respectively.

6.4 Conceptual Site Model

Based on the site observations and knowledge obtained about site activities as outlined above, a conceptual site model (CSM) has been developed.

6.5 Potential Sources of Contamination

Potential Areas of Environmental Concern (AECs) and Chemicals of Concern (COCs) identified for the assessment have been updated and are outlined in Table 7.

Table 7: Potential AECs and COCs

AEC	Mode of Potential Contamination	Potential COCs	Likelihood of Contamination
AEC1: Former service station at 1038 Wingham Road	Potential hydrocarbon impact of soils and groundwater due to proximity of former service station. Potential hazardous building materials debris from demolition of structures	TRH, BTEX and other volatile organic compounds, PAH, lead Asbestos, lead	Low
AEC2: Operating smash repairer at 1034 Wingham Road	Potential spillage or leaks of chemicals from vehicles and stored containers of fuel/oils/solvents.	Heavy Metals, TRH, BTEX and other volatile organic compounds, PAH, PCB	Low



AEC	Mode of Potential Contamination	Potential COCs	Likelihood of Contamination
AEC3: Stockpiled waste materials at rear of 1058 Wingham Road	Importation of potentially contaminated fill	Heavy Metals, TRH, BTEX, PAH, PCB, OC/OPP and asbestos	Low to moderate
AEC4: Fencing material at rear of existing residences in the southern part of the site	Potential for hazardous building materials in fencing	Asbestos, lead	Low to moderate
AEC5: Former and current farming / grazing activities	Potential spillage or leaks of stored fuels/oils/lubricants and agro-chemicals	Heavy Metals, TRH, BTEX, PAH, OC/OPP	Low
AEC6: Cattle yard and livestock loading area in eastern part of the site	Potential spillage of fuels/oils	TRH, BTEX, PAH, lead, pathogens	Low
AEC7: Disturbed ground in the eastern part of the site	Importation of potentially contaminated fill Potential spillage of chemicals including agro-chemicals, fuels/oils, pesticides	Heavy Metals, TRH, BTEX, PAH, PCB, OC/OPP, asbestos	Low
AEC8: Electricity lines transecting through central part of the site east to west	Potential spillage or leaks of fuels/oils from machinery during construction and maintenance of electrical infrastructure	Heavy metals, TRH, BTEX, PAH, PCB	Low
AEC9: Vegetation stockpiles	Potential spillage or leaks of fuels/oils from machinery during felling and stockpiling	TRH, BTEX, PAH, OC/OPP, lead	Low
AEC10: Unidentified stockpiles of fill	Importation of potentially contaminated fill	Heavy Metals, TRH, BTEX, PAH, PCB, OC/OPP and asbestos	Low



AEC	Mode of Potential Contamination	Potential COCs	Likelihood of Contamination
AEC11: Unidentified waste from illegal dumping	Potential buried waste from historical agricultural land use impacting site soils	Heavy Metals, TRH, BTEX, PAH, PCB, OC/OPP, asbestos, pathogens	Low
<i>Heavy Metals - Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel and Zinc</i> <i>BTEX - Benzene, Toluene, Ethylbenzene and Xylene</i> <i>TRH - Total Recoverable Hydrocarbons</i> <i>PAH - Polycyclic Aromatic Hydrocarbons</i> <i>PCB - Polychlorinated Biphenyls</i> <i>OC/OPP - Organochlorine and Organophosphorus Pesticides</i>			

The approximate locations of the AEC's are shown on Figure 3 and Figure 4.

Sampling locations undertaken during the DSI are shown on Figure 5.

6.6 Potential Exposure Pathways and Receptors

Based on the site observations and knowledge obtained about site activities as outlined above, potential exposure pathways and receptors identified for the assessment are summarised in Table 8.

Table 8: Potential Exposure Pathways and Receptors

Chemicals of Concern	Key Pathways	Key Receptors
Asbestos, heavy metals	Generation of dust, notably during earthworks or from landscaped areas which is inhaled	Onsite - Construction and site workers, future site users Offsite – Occupants and users of adjacent sites
Heavy metals, TRH, BTEX, PAH, OC/OPP	Skin contact / ingestion, plant uptake	Onsite - Construction and site workers, future site users, vegetation in landscaped areas
Heavy Metals, TRH, BTEX, PAH, OC/OPP	Surface runoff and leaching of soils	Offsite/Onsite - Surface water ecosystems and users of surface water and groundwater
<i>Heavy Metals - Arsenic, Cadmium, Chromium, Copper, Lead, Mercury– Nickel and Zinc</i> <i>BTEX - Benzene, Toluene, Ethyl–benzene and Xylene</i> <i>TRH - Total Recoverable Hydrocarbons</i> <i>PAH - Polycyclic Aromatic Hydrocarbons</i> <i>PCB - Polychlorinated Biphenyls</i> <i>OC/OPP - Organochlorine and Organophosphorus Pesticides</i>		



6.7 Discussion

The DSI was required to evaluate the site's suitability for future residential land use from a contamination perspective with respect to potential groundwater contamination and vapour intrusion from an adjoining former service station site (AEC1). In addition, the DSI was required to address an RFI from Midcoast Council.

Identified AEC's included the former service station and neighbouring property to the west, the existing smash repairer bounding the southern part of the site, stockpiled waste materials at the rear of 1058 Wingham Road, potential ACM in fencing at the rear of the residences in the southern part of the site, former and current agricultural activities, a cattle yard and livestock loading area in the eastern part of the site, disturbed terrain in the eastern part of the site, electricity lines transecting the central part of the site, vegetation stockpiles, unidentified stockpiles of fill and/or waste from illegal dumping.

With the exception of AEC1, the AEC's are considered to have been sufficiently addressed by the PSI with regard to their potential to have resulted in contamination that might pose a risk to human health and/or the environment in relation to the site's proposed residential development. As such, sampling for the DSI was designed to target AEC1 and identify the nature and extent of groundwater contamination and vapour intrusion at the subject site (if any).

Two groundwater monitoring wells were installed down gradient of both AEC1 and the adjoining property to the west where a previously identified residual groundwater plume was located beneath the residence. Groundwater samples were obtained from each well (MW101 and MW102) and submitted for laboratory analysis. In addition, two soil samples from each of the boreholes were also submitted for laboratory analysis. PID screening of the boreholes and soil samples was undertaken.

In summary, the results of laboratory analysis of soil samples collected from the boreholes revealed concentrations of the chemicals of concern were either below the laboratory detection limit, or below the adopted health investigation criteria for a Residential A site. Similarly, the results of laboratory analysis of groundwater samples collected from the monitoring wells revealed concentrations of the chemicals of concern were below the laboratory reporting limit. The results of PID screening of both the soil samples and the boreholes indicated negligible vapour concentrations. In addition, no visual or olfactory evidence of hydrocarbon contamination was observed during the field investigations.

Based on the results of the field and laboratory testing, unacceptable risks associated with the potential presence of contaminated groundwater and associated vapour intrusion that would impact future residential land use are absent. Due to the absence of potentially contaminated groundwater there is no source of vapour that could potentially pose an unacceptable risk to future residential land use. As such, further groundwater and vapour investigations are considered to be unwarranted.



6.8 Conclusions and Recommendations

The recommendations made by PSI remain valid. However, waste materials including an old car bonnet, scrap metal, timber, concrete, vegetation, mattresses, timber, rope, plastic and domestic rubbish stockpiled at the rear of No. 1058 Wingham Road in the southern part of the site which were identified during the PSI are understood to have since been removed. The cattle yard and livestock loading area located to the east of the smash repairer near the intersection with Youngs Road, should be removed and appropriately disposed of, if and when it is no longer actively used.

Some of the fencing at the rear of the residences which form the southern perimeter of the subject site could potentially be ACM. It would therefore be prudent to consult with the owners of these fences to ascertain if they are ACM and, if found to be so, discuss their removal and replacement. Should it be proposed to remove these fences during development of the site, an experienced occupational hygienist or environmental consultant should be sought to screen the fence materials for the presence of ACM. It is noted no fragments of these materials were observed on the ground surface at the time of investigation.

On the basis of the sampling and analysis undertaken, residual hydrocarbon impacts to groundwater (if any) will further attenuate over time and will not pose an unacceptable risk to future site users from vapour inhalation.

Should unidentified fill materials be encountered that require removal off site, assessment for a *Resource Recovery Exemption under Part 9, Clauses 91 and 92 of the Protection of the Environment Operations (Waste) Regulation 2014* in accordance with the *Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014 – the Excavated Natural Material (ENM) Order 2014*, will be required.

Should materials suspected of being contaminated (by way of visual or olfactory evidence) be encountered during development of the site, it is recommended that advice from a suitably qualified and experienced environmental consultant be sought without delay.

Based on the results obtained in this investigation and in combination with the findings of the PSI, it is considered that the site is suitable in its current state for future residential land use with regard to the presence of soil contamination, provided the recommendations and advice of this report are adopted, and site preparation works are conducted in accordance with appropriate site management protocols and legislative requirements.

7 DISPOSAL OF MATERIALS

7.1 Preliminary Waste Classification

A preliminary waste classification has been provided for excavated materials comprising fill or foreign materials which may be geotechnically or otherwise unsuitable in order to facilitate off-site disposal to a licensed landfill in accordance with NSW EPA (2014) *Waste Classification Guidelines*.

Table 2 of the '*Waste Classification Guidelines (2014)*' nominates a suite of analytes to be tested (Column 1) and also provides the maximum concentration (CT1) allowable within the soil for classification without the need for additional toxicity characteristics leaching procedure (TCLP) testing for both general solid waste (Column 2) and restricted solid waste (Column 3) for each analyte. Should the CT1 values be exceeded, the guidelines provide a Specific Contaminant



Concentration (SCC) value to allow further evaluation of contaminant concentrations in conjunction with TCLP testing.

An evaluation of the laboratory test results for sampled soils against the waste classification guidelines outlined above are presented in the summary table in Appendix C.

Preliminary waste classification results indicate that the soils present on-site would classify as General Solid Waste and could be disposed of to a landfill licensed to accept to **General Solid Waste**. This concurs with the preliminary waste classification results obtained from the soil sampling undertaken as part of the PSI.

It is likely that the majority of natural soils and rock present on the site would classify as Virgin Excavated Natural Material (VENM) in accordance with the NSW EPA (2014) *Waste Classification Guidelines*, subject to an evaluation by a suitably qualified environmental consultant at the commencement of excavation works.



8 LIMITATIONS

This report comprises the results of an investigation carried out for a specific purpose and client as defined in the document. The report should not be used by other parties or for purposes or projects other than those assumed and stated within the report, as it may not contain adequate or appropriate information for applications other than those assumed or advised at the time of its preparation. The contents of the report are for the sole use of the client and no responsibility or liability will be accepted to any third party. The report should not be reproduced either in part or in full, without the express permission of Regional Geotechnical Solutions Pty Ltd.

Contaminated site investigations are based on data collection, judgment, experience, and opinion. By nature, these investigations are less exact than other engineering disciplines. The findings presented in this report and used as the basis for the recommendations presented herein were obtained using normal, industry accepted practises and standards. To our knowledge, they represent a reasonable interpretation of the general condition of the site. Under no circumstances, however, can it be considered that these findings represent the actual state of the site at all points.

Recommendations regarding ground conditions referred to in this report are estimates based on the information available at the time of its writing. Estimates are influenced and limited by the fieldwork method and testing carried out in the site investigation, and other relevant information as has been made available. In cases where information has been provided to Regional Geotechnical Solutions for the purposes of preparing this report it has been assumed that the information is accurate and appropriate for such use. No responsibility is accepted by Regional Geotechnical Solutions for inaccuracies within any data supplied by others.

If site conditions encountered during construction vary significantly from those discussed in this report, Regional Geotechnical Solutions Pty Ltd should be contacted for further advice.

This report alone should not be used by contractors as the basis for preparation of tender documents or project estimates. Contractors using this report as a basis for preparation of tender documents should avail themselves of all relevant background information regarding the site before deciding on selection of construction materials and equipment.

If you have any questions regarding this project, or require any additional consultations, please contact the undersigned.

For and on behalf of

Regional Geotechnical Solutions Pty Ltd

Prepared by

Andrew Hills

Associate Environmental Engineer

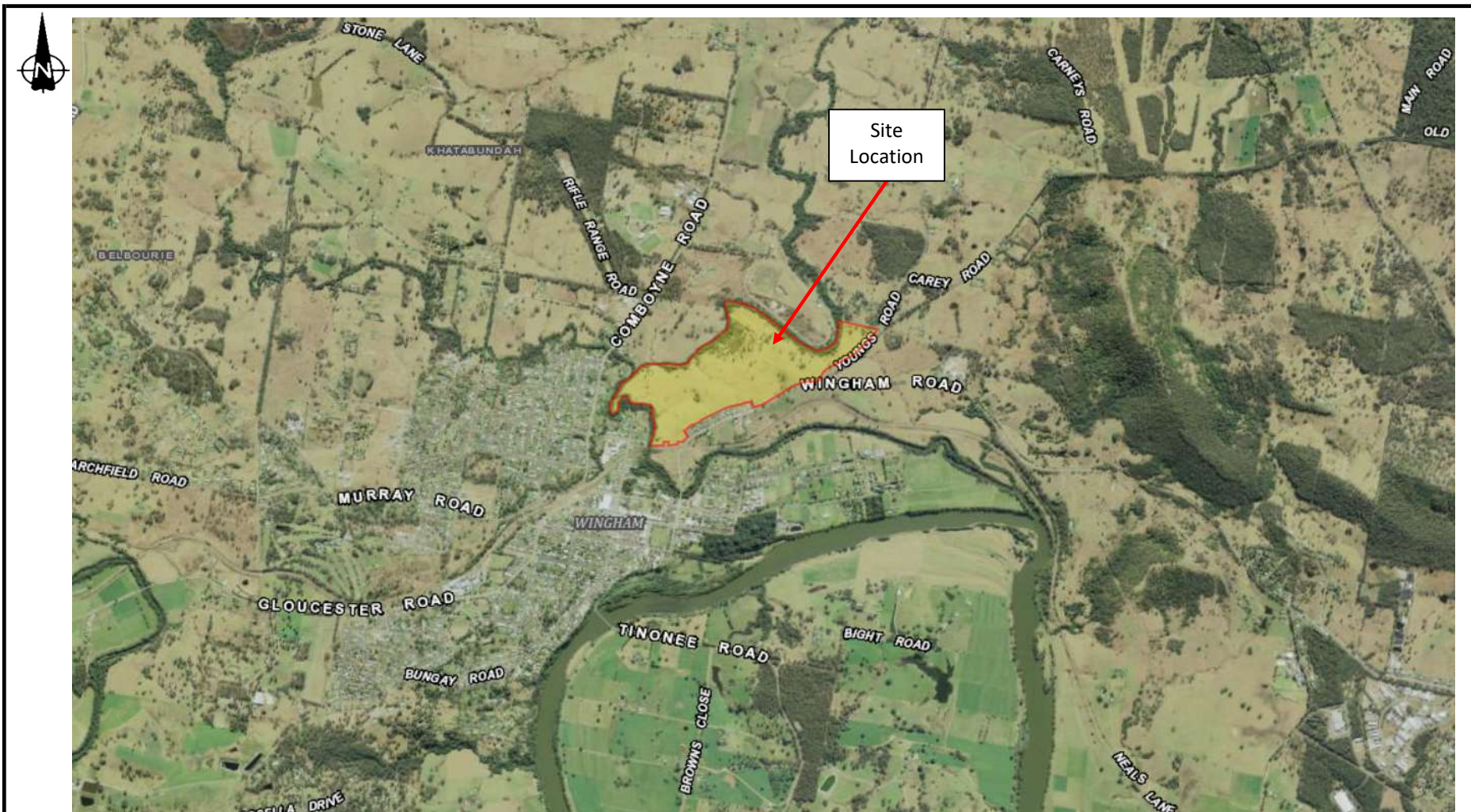
Reviewed by

Steve Morton

Principal Geotechnical Engineer

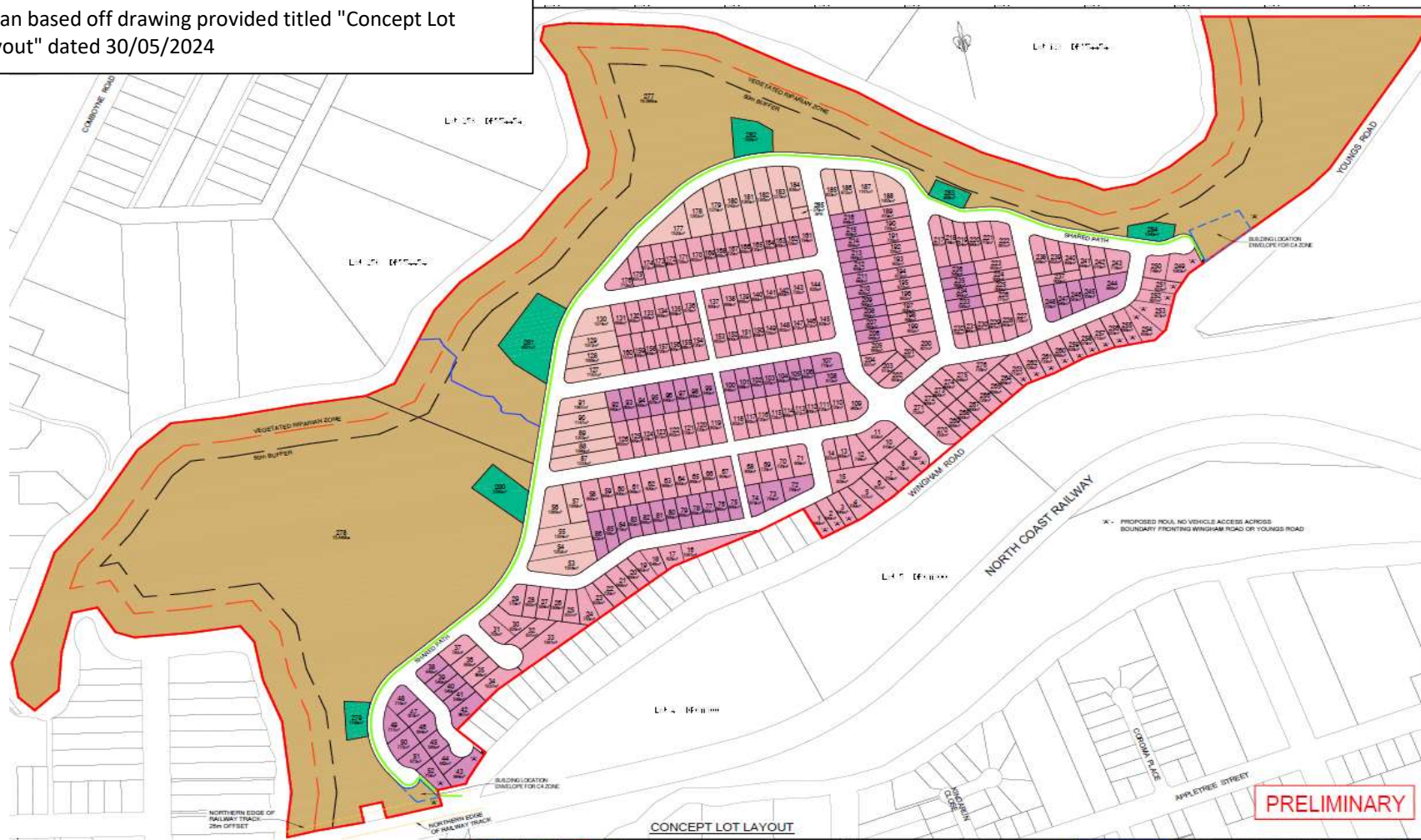


Figures

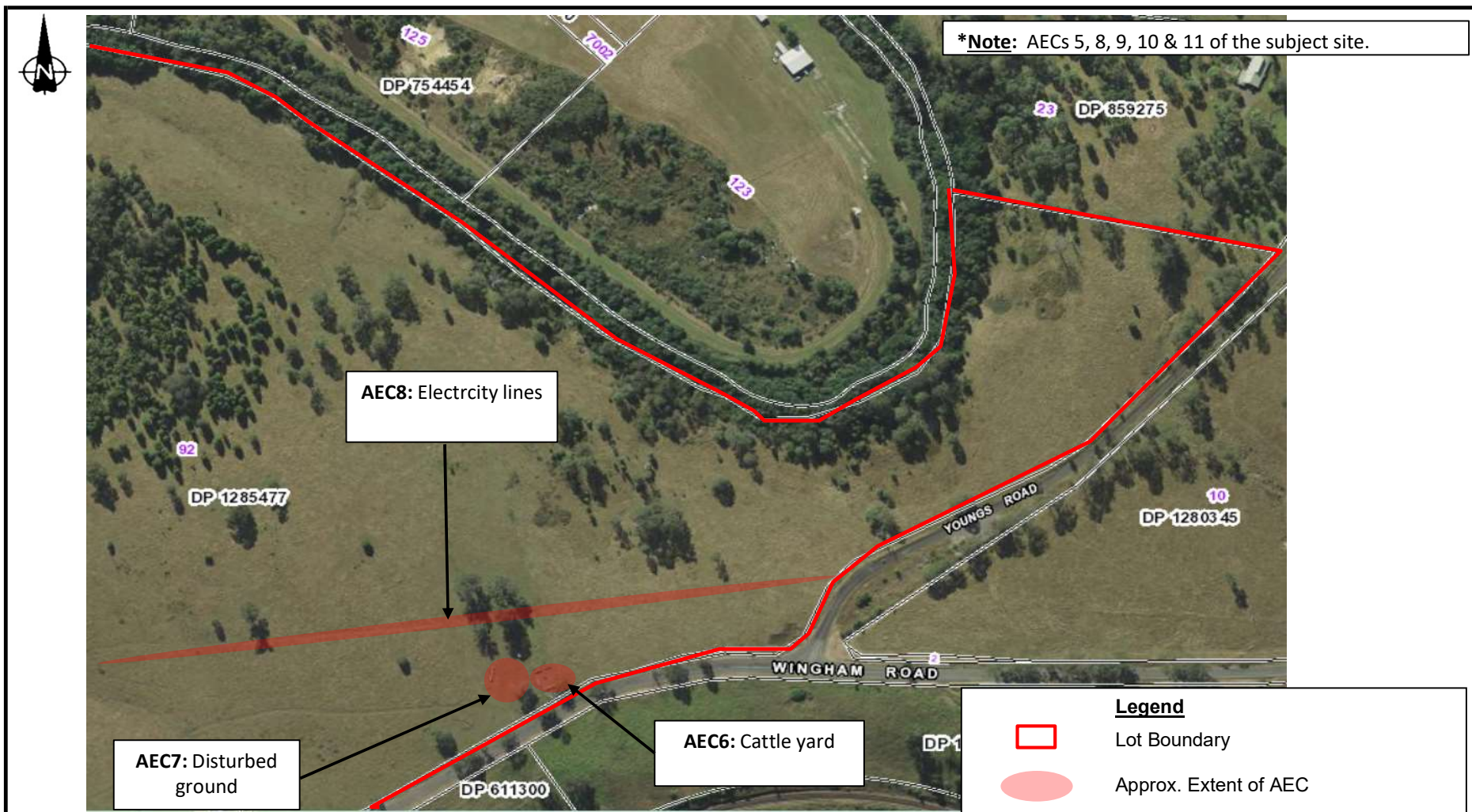


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	Project:	Proposed Residential Subdivision	Drawn By:	APH
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	Title:	Site Location Plan	Date:	14-Feb-24
			Drawing No.	Figure 1

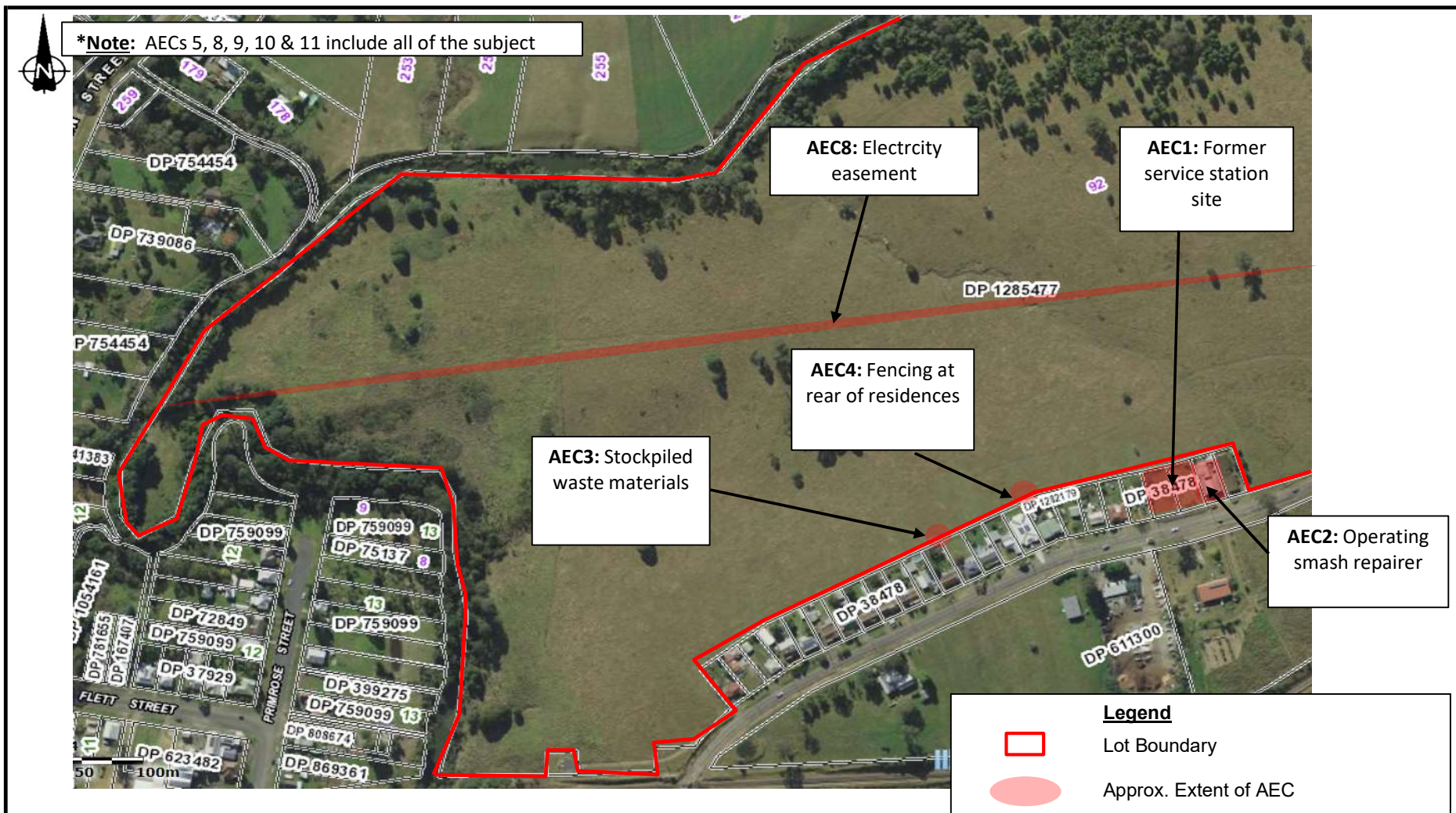
*Plan based off drawing provided titled "Concept Lot Layout" dated 30/05/2024



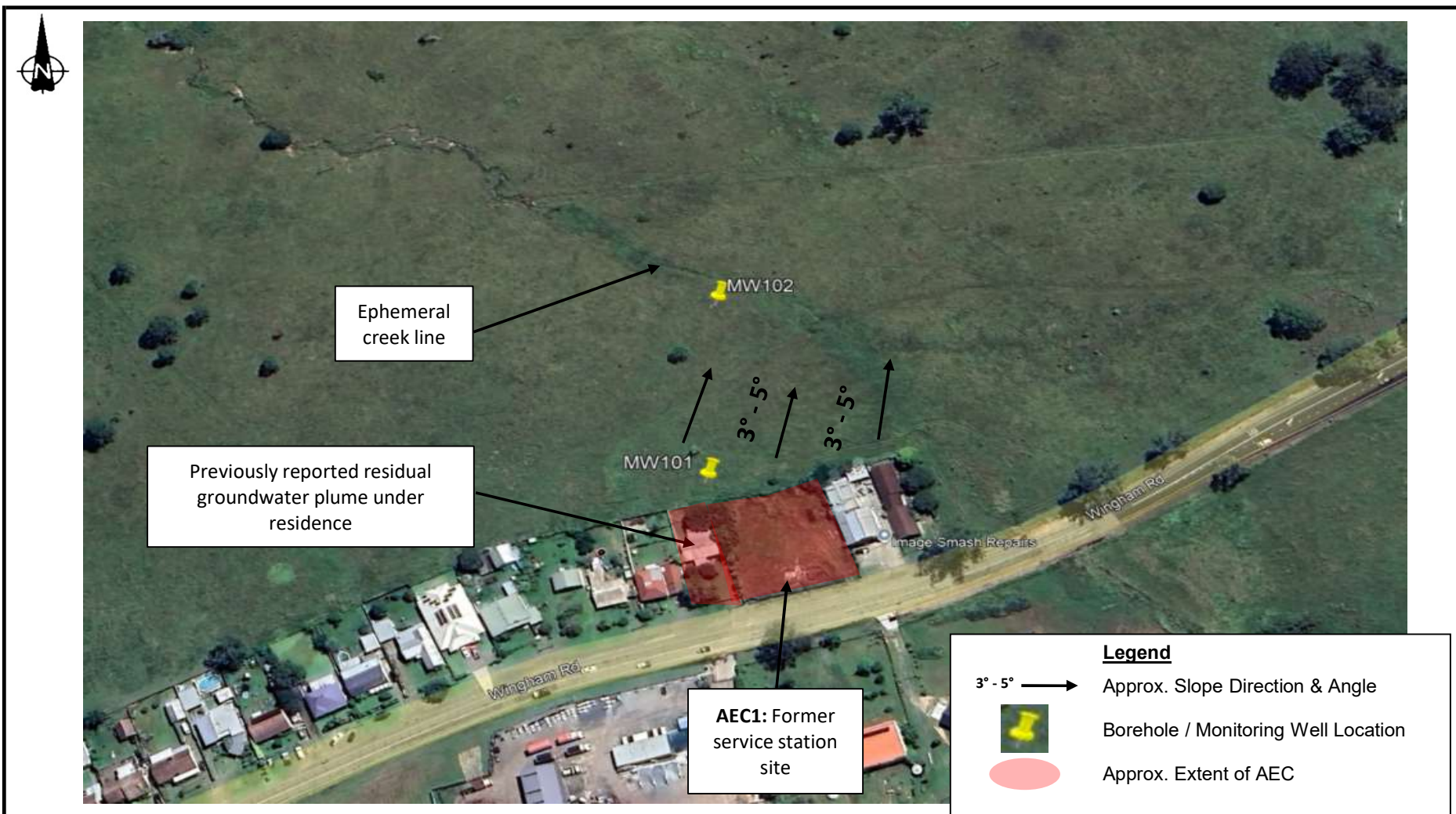
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Project:	Proposed Residential Subdivision	Drawn By:	APH
	Lot 92 Wingham Road, Wingham	Scale:	As Shown
Title:	Indicative Subdivision Layout Plan	Date:	14-Feb-24
		Drawing No.	Figure 2



 REGIONAL GEOTECHNICAL SOLUTIONS	Client:	MPT Farms Pty Ltd	Job No.	RGS03311.1
	Project:	Proposed Residential Subdivision	Drawn By:	APH
		Lot 92 Wingham Road, Wingham	Scale:	As Shown
	Title:	Areas of Environmental Concern- East	Date:	14-Feb-24
			Drawing No.	Figure 3



 REGIONAL GEOTECHNICAL SOLUTIONS	Client:	MPT Farms Pty Ltd	Job No.	RGS03311.1
	Project:	Proposed Residential Subdivision	Drawn By:	APH
		Lot 92 Wingham Road, Wingham	Scale:	As Shown
	Title:	Areas of Environmental Concern - West	Date:	14-Feb-24
			Drawing No.	Figure 4



 REGIONAL GEOTECHNICAL SOLUTIONS	Client:	MPT Farms Pty Ltd	Job No.	RGS03311.1
	Project:	Proposed Residential Subdivision	Drawn By:	APH
		Lot 92 Wingham Road, Wingham	Scale:	As Shown
	Title:	Investigation Location Plan - DSI	Date:	23-Jan-25
			Drawing No.	Figure 5



Appendix A

Results of Field Investigations

Soil Description Explanation Sheet

The following summary of the description and classification of soils used by Regional Geotechnical Solutions Pty Ltd (RGS) in this report are based on Australia Standard AS1726-2017 'Geotechnical Site Investigations'. When describing soils, the dominant component is shown in upper case and secondary components are shown in lower case. Soil descriptions, in general, will contain soil type, plasticity or particle size/shape, colour, secondary components, consistency or density, moisture and inclusions, along with other relevant additional observations.

Particle Size Distribution		
Components	Subdivision	Size (mm)
Boulders		>200
Cobbles		63 - 200
Gravel	Coarse	19 - 63
	Medium	6.7 - 19
	Fine	2.36 - 6.7
Sand	Coarse	0.6 - 2.36
	Medium	0.21 - 0.6
	Fine	0.075 - 0.21
Silt		0.002 - 0.075
Clay		<0.002

Secondary & Minor Components			
Terminology	Coarse Grained Soil		Fine Grained Soil
	% Fines	% Coarse	% Coarse
Trace	≤5	≤15	≤15
With	>5, ≤12	>15, ≤30	>15, ≤30
Secondary	>12	>30	>30

Consistency			
Term	Abbr.	Undrained Shear Strength (kPa)	Unconfined Compressive Strength (kPa)
Very Soft	VS	<12	<24
Soft	S	12 - 25	25 - 50
Firm	F	25 - 50	50 - 100
Stiff	St	50 - 100	100 - 200
Very Stiff	VSt	100 - 200	200 - 400
Hard	H	>200	>400
Friable	Fb	Crumbles or powders under pressure	

Relative Density (Non-Cohesive Soils)		
Term	Abbr.	Relative Density (%)
Very Loose	VL	≤15
Loose	L	>15 and ≤35
Medium Dense	MD	>35 and ≤65
Dense	D	>65 and ≤85
Very Dense	VD	>85

Plasticity		
Term	Range of Liquid Limit (Silt)	Range of Liquid Limit (Clay)
Non-Plastic	Not applicable	Not applicable
Low Plasticity	≤50	≤35
Medium Plasticity	Not applicable	>35 and ≤50
High Plasticity	>50	>50

Moisture (Coarse Grained)	
Term	Description
Wet (W)	Feels cool, darkened and free water forms when handling
Moist (M)	Feels cool, slightly darkened, tends to stick together
Dry (D)	Non-cohesive and free-running

Moisture (Fine Grained)	
Term	Description
W < PL	Dry of Plastic Limit
w ≈ PL	Near Plastic Limit
W > PL	Wet of Plastic Limit

Soil Origin	
Term	Description
Fill	Any material placed by anthropogenic processes.
Topsoil	Near-surface soil often with high levels of organic material
Slopewash	Soils moved down a slope by gravity aided by non-channelled running water
Alluvial	Deposited by streams and rivers
Colluvial	Deposited by gravity, generally in gullies or at the base of slopes
Aeolian	Deposited by wind
Marine	Deposited in a marine environment
Lacustrine	Deposited in freshwater lakes
Estuarine	Deposited in coastal estuaries, including sediments carried by inflowing rivers and tidal currents
Residual	Formed in-situ through weathering of geological formations. No longer retains any visible structure of parent material
Extremely Weathered Material	Formed in-situ through weathering of geological formations. Retains structure of parent rock material but with soil strength.

Rock Description Explanation Sheet

The following summary of the description and classification of rocks used in this report by Regional Geotechnical Solutions Pty Ltd (RGS) are based on Australia Standard AS1726-2017 'Geotechnical Site Investigations'. Material is described as a rock if it cannot be remoulded by hand in field conditions or when water is added. Rock descriptions, in general, will contain rock type, grain size, structure, colour, degree of weathering, strength, minor components and where applicable, the defect types, inclination, roughness and coating/infill.

Rock Description	
Sedimentary	Sedimentary rocks are deposited in beds, have grains that are cemented together and may be interbedded with varying sediment types.
Igneous	Igneous rocks are formed from molten rock and have a crystalline structure. Typically massive, with some exhibiting flow banding.
Metamorphic	Metamorphic rocks are formed when rocks are subject to significant heat and/or pressure. Commonly have direction fabric (e.g. foliation) although some are massive.
Simple rock names are often used in the absence of petrographic assessment. When rock cannot be precisely classified, the simple rock name should be chosen by considering the nature and shape of grains or crystals, the texture and fabric of the rock, the geological structure and setting along with geological map and/or knowledge of the area.	

Grain Size			
Rock Type	Fine (F)	Medium (M)	Coarse (C)
Sedimentary	0.06 – 0.2	0.2 – 0.6	0.6 – 2.0
Igneous / Metamorphic	<0.06	0.06 – 2.0	>2.0

Fabric & Texture		
Rock Type	Term	Description
Sedimentary	Bedding	Layering produced by changes in sedimentation. May be defined by grain size, colour etc.
	Lamination	Like bedding but developed in thin layers, typically less than 20mm.
Metamorphic	Foliation	Parallel arrangement of minerals due to metamorphic processes.
	Cleavage	A type of foliation developed in fine grained metamorphic rocks
Igneous	Flow Banding	Layering produced during flow of partially solidified igneous rock, causing crystals to become oriented.
The above terms are common terms for describing the type of texture and/or fabric in rock material. Other terms may be used.		

Degree of Fracturing	
Term	Fracture Spacing (mm)
Fragmented	<20
Highly Fractured	20 – 40
Fractured	40 – 200
Slightly Fractured	200 – 1,000
Unbroken	Core does not contain fractures

Rock Strength			
Term	Abbr.	UCS (MPa)	Point Load, $I_{s(50)}$ (MPa)
Very Low Strength	VL	0.6 – 2	0.03 – 0.1
Low Strength	L	2 – 6	0.1 – 0.3
Medium Strength	M	6 – 20	0.3 – 1.0
High Strength	H	20 – 60	1 – 3
Very High Strength	VH	60 – 200	3 – 10
Extremely High Strength	EH	>200	> 10
In absence of UCS testing or Point Load Testing a field assessment is made to adopt a strength classification.			

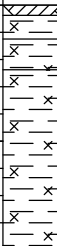
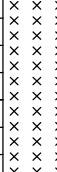
Weathering		
Term	Abbr.	Definition
Extremely Weathered	XW	Material is weathered to such an extent that it has soil properties. Mass structure and fabric of original rock are still visible
Highly Weathered	HW	Whole of rock material is discoloured, and rock strength is significantly changed. Some minerals have weathered to clay. Original colour is not recognisable due to iron staining, bleaching etc.
Moderately Weathered	MW	Whole of rock material is discoloured, with minor change to strength of fresh rock. Original colour is not recognisable due to iron staining, bleaching etc.
Slightly Weathered	SW	Rock is partially discoloured with staining or bleach along joints. Minimal or no change of strength from fresh rock.
Fresh	Fr	Rock shows no sign of decomposition of minerals or colour changes

Features, Inclusions & Minor Components	
Term	Description
Gas Bubbles	Vesicles if empty; amygdules if mineralized. Found in igneous rocks.
Veins	A sheet-like inclusion, can consist of quartz, calcite or other minerals
Cross-Bedding	Layering at an angle to the main bedding plane
Clast or Matrix Supported	Relevant to conglomerates and breccia. Clast supported is when clasts (i.e. gravel/cobbles) are in contact with each other and the matrix is filling the voids. Matrix supported is when clasts are not in contact and the matrix surrounds each clast.
The above terms are some common features, inclusions and minor components in rock material, however, other terms may be used.	



ENGINEERING LOG - BOREHOLE

BOREHOLE NO: MW101**CLIENT:** MPT Farms Pty Ltd**PAGE:** 1 of 1**PROJECT NAME:** Proposed Rezoning**JOB NO:** RGS03311.1**SITE LOCATION:** Wingham Road, Wingham**LOGGED BY:** AH**TEST LOCATION:** See Figure 2**DATE:** 12/12/24**DRILL TYPE:** DB8 Truck Mounted Rig**EASTING:** 441374 m**SURFACE RL:****BOREHOLE DIAMETER:** 100 mm**INCLINATION:** 90°**NORTHING:** 6474676 m**DATUM:** AHD

Drilling and Sampling					Material description and profile information					Field Test		Structure and additional observations
METHOD	WATER	SAMPLES	RL (Not measured)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics, colour, minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	
AD/T		0.80m		2.0		CL	TOPSOIL: Silty CLAY, low plasticity, brown/ dark brown, some gravel, coarse grained, some roots. Silty Gravelly CLAY: Low plasticity, brown, gravel, coarse grained, some roots. Silty CLAY: Medium to high plasticity, brown/ pale brown, trace roots. Silty CLAY: Low to medium plasticity, pale brown/ pale grey/ white.	M	Fr			TOPSOIL
		CL				M		SLOPEWASH				
		CH				M		RESIDUAL SOIL				
		CL				M		EXTREMELY WEATHERED SILTSTONE				
PCD	12/12/2024	1.00m		4.0			SILTSTONE: Grey/ brown/ orange.	M				HIGHLY TO MODERATELY WEATHERED, FRACTURED SILTSTONE
		1.80m		10.0			SILTSTONE:	M				EXTREMELY TO HIGHLY WEATHERED, FRACTURED SILTSTONE
		2.00m		10.60			SILTSTONE:	M				HIGHLY TO MODERATELY WEATHERED, FRACTURED SILTSTONE
		E		12.0			SILTSTONE:	M				MODERATELY WEATHERED TO FRESH FRACTURED SILTSTONE
				16.0								
				17.45m								
				18.0			Hole Terminated at 17.45 m					

LEGEND:**Water**

- Water Level
(Date and time shown)
- Water Inflow
- Water Outflow

Strata Changes

- Gradational or transitional strata
- Definitive or distinct strata change

Notes, Samples and Tests

- U₅₀ 50mm Diameter tube sample
- CBR Bulk sample for CBR testing
- E Environmental sample
- ASS Acid Sulfate Soil Sample
- B Bulk Sample

Field Tests

- PID Photoionisation detector reading (ppm)
- DCP(x-y) Dynamic penetrometer test (test depth interval shown)
- HP Hand Penetrometer test (UCS kPa)

Consistency

- VS Very Soft
- S Soft
- F Firm
- St Stiff
- VSt Very Stiff
- H Hard
- Fb Friable

UCS (kPa)

- <25
- 25 - 50
- 50 - 100
- 100 - 200
- 200 - 400
- >400

Moisture Condition

- D Dry
- M Moist
- W Wet
- W_p Plastic Limit
- W_L Liquid Limit

Density

- V Very Loose
- L Loose
- MD Medium Dense
- D Dense
- VD Very Dense

- Density Index <15%
- Density Index 15 - 35%
- Density Index 35 - 65%
- Density Index 65 - 85%
- Density Index 85 - 100%



ENGINEERING LOG - BOREHOLE

BOREHOLE NO: MW102

CLIENT: MPT Farms Pty Ltd
PROJECT NAME: Proposed Rezoning
SITE LOCATION: Wingham Road, Wingham
TEST LOCATION: See Figure 2

PAGE: 1 of 1
JOB NO: RGS03311.1
LOGGED BY: AH
DATE: 12/12/24

DRILL TYPE: DB8 Truck Mounted Rig**EASTING:** 441376 m**SURFACE RL:****BOREHOLE DIAMETER:** 100 mm**INCLINATION:** 90°**NORTHING:** 6474761 m**DATUM:** AHD

Drilling and Sampling					Material description and profile information					Field Test		Structure and additional observations
METHOD	WATER	SAMPLES	RL (Not measured)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics, colour, minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	
AD/T	12/12/2024	0.80m	E	2.0		CL	0.20m TOPSOIL: Silty CLAY, low plasticity, brown/ dark brown, some gravel, coarse grained, some roots.	M	Fr			TOPSOIL
		CL				0.70m Silty Gravelly CLAY: Low to medium plasticity, orange/ brown, gravel, coarse grained, some roots.	M	SLOPEWASH				
		CH				0.90m Silty CLAY: Medium to high plasticity, brown/ pale brown, trace roots.	M > w _p	RESIDUAL SOIL				
		CL				Silty CLAY: Low to medium plasticity, pale brown/ brown/ white.		EXTREMELY WEATHERED SILTSTONE				
				4.0			4.00m SILTSTONE: Grey/ brown/ orange.					HIGHLY TO MODERATELY WEATHERED SILTSTONE
				6.0			5.10m SILTSTONE:	M				EXTREMELY TO HIGHLY WEATHERED SILTSTONE
				8.0			6.30m SILTSTONE:	M				HIGHLY TO MODERATELY WEATHERED SILTSTONE
				10.0								
				11.10m			Hole Terminated at 11.10 m Practical TC Bit refusal					
				12.0								
				14.0								
				16.0								
				18.0								

LEGEND:**Water**

- Water Level
(Date and time shown)
- Water Inflow
- Water Outflow

Strata Changes

- Gradational or transitional strata
- Definitive or distinct strata change

Notes, Samples and Tests

- U₅₀ 50mm Diameter tube sample
- CBR Bulk sample for CBR testing
- E Environmental sample
- ASS Acid Sulfate Soil Sample
- B Bulk Sample

Field Tests

- PID Photoionisation detector reading (ppm)
- DCP(x-y) Dynamic penetrometer test (test depth interval shown)
- HP Hand Penetrometer test (UCS kPa)

Consistency

- VS Very Soft
- S Soft
- F Firm
- St Stiff
- VSt Very Stiff
- H Hard
- Fb Friable

UCS (kPa)

- <25
- 25 - 50
- 50 - 100
- 100 - 200
- 200 - 400
- >400

Moisture Condition

- D Dry
- M Moist
- W Wet
- W_p Plastic Limit
- W_L Liquid Limit

Density

- V Very Loose
- L Loose
- MD Medium Dense
- D Dense
- VD Very Dense

- Density Index <15%
- Density Index 15 - 35%
- Density Index 35 - 65%
- Density Index 65 - 85%
- Density Index 85 - 100%



Appendix B

Laboratory Test Result Sheets



Client: MPT Farms Pty Ltd
Job No. RGS03311.1-AG
Project: Proposed Residential Subdivision
Location: Cedar Creek Estate, Wingham

Comparison of Contamination Analysis Results with Adopted Investigation Levels (Results in mg/kg)

SAMPLE	DEPTH (m)	MATERIAL	TOTAL RECOVERABLE HYDROCARBONS					PAH		BTEX		Heavy Metals							
			C6-C10	C10-C16	C16-C34	C34-C40	TOTAL 10-40	Total	b-a-p (TEQ)	Sum	Napthalene	As	Cd	Cr (total)#	Cu	Pb	Ni	Zn	Hg
MW101	0.8 - 1.0	Residual Soil	<10	<50	<100	<100	<50	<0.5	<0.5	<0.2	<1	6	<1	3	12	8	3	32	<0.1
MW101	1.8 - 2.0	Weathered Siltstone	<10	<50	<100	<100	<50	<0.5	<0.5	<0.2	<1	8	<1	2	14	<5	4	39	<0.1
MW102	0.8 - 1.0	Residual Soil	<10	<50	<100	<100	<50	<0.5	<0.5	<0.2	<1	13	<1	29	13	13	5	17	<0.1
MW102	1.8 - 2.0	Weathered Siltstone	<10	<50	<100	<100	<50	<0.5	<0.5	<0.2	<1	6	<1	12	22	6	8	45	<0.1
D1 (duplicate of MW102 0.8 - 1.0m)	0.8 - 1.0	Residual Soil	----	----	----	----	----	----	----	----	----	9	<1	20	12	10	4	13	<0.1
RINSATE1 (mg/L)		Water	----	----	----	----	----	----	----	----	----	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.0001
D1RPD%			----	----	----	----	----	----	----	----	----	36.4	0.0	18.6	8.0	26.1	22.2	26.7	0.0
CRITERIA (NEPM 2013)																			
Health Investigation Level (HIL)*:								300	3			100	20	100#	6000	300	400	7400	40
Health Screening Level (HSL)**			50	110	NL	NL	NL												
Ecological Screening Level (ESL)***			280	120	1300	5600	NL			45-125									
Ecological Investigation Level (EIL)@											170	100				1100			

CRITERIA:

* Health Based Investigation Levels for Residential A (NEPM 2013)

** Health Screening Level (F2) for residential land use and fine grained soil (clay), 0 - 1m depth

*** Ecological Screening Level for residential land use

@ Ecological Investigation Level - aged (>2 years) for residential landuse

Chromium VI

Speciation testing confirmed only Chromium III present

<LOR - Below the laboratory limit of reporting

Summary Table - Comparison of Contamination Analysis Results With Waste Classification Threshold Limits (Results in mg/kg)																	
 REGIONAL GEOTECHNICAL SOLUTIONS			Client: MPT Farms Pty Ltd Job No. RGS03311.1-AG Project: Proposed Residential Subdivision Location: Cedar Creek Estate, Wingham														
SAMPLE	MATERIAL	DEPTH (m)	TOTAL PETROLEUM HYDROCARBONS					PAH	HEAVY METALS								
			C6-C9	C10-C14	C15-C28	C29-C36	TOTAL		Arsenic	TCLP	Cadmium	TCLP	Nickel	TCLP	Lead	TCLP	Mercury
MW101	Residual Soil	0.8 - 1.0	<10	<50	<100	<100	<50	<0.5	6		<1		3		8		<0.1
MW101	Weathered Siltstone	1.8 - 2.0	<10	<50	<100	<100	<50	<0.5	8		<1		4		<5		<0.1
MW102	Residual Soil	0.8 - 1.0	<10	<50	<100	<100	<50	<0.5	13		<1		5		13		<0.1
MW102	Weathered Siltstone	1.8 - 2.0	<10	<50	<100	<100	<50	<0.5	6		<1		8		6		<0.1
THRESHOLD LIMITS																	
GENERAL SOLID WASTE		CT1							100		20		40		100		4
		SCC1	650				10000	200	500		100		1050		1500		50
		TCLP1							5		1		2		5		0.2
RESTRICTED SOLID WASTE		CT2							400		80		160		400		16
		SCC2	2600				40000	800	2000		400		4200		6000		200
		TCLP2							20		4		8		20		0.8

NOTES

CT	Contaminant Threshold (without TCLP)
SCC	Specific Contaminant Concentrations (used with TCLP)
TCLP	Toxicity Characteristics Leaching Procedure (used with SCC)
Shaded	Exceeds General Solid Waste Threshold = Restricted Solid Waste
BOLD and Shaded	Exceeds Restricted Solid Waste Threshold = Hazardous Waste

CRITERIA:

Waste Classification - Classifying Waste, Part 1 (NSW EPA 2014)



Summary Table - Comparison of Groundwater Chemical Analysis Results (concentrations in ug/L) for 'Aquatic Ecosystems'

Client: MPT Farms Pty Ltd
Job No. RGS03311.1-AG
Project: Proposed Residential Subdivision
Location: Wingham Road, Wingham

Location	TOTAL RECOVERABLE HYDROCARBONS					Total PAH	Naphthalene (PAH)	BTEX				Lead (Dissolved)	PHYSICAL PARAMETERS		
	C6-C10	C10-C16	C16-C34	C34-C40	TOTAL 10-40			Benzene	Toluene	Ethyl-benzene	Xylenes (Total)		pH	EC (µS/cm)	DO (mg/L)
MW101	<20	<100	<100	<100	<100	<0.5	<1.0	<1	<2	<2	<2	<0.001	6.82	7210	8.2
MW102	<20	<100	<100	<100	<100	<0.5	<1.0	<1	<2	<2	<2	<0.001	7.24	10800	8.0
D101 (Duplicate of MW101)	<20	<100	<100	<100	<100	<0.5	<1.0	<1	<2	<2	<2	--	--	--	--
D101 - RPD%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--	--
CRITERIA (ANZECC 2000) - 95% Protection of Species for Aquatic Ecosystems - Freshwater	NL	NL	NL	NL	NL	NL	16	950	NL	NL	550	0.0034			
Recreational Human Health Screening Criteria (NHMRC 2008)	NL	NL	NL	NL	NL	NL	NL	10	8000	3000	6000	0.01			
Health Screening Level (HSL)^	NL	NL	NL	NL	NL	NL	NL	5000	NL	NL	NL	0.0034			
Dutch Intervention Level					600						350				
NSW Clean Waters Act					10,000*										

NOTES:

Denotes concentration exceeds adopted guideline criteria

*TRH Criteria based on NSW Clean Waters Act criteria for oil and grease entering waters

^Health Screening Level (F2) for Residential A land use and fine grained soil (clay)

NLNo Limit available

LORLimit of Reporting

N/DNot Detected



CERTIFICATE OF ANALYSIS

Work Order	: ES2441907	Page	: 1 of 7
Client	: REGIONAL GEOTECHNICAL SOLUTION	Laboratory	: Environmental Division Sydney
Contact	: ANDREW HILLS	Contact	: Customer Services ES
Address	: 44 BENT STREET WINGHAM NSW, AUSTRALIA 2429	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: RGS03311.1 Proposed Residential Subdivision	Date Samples Received	: 23-Dec-2024 09:35
Order number	: ----	Date Analysis Commenced	: 24-Dec-2024
C-O-C number	: ----	Issue Date	: 03-Jan-2025 09:34
Sampler	: ----		
Site	: Lot 11 Wingham Road, Wingham		
Quote number	: EN/222		
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, unless the sampling was conducted by ALS. 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
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjjar	Organic Coordinator	Sydney Organics, Smithfield, NSW



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the 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 Contract 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) per the NEPM (2013) 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.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- EP080: Samples not received in a suitable time frame to conduct the analysis within the recommended holding time.



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				MW101_0.8-1.0	MW101_1.8-2.0	MW102_0.8-1.0	MW102_1.8-2.0	D1
Sampling date / time				12-Dec-2024 00:00	12-Dec-2024 00:00	12-Dec-2024 00:00	12-Dec-2024 00:00	12-Dec-2024 00:00
Compound	CAS Number	LOR	Unit	ES2441907-001	ES2441907-002	ES2441907-003	ES2441907-004	ES2441907-005
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	11.5	15.2	21.8	9.8	22.1
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	6	8	13	6	9
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	3	2	29	12	20
Copper	7440-50-8	5	mg/kg	12	14	13	22	12
Lead	7439-92-1	5	mg/kg	8	<5	13	6	10
Nickel	7440-02-0	2	mg/kg	3	4	5	8	4
Zinc	7440-66-6	5	mg/kg	32	39	17	45	13
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	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<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	<0.5	<0.5	<0.5	<0.5	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW101_0.8-1.0	MW101_1.8-2.0	MW102_0.8-1.0	MW102_1.8-2.0	D1
Sampling date / time					12-Dec-2024 00:00	12-Dec-2024 00:00	12-Dec-2024 00:00	12-Dec-2024 00:00	12-Dec-2024 00:00
Compound	CAS Number	LOR	Unit		ES2441907-001	ES2441907-002	ES2441907-003	ES2441907-004	ES2441907-005
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		0.6	0.6	0.6	0.6	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		1.2	1.2	1.2	1.2	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	----
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	----
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	<100	----
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	<100	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	----
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	----
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	<100	----
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	----
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg		<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	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW101_0.8-1.0	MW101_1.8-2.0	MW102_0.8-1.0	MW102_1.8-2.0	D1		
Sampling date / time					12-Dec-2024 00:00	12-Dec-2024 00:00	12-Dec-2024 00:00	12-Dec-2024 00:00	12-Dec-2024 00:00		
Compound	CAS Number	LOR	Unit	ES2441907-001	ES2441907-002	ES2441907-003	ES2441907-004	ES2441907-005			
				Result	Result	Result	Result	Result			
EP080: BTEXN - Continued											
^ Total Xylenes				----	0.5	mg/kg	<0.5	<0.5	<0.5	----	
Naphthalene				91-20-3	1	mg/kg	<1	<1	<1	----	
EP075(SIM)S: Phenolic Compound Surrogates											
Phenol-d6				13127-88-3	0.5	%	96.3	95.7	94.5	93.6	----
2-Chlorophenol-D4				93951-73-6	0.5	%	91.6	94.6	91.4	93.6	----
2.4.6-Tribromophenol				118-79-6	0.5	%	65.6	61.8	62.5	62.8	----
EP075(SIM)T: PAH Surrogates											
2-Fluorobiphenyl				321-60-8	0.5	%	101	101	102	102	----
Anthracene-d10				1719-06-8	0.5	%	108	104	93.2	87.1	----
4-Terphenyl-d14				1718-51-0	0.5	%	105	105	106	106	----
EP080S: TPH(V)/BTEX Surrogates											
1.2-Dichloroethane-D4				17060-07-0	0.2	%	96.4	104	96.1	80.9	----
Toluene-D8				2037-26-5	0.2	%	95.5	105	101	74.1	----
4-Bromofluorobenzene				460-00-4	0.2	%	108	116	115	85.8	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RINSATE1	----	----	----	----
Sampling date / time					12-Dec-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2441907-006	-----	-----	-----	-----
				Result	----	----	----	----	----
EG020T: Total Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L		<0.001	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		<0.005	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	----	----	----	----



Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	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	63	125
Toluene-D8	2037-26-5	67	124
4-Bromofluorobenzene	460-00-4	66	131



CERTIFICATE OF ANALYSIS

Work Order : **ES2501432**
Client : **REGIONAL GEOTECHNICAL SOLUTION**
Contact : ANDREW HILLS
Address : 44 BENT STREET
WINGHAM NSW, AUSTRALIA 2429
Telephone : ----
Project : RGS03311.1 Proposed Rezoning
Order number : ----
C-O-C number : ----
Sampler : ----
Site : WINGHAM ROAD, WINGHAM
Quote number : EN/222
No. of samples received : 3
No. of samples analysed : 3

Page : 1 of 6
Laboratory : Environmental Division Sydney
Contact : Customer Services ES
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61-2-8784 8555
Date Samples Received : 17-Jan-2025 10:15
Date Analysis Commenced : 20-Jan-2025
Issue Date : 22-Jan-2025 17:31



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, unless the sampling was conducted by ALS. 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
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the 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 Contract 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.

- EP075 (SIM): Where reported, Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) 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), Dibenzo(a,h)anthracene (1.0), Benzo(g,h,i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- The IDs for Sample 1 and 2 on the COC are M101 and M102, but they were received as MW101 and MW102. Please confirm which is the correct ID.

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	M101	M102	D101	----	----
Sampling date / time				15-Jan-2025 00:00	15-Jan-2025 00:00	15-Jan-2025 00:00	----	----	
Compound	CAS Number	LOR	Unit	ES2501432-001	ES2501432-002	ES2501432-003	-----	-----	
				Result	Result	Result	----	----	
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit	6.82	7.24	----	----	----	
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm	7210	10800	----	----	----	
EG020F: Dissolved Metals by ICP-MS									
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	----	----	----	
EP025: Oxygen - Dissolved (DO)									
Dissolved Oxygen	----	0.1	mg/L	8.2	8.0	----	----	----	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	<1.0	----	----	
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	<1.0	----	----	
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	<1.0	----	----	
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	<1.0	----	----	
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	<1.0	----	----	
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	<1.0	----	----	
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	<1.0	----	----	
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	<1.0	----	----	
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	<1.0	----	----	
Chrysene	218-01-9	1.0	µg/L	<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	----	----	
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	<1.0	----	----	
Benzo(a)pyrene	50-32-8	0.5	µg/L	<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	----	----	
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	<1.0	----	----	
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	<1.0	----	----	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	<0.5	<0.5	----	----	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	<0.5	<0.5	----	----	
EP080/071: Total Petroleum Hydrocarbons									



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	M101	M102	D101	----	----
Sampling date / time					15-Jan-2025 00:00	15-Jan-2025 00:00	15-Jan-2025 00:00	----	----
Compound	CAS Number	LOR	Unit		ES2501432-001	ES2501432-002	ES2501432-003	-----	-----
					Result	Result	Result	----	----
EP080/071: Total Petroleum Hydrocarbons - Continued									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	----	----
C10 - C14 Fraction	----	50	µg/L		<50	<50	<50	----	----
C15 - C28 Fraction	----	100	µg/L		<100	<100	<100	----	----
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	<20	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	<100	<100	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	<100	<100	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	<100	<100	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	<100	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	----	----
Toluene	108-88-3	2	µg/L		<2	<2	<2	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	----	----
^ Total Xylenes	----	2	µg/L		<2	<2	<2	----	----
^ Sum of BTEX	----	1	µg/L		<1	<1	<1	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%		25.2	28.0	30.7	----	----
2-Chlorophenol-D4	93951-73-6	1.0	%		64.5	67.2	61.2	----	----
2,4,6-Tribromophenol	118-79-6	1.0	%		64.7	68.2	52.7	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	M101	M102	D101	----	----
Sampling date / time					15-Jan-2025 00:00	15-Jan-2025 00:00	15-Jan-2025 00:00	----	----
Compound	CAS Number	LOR	Unit		ES2501432-001	ES2501432-002	ES2501432-003	-----	-----
					Result	Result	Result	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%		77.3	85.0	87.6	----	----
Anthracene-d10	1719-06-8	1.0	%		92.3	98.4	82.2	----	----
4-Terphenyl-d14	1718-51-0	1.0	%		79.1	91.5	85.6	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	2	%		99.1	94.8	95.8	----	----
Toluene-D8	2037-26-5	2	%		108	110	111	----	----
4-Bromofluorobenzene	460-00-4	2	%		114	114	115	----	----



Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	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	72	143
Toluene-D8	2037-26-5	75	131
4-Bromofluorobenzene	460-00-4	73	137



Appendix C

Groundwater Sampling Field Sheets

**REGIONAL
GEOTECHNICAL
SOLUTIONS**

Date: 15/01/28

Job No: R68033114

Sampler: A4

Top of Casing (TOC):	2.60	m	Top of Casing (TOC):	N/A	m AHD
Depth to Groundwater:	8.50	m (TOC)	Surface Elevation		m AHD
Depth to Groundwater:	7.90	m (bgs)	Groundwater Elevation	↓	m AHD
Well Depth:	18.05	m (TOC)	Organic Vapours in well	0.0	ppm
Well Depth:	17.45	m (bgs)	Depth to Phase Separated Layer	N/A	m
Thickness of Groudwater Column:	9.55	m	Thickness of Phase Separated Layer	↓	m

Purge Method: <u>Bailer</u>	Start Purge: <u>9:45am</u>
Field Measurement Device: <u>HANNA probe</u>	End Purge: <u>10:00am</u>
	Total Volume Purged: <u>1.5</u> L

Well Sampling	
Sampling Material: <i>Plastic Bailer</i>	Material:
Start Sampling: <i>9:55am</i>	Finish Sampling: <i>10:00am</i>

Well Head Integrity:	Good
Samples Filtered:	yes
Weather Conditions:	Hot / Sunny
Other:	Duplicate Sample (P101) taken.

GROUNDWATER SAMPLING FIELD SHEET



CLIENT: *MPT Farms Pty Ltd* Date: *15/01/25*
 PROJECT: *Proposed Rezoning*
 LOCATION: *Wingham Road, Wingham* Job No: *RC803311-1*
 Well Number: *MW102* Sampler: *ART*

Field Measurements

Top of Casing (TOC):	<i>0.7</i>	m	Top of Casing (TOC):	<i>N/A</i>	m AHD
Depth to Groundwater:	<i>8.20</i>	m (TOC)	Surface Elevation	<i>↓</i>	m AHD
Depth to Groundwater:	<i>7.50</i>	m (bgs)	Groundwater Elevation	<i>↓</i>	m AHD
Well Depth:	<i>11.80</i>	m (TOC)	Organic Vapours in well	<i>0.0</i>	ppm
Well Depth:	<i>11.10</i>	m (bgs)	Depth to Phase Separated Layer	<i>N/A</i>	m
Thickness of Groudwater Column:	<i>3.60</i>	m	Thickness of Phase Separated Layer	<i>↓</i>	m

Well Purging

Purge Method: *Boiler* Start Purge: *10:15am*
 Field Measurement Device: *HANNA Robe* End Purge: *10:30am*
 Total Volume Purged: *4.5* L

Time	Temp (°C)	EC (µS/cm)	pH	DO (mg/L)	Purge Volume (L)	Water Level (TOC)	Comments (Appearance, Odour, etc.)
<i>10:15am</i>	<i>20.5</i>	<i>N/A</i>	<i>6.71</i>	<i>N/A</i>	<i>1.5</i>	<i>8.20</i>	<i>Clear, cool temp. No odour/No sheen</i>
<i>10:20am</i>	<i>20.6</i>	<i>↓</i>	<i>6.70</i>	<i>↓</i>	<i>1.5</i>	<i>8.40</i>	<i>As above.</i>
<i>10:25am</i>	<i>20.5</i>	<i>↓</i>	<i>6.70</i>	<i>↓</i>	<i>1.5</i>	<i>8.75</i>	<i>Slightly turbid with purge, mostly clear. Cool temp. No odour, no sheen.</i>

Well Sampling

Sampling Material: *Plastic Boiler* Material:
 Start Sampling: *10:25am* Finish Sampling: *10:30am*

Field Comments

Well Head Integrity: *Good*
 Samples Filtered: *Yes*
 Weather Conditions: *Hot / Sunny.*
 Other:



Appendix D

PID Calibration Certificate



Calibration Certificate

Instrument:

Date:	28/11/2024
Model:	RAE, MINIRAE3000+
Description:	MiniRAE 3000+ PID for VOC detection
Asset #:	203935
Serial #:	592-927164
Worksheet #:	632321
Location:	TR MEL
Completed By:	ADA
Comments:	Battery fully charged, data log and peak readings cleared
Moisture test	pass
High alarm	100,000 ppb
Low alarm	50,000 ppb
STEL	25,000 ppb
TWA	10,000 ppb
Alarm mode	Latch
Buzzer and Light	Both ON
Datalog	Cleared
Interval	60 sec
Data selection	Average
Data type	Auto
Radio power	ON
Op mode	Hygiene
Pump duty cycle	100%
Pump speed	High
Temp unit	°C
Real time protocol	P2P (cable)
Power on zero	OFF
LCD contrast	31
Lamp ID	10.6 eV
Bump test	102.4 ppm, pass

Calibration Report:

Range	Source	Tolerance	Reading	Pass/Fail
-	Fresh Air	-	0.0 ppm	Pass
100ppm Isobutylene 103DS100ISOA	Bat No: A00693 Exp Date: 9 Dec 2026	± 2%	100.0 ppm	Pass

Technician: ADA

Date: 28/11/2024



Appendix E

Letter from Dr David Tully CEnvP SC

Contaminated Land Solutions

29 January 2025

Ref: CLS0308.L02

Regional Geotechnical Solutions Pty Ltd
82 Combined Street
Wingham
NSW 2429

For the attention of Andrew Hills

Dear Andrew,

RE: Report Review: Detailed Site Investigation – Contamination Assessment Proposed Residential Subdivision Lot 92 DP1285477 Wingham Road, Wingham

I, Dr David Tully of Contaminated Land Solutions Pty Ltd, am a Certified Environmental Practitioner Site Contamination Specialist (General Certified Environmental Practitioner certification no. 1138 and Site Contamination Specialist certification no. SC40084).

I confirm I have reviewed the Regional Geotechnical Solutions report entitled “*Detailed Site Investigation – Contamination Assessment Proposed Residential Subdivision Lot 92 DP1285477 Wingham Road, Wingham*” (Ref: RGS03311.1-AG), dated 29 January 2025 and a copy of which I have retained.

I can confirm that on the basis of the information contained within the report, I support the conclusions and recommendations provided therein.

Should the client, regulator or local authority have any queries regarding the report review, I can be contacted by e-mail via david.tully@contaminatedlandsolutions.com.au. Specific queries regarding the content of the report should be addressed to Andrew Hills at Regional Geotechnical Solutions.

For and on behalf of

**Contaminated Land Solutions Pty
Ltd**

Dr David Tully CEnvP SC
Director
Contaminated Land Solutions Pty Ltd



Contaminated Land Solutions Pty Ltd
10 Heath Road
Crafers West SA 5152
0410 012 292

david.tully@contaminatedlandsolutions.com.au

CONTAMINATION – PRELIMINARY SITE INVESTIGATION

MPT Farms Pty Ltd

Preliminary Site Investigation - Contamination Assessment

Proposed Residential Subdivision

Lot 92 DP1285477 Wingham Road, Wingham

Report No. RGS03311.1-AE

22 February 2024



RGS03311.1-AE

22 February 2024

MPT Farms Pty Ltd
C/O Hampstead Property
PO Box 358
KIAMA NSW 2533

Attention: Tim Colless

Dear Tim

**RE: Proposed Residential Subdivision – Lot 92 DP1285477 Wingham Road, Wingham
Preliminary Site Investigation - Contamination Assessment**

As requested, Regional Geotechnical Solutions Pty Ltd (RGS) has undertaken a Preliminary Site Investigation Contamination Assessment for the proposed residential subdivision at Lot 92 DP1285477, Wingham Road, Wingham, NSW.

Based on the results obtained in this investigation, it is considered that the subject site is suitable for future residential land use in its current state with regard to the presence of soil contamination, provided the recommendations and advice of this report are adopted, and site preparation works are conducted in accordance with appropriate site management protocols and legislative requirements. The work presented herein was reviewed by Dr David Tully CEnvP SC. A copy of Dr Tully's letter pertaining to the review is appended to the report.

If you have any questions regarding this project, or require any additional consultations, please contact the undersigned.

For and on behalf of

Regional Geotechnical Solutions Pty Ltd

Prepared by



Andrew Hills

Associate Environmental Engineer

Reviewed by



Adam Holzhauser

Principal Geotechnical Engineer



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Figure 2	Indicative Subdivision Layout Plan
Figure 3	Investigation Location Plan – East
Figure 4	Investigation Location Plan – West

Appendices

Appendix A	Site History Documentation
Appendix B	Results of Field Investigations
Appendix C	Laboratory Test Result Sheets
Appendix D	PID Calibration Certificate
Appendix E	Letter from Dr David Tully CEnvP SC



1 INTRODUCTION and BACKGROUND

1.1 General

Regional Geotechnical Solutions Pty Ltd (RGS) has undertaken a Preliminary Site Investigation Contamination Assessment (PSI) for the proposed residential subdivision at Lot 92 DP1285477 Wingham Road, Wingham, NSW. The site location is shown on Figure 1. An indicative subdivision layout plan is shown on Figure 2 which is understood to be subject to change during the planning process. The portion of the property proposed to accommodate residential development approximately 28.1 hectares.

The site is currently zoned RU1 Primary Production under the Midcoast Council Local Environment Plan (LEP). Recent "Midcoast Urban Release Areas Report, July 2021" identified the subject area as potential low density urban residential land use". It is understood that the Client is seeking to have the land re-zoned for residential development under the Council planning arrangement for future land use.

An indicative plan provided by the Client indicates that residential subdivision will involve multiple stages.

Minutes of a planning proposal pre-lodgement meeting between the proponent and Midcoast Council representatives have been provided to RGS. Regarding environmental health, the minutes state the following:

- **A Preliminary Site Investigation (PSI) Contamination Assessment (and Detailed Site Investigation and Remediation Action Plan, if required by the PSI).**
- **An Acoustic Report and Acid Sulfate Soils Assessment/Management Plan will be required for this Planning Proposal.**
- It must be determined if the site has any contamination issues. An appropriate level of contamination assessment is required to determine if the land is suitable (or can be made suitable following remediation) for the proposed use. Any assessment will need to be undertaken in accordance with NSW Environment Protection Authority guidelines and Council's Contaminated Land Policy and be prepared (or reviewed and approved) by a certified consultant.
- The site adjoins land that is identified as Contaminated Land, in particular the former service station site. The proposal will need to establish if this site and any others identified have been remediated or if they affect the suitability of the site for residential land use.

The purpose of the work documented herein is to satisfy the requirement for a contamination assessment to support a re-zoning and address the environmental health requirements outlined in the Council minutes described above. The brief provided indicates that at this stage, the PSI is required for planning purposes.

1.2 Objective

The objective of the PSI is to provide a preliminary assessment of the potential for soil contamination to be present on the site which may affect future residential land use.



1.3 Scope of Works

In accordance with the relevant sections of the *National Environment Protection (Assessment of Site Contamination) Measure 1999 (Amended 2013)*, the assessment involved the following process:

- Review of the provided audit report for the former service station site located adjacent to the subject site and provide comment on the implications for the proposed development from a contamination perspective;
- Land titles search to check for evidence of past ownership that may be indicative of potentially contaminating activities;
- Search of government records such as the EPA's contaminated site register, groundwater bore register, etc;
- Review of available aerial photography to check for evidence of potential contamination or potentially contaminating activities (if any);
- Site walkover to assess surface conditions and, in conjunction with the information above, identify Areas of Environmental Concern and associated Chemicals of Concern on the site;
- Undertake targeted soil sampling and analysis at the selected Areas of Concern to allow some preliminary analysis of the presence of contamination. Samples were collected from ten boreholes drilled using a 4WD mounted drilling rig to about 1m depth or refusal on rock;
- Volatile gas/vapour measurement of the soil samples and within the boreholes outlined above using a Photoionization Detector (PID);
- Analyse soil samples for a suite of potential contaminants associated with the past and present activities; and
- Evaluate the results against industry accepted criteria for residential land use.

1.4 Site Identification

General site information is provided below in Table 1. The site location is shown in Figure 1.

Table 1: Summary of Site Details

Site location:	Wingham Road, Wingham, NSW
Approximate subject site area:	28.1 hectares
Title Identification Details:	Lot 92 DP 1285477
Zoning	RU1 – Primary Production
Current Landuse:	Farming / grazing land
Proposed Landuse:	Residential



Adjoining Site Uses:	• Cedar Party Creek, rural residential and farming / grazing land to the north and east; • Wingham Road to the south; • Residential, former service station and operating smash repairer to the south-west; and • Cedar Party Creek and residential to the west.
Government Area:	Midcoast Council

2 SITE DESCRIPTION

2.1 Topography and Drainage

The site is bound by Cedar Party Creek, rural residential and farming / grazing land to the north and east, by Wingham Road to the south, by residential properties, a former service station and an operating smash repairer to the south-west, and by Cedar Party Creek and residential properties to the west.

The topography of the site comprises gently to moderately undulating terrain and is situated on a north facing slope which grades down to a creek line in the central part of the site. The creek is a tributary of Cedar Party Creek which is located along the site's northern boundary.

Slope changes in the central part of the site, in the vicinity of the tributary creek, are of the order of 4° to 6°. Slope changes in the northern part of the site which are towards Cedar Party Creek are also of the order of 4° to 6°. Slope changes at the rear of the existing residences in the southern part of the site are of the order to 1° to 3° grading to 4° to 6° towards the north-western corner.

Drainage is anticipated to be via a combination of overland flow into the tributary creek and Cedar Party Creek. Ponded water was present in the western part of the tributary creek at the time of the field investigations. There was some scouring around the banks of the tributary creek.

Vegetation comprised long grass and pasture with small shrubs and stands of large Eucalyptus trees up to 25m in height mainly around the site perimeters with the exception of the southern part of the site which is bounded by the existing residences and commercial properties.

Trafficability was good via 4WD vehicle.

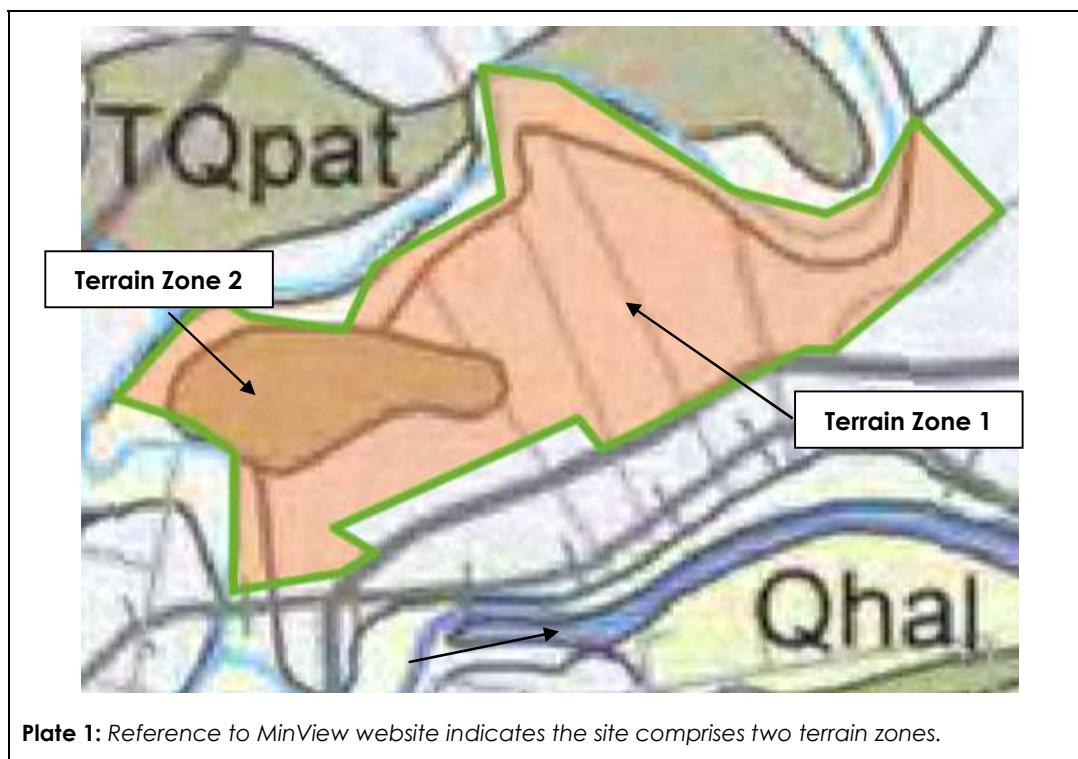
2.2 Geology

Based on the topographic conditions, the site has been divided into two terrain zones. Reference to the MinView website indicates that the underlying geology varies with each terrain as outlined below:

- Terrain Zone 1: The majority of the site is underlain by Devonian to Carboniferous sedimentary rocks belonging to the Tamworth Belt and soils derived from those rocks; and
- Terrain Zone 2: The western and north-western part of the site is underlain by Tertiary to Pleistocene high-level terrace deposits comprising silt, clay, gravel and fluvial sand.



The geology of the site is presented in Plate 1 below:



The materials encountered during the investigation are summarised in Table 2 and Table 3. Further details are presented on the attached engineering logs (Appendix B).

Table 2: Summary of Geological Units

Unit	Material	Material Description
UNIT 1	Topsoil	Silty CLAY, low plasticity, brown / dark brown, some gravel, coarse grained, some roots
UNIT 2	Fill / Topsoil	Silty Gravelly CLAY, low plasticity, brown / pale brown, gravel, coarse grained, some roots
UNIT 3	Slopewash	Silty Gravelly CLAY, low plasticity, brown, gravel, coarse grained, some roots
UNIT 4	Residual Soil	Silty CLAY, medium to high plasticity, brown / pale brown / dark brown / orange, trace roots
UNIT 5	Extremely Weathered Siltstone	Silty Clay, low plasticity, pale brown / pale grey / orange / white



Table 3: Summary of Subsurface Profile

Borehole	Depth of Material Layer (m)				
	UNIT 1 Topsoil	UNIT 2 Fill/Topsoil	UNIT 3 Slopewash	UNIT 4 Residual Soil	UNIT 5 Extremely Weathered Siltstone
BH1	0.0 – 0.15	--	0.15 – 0.5	0.5 – 0.9	0.9 – ≥1.1*
BH2	0.0 – 0.25	--	--	0.25 – 0.8	0.8 – ≥1.3*
BH3	0.0 – 0.25	--	--	0.25 – 0.6	0.6 – ≥0.7*
BH4	0.0 – 0.15	--	--	0.15 – 1.0	1.0 – ≥1.3*
BH5	0.0 – 0.1	--	--	0.1 – 0.8	0.8 – ≥0.9*
BH6	0.0 – 0.2	--	--	--	0.2 – ≥0.9*
BH7	0.0 – 0.25	--	--	--	0.25 – ≥0.4*
BH8	0.0 – 0.25	--	--	--	0.25 – ≥0.35*
BH9	0.0 – 0.3	--	--	--	0.3 – ≥0.8*
BH10	--	0.0 – 0.25	--	--	0.25 – ≥0.3*

Note: ≥ Indicates that base of material layer was not encountered

* Indicates that the borehole was terminated due to practical drill bit refusal on rock

-- Indicates that the material was not encountered within the borehole

Groundwater inflow was not encountered in the boreholes during the limited time they remained open during the field investigations.

Groundwater levels fluctuate as a result of seasonal variations, temperature, rainfall and other similar factors, the influence of which may not have been apparent at the time of the assessment.

2.3 Hydrogeology

A groundwater bore search on the NSW Water Information website, <http://waterinfo.nsw.gov.au/gw/> indicates that there is a licenced groundwater bore located approximately 120m to north of the site as shown below:

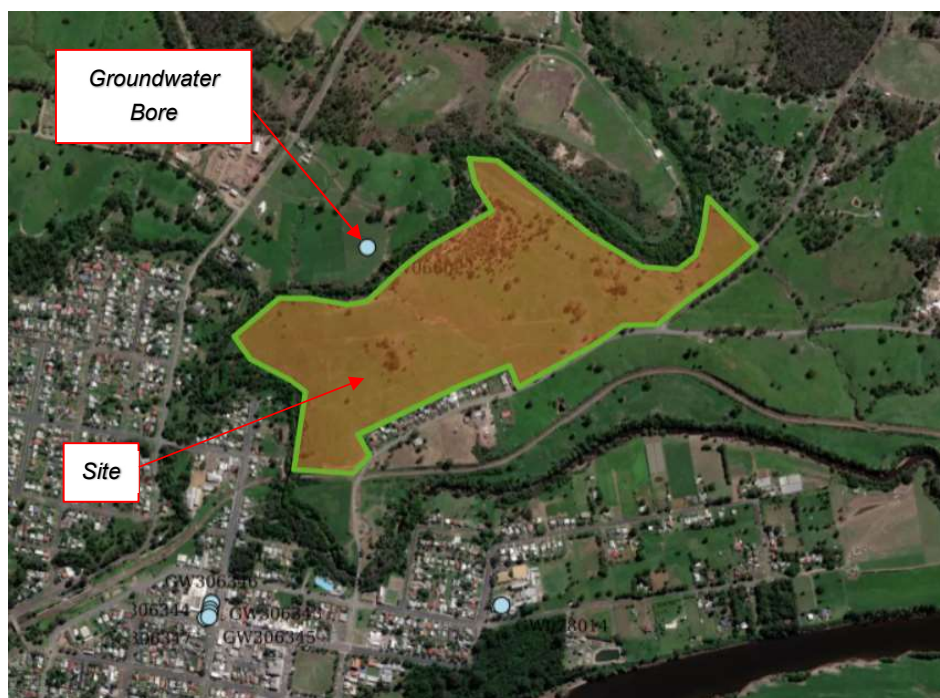


Plate 1: Approximate site boundary outlined in green. Nearest off-site licensed groundwater bore is located approximately 120m to the north of the site.

Groundwater bore GW066022 was drilled to a depth of 68.0m on 1 January 1992, is licenced for industrial purposes and its licence status is unknown. No other information is provided.

3 SITE HISTORY

3.1 Historical Aerial Photography

Aerial photographs and satellite imagery of the site were obtained from NSW Spatial Services and Google Earth and reviewed to assist in identifying past land uses that may contribute to site contamination. The results of the review are summarised in Table 4.



Table 4 – Aerial Photograph and Satellite Imagery Summary

Year	Site	Surrounding Land
1969	The site has been cleared and appears to be used for farming / grazing activities. No structures are present however an unsealed track appears to be present where the existing electricity easement is located.	Wingham Road is present as are a number of the residential properties bounding the southern part of the site. There are some vacant lots between the existing residences. More broadly, the site is surrounded by residential and rural residential properties and farming land.
1985	No significant visible changes.	Previously vacant lots as described above now have structures. The service station site appears to be in operation. It is unknown if the smash repair business is in operation, however there is a structure(s) present in that location. Further residential and rural residential development has occurred.
1991	No significant visible changes.	No significant visible changes.
1997	A cattle yard / livestock loading area appears to be present in the eastern part of the site near the Young's Road intersection.	Some further residential development has occurred to the west of the site.
2003 (Google Earth)	No significant visible change.	No significant visible change.
2011 (Google Earth)	No significant visible change.	The service station bounding the southern part of the site appears to have been decommissioned.
2022 (Google Earth)	There appears to be additional unsealed access tracks across the site and some disturbed ground in the vicinity of the cattle yards / livestock loading area in the eastern part of the site.	No significant visible changes.



3.2 Site Observations

A site walkover was undertaken on 1 February 2024. Observations made during the site visit are summarised below:

- The majority of the site comprised cleared and semi-cleared land which appears to have been used for farming and grazing purposes;
- A small number of beef cattle and no crops were present at the time of the investigation;
- Access was via a farm gate off Wingham Road;
- A cattle yard and livestock loading area was present just to the east of the site access;
- An area of disturbed ground was present to the north-west of the cattle yard and livestock loading area. It appeared to have been the result of vehicle and/or machinery movements;
- A number of vegetation stockpiles were present in the eastern part of the site;
- An electricity easement transecting through the central part of the site from east to west;
- Existing residential and commercial/industrial properties bound the site in the southern part along Wingham Road including a former remediated service station at No. 1038 Wingham Road and an operating smash repairer at No. 1034 Wingham Road;
- Fencing at the rear of some of the existing residences in the southern part of the site was observed to be potentially Asbestos Containing Materials (ACM);
- A stockpile of waste materials was observed at the rear of No. 1058 Wingham Road. The waste materials included an old car bonnet, scrap metal, timber, concrete, vegetation, mattresses, timber, rope, plastic and domestic rubbish;
- With the exception of the cattle yard and livestock loading area described above, no structures were present at the time of investigation; and
- No hydrocarbon odours or staining were observed;
- With the exception of the fence at the rear of some of the existing residence being potential ACM, no suspected other suspected ACM were observed across the site.

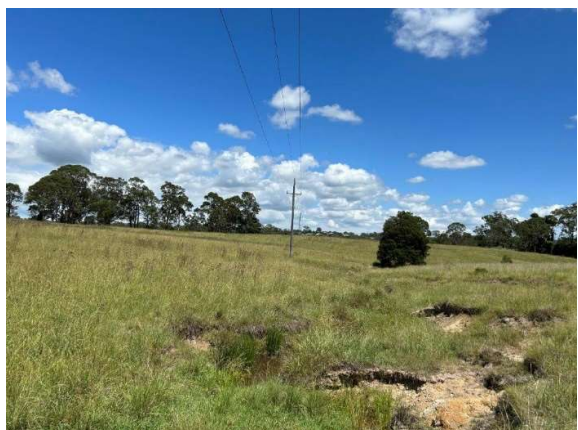
A selection of images of the site is presented below.



Looking north near the site access from Wingham Road showing a cattle yard and livestock loading area.



Looking west showing an area of disturbed ground in the foreground and a vegetation stockpile in the background.



Looking west showing the electricity easement and tributary creek in the central part of the site. Some scouring was present on the banks of the creek as shown on the right.



Looking south-east at the rear of the former service station located at 1038 Wingham Road. The service station site has been remediated.



Looking west in the southern part of the site showing an existing residence and operating smash repairer respectively which bound the site.



Looking east in the southern part of the site showing a fence at the rear of some of the existing residences which is potential ACM.



Looking south-west in the southern part of the site showing a stockpile of waste materials located at the rear of No. 1058 Wingham Road.



Street view on Wingham Road showing the former service station site (green fencing) and adjoining operating smash repairer to the east (yellow signage).

3.3 NSW EPA Records

A check with the NSW Office of Environment and Heritage website (www.environment.nsw.gov.au) revealed that no notices have been issued on the site under the Contaminated Land Management Act (1997).

3.4 Land Title Search

A list of past registered proprietors and lessors of the site was obtained from the Land Titles Office. A summary of the title details is included in Appendix A.

The title history search revealed the following:

1932 - 1934	Thomas William Gollan, grazier
1934 - 1973	Christina May Gollan, spinster
1973 - 1974	John Alfred Gollan Clayton, clerk / executor Christina May Gollan, estate
1974 - 1984	John Alfred Gollan Clayton, clerk
1984 - 1984	Kenneth Allan Hobson, retired / executor John Alfred Gollan Clayton, estate



1984 - 2016	Nancy Margaret Clayton, widow
2016 - 2018	Tracey Murphy Anne Poole
2018 to date	MPT Farms Ptd Ltd

3.5 Site History Summary

Based on available data the chronological development of the site is summarised below:

- Land title information indicates that the site was initially owned by a grazier followed by various individuals until 2018 when it was acquired by the current owner;
- Historically, the site appears to have been used for farming and grazing activities up to and including the present;
- There appears to have been minimal changes to the site over time excluding an electrical easement in the central part of the site since at least 1969, a cattle yard and livestock area between 1991 and 1997 and a disturbed area of ground in the vicinity of the cattle yard and livestock area between 2011 and 2022 mostly likely associated with vehicle and machinery movements;
- A former service station and operating smash repair business adjoining the residences bounding the southern part of the site appear to have been present since at least 1985. The service station was decommissioned between 2007 and 2011 whilst the smash repairer is still operating at present.

4 FORMER SERVICE STATION SITE AUDIT STATEMENT REPORT

A Site Audit Report (SAR) prepared by Ramboll Australia Pty Ltd (Ramboll) for Caltex Australia Pty Ltd (Caltex) Ref. 318000089, dated October 2018 for the former service station located at 1036-1038 Wingham Road, Wingham which bounds the subject site to the south has been provided for review.

A summary of the key remarks and conclusions from the SAR with respect to the subject site are provided below:

- The SAR reviewed a number of reports prepared by Coffey Environments Australia Pty Ltd (Coffey). It is noted that RGS has not been provided with any of the subject Coffey reports;
- The SAR states that environmental investigations and remedial works the former service station site were undertaken between 2007 and 2011 which included decommissioning and removal of fuel infrastructure;
- Additional remediation and validation works were required to render the site suitable for future residential land use;



- A Remedial Action Plan (RAP) was developed for the additional remediation and validation works in 2014 and the remedial works were completed between 2014 and 2015. Post remediation groundwater and soil vapour monitoring were undertaken in 2015, and with two further groundwater monitoring rounds completed in March 2017 and November 2017;
- Depth to groundwater as identified by Coffey ranged from approximately 8m below top of casing to 14m below casing in groundwater monitoring wells. Groundwater was inferred to be in fractured siltstone;
- Pre-remediation groundwater results indicated the presence of a petrol plume in groundwater. Based on these findings, a groundwater remediation system was installed to remove identified Phase Separated Hydrocarbons (PSH);
- Excavations of hydrocarbon impacted soil were completed to the extent practicable and it is stated that these were adequately validated;
- Groundwater remediation was attempted, however, the nature of the aquifer within fractured rock was a challenge for complete remediation of hydrocarbon impacted groundwater. Groundwater sample in the years following remediation indicates that the dissolved phase plume remains on-site in close proximity to the former location of the main underground fuel storage tank group;
- Oxygen concentrations recorded during vapour sampling indicate soil overlying groundwater contamination has a high potential for bioattenuation;
- The auditor considers that the conclusion of Coffey that residual impacts in groundwater have decreased significantly when compared to post-remediation concentrations is valid and that soil vapour sampling results are valid;
- Coffey concluded that the site is "considered suitable, with respect to land contamination, for possible development including residential dwellings with accessible garden beds";
- Based on the information presented in Coffey's reports and observations made on-site, the auditor concluded that the site is suitable for the purposes of "residential with gardens and accessible soil", noting that residual groundwater contamination remains on-site and has impacted the residential property to the west; and
- The EPA is involved in correspondence with occupant of the residential property to the west.

5 FIELD and LABORATORY INVESTIGATIONS

5.1 Sampling Plan

The NSW EPA (2022) Sampling Design Guidelines recommend a minimum of about 320 sampling locations to characterise a site of 28.1 hectares where a systematic sampling pattern is adopted. Due to the preliminary nature of the assessment and that the site history research has not revealed indications of current or previous potentially contaminating activities that might have resulted in site wide contamination, at this stage eleven sampling locations were selected using a judgemental approach based on the identification of key Areas of Environmental Concern. The sampling program was designed to target the key Areas of Environmental Concern identified from the site history research and walkover (refer Section 6.4). Ten soil samples were collected from boreholes



drilled within targeted locations across the subject site. In addition, one surface soil sample identified as AS1 was collected using hand tools.

5.2 Field Work

Field work for the assessment was undertaken on 1 February 2024 by an Environmental Engineer from RGS and included:

- Site walkover to assess visible surface conditions and identify evidence of contamination, or past activities that may cause contamination (if any);
- Drilling of ten boreholes to depths of between 0.35m and 1.3m below ground surface using a four-wheel drive mounted drill rig;
- Drilling of one borehole (BH10) using hand auger techniques to 0.3m below ground surface;
- Collection of eleven soil samples from the boreholes and surface; and

Screening of each of the soil samples and within the boreholes drilled in the vicinity of the former service station and smash repairer for vapours associated with the presence of hydrocarbons using a Photoionization Detector (PID). Vapour screening within the boreholes was conducted by leaving them open whilst onsite and measuring the levels before backfilling at the completion of the field investigations.

The locations of the sampling points are shown on Figure 3 and Figure 4. They were obtained on site and located by measurement relative to existing site features.

Soil samples were taken from natural soils and fill using disposable gloves. Drill augers and hand tools used for sample collection were decontaminated between sampling points using Decon90 detergent and deionised water. The samples were collected in acid-rinsed 250mL glass jars and placed in an ice-chilled cooler box.

5.3 Laboratory Analysis

Samples were transported under chain-of-custody conditions to ALS Laboratory Group, a NATA accredited specialist chemical testing laboratory, to be analysed for the following suite of common potential contaminants;

- Polycyclic Aromatic Hydrocarbons (PAH);
- Total Recoverable Hydrocarbons (TRH);
- Benzene, Toluene, Ethyl-benzene, Xylenes (BTEX);
- Organochlorine and Organophosphorus Pesticides (OC/OPs);
- Heavy metals (arsenic, cadmium, chromium, cobalt, copper, lead, mercury, and zinc);
- Polychlorinated Biphenyls (PCB); and
- Presence of asbestos.

The results are presented in Appendix C.



5.4 Data Quality Objectives

The Data Quality Objectives (DQOs) are presented in Table 5.

Table 5 – Data Quality Objectives

DQO	Details of Process
State the Problem	A PSI is required to assess the suitability of the site for future residential land use from a contamination perspective, and to satisfy the requirement for a contamination assessment to support a re-zoning application outlined in Midcoast Council's planning proposal pre-lodgement meeting minutes.
Identify the Decision	The principal study questions that are: - What is the nature and extent of soil contamination on the subject land (if any)?; and - Is the land likely to be suitable for the proposed rezoning and future residential development from a contamination viewpoint?
Identify Inputs to the Decision	The primary inputs are: - Site history study; - Site walkover assessment; - Chemical analysis of selected soil samples; - PID screening of soil samples and within boreholes drilled in the vicinity of the former service station and smash repairer for the presence of hydrocarbon vapours; and - Results summary.
Define the Boundary of the Assessment	- The spatial boundaries are limited to the property boundaries of the subject site as shown on Figure 1 and Figure 2; - The investigation and screening levels for a Residential A land use scenario.
Develop a Decision Rule	The decision rules for the investigation are: - If concentrations of contaminants in soil exceed the adopted investigation and screening levels for a Residential A land use scenario, then further assessment may be required; Decision criteria for QA/QC measures are defined in Section 3.6. A decision on the acceptance of analytical data will be made on the basis of the data quality indicators (DQIs) in the context of precision, accuracy, representativeness, completeness and comparability (PARCC) parameter– as follows: Precision - NATA registered laboratories were used following NATA accredited systems and industry standard test methods. An appropriate number of intra-laboratory samples were



DQO	Details of Process
	collected and analysed (following ASC NEPM guidance), the results of which are considered to be satisfactory; • Accuracy - The laboratory limit or reporting (LOR) was appropriate for the screening criteria utilised. NATA registered laboratories were used following industry standard methods including appropriate method blanks, laboratory control samples, laboratory spikes and duplicates the results of which are considered to be satisfactory. • Representativeness – The samples were received by the laboratories in good condition. The data obtained is considered to be representative of the soils present on site; • Completeness – Experienced field staff were utilised to undertake the sampling and keep appropriate documentation. Samples were in proper custody between the field and reaching the laboratory. The laboratories performed the tests requested. The data obtained from the field investigations is considered to be relevant and usable; and • Comparability – Sample holding times were met and samples were properly and adequately preserved. Field sampling and handling procedures were followed. The data collected is considered to be comparable.
Specify Acceptable Limits on Decision Errors	• Acceptable limits for QA/QC measures are defined in Section 5.6; • Acceptable investigation and screening levels are those for a Residential A land use scenario; and • Specific limits are in accordance with the appropriate NSW EPA guidelines including indicators of data quality and standard procedures for field sampling and handling.
Optimise the Design for Obtaining Data	Based on the above steps of the DQO process. The design for obtaining the required data (i.e proposed field and laboratory investigations) is presented in Section 5.1.

5.5 Guidelines and Assessment Criteria

Assessment as outlined in NSW EPA *Guidelines for Consultants Reporting on Contaminated Land (2020)*.

To evaluate results, and for guidance on assessment requirements, the assessment will adopt the guidelines provided in the *National Environment Protection (Assessment of Site Contamination) Measure (ASC NEPM 2013)*. The ASC NEPM document provides a range of guidelines for assessment of contaminants for various land use scenarios. It is understood that the future land use for the site is residential. As such, comparison with the ASC NEPM guideline Health Investigation Levels (HIL) for Residential A land use is considered appropriate for the site. In accordance with the NEPM guideline the following criteria will be adopted for this assessment:



- Health Investigation Levels (HILs) for residential 'A' land use (HIL-A) will be used to assess the potential human health impact of heavy metals and polycyclic aromatic hydrocarbons (PAHs);
- Health Screening Levels (HSLs) for coarse textured (sand) or fine textured (silt and clay) soils on a residential site will be adopted as appropriate for the soils encountered to assess the potential human health impact of petroleum hydrocarbons and benzene, toluene, ethylbenzene and xylene (BTEX) compounds;
- Ecological Investigation Levels (EILs) for residential land use will be used for evaluation of the potential ecological / environmental impact of heavy metals and naphthalene. Due to the preliminary nature of this investigation, soil specific EILs have not been calculated for chromium, copper, nickel and zinc and
- Ecological Screening Levels (ESLs) for coarse textured (sand) soils or fine textured (silt and clay) soils on a residential land use site will be adopted as appropriate for the soils encountered, to assess the potential ecological / environmental impact of petroleum hydrocarbons BTEX compounds and benzo(a)pyrene.

In accordance with NEPM 2013, exceedance of the respective criteria does not necessarily deem that remediation or clean-up is required but is a trigger for further assessment of the extent of contamination and associated risks.

5.6 Quality Assurance / Quality Control

Samples were obtained using industry accepted protocols for sample treatment, preservation, and equipment decontamination. Sampling equipment was decontaminated between sample locations and a clean pair of nitrile gloves used for the collection of each sample into laboratory supplied glass sampling jars.

Samples were placed on ice on-site and maintained on ice during transport to the testing laboratories. One duplicate soil sample identified as D1, duplicate of primary sample BH2 0.0 – 0.2m was submitted to the laboratory for analysis for quality control purposes. Comparison between the primary and duplicate samples are presented in the results summary tables in Appendix C.

The Relative Percent Differences (RPDs) were calculated for the duplicate sample and presented in the results summary table in Appendix A.

The duplicate RPDs were within the control limit of 40% (with the exception of Arsenic, Cadmium, and Chromium) and indicated generally good correlation between the primary and duplicate sample.

It is noted that low analyte concentrations exaggerate the percentage differences with respect to small total concentration differences, therefore where results for the primary and duplicate, were less than 10 times the laboratory limit of reporting (LOR), the RPDs have been disregarded. The RPDs for Arsenic, Cadmium and Chromium in sample D1 which exceeded the 40% control limit as outlined above were disregarded on this basis.

One rinsate sample (RINSATE) was collected from the hand tools to assess the efficacy of the decontamination techniques. Analysis of the rinsate sample indicated that it was free of contaminants. In addition to the field quality control procedures, the laboratory conducted internal



quality control testing including surrogates, blanks, and laboratory duplicate samples. The results are presented with the laboratory test results in Appendix C.

In addition to the field quality control procedures, the laboratory conducted internal quality control testing including surrogates, blanks, and laboratory duplicate samples. The results are presented with the laboratory test results in Appendix C.

All laboratory quality control data is within acceptable limits for the tests carried out. Therefore, on the basis of the results of the field and laboratory quality control procedures and testing, the data is considered to reasonably represent the concentrations of contaminants in the soils at the sample locations at the time of sampling and the results can be adopted for this assessment.

6 SITE CONTAMINATION ASSESSMENT RESULTS

6.1 Subsurface Conditions

Hydrocarbon odours were absent from each borehole to the depth that it was terminated. No staining was observed on soil samples and no evidence of gross hydrocarbon contamination was identified.

Boreholes BH1 to BH6 which were drilled in the vicinity of the adjacent former service station and existing smash repairer were left open during the field investigations and screened prior to backfilling. A PID was utilised to screen the air within the open boreholes and individual soil samples collected. The PID is primarily a qualitative tool use for field screening purposes. For the purposes of this assessment the following screening categories set out in Table 6 were adopted. It should be noted that a PID may give false positive readings for water vapor. Rain may also affect performance. High humidity can cause lamp fogging and decreased sensitivity. This can be significant when soil moisture levels are high. It is noted that the weather was hot and sunny on the day of the field investigations.

Table 6: PID Reading Screening Categories

PID Reading (ppm)	Description
0.0 – 5.0	Negligible vapour concentrations detected
> 5.0 – 10.0	Very low vapour concentrations detected
>10.0 – 50.0	Low vapour concentrations detected
>50.0 – 100	Low to moderate vapour concentrations detected
>100 – 200	Moderate vapour concentrations detected

PID readings from within the boreholes which were screened are outlined below:

- BH1 – 52.4 ppm (low to moderate vapour concentrations detected);
- BH2 – 12.5 ppm (low vapour concentrations detected);



- BH3 – 6.8 ppm (very low vapour concentrations detected);
- BH4 – 9.6 ppm (very low vapour concentrations detected);
- BH5 – 2.6 ppm (negligible vapour concentrations detected);
- BH6 – 50.0 ppm (low vapour concentrations detected);

PID readings from soil samples which were headspace screened are outlined below:

- BH1 – 46 ppm (low vapour concentrations detected);
- BH2 – 28 ppm (low vapour concentrations detected);
- BH3 – 20.1 ppm (low vapour concentrations detected);
- BH4 – 2.3 ppm (negligible vapour concentrations detected);
- BH5 – 5.2 ppm (very low vapour concentrations detected);
- BH6 – 65.5 ppm (low to moderate vapour concentrations detected);
- BH7 – 12.0 ppm (low vapour concentrations detected);
- BH8 – 2.3 ppm (negligible vapour concentrations detected);
- BH9 – 5.4 ppm (very low vapour concentrations detected); and
- BH10 – 3.1 ppm (negligible vapour concentrations detected).

The calibration certificate (Worksheet No. 625771) for the PID is attached in Appendix E.

The soil types recorded in surface samples are summarised below in Table 7.

Table 7: Summary of Subsurface Conditions

Sample ID	Description
BH2 0.0 – 0.2m, BH6 0.0 – 0.2m, BH7 0.0 – 0.2m, BH8 0.0 – 0.2m, BH9 0.0 – 0.2m, AS1 0.0 – 0.2m	Topsoil: Silty CLAY, low plasticity, brown / dark brown, some gravel, coarse grained, some roots
BH10 0.0 – 0.2m	Fill / Topsoil: Silty Gravelly CLAY, low plasticity, brown / pale brown, gravel, coarse grained, some roots
BH1 0.2 – 0.4m	Slopewash: Silty Gravelly CLAY, low plasticity, brown, gravel, coarse grained, some roots
BH3 0.3 – 0.5m, BH4 0.2 – 0.4m, BH5 0.1 – 0.3m	Residual Soil: Silty CLAY, medium to high plasticity, brown / pale brown / dark brown / orange, trace roots



6.2 Laboratory Results

An appraisal of the laboratory test results presented in Appendix C is provided below with reference to the adopted soil investigation and screening levels discussed in Section 5.5.

- Concentrations of heavy metals were either below the laboratory limit of reporting or below the adopted health investigation criteria for a Residential A site in each of the samples analysed;
- Concentrations of arsenic and lead were below the adopted EILs. Due to the preliminary nature of this investigation, soil specific EILs have not been calculated for chromium, copper, nickel and zinc;
- Concentrations of TRH were either below the laboratory limit of reporting and below the adopted health and ecological investigation criteria for a Residential A site in each of the samples analysed;
- Concentrations of TRH, PAH, BTEX, PCB, OC/OP pesticides were below the laboratory limit of reporting in each of the samples analysed; and
- Asbestos was not detected in each of the soil sample analysed.

6.3 Conceptual Site Model

Based on the site observations and knowledge obtained about site activities as outlined above, a conceptual site model (CSM) has been developed.

6.4 Potential Sources of Contamination

Potential Areas of Environmental Concern (AECs) and Chemicals of Concern (COCs) identified for the assessment are outlined in Table 8.

Table 8: Potential AECs and COCs

AEC	Mode of Potential Contamination	Potential COCs	Likelihood of Contamination
AEC1: Former service station at 1038 Wingham Road	Potential hydrocarbon impact of soils and groundwater due to proximity of former service station. Potential hazardous building materials debris from demolition of structures	TRH, BTEX and other volatile organic compounds, PAH, lead Asbestos, lead	Moderate



AEC	Mode of Potential Contamination	Potential COCs	Likelihood of Contamination
AEC2: Operating smash repairer at 1034 Wingham Road	Potential spillage or leaks of chemicals from vehicles and stored containers of fuel/oils/solvents.	Heavy Metals, TRH, BTEX and other volatile organic compounds, PAH, PCB	Low to moderate
AEC3: Stockpiled waste materials at rear of 1058 Wingham Road	Importation of potentially contaminated fill	Heavy Metals, TRH, BTEX, PAH, PCB, OC/OPP and asbestos	Low to moderate
AEC4: Fencing material at rear of existing residences in the southern part of the site	Potential for hazardous building materials in fencing	Asbestos, lead	Low to moderate
AEC5: Former and current farming / grazing activities	Potential spillage or leaks of stored fuels/oils/lubricants and agro-chemicals	Heavy Metals, TRH, BTEX, PAH, OC/OPP	Low to Moderate
AEC6: Cattle yard and livestock loading area in eastern part of the site	Potential spillage of fuels/oils	TRH, BTEX, PAH, lead, pathogens	Low
AEC7: Disturbed ground in the eastern part of the site	Importation of potentially contaminated fill Potential spillage of chemicals including agro-chemicals, fuels/oils, pesticides	Heavy Metals, TRH, BTEX, PAH, PCB, OC/OPP, asbestos	Low
AEC8: Electricity easement transecting through central part of the site east to west	Potential spillage or leaks of fuels/oils from machinery during construction and maintenance of electrical infrastructure	Heavy metals, TRH, BTEX, PAH, PCB	Low
AEC9: Vegetation stockpiles	Potential spillage or leaks of fuels/oils from machinery during felling and stockpiling	TRH, BTEX, PAH, OC/OPP, lead	Low



AEC	Mode of Potential Contamination	Potential COCs	Likelihood of Contamination
AEC10: Unidentified stockpiles of fill	Importation of potentially contaminated fill	Heavy Metals, TRH, BTEX, PAH, PCB, OC/OPP and asbestos	Low
AEC11: Unidentified waste from illegal dumping	Potential buried waste from historical agricultural land use impacting site soils	Heavy Metals, TRH, BTEX, PAH, PCB, OC/OPP, asbestos, pathogens	Low
<i>Heavy Metals - Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel and Zinc</i> <i>BTEX - Benzene, Toluene, Ethylbenzene and Xylene</i> <i>TRH - Total Recoverable Hydrocarbons</i> <i>PAH - Polycyclic Aromatic Hydrocarbons</i> <i>PCB - Polychlorinated Biphenyls</i> <i>OC/OPP - Organochlorine and Organophosphorus Pesticides</i>			

The approximate locations of the AEC's are shown on Figure 3 and Figure 4.

6.5 Potential Exposure Pathways and Receptors

Based on the site observations and knowledge obtained about site activities as outlined above, potential exposure pathways and receptors identified for the assessment are summarised in Table 9.

Table 9: Potential Exposure Pathways and Receptors

Chemicals of Concern	Key Pathways	Key Receptors
Asbestos, heavy metals	Generation of dust, notably during earthworks or from landscaped areas which is inhaled	Onsite - Construction and site workers, future site users Offsite – Occupants and users of adjacent sites
Heavy metals, TRH, BTEX, PAH, OC/OPP	Skin contact / ingestion, plant uptake	Onsite - Construction and site workers, future site users, vegetation in landscaped areas
Heavy Metals, TRH, BTEX, PAH, OC/OPP	Surface runoff and leaching of soils	Offsite/Onsite - Surface water ecosystems and users of surface water and groundwater
<i>Heavy Metals - Arsenic, Cadmium, Chromium, Copper, Lead, Mercury– Nickel and Zinc</i> <i>BTEX - Benzene, Toluene, Ethyl-benzene and Xylene</i> <i>TRH - Total Recoverable Hydrocarbons</i> <i>PAH – Polycyclic Aromatic Hydrocarbons</i> <i>PCB – Polychlorinated Biphenyls</i> <i>OC/OPP – Organochlorine and Organophosphorus Pesticides</i>		



6.6 Discussion

The PSI is required to evaluate past and present potentially contaminating activities and contamination types with regard to the site's suitability for future residential land use and to assist with the rezoning application.

From the site history review, the subject property is likely to have been used mainly for agricultural activities since at least the early 1930's and appears to have undergone minimal changes since at least 1969.

The historical aerial photograph review indicates that a cattle yard and livestock area was constructed in the eastern part of the site between 1991 and 1997 and a disturbed area of ground appeared in the vicinity of the cattle yard and livestock area between 2011 and 2022, mostly likely associated with vehicle and machinery movements.

Identified AEC's included the former service station and existing smash repairer bounding the southern part of the site, stockpiled waste materials at the rear of 1058 Wingham Road, potential ACM in fencing at the rear of the residences in the southern part of the site, former and current agricultural activities, a cattle yard and livestock loading area in the eastern part of the site, disturbed terrain in the eastern part of the site, an electricity easement transecting the central part of the site, vegetation stockpiles, unidentified stockpiles of fill and/or waste from illegal dumping.

With regard to the former service station located at 1036-1038 Wingham Road which bounds the site to the south, it appears that it was decommissioned and remediated between 2007 and 2011. The former service station site was the subject of a SAR by Ramboll in 2018 which stated that the auditor concluded that the site is suitable for the purposes of "residential with gardens and accessible soil", noting that residual groundwater contamination remains on-site and has impacted the residential property to the west. There were no additional comments or recommendations regarding potential offsite groundwater contamination migrating to the south to the subject site. PID readings taken within some of the boreholes drilled for the current investigation and head space screening of some of the soil samples obtained indicated the potential presence of volatile organic compounds however, these were generally at low levels. This was undertaken through chemical analysis of soil samples obtained from boreholes which recorded concentrations of hydrocarbon contaminants below the laboratory limit of reporting and adopted screening criteria. It is possible that, to a degree, the concentrations reported on-site from the PID screening were influenced by water vapor and humidity.

Although it is considered that residual petroleum hydrocarbon impacts associated with the previous off-site activities to the south of the site are likely to be present, these will degrade over time as a result of natural attenuation. Furthermore, given the presence of predominantly clay soil across this area of the site and the depth to groundwater (reported to be approximately 8m below top of casing to 14m below casing in the former service station groundwater monitoring wells), the oxygen concentrations recorded during vapour sampling at the former service station which indicated that soil overlying groundwater contamination has a high potential for bioattenuation and the auditor's opinion presented in the SAR, and provided groundwater extraction does not take place, the risk of groundwater contamination associated with the former service station having the potential to impact the proposed residential development is considered to be low.

The existing smash repair business also adjoining the residences bounding the southern part of the site appears to have been present since at least 1985. Similar to the above, soil samples obtained from boreholes drilled in this area reported petroleum hydrocarbon concentrations either below the laboratory limit of reporting and below the adopted investigation criteria.



In summary, the results of laboratory analysis of soil samples collected from targeted locations (AEC's outlined above), revealed concentrations of the chemicals of concern were either below the laboratory detection limit, or below the adopted health investigation criteria for a Residential A site.

No visual or olfactory evidence of widespread or gross hydrocarbon contamination was observed in the vicinity of the former service station or smash repairer in the southern part of the site or elsewhere across the site..

Asbestos was not detected in each of the soil samples submitted for analysis.

6.7 Conclusions and Recommendations

It is recommended that the waste materials including an old car bonnet, scrap metal, timber, concrete, vegetation, mattresses, timber, rope, plastic and domestic rubbish stockpiled at the rear of No. 1058 Wingham Road in the southern part of the site be appropriately disposed of to a waste management facility. In addition, the same should be undertaken for the cattle yard and livestock loading area located to the east of the smash repairer near the intersection with Youngs Road, if and when it is no longer actively used.

No evidence of ACM was observed in the stockpile and cattle yard area described above, no across the site more broadly. However, some of the fencing at the rear of the residences which form the southern perimeter of the subject site could potentially be ACM. It would therefore be prudent to consult with the owners of these fences to ascertain if they are ACM and, if found to be so, discuss their removal and replacement. Should it be proposed to remove these fences during development of the site, an experienced occupational hygienist or environmental consultant should be sought to screen the fence materials for the presence of ACM. It is noted no fragments of these materials were observed on the ground surface at the time of investigation.

Residual hydrocarbon impacts to groundwater are likely to be present near the southern boundary as a result of off-site activities (the former service station and existing smash repair business). On the basis of the findings of this investigation it is considered unlikely that these impacts, which will further attenuate over time, will pose an unacceptable risk to future site users from a vapour inhalation. However, should extraction of groundwater for any use be considered, then an appropriate sampling assessment of these impacts should be undertaken prior to use to make a suitability for use evaluation.

Should unidentified fill materials be encountered that require removal off site, assessment for a *Resource Recovery Exemption under Part 9, Clauses 91 and 92 of the Protection of the Environment Operations (Waste) Regulation 2014* in accordance with the *Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014 – the Excavated Natural Material (ENM) Order 2014*, will be required.

The investigation works undertaken were of limited scope and provide a preliminary assessment of identified AECs. Should materials suspected of being contaminated (by way of visual or olfactory evidence) be encountered during development of the site, it is recommended that advice from a suitably qualified and experienced environmental consultant be sought without delay.

Based on the results obtained in this investigation, it is considered that the site is suitable in its current state for future residential land use with regard to the presence of soil contamination, provided the recommendations and advice of this report are adopted, and site preparation works are conducted in accordance with appropriate site management protocols and legislative requirements.



7 DISPOSAL OF MATERIALS

7.1 Preliminary Waste Classification

A preliminary waste classification has been provided for excavated materials comprising fill or foreign materials which may be geotechnically or otherwise unsuitable in order to facilitate off-site disposal to a licensed landfill in accordance with NSW EPA (2014) *Waste Classification Guidelines*.

Table 2 of the '*Waste Classification Guidelines (2014)*' nominates a suite of analytes to be tested (Column 1) and also provides the maximum concentration (CT1) allowable within the soil for classification without the need for additional toxicity characteristics leaching procedure (TCLP) testing for both general solid waste (Column 2) and restricted solid waste (Column 3) for each analyte. Should the CT1 values be exceeded, the guidelines provide a Specific Contaminant Concentration (SCC) value to allow further evaluation of contaminant concentrations in conjunction with TCLP testing.

An evaluation of the laboratory test results for sampled soils against the waste classification guidelines outlined above are presented in the summary table in Appendix C.

Preliminary waste classification results indicate that the soils present on-site would classify as General Solid Waste and could be disposed of to a landfill licensed to accept to **General Solid Waste**.

It is likely that the majority of natural soils and rock present on the site would classify as Virgin Excavated Natural Material (VENM) in accordance with the NSW EPA (2014) *Waste Classification Guidelines*, subject to an evaluation by a suitably qualified environmental consultant at the commencement of excavation works.



8 LIMITATIONS

This report comprises the results of an investigation carried out for a specific purpose and client as defined in the document. The report should not be used by other parties or for purposes or projects other than those assumed and stated within the report, as it may not contain adequate or appropriate information for applications other than those assumed or advised at the time of its preparation. The contents of the report are for the sole use of the client and no responsibility or liability will be accepted to any third party. The report should not be reproduced either in part or in full, without the express permission of Regional Geotechnical Solutions Pty Ltd.

Contaminated site investigations are based on data collection, judgment, experience, and opinion. By nature, these investigations are less exact than other engineering disciplines. The findings presented in this report and used as the basis for the recommendations presented herein were obtained using normal, industry accepted practises and standards. To our knowledge, they represent a reasonable interpretation of the general condition of the site. Under no circumstances, however, can it be considered that these findings represent the actual state of the site at all points.

Recommendations regarding ground conditions referred to in this report are estimates based on the information available at the time of its writing. Estimates are influenced and limited by the fieldwork method and testing carried out in the site investigation, and other relevant information as has been made available. In cases where information has been provided to Regional Geotechnical Solutions for the purposes of preparing this report it has been assumed that the information is accurate and appropriate for such use. No responsibility is accepted by Regional Geotechnical Solutions for inaccuracies within any data supplied by others.

If site conditions encountered during construction vary significantly from those discussed in this report, Regional Geotechnical Solutions Pty Ltd should be contacted for further advice.

This report alone should not be used by contractors as the basis for preparation of tender documents or project estimates. Contractors using this report as a basis for preparation of tender documents should avail themselves of all relevant background information regarding the site before deciding on selection of construction materials and equipment.

If you have any questions regarding this project, or require any additional consultations, please contact the undersigned.

For and on behalf of

Regional Geotechnical Solutions Pty Ltd

Prepared by

Andrew Hills

Associate Environmental Engineer

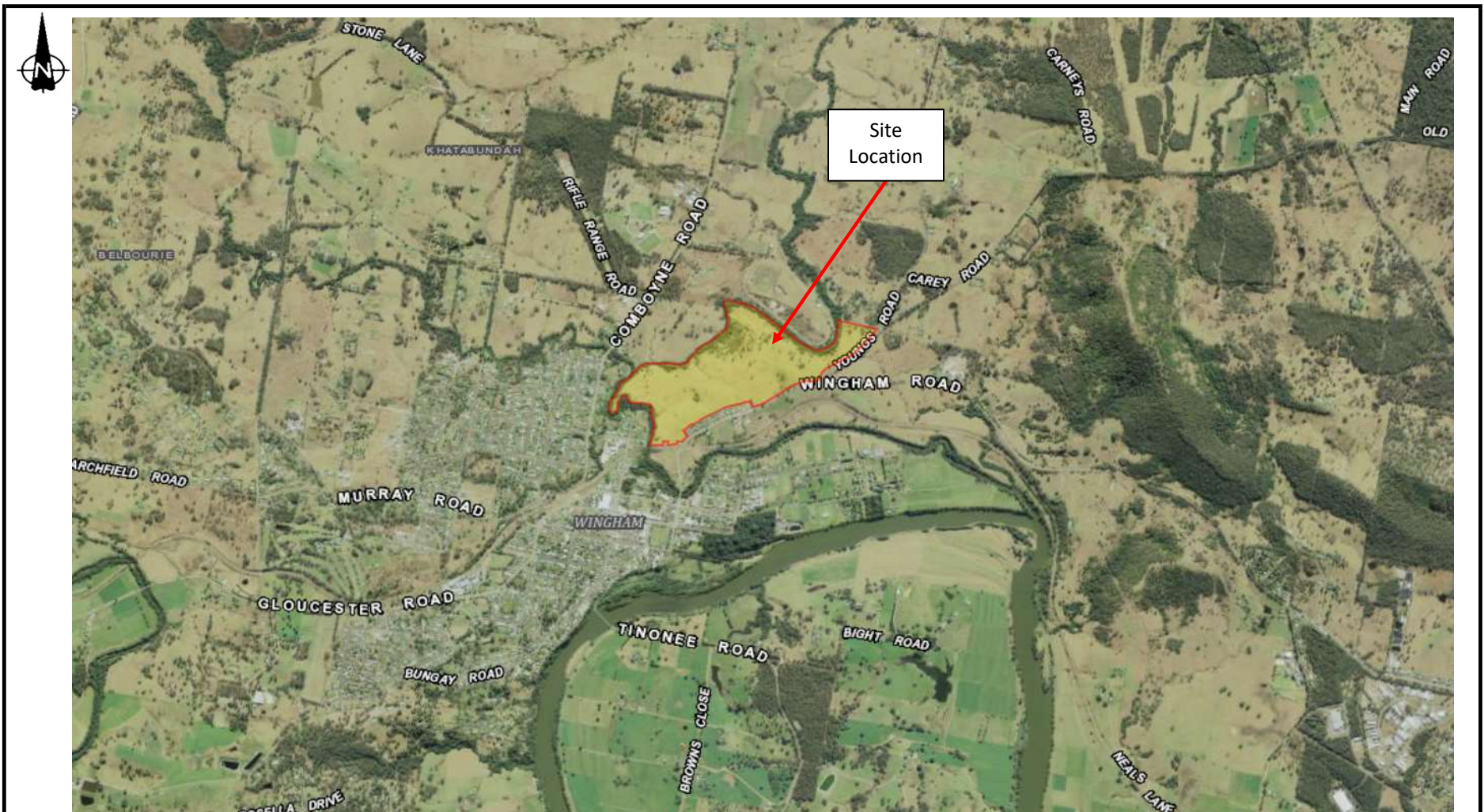
Reviewed by

Adam Holzhauser

Principal Geotechnical Engineer



Figures

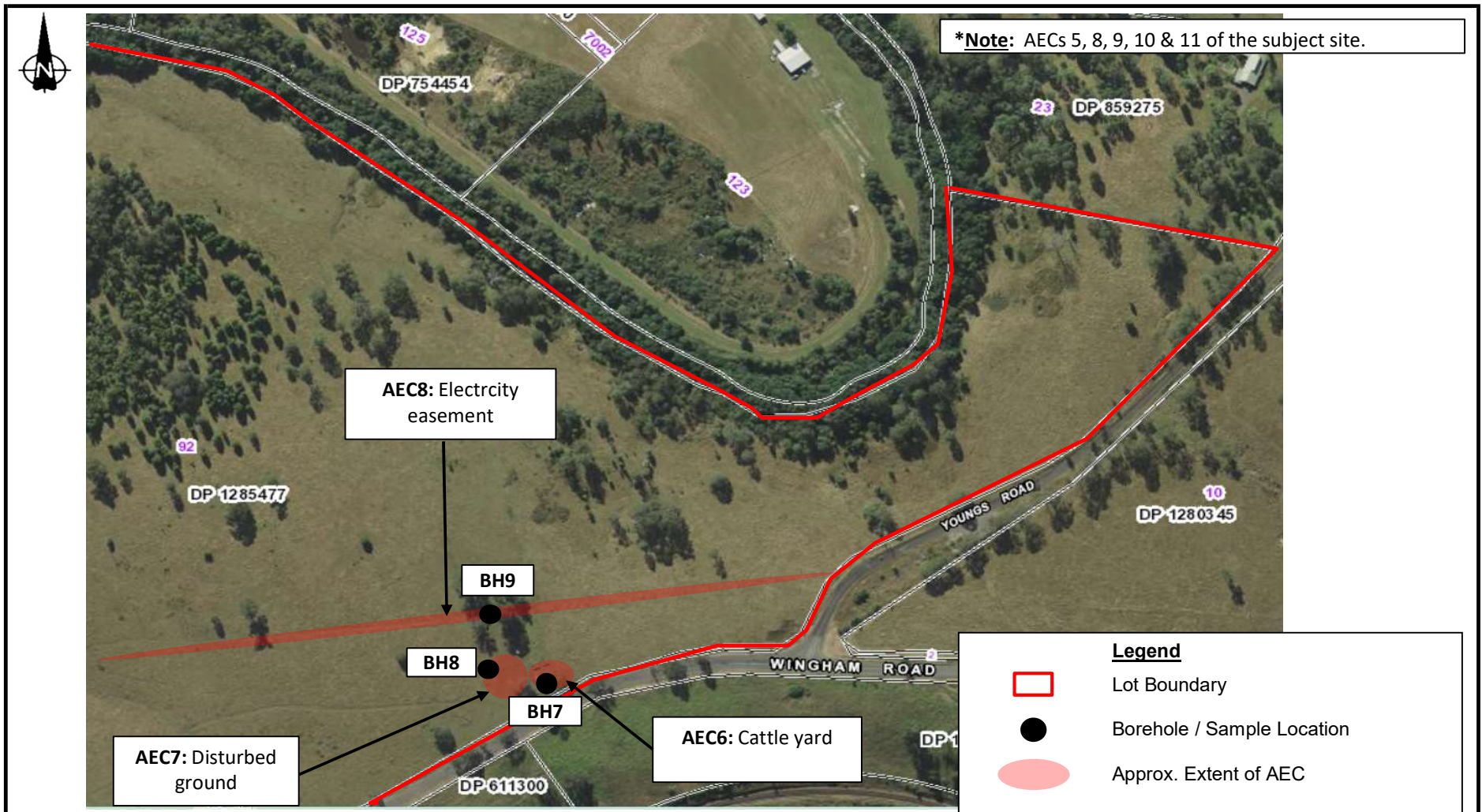


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	Project:	Proposed Residential Subdivision	Drawn By:	APH
		Lot 92 Wingham Road, Wingham	Scale:	As Shown
	Title:	Site Location Plan	Date:	14-Feb-24
			Drawing No.	Figure 1

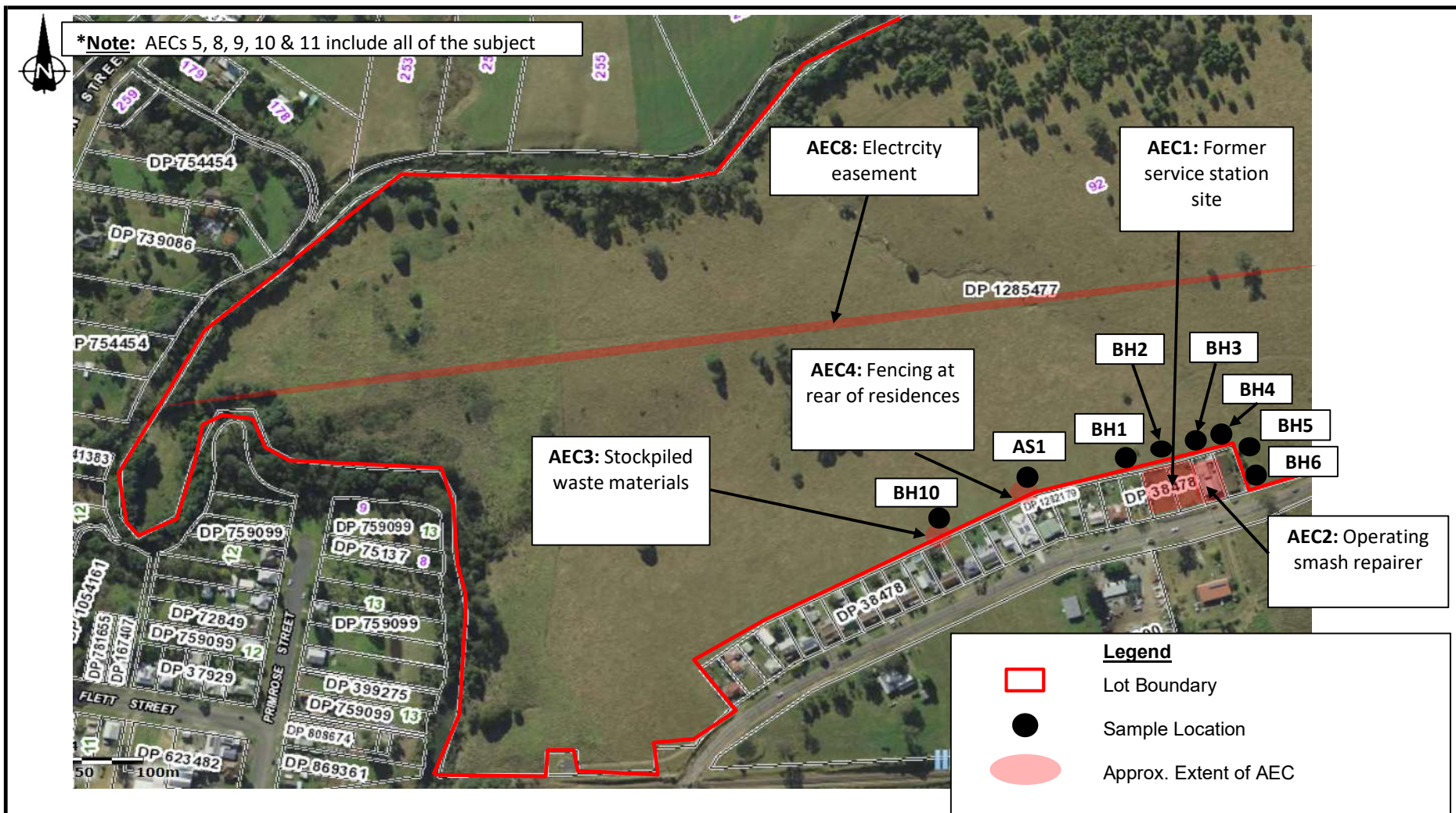
*Plan based off drawing provided titled "Indicative /Plan Tab" Version 2 dated 17/01/2023



Client:	MPT Farms Pty Ltd	Job No.	RGS03311.1
Project:	Proposed Residential Subdivision	Drawn By:	APH
	Lot 92 Wingham Road, Wingham	Scale:	As Shown
	Indicative Subdivision Layout Plan	Date:	14-Feb-24
Title:		Drawing No.	Figure 2



 REGIONAL GEOTECHNICAL SOLUTIONS	Client:	MPT Farms Pty Ltd	Job No.	RGS03311.1
	Project:	Proposed Residential Subdivision	Drawn By:	APH
		Lot 92 Wingham Road, Wingham	Scale:	As Shown
	Title:	Investigation Location Plan - East	Date:	14-Feb-24
			Drawing No.	Figure 3



 REGIONAL GEOTECHNICAL SOLUTIONS	Client:	MPT Farms Pty Ltd	Job No.	RGS03311.1
	Project:	Proposed Residential Subdivision	Drawn By:	APH
		Lot 92 Wingham Road, Wingham	Scale:	As Shown
	Title:	Investigation Location Plan - West	Date:	14-Feb-24
			Drawing No.	Figure 4



Appendix A

Site History Documentation

ADVANCE LEGAL SEARCHERS PTY LTD

(ACN 147 943 842)

ABN 82 147 943 842

18/36 Osborne Road,
Manly NSW 2095

Mobile: +61412 169 809
Email: search@alsearchers.com.au

16th February, 2024

REGIONAL GEOTECHNICAL SOLUTIONS PTY LTD

44 Bent Street,
WINGHAM, NSW, 2429

Attention: Andrew Hills,

**RE: Wingham Road,
 Wingham
 RGS03311.1**

Current Search

Folio Identifier 92/1285477 (title attached)

DP 1285477 (plan attached)

Dated 15th February, 2024

Registered Proprietor:

MPT FARMS PTY LTD (*ACN 623 375 020*)

Title Tree
Lot 92 DP 1285477

Folio Identifier 92/1285477

Folio Identifier 11/1240421

Folio Identifier 23/1169955

Folio Identifier 2/1133826

Folio Identifier 8/876062

Folio Identifier 8/844349

CA 58592

Conveyance Book 3591 No 335

Conveyance Book 3148 No 653

Conveyance Book 1699 No 143

Conveyance Book 1650 No 353

Index

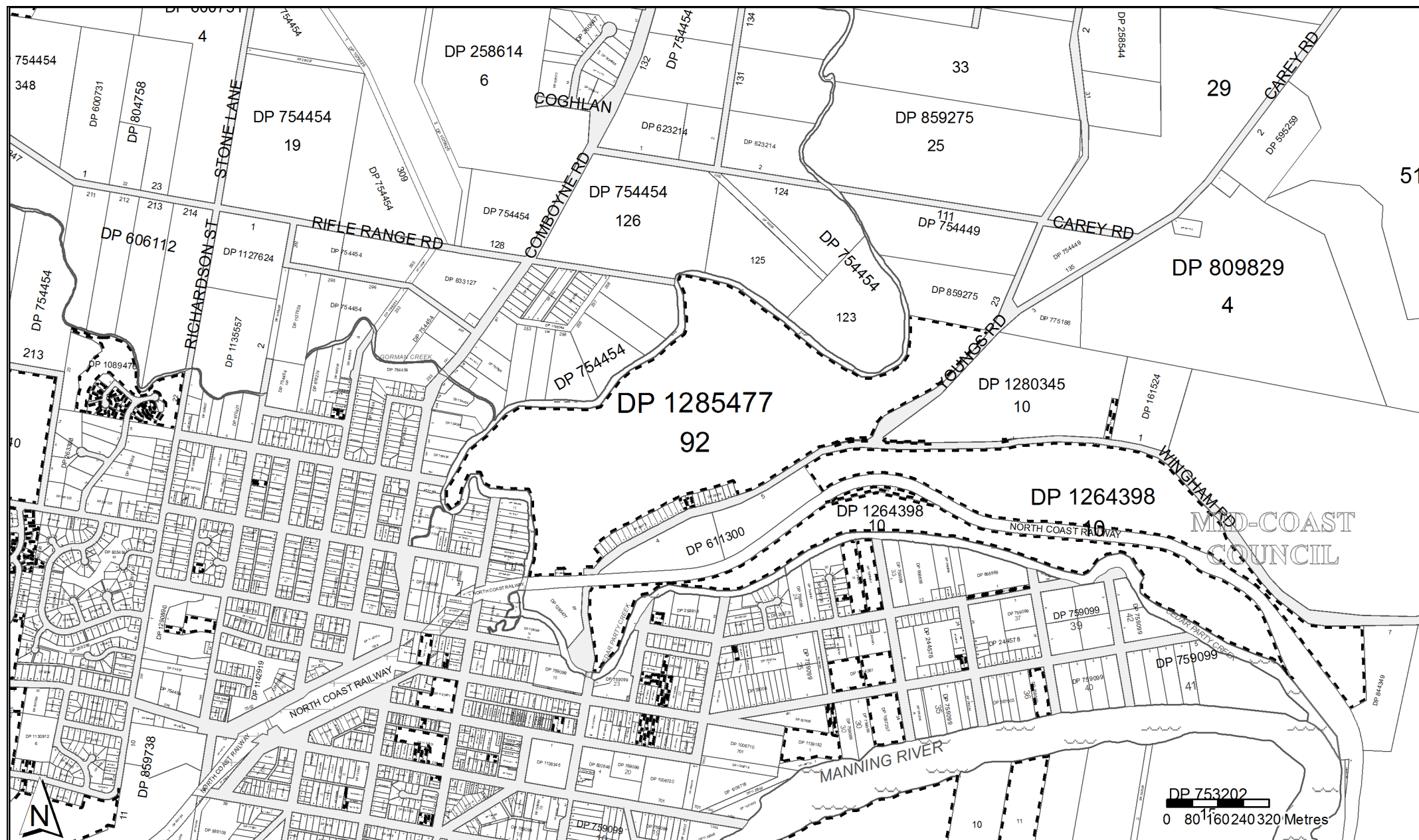
T – Transfer

TA – Transmission Application

C – Conveyance

Summary of proprietor(s) Lot 92 DP 1285477

Year	Proprietor(s)	
	(Lot 3001 DP 1280014)	
13 Sep 2022 todate	MPT Farms Pty Ltd (ACN 623 375 020)	
	(Lot 11 DP 1240421)	
13 Apr 2018	MPT Farms Pty Ltd (ACN 623 375 020)	T
23 Mar 2018	Tracey Murphy Anne Poole	
	(Lot 23 DP 1169955)	
22 Sep 2016	Tracey Murphy Anne Poole	TA
18 May 2012	Nancy Margaret Clayton, widow	
	(Lot 2 DP 1133826)	
04 Feb 2010	Nancy Margaret Clayton, widow	
	(Lot 8 DP 876062)	
29 Apr 1998	Nancy Margaret Clayton, widow	
	(Lot 8 DP 844349)	
29 Mar 1995	Nancy Margaret Clayton, widow	
	(Part Portion 2 Parish Taree and other lands – Conv Bk 3591 No 335)	
13 Jun 1984	Nancy Margaret Clayton, widow	C
13 Feb 1984	Kenneth Allan Hobson, retired / executor John Alfred Gollan Clayton, estate	
	(Part Portion 2 Parish Taree and other lands – Area 870 Acres – Conv Bk 3148 No 653)	
29 Mar 1974	John Alfred Gollan Clayton, clerk	C
24 Feb 1973	John Alfred Gollan Clayton, clerk / executor Christina May Gollan, estate	
	(Part Portion 2 Parish Taree and other lands – Area 870 Acres – Conv Bk 1699 No 143)	
01 Feb 1934	Christina May Gollan, spinster	C
	(Part Portion 2 Parish Taree and other lands – Area 870 Acres – Conv Bk 1650 No 353)	
01 Nov 1932	Thomas William Gollan, grazier	C



	Status	Surv/Comp	Purpose
DP35602 Lot(s): 14			
 DP1063668	REGISTERED	SURVEY	SUBDIVISION
DP154038 Lot(s): A, B			
 DP1187898	REGISTERED	SURVEY	REDEFINITION
 PA83371 - LOT 1 DP1187898			
DP156778 Lot(s): A			
 DP1187898	REGISTERED	SURVEY	REDEFINITION
 CA95623 - LOT A DP156778			
 PA83371 - LOT 1 DP1187898			
DP250730 Lot(s): 36			
 DP1228895	NUMBER ISSUED IN ERROR	SURVEY	DELIMITATION
 DP1228897	REGISTERED	SURVEY	DELIMITATION
DP263438 Lot(s): 107			
 DP649830	REGISTERED	COMPILATION	EASEMENT
DP514899 Lot(s): 23, 24			
 DP1187898	REGISTERED	SURVEY	REDEFINITION
 PA83371 - LOT 1 DP1187898			
Lot(s): 24			
 CA87442 - LOT 24 DP514899			
DP541914 Lot(s): 1			
 DP1294662	PRE-ALLOCATED	UNAVAILABLE	EASEMENT
 CA94166 - LOT 1 DP541914			
DP596767 Lot(s): 2			
 DP1280345	REGISTERED	COMPILATION	ROADS ACT, 1993
 DP1294662	PRE-ALLOCATED	UNAVAILABLE	EASEMENT
DP753202 Lot(s): 146			
 DP1001907	REGISTERED	COMPILATION	EASEMENT
DP759099 Lot(s): 3 Section : 32			
 DP1228895	NUMBER ISSUED IN ERROR	SURVEY	DELIMITATION
 DP1228897	REGISTERED	SURVEY	DELIMITATION
Lot(s): 4 Section : 36			
 DP1147987	REGISTERED	SURVEY	EASEMENT
DP776372 Lot(s): 11			
 DP1132834	REGISTERED	SURVEY	EASEMENT
 NSW GAZ. 14-10-2011			Folio : 6102
ACQUIRED FOR THE PURPOSES OF THE MIDCOAST COUNTY COUNCIL. EASEMENT FOR SEWER PIPELINE 5 WIDE DESIGNATED (C) SHOWN IN DP1132834			
DP798611 Lot(s): 1			
 CA94037 - LOT 1 DP798611			
DP833240 Lot(s): 192			
 DP1239881	REGISTERED	SURVEY	SUBDIVISION
DP1014105 Lot(s): 2			
 DP759099	HISTORICAL	COMPILATION	CROWN ADMIN NO.

Caution: 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
DP1014381 Lot(s): 10, 11			
 DP759099	HISTORICAL	COMPILATION	CROWN ADMIN NO.
DP1039285 Lot(s): 1511			
 DP521764	HISTORICAL	SURVEY	SUBDIVISION
DP1054022 Lot(s): 1			
 NSW GAZ. CLOSED ROAD LOT 1 DP1054022		20-06-2003	Folio : 5816
DP1056706 Lot(s): 2, 3, 4, 5, 6, 7, 8, 9, 11, 13, 14, 15			
 DP244904	HISTORICAL	SURVEY	SUBDIVISION
DP1058052 Lot(s): 7			
 DP759099	HISTORICAL	COMPILATION	CROWN ADMIN NO.
DP1062713 Lot(s): 3			
 DP568611	HISTORICAL	SURVEY	SUBDIVISION
DP1063668 Lot(s): 8, 9			
 DP759099	HISTORICAL	COMPILATION	CROWN ADMIN NO.
 DP1058052	HISTORICAL	SURVEY	SUBDIVISION
DP1064301 Lot(s): 23			
 DP244904	HISTORICAL	SURVEY	SUBDIVISION
 DP1056706	HISTORICAL	SURVEY	SUBDIVISION
DP1089476 Lot(s): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 15, 16, 17, 18, 20, 21, 22			
 DP588954	HISTORICAL	SURVEY	SUBDIVISION
DP1097297 Lot(s): 34			
 DP759099	HISTORICAL	COMPILATION	CROWN ADMIN NO.
DP1100831 Lot(s): 200			
 DP362943	HISTORICAL	COMPILATION	UNRESEARCHED
 DP395048	HISTORICAL	SURVEY	UNRESEARCHED
 DP557324	HISTORICAL	SURVEY	SUBDIVISION
 DP872019	HISTORICAL	SURVEY	SUBDIVISION
DP1101420 Lot(s): 11			
 DP258918	HISTORICAL	SURVEY	SUBDIVISION
DP1130912 Lot(s): 3, 4			
 DP261952	HISTORICAL	SURVEY	SUBDIVISION
DP1134783 Lot(s): 1, 2			
 DP244904	HISTORICAL	SURVEY	SUBDIVISION
 DP1056706	HISTORICAL	SURVEY	SUBDIVISION
DP1139152 Lot(s): 1			
 DP759099	HISTORICAL	COMPILATION	CROWN ADMIN NO.
 DP808497	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
 DP1089724	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
 NSW GAZ. ACQUIRED FOR COUNCIL PURPOSES LOT 1 DP1089724		18-05-2007	Folio : 2950
 PA82345 - LOT 1 DP1089724			

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ACTIVITY PRIOR TO SEPTEMBER 2002 you must refer to the RGs Charting and Reference Maps.

	Status	Surv/Comp	Purpose
DP1146515 Lot(s): 3, 4			
 DP261952	HISTORICAL	SURVEY	SUBDIVISION
DP1169955 Lot(s): 21			
 DP1133826	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
DP1172950 Lot(s): 1			
 DP759099	HISTORICAL	COMPILATION	CROWN ADMIN NO.
 DP781841	HISTORICAL	COMPILATION	DEPARTMENTAL
 DP925249	HISTORICAL	COMPILATION	UNRESEARCHED
DP1181227 Lot(s): 1			
 NSW GAZ. CLOSED ROAD LOT 1 DP1181227	11-07-2014		Folio : 2615
DP1183971 Lot(s): 1			
 DP322730	HISTORICAL	COMPILATION	UNRESEARCHED
 DP773410	HISTORICAL	SURVEY	CONSOLIDATION
 DP937494	HISTORICAL	COMPILATION	UNRESEARCHED
 DP1128999	HISTORICAL	UNRESEARCHED	ROADS ACT, 1993
 NSW GAZ. CLOSED ROAD LOT 1 DP1128999 - SEE AE699028	17-04-2009		Folio : 1681
DP1187898 Lot(s): 1			
 DP156778	HISTORICAL	COMPILATION	UNRESEARCHED
 PA83371 - LOT 1 DP1187898			
DP1207294 Lot(s): 1, 2			
 DP819087	HISTORICAL	SURVEY	SUBDIVISION
DP1209384 Lot(s): 114			
 DP564888	HISTORICAL	SURVEY	SUBDIVISION
 DP781777	HISTORICAL	COMPILATION	DEPARTMENTAL
DP1214294 Lot(s): 1			
 DP1065124	HISTORICAL	COMPILATION	DEPARTMENTAL
DP1228897 Lot(s): 4			
 DP759099	HISTORICAL	COMPILATION	CROWN ADMIN NO.
DP1249610 Lot(s): 2			
 DP754454	HISTORICAL	COMPILATION	CROWN ADMIN NO.
 DP1233863	HISTORICAL	SURVEY	SUBDIVISION
 DP1237807	HISTORICAL	COMPILATION	CONSOLIDATION
 DP1271104	REGISTERED	SURVEY	EASEMENT
DP1257348 Lot(s): 1, 2			
 DP759099	HISTORICAL	COMPILATION	CROWN ADMIN NO.
DP1264398 Lot(s): 10			
 DP1133826	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
 DP1169955	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
 DP1240421	HISTORICAL	SURVEY	SUBDIVISION
 DP1280345	REGISTERED	COMPILATION	ROADS ACT, 1993

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	Status	Surv/Comp	Purpose
DP1266055			
Lot(s): 3			
 DP861984	HISTORICAL	SURVEY	SUBDIVISION
 DP1236323	REGISTERED	SURVEY	SURVEY INFORMATION ONLY
DP1266855			
Lot(s): 1			
 DP244578	HISTORICAL	SURVEY	OLD SYSTEM CONVERSION
DP1280345			
Lot(s): 2			
 DP1133826	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
 DP1169955	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
 DP1240421	HISTORICAL	SURVEY	SUBDIVISION
DP1282179			
Lot(s): 101, 102			
 DP38478	HISTORICAL	SURVEY	UNRESEARCHED
DP1285477			
Lot(s): 92			
 DP1133826	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
 DP1169955	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
 DP1240421	HISTORICAL	SURVEY	SUBDIVISION
DP1290890			
Lot(s): 4, 5			
 DP754454	HISTORICAL	COMPILATION	CROWN ADMIN NO.
 DP1294714	REGISTERED	COMPILATION	EASEMENT
DP1292762			
Lot(s): 81			
 DP244904	HISTORICAL	SURVEY	SUBDIVISION
 DP1056706	HISTORICAL	SURVEY	SUBDIVISION
 DP1064301	HISTORICAL	SURVEY	SUBDIVISION
 DP1119972	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
 DP1239881	HISTORICAL	SURVEY	SUBDIVISION
DP1295637			
Lot(s): 1			
 DP550845	HISTORICAL	COMPILATION	SUBDIVISION
 DP554394	HISTORICAL	COMPILATION	SUBDIVISION
SP60696			
 DP733280	HISTORICAL	SURVEY	SUBDIVISION
SP69356			
 DP860944	HISTORICAL	SURVEY	SUBDIVISION
SP76590			
 DP798612	HISTORICAL	COMPILATION	DEPARTMENTAL
 DP1084484	HISTORICAL	COMPILATION	REDEFINITION
 CA91489 - LOT 1 DP798612			
 PA82035 - LOT 6 DP1084484			
SP82567			
 DP781841	HISTORICAL	COMPILATION	DEPARTMENTAL
 DP1140682	HISTORICAL	SURVEY	REDEFINITION
SP88014			
 DP564344	HISTORICAL	SURVEY	SUBDIVISION
 DP1180401	HISTORICAL	SURVEY	REDEFINITION
SP94253			
 DP24417	HISTORICAL	SURVEY	UNRESEARCHED
 DP1222482	HISTORICAL	SURVEY	REDEFINITION

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Plan	Surv/Comp	Purpose
DP5434	SURVEY	UNRESEARCHED
DP8150	SURVEY	UNRESEARCHED
DP8575	SURVEY	UNRESEARCHED
DP9098	SURVEY	UNRESEARCHED
DP11171	SURVEY	UNRESEARCHED
DP17581	SURVEY	UNRESEARCHED
DP18885	SURVEY	UNRESEARCHED
DP20528	SURVEY	UNRESEARCHED
DP20578	SURVEY	UNRESEARCHED
DP20581	SURVEY	UNRESEARCHED
DP21438	SURVEY	UNRESEARCHED
DP21644	SURVEY	UNRESEARCHED
DP22582	SURVEY	UNRESEARCHED
DP23484	SURVEY	UNRESEARCHED
DP24313	SURVEY	UNRESEARCHED
DP24417	SURVEY	UNRESEARCHED
DP25493	SURVEY	UNRESEARCHED
DP33008	SURVEY	UNRESEARCHED
DP33180	SURVEY	UNRESEARCHED
DP35602	SURVEY	UNRESEARCHED
DP35775	SURVEY	UNRESEARCHED
DP37929	SURVEY	UNRESEARCHED
DP38335	SURVEY	UNRESEARCHED
DP38478	SURVEY	UNRESEARCHED
DP38485	SURVEY	UNRESEARCHED
DP38630	SURVEY	UNRESEARCHED
DP40745	SURVEY	CROWN FOLIO CREATION
DP43103	COMPILATION	CROWN FOLIO CREATION
DP72849	COMPILATION	UNRESEARCHED
DP75137	SURVEY	UNRESEARCHED
DP84642	SURVEY	UNRESEARCHED
DP96090	COMPILATION	DEPARTMENTAL
DP100061	SURVEY	UNRESEARCHED
DP114687	COMPILATION	DEPARTMENTAL
DP136597	COMPILATION	DEPARTMENTAL
DP137291	COMPILATION	DEPARTMENTAL
DP151945	COMPILATION	UNRESEARCHED
DP153756	SURVEY	UNRESEARCHED
DP154038	COMPILATION	UNRESEARCHED
DP156778	COMPILATION	UNRESEARCHED
DP157537	SURVEY	UNRESEARCHED
DP158930	SURVEY	UNRESEARCHED
DP159703	SURVEY	UNRESEARCHED
DP159744	SURVEY	UNRESEARCHED
DP161524	SURVEY	UNRESEARCHED
DP163860	SURVEY	UNRESEARCHED
DP163912	SURVEY	UNRESEARCHED
DP167407	SURVEY	UNRESEARCHED
DP175500	SURVEY	UNRESEARCHED
DP194165	COMPILATION	DEPARTMENTAL
DP196748	COMPILATION	DEPARTMENTAL
DP202235	SURVEY	SUBDIVISION
DP209602	SURVEY	SUBDIVISION
DP228623	SURVEY	SUBDIVISION
DP231171	SURVEY	SUBDIVISION
DP243309	SURVEY	SUBDIVISION
DP243540	SURVEY	SUBDIVISION
DP244578	SURVEY	OLD SYSTEM CONVERSION
DP245194	SURVEY	SUBDIVISION
DP245211	SURVEY	SUBDIVISION
DP246689	SURVEY	SUBDIVISION
DP246858	SURVEY	SUBDIVISION
DP246881	SURVEY	SUBDIVISION
DP247461	SURVEY	SUBDIVISION
DP248479	SURVEY	SUBDIVISION

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Plan	Surv/Comp	Purpose
DP250227	SURVEY	SUBDIVISION
DP250730	SURVEY	SUBDIVISION
DP250731	SURVEY	SUBDIVISION
DP252528	COMPILATION	DEPARTMENTAL
DP253125	SURVEY	SUBDIVISION
DP254287	COMPILATION	CROWN FOLIO CREATION
DP254566	COMPILATION	CROWN FOLIO CREATION
DP254666	COMPILATION	CROWN FOLIO CREATION
DP255338	SURVEY	SUBDIVISION
DP255671	SURVEY	SUBDIVISION
DP258027	SURVEY	SUBDIVISION
DP258544	SURVEY	SUBDIVISION
DP258614	SURVEY	SUBDIVISION
DP258644	SURVEY	SUBDIVISION
DP258918	SURVEY	SUBDIVISION
DP259266	SURVEY	SUBDIVISION
DP259293	SURVEY	SUBDIVISION
DP260647	SURVEY	SUBDIVISION
DP261142	SURVEY	SUBDIVISION
DP261335	SURVEY	SUBDIVISION
DP263308	SURVEY	SUBDIVISION
DP263438	SURVEY	SUBDIVISION
DP301704	SURVEY	UNRESEARCHED
DP303531	SURVEY	UNRESEARCHED
DP303966	SURVEY	UNRESEARCHED
DP309590	SURVEY	UNRESEARCHED
DP312706	SURVEY	UNRESEARCHED
DP313276	SURVEY	UNRESEARCHED
DP317417	SURVEY	UNRESEARCHED
DP317901	SURVEY	UNRESEARCHED
DP321956	SURVEY	UNRESEARCHED
DP322048	COMPILATION	UNRESEARCHED
DP323383	SURVEY	UNRESEARCHED
DP325856	SURVEY	UNRESEARCHED
DP326103	SURVEY	UNRESEARCHED
DP326373	SURVEY	UNRESEARCHED
DP327277	SURVEY	UNRESEARCHED
DP329164	SURVEY	UNRESEARCHED
DP331494	SURVEY	UNRESEARCHED
DP332534	COMPILATION	UNRESEARCHED
DP345124	SURVEY	UNRESEARCHED
DP349568	COMPILATION	UNRESEARCHED
DP349696	SURVEY	UNRESEARCHED
DP350229	COMPILATION	UNRESEARCHED
DP354057	COMPILATION	UNRESEARCHED
DP356917	COMPILATION	UNRESEARCHED
DP356918	COMPILATION	UNRESEARCHED
DP358123	SURVEY	UNRESEARCHED
DP359831	COMPILATION	UNRESEARCHED
DP359979	SURVEY	UNRESEARCHED
DP360706	SURVEY	UNRESEARCHED
DP360707	SURVEY	UNRESEARCHED
DP361431	SURVEY	UNRESEARCHED
DP362099	COMPILATION	UNRESEARCHED
DP363954	SURVEY	UNRESEARCHED
DP365441	SURVEY	UNRESEARCHED
DP365442	COMPILATION	UNRESEARCHED
DP366093	SURVEY	UNRESEARCHED
DP366109	COMPILATION	UNRESEARCHED
DP366890	SURVEY	UNRESEARCHED
DP367515	SURVEY	UNRESEARCHED
DP371418	COMPILATION	UNRESEARCHED
DP372053	COMPILATION	UNRESEARCHED
DP373027	SURVEY	UNRESEARCHED
DP374714	SURVEY	UNRESEARCHED
DP377517	SURVEY	UNRESEARCHED

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Plan	Surv/Comp	Purpose
DP378014	SURVEY	UNRESEARCHED
DP379112	SURVEY	UNRESEARCHED
DP379384	COMPILATION	UNRESEARCHED
DP380059	COMPILATION	UNRESEARCHED
DP381057	SURVEY	UNRESEARCHED
DP382907	SURVEY	UNRESEARCHED
DP383012	SURVEY	UNRESEARCHED
DP384259	SURVEY	UNRESEARCHED
DP384671	SURVEY	UNRESEARCHED
DP388322	SURVEY	UNRESEARCHED
DP388777	SURVEY	UNRESEARCHED
DP391140	SURVEY	UNRESEARCHED
DP391308	COMPILATION	UNRESEARCHED
DP391408	SURVEY	UNRESEARCHED
DP391691	COMPILATION	UNRESEARCHED
DP393462	SURVEY	UNRESEARCHED
DP393608	SURVEY	UNRESEARCHED
DP394017	SURVEY	UNRESEARCHED
DP394104	SURVEY	UNRESEARCHED
DP395266	SURVEY	UNRESEARCHED
DP395735	SURVEY	UNRESEARCHED
DP399185	SURVEY	UNRESEARCHED
DP399275	SURVEY	UNRESEARCHED
DP400619	COMPILATION	UNRESEARCHED
DP402748	SURVEY	UNRESEARCHED
DP409504	SURVEY	UNRESEARCHED
DP413960	SURVEY	UNRESEARCHED
DP414085	SURVEY	UNRESEARCHED
DP418584	SURVEY	UNRESEARCHED
DP418977	SURVEY	UNRESEARCHED
DP419513	SURVEY	UNRESEARCHED
DP432660	COMPILATION	UNRESEARCHED
DP433443	COMPILATION	UNRESEARCHED
DP435751	SURVEY	UNRESEARCHED
DP435955	SURVEY	UNRESEARCHED
DP436796	SURVEY	UNRESEARCHED
DP437378	SURVEY	UNRESEARCHED
DP437432	SURVEY	UNRESEARCHED
DP500109	SURVEY	SUBDIVISION
DP500918	SURVEY	SUBDIVISION
DP504518	SURVEY	SUBDIVISION
DP507311	SURVEY	SUBDIVISION
DP510739	SURVEY	SUBDIVISION
DP512075	SURVEY	SUBDIVISION
DP514899	SURVEY	SUBDIVISION
DP517609	SURVEY	SUBDIVISION
DP518581	SURVEY	SUBDIVISION
DP522716	SURVEY	SUBDIVISION
DP524095	SURVEY	SUBDIVISION
DP524190	SURVEY	SUBDIVISION
DP527807	COMPILATION	SUBDIVISION
DP528626	COMPILATION	SUBDIVISION
DP528628	COMPILATION	SUBDIVISION
DP531695	COMPILATION	SUBDIVISION
DP534398	SURVEY	SUBDIVISION
DP535187	SURVEY	SUBDIVISION
DP538406	SURVEY	SUBDIVISION
DP538462	SURVEY	SUBDIVISION
DP541914	SURVEY	SUBDIVISION
DP544130	SURVEY	SUBDIVISION
DP550032	COMPILATION	SUBDIVISION
DP550845	COMPILATION	SUBDIVISION
DP552664	SURVEY	SUBDIVISION
DP553716	SURVEY	SUBDIVISION
DP553859	SURVEY	SUBDIVISION
DP554394	COMPILATION	SUBDIVISION

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Plan	Surv/Comp	Purpose
DP557270	SURVEY	SUBDIVISION
DP557740	SURVEY	SUBDIVISION
DP559165	COMPILATION	OLD SYSTEM CONVERSION
DP560013	SURVEY	SUBDIVISION
DP560040	SURVEY	SUBDIVISION
DP560790	SURVEY	SUBDIVISION
DP561340	SURVEY	SUBDIVISION
DP562998	SURVEY	SUBDIVISION
DP563106	SURVEY	SUBDIVISION
DP563404	SURVEY	SUBDIVISION
DP563581	SURVEY	SUBDIVISION
DP566339	SURVEY	SUBDIVISION
DP566770	SURVEY	SUBDIVISION
DP567034	SURVEY	SUBDIVISION
DP568321	SURVEY	SUBDIVISION
DP568926	SURVEY	SUBDIVISION
DP572526	SURVEY	SUBDIVISION
DP573024	COMPILATION	DEPARTMENTAL
DP573195	SURVEY	SUBDIVISION
DP574074	SURVEY	SUBDIVISION
DP575967	COMPILATION	SUBDIVISION
DP576034	SURVEY	SUBDIVISION
DP581245	SURVEY	SUBDIVISION
DP584859	COMPILATION	SUBDIVISION
DP585105	SURVEY	SUBDIVISION
DP585108	SURVEY	SUBDIVISION
DP585521	SURVEY	SUBDIVISION
DP587003	SURVEY	SUBDIVISION
DP587422	SURVEY	SUBDIVISION
DP587801	SURVEY	SUBDIVISION
DP588780	SURVEY	SUBDIVISION
DP589449	SURVEY	SUBDIVISION
DP590022	SURVEY	SUBDIVISION
DP595259	SURVEY	SUBDIVISION
DP596767	SURVEY	SUBDIVISION
DP598692	SURVEY	SUBDIVISION
DP600303	SURVEY	SUBDIVISION
DP600731	SURVEY	SUBDIVISION
DP606112	SURVEY	SUBDIVISION
DP607154	SURVEY	LEASE
DP609022	SURVEY	SUBDIVISION
DP610421	SURVEY	SUBDIVISION
DP611300	SURVEY	SUBDIVISION
DP614861	SURVEY	SUBDIVISION
DP616802	SURVEY	SUBDIVISION
DP620761	SURVEY	SUBDIVISION
DP623214	SURVEY	SUBDIVISION
DP623482	SURVEY	SUBDIVISION
DP624237	SURVEY	SUBDIVISION
DP625165	SURVEY	SUBDIVISION
DP626507	COMPILATION	SUBDIVISION
DP628172	COMPILATION	CONSOLIDATION
DP628351	SURVEY	SUBDIVISION
DP629139	SURVEY	SUBDIVISION
DP629439	SURVEY	SUBDIVISION
DP629987	SURVEY	SUBDIVISION
DP633110	SURVEY	SUBDIVISION
DP666450	COMPILATION	DEPARTMENTAL
DP702202	SURVEY	SUBDIVISION
DP703053	SURVEY	SUBDIVISION
DP704843	COMPILATION	CROWN FOLIO CREATION
DP708361	SURVEY	SUBDIVISION
DP712145	SURVEY	SUBDIVISION
DP713778	COMPILATION	SUBDIVISION
DP713925	SURVEY	SUBDIVISION
DP715541	SURVEY	SUBDIVISION

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Plan	Surv/Comp	Purpose
DP717618	SURVEY	SUBDIVISION
DP724338	COMPILATION	DEPARTMENTAL
DP731426	SURVEY	SUBDIVISION
DP733280	SURVEY	SUBDIVISION
DP737014	SURVEY	SUBDIVISION
DP737735	COMPILATION	DEPARTMENTAL
DP739086	SURVEY	SUBDIVISION
DP753202	COMPILATION	CROWN ADMIN NO.
DP754449	COMPILATION	CROWN ADMIN NO.
DP754454	COMPILATION	CROWN ADMIN NO.
DP759089	COMPILATION	CROWN ADMIN NO.
DP759099	COMPILATION	CROWN ADMIN NO.
DP773563	SURVEY	SUBDIVISION
DP773785	SURVEY	SUBDIVISION
DP775186	SURVEY	SUBDIVISION
DP776372	SURVEY	SUBDIVISION
DP777538	SURVEY	SUBDIVISION
DP780647	COMPILATION	DEPARTMENTAL
DP780839	COMPILATION	DEPARTMENTAL
DP781655	COMPILATION	DEPARTMENTAL
DP781778	COMPILATION	DEPARTMENTAL
DP781779	COMPILATION	DEPARTMENTAL
DP781782	COMPILATION	DEPARTMENTAL
DP781784	COMPILATION	DEPARTMENTAL
DP781805	COMPILATION	DEPARTMENTAL
DP781806	COMPILATION	DEPARTMENTAL
DP781828	COMPILATION	DEPARTMENTAL
DP781829	COMPILATION	DEPARTMENTAL
DP781830	COMPILATION	DEPARTMENTAL
DP781831	COMPILATION	DEPARTMENTAL
DP781838	COMPILATION	DEPARTMENTAL
DP781839	COMPILATION	DEPARTMENTAL
DP781840	COMPILATION	DEPARTMENTAL
DP781841	COMPILATION	DEPARTMENTAL
DP795134	COMPILATION	DEPARTMENTAL
DP798149	COMPILATION	UNRESEARCHED
DP798611	COMPILATION	DEPARTMENTAL
DP798613	COMPILATION	DEPARTMENTAL
DP798614	COMPILATION	DEPARTMENTAL
DP798619	COMPILATION	DEPARTMENTAL
DP801981	COMPILATION	CONSOLIDATION
DP804758	SURVEY	SUBDIVISION
DP805494	SURVEY	SUBDIVISION
DP806327	COMPILATION	SUBDIVISION
DP807638	SURVEY	SUBDIVISION
DP808674	SURVEY	REDEFINITION
DP808979	SURVEY	SUBDIVISION
DP809744	SURVEY	SUBDIVISION
DP809829	SURVEY	SUBDIVISION
DP814719	SURVEY	SUBDIVISION
DP816717	SURVEY	SUBDIVISION
DP818018	SURVEY	SUBDIVISION
DP818274	SURVEY	SUBDIVISION
DP819087	SURVEY	SUBDIVISION
DP819287	SURVEY	SUBDIVISION
DP820546	COMPILATION	CROWN FOLIO CREATION
DP820556	COMPILATION	CROWN FOLIO CREATION
DP822647	SURVEY	CROWN FOLIO CREATION
DP828281	SURVEY	SUBDIVISION
DP829794	SURVEY	SUBDIVISION
DP831604	SURVEY	SUBDIVISION
DP832787	SURVEY	SUBDIVISION
DP833127	SURVEY	SUBDIVISION
DP833240	SURVEY	SUBDIVISION
DP836414	SURVEY	SUBDIVISION
DP840890	SURVEY	SUBDIVISION

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Plan	Surv/Comp	Purpose
DP841094	SURVEY	SUBDIVISION
DP841383	SURVEY	SUBDIVISION
DP844332	SURVEY	SUBDIVISION
DP844349	SURVEY	SUBDIVISION
DP845736	SURVEY	SUBDIVISION
DP848166	COMPILATION	CONSOLIDATION
DP849765	SURVEY	SUBDIVISION
DP851206	SURVEY	SUBDIVISION
DP858656	SURVEY	SUBDIVISION
DP858969	SURVEY	PRIMARY APPLN NON SUBDIVISION
DP859275	SURVEY	ROADS ACT, 1993
DP859738	SURVEY	SUBDIVISION
DP859910	SURVEY	SUBDIVISION
DP860605	SURVEY	SUBDIVISION
DP860944	SURVEY	SUBDIVISION
DP863911	SURVEY	SUBDIVISION
DP864793	SURVEY	SUBDIVISION
DP869361	COMPILATION	REDEFINITION
DP872019	SURVEY	SUBDIVISION
DP882964	SURVEY	SUBDIVISION
DP883623	SURVEY	SUBDIVISION
DP900370	COMPILATION	UNRESEARCHED
DP918591	COMPILATION	UNRESEARCHED
DP925163	SURVEY	UNRESEARCHED
DP925437	COMPILATION	UNRESEARCHED
DP939223	SURVEY	UNRESEARCHED
DP942432	COMPILATION	UNRESEARCHED
DP953722	COMPILATION	UNRESEARCHED
DP955128	SURVEY	UNRESEARCHED
DP961987	COMPILATION	UNRESEARCHED
DP974389	COMPILATION	UNRESEARCHED
DP982228	COMPILATION	UNRESEARCHED
DP986109	COMPILATION	DEPARTMENTAL
DP999657	COMPILATION	DEPARTMENTAL
DP1006710	COMPILATION	LIMITED FOLIO CREATION
DP1006718	COMPILATION	LIMITED FOLIO CREATION
DP1006719	COMPILATION	LIMITED FOLIO CREATION
DP1006720	COMPILATION	LIMITED FOLIO CREATION
DP1014105	SURVEY	SUBDIVISION
DP1014381	SURVEY	SUBDIVISION
DP1019335	COMPILATION	CROWN FOLIO CREATION
DP1026574	COMPILATION	DEPARTMENTAL
DP1027230	SURVEY	CROWN FOLIO CREATION
DP1038251	SURVEY	ROADS ACT, 1993
DP1039285	COMPILATION	SUBDIVISION
DP1051457	SURVEY	SUBDIVISION
DP1051663	COMPILATION	DEPARTMENTAL
DP1054022	COMPILATION	ROADS ACT, 1993
DP1054161	COMPILATION	DEPARTMENTAL
DP1056706	SURVEY	SUBDIVISION
DP1058052	SURVEY	SUBDIVISION
DP1062713	SURVEY	SUBDIVISION
DP1063668	SURVEY	SUBDIVISION
DP1064301	SURVEY	SUBDIVISION
DP1079926	COMPILATION	CROWN FOLIO CREATION
DP1084877	SURVEY	SUBDIVISION
DP1089476	SURVEY	SUBDIVISION
DP1089724	SURVEY	RESUMPTION OR ACQUISITION
DP1097297	COMPILATION	CONSOLIDATION
DP1099935	COMPILATION	DEPARTMENTAL
DP1100831	COMPILATION	CONSOLIDATION
DP1101420	COMPILATION	CONSOLIDATION
DP1108311	SURVEY	SUBDIVISION
DP1115291	SURVEY	SUBDIVISION
DP1118212	COMPILATION	CROWN LAND CONVERSION
DP1120599	COMPILATION	CROWN LAND CONVERSION

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Plan	Surv/Comp	Purpose
DP1125717	COMPILATION	CROWN LAND CONVERSION
DP1127624	SURVEY	CONSOLIDATION
DP1130912	SURVEY	SUBDIVISION
DP1133826	SURVEY	RESUMPTION OR ACQUISITION
DP1134783	SURVEY	SUBDIVISION
DP1135014	COMPILATION	DEPARTMENTAL
DP1135557	SURVEY	CONSOLIDATION
DP1135557	UNRESEARCHED	CONSOLIDATION
DP1138345	COMPILATION	DEPARTMENTAL
DP1139152	SURVEY	CONSOLIDATION
DP1142407	COMPILATION	CROWN LAND CONVERSION
DP1142919	COMPILATION	CROWN LAND CONVERSION
DP1146515	SURVEY	SUBDIVISION
DP1147475	COMPILATION	CROWN LAND CONVERSION
DP1148704	COMPILATION	CROWN LAND CONVERSION
DP1149346	COMPILATION	CROWN LAND CONVERSION
DP1149733	COMPILATION	CROWN LAND CONVERSION
DP1154525	COMPILATION	LIMITED FOLIO CREATION
DP1156217	SURVEY	SUBDIVISION
DP1169955	SURVEY	RESUMPTION OR ACQUISITION
DP1172950	COMPILATION	CONSOLIDATION
DP1181227	SURVEY	ROADS ACT, 1993
DP1183971	SURVEY	CONSOLIDATION
DP1186670	COMPILATION	DEPARTMENTAL
DP1187898	SURVEY	REDEFINITION
DP1189430	COMPILATION	CROWN ROAD ENCLOSURE
DP1198044	COMPILATION	CROWN ROAD ENCLOSURE
DP1207132	SURVEY	SUBDIVISION
DP1207294	SURVEY	SUBDIVISION
DP1208367	COMPILATION	CROWN ROAD ENCLOSURE
DP1209384	COMPILATION	CONSOLIDATION
DP1214294	SURVEY	REDEFINITION
DP1224686	COMPILATION	CONSOLIDATION
DP1228897	SURVEY	DELIMITATION
DP1229225	SURVEY	SUBDIVISION
DP1229225	UNRESEARCHED	SUBDIVISION
DP1230831	SURVEY	SUBDIVISION
DP1239881	SURVEY	SUBDIVISION
DP1249610	SURVEY	SUBDIVISION
DP1257348	SURVEY	SUBDIVISION
DP1264398	SURVEY	SUBDIVISION
DP1266055	SURVEY	SUBDIVISION
DP1266855	COMPILATION	CONSOLIDATION
DP1280345	COMPILATION	ROADS ACT, 1993
DP1280345	UNRESEARCHED	ROADS ACT, 1993
DP1282179	SURVEY	SUBDIVISION
DP1285477	COMPILATION	ROADS ACT, 1993
DP1286390	COMPILATION	DEPARTMENTAL
DP1287892	COMPILATION	CONSOLIDATION
DP1290890	SURVEY	SUBDIVISION
DP1290890	UNRESEARCHED	SUBDIVISION
DP1292762	SURVEY	SUBDIVISION
DP1295637	COMPILATION	CONSOLIDATION
SP13870	COMPILATION	STRATA PLAN
SP17109	COMPILATION	STRATA PLAN
SP18158	COMPILATION	STRATA PLAN
SP20245	COMPILATION	STRATA PLAN
SP22429	COMPILATION	STRATA PLAN
SP32420	COMPILATION	STRATA PLAN
SP37237	COMPILATION	STRATA PLAN
SP38061	COMPILATION	STRATA PLAN
SP39871	COMPILATION	STRATA PLAN
SP41046	COMPILATION	STRATA PLAN
SP60696	COMPILATION	STRATA PLAN
SP69356	COMPILATION	STRATA PLAN
SP72877	COMPILATION	STRATA PLAN

Caution: 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.

Plan	Surv/Comp	Purpose
SP73704	COMPILATION	STRATA PLAN
SP76338	COMPILATION	STRATA PLAN
SP76590	COMPILATION	STRATA PLAN
SP82567	COMPILATION	STRATA PLAN
SP82900	COMPILATION	STRATA PLAN
SP88014	COMPILATION	STRATA PLAN
SP94253	COMPILATION	STRATA PLAN
SP94770	COMPILATION	STRATA PLAN
SP101794	COMPILATION	STRATA PLAN

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Form: 01TG
Licence: 01-05-042
Licensee: LEAP Legal Software Pty Limited
Firm name: Stacks/Forster

TRANSFER GRANTING EASEMENT



AF211277A

New South Wales
Real Property Act 1900

PRIVACY NOTE: Section 31B of the Real Property Act 1900 (RP Act) authorises the Registrar General to collect the information required by this form for the establishment and maintenance of the Real Property Act Register. Section 96B RP Act requires that the Register is made available to any person for search upon payment of a fee, if any.

(A) **TORRENS TITLE**

Servient Tenement (land burdened) 2/1133826	Dominant Tenement (land benefited) MidCoast County Council ABN 33 274 464 218
--	--

(B) **LODGED BY**

\$190. -
EXTRA FEE
PAID

Delivery Box	Name, Address or DX and Telephone 285D M J ARMSTRONG LLP: 127955Y REF: STACKS - MIDCOAST Reference:	CODE TG
--------------	--	-----------------------

(C) **TRANSFEROR**

NANCY MARGARET CLAYTON

(D) The transferor acknowledges receipt of the consideration of \$11,250.00 and transfers and grants

(E) **DESCRIPTION OF EASEMENT**

SEE ANNEXURE "A" HERETO

out of the servient tenement and appurtenant to the dominant tenement.

(F) Encumbrances (if applicable):

(G) **TRANSFeree**

MIDCOAST COUNTY COUNCIL ABN 33 274 464 218
--

DATE

15/12/2009

(H) I certify that the person(s) signing opposite, with whom I am personally acquainted or as to whose identity I am otherwise satisfied, signed this instrument in my presence.

Signature of witness: R. Simpson
Name of witness: LORRAINE SIMPSON
Address of witness: 143 BUNGAY RD
WINGHAM

Certified correct for the purposes of the Real Property Act 1900 by the person(s) named below who signed this instrument pursuant to the power of attorney specified.

Signature of attorney: A. Poole
Attorney's name: Anne Poole
Signing on behalf of: Nancy Margaret Clayton
Power of attorney-Book: 4575
-No.: 942

Certified correct for the purposes of the Real Property Act 1900 by the person whose signature appears below.

Signature: W. John Akhurst
Signatory's name: William John Akhurst
Signatory's capacity: Solicitor for the Transferee

FILM WITH AF211277

ANNEXURE "A" TO TRANSFER GRANTING EASEMENT

Between: **Nancy Margaret Clayton** (Transferor)
And: **MidCoast County Council ABN 33 274 464 218** (Transferee)

Dated: 15 / 12 / 2009

Part (E): DESCRIPTION OF EASEMENT

1. Easement for Access variable width shown as "C. Proposed Easement for Access variable width" in DP1133826 the terms of which are those set out in Part 11 of Schedule 4A to the Conveyancing Act 1919.
2. Easement for Sewer Pipeline 3 wide 6 wide and variable width shown as "E. Proposed Easement for Sewer Pipeline 3 wide 6 wide and variable width" in DP1133826 the terms of which are those set out in Part 6 of Schedule 4A to the Conveyancing Act 1919.
3. Easement for Sewer Pipeline 6 wide and variable shown as "F. Proposed Easement for Sewer Pipeline 6 wide and variable width" in DP1133826 the terms of which are those set out in Parts 6 of Schedule 4A to the Conveyancing Act 1919.

SIGNATURE OF TRANSFEROR

I certify that the person signing opposite, with whom I am personally acquainted or as to whose identity I am otherwise satisfied, signed this instrument in my presence.

Certified correct for the purposes of the Real Property Act 1900 by the person(s) named below who signed this instrument pursuant to the power of attorney specified.

Signature of witness: 
Name of witness: **CORRINE SIMPSON**
Address of witness: **143 BUDGAY ROAD**
WINGHAM.

Signature of attorney: 
Attorney's name: **Anne Poole**
Signing on behalf of: **Nancy Margaret Clayton**
Power of Attorney - Book:
No.:

SIGNATURE OF TRANSFEE

Certified correct for the purposes of the Real Property Act 1900 by the Person whose signature appears below.

Signature:



Signatory's name: **William John Akhurst**
Signatory's capacity: **Solicitor for the Transferee**

Form: 01T
Release: 6.2

TRANSFER

New South Wales
Real Property Act 1900



AN254738W

PRIVACY NOTE: Section 31B of the Real Property Act 1900 (RP Act) authorises the by this form for the establishment and maintenance of the Real Property Act Register. Section 96B RP Act requires that the Register is made available to any person for search upon payment of a fee, if any.

STAMP DUTY

Revenue NSW use only

Office of State Revenue	
NSW Treasury	
Client No: 4211801	751
Duty: \$10 -	Trans No: 9328397
Asst details: -001	

(A) TORRENS TITLE

11/1240421

(B) LODGED BY

Document Collection Box	Name, Address or DX, Telephone, and Customer Account Number if any V. J. RALPH & CO 123788S 1089X	CODES T TW
Reference: 20181748	1089X	

(C) TRANSFEROR

Tracey Murphy and Anne Poole

(D) CONSIDERATION

The transferor acknowledges receipt of the consideration of \$ 800,000.00 and as regards

(E) ESTATE

the abovementioned land transfers to the transferee an estate in fee simple

(F) SHARE TRANSFERRED

(G)

Encumbrances (if applicable):

(H) TRANSFEREE

MPT Farms Pty Limited ACN 623 375 020

(I)

TENANCY:

DATE

9-04-2018

(J) I certify I am an eligible witness and that the transferor signed this dealing in my presence.
[See note* below]

Certified correct for the purposes of the Real Property Act 1900 by the transferor.

Signature of witness:

Signature of transferor: See Annexure A for execution by Transferor

Name of witness:

Address of witness:

Certified correct for the purposes of the Real Property Act 1900 on behalf of the transferee by the person whose signature appears below.

Signature:

Signatory's name:

SHARON NORTHAM

Signatory's capacity:

Licensed Conveyancer

(K) The transferee's agent

certifies that the eNOS data relevant to this dealing has been submitted and stored under

eNOS ID No. 1548099

Full name: SHARON NORTHAM

Signature:

* s117 RP Act requires that you must have known the signatory for more than 12 months or have sighted identifying documentation.

Annexure A to Transfer

PARTIES:

Tracey Murphy and Anne Poole - Transferor

~~Cecil Peter Boyd Colless - Transferee~~

MPT Farms Pty Limited ACN 623 375 020 - Transferee

I certify that I am an eligible witness and that the Transferor
signed this dealing in my presence.

[See note* below]

Signature of witness

Name of witness:

Address of witness:

Certified correct for the purposes of the Real Property Act
1900 by the Transferor.

Signature of the Transferor:

I certify that I am an eligible witness and that the Transferor
signed this dealing in my presence.

[See note* below]

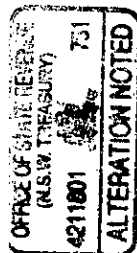
Signature of witness

Name of witness:

Address of witness:

Certified correct for the purposes of the Real Property Act
1900 by the Transferor.

Signature of the Transferor:



PLAN FORM 2
SIGNATURE AND SEALS ONLY.

Plan Drawing only to appear in this space

CA 58592

OFFICE USE ONLY

DP 844349

Registered: 29-3-1995

C.A. No. 95/94 OF 9-9-1994

Title System: **TORRENS & OLD SYSTEM**
Purpose: **SUBDIVISION**

Ref. Map: **PARISH 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100**
Last Plan: **DP 611301**

PLAN OF SUBDIVISION OF LOT 6 DP 611301 & PART POR. 2 & LOT 1 DP 781663

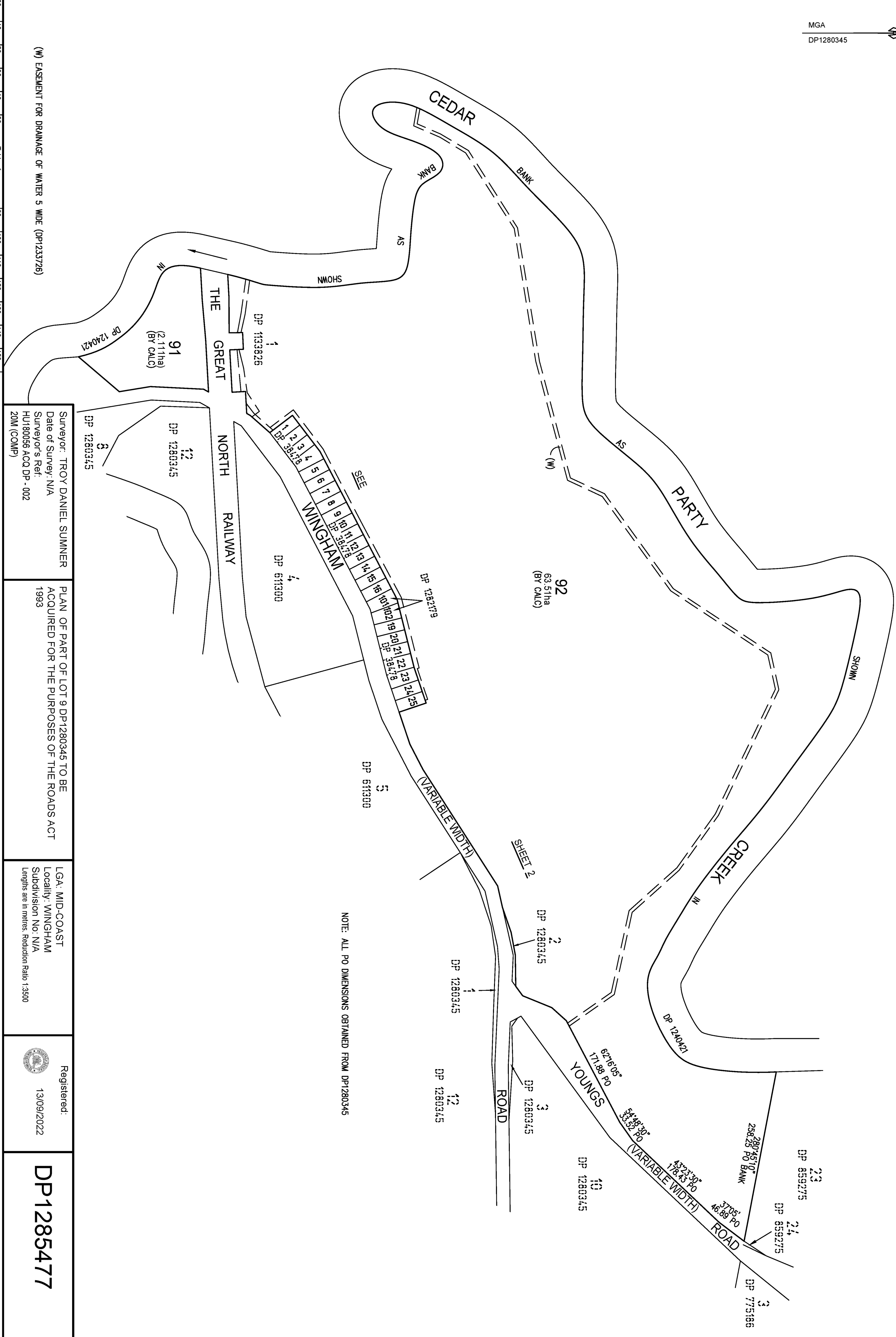
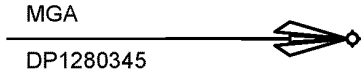
Lengths are in metres. Reduction Ratio: 1:10000

Locality: **WINGHAM**
Parish: **TARBE (56)**
County: **MACQUARIE**

1. **ERIAN CHAP**
of **WINGHAM, A. G. S. P. L. D. T. A. R. B. E.**
a surveyor registered under the Surveyors Act 1923, hereby certifies that the survey represented in this plan is accurate, has been made in accordance with the Survey Practice Regulation 1930 and was completed on **11/1/95** at **11/1/95**.

Signature: **ERIAN CHAP**
Surveyor registered under the Surveyors Act 1923

Plans used in preparation of survey/compilation
DPs: **541504, 711810, 711811, 711812, 711813, 711814, 711815, 711816, 711817, 711818, 711819, 711820, 711821, 711822, 711823, 711824, 711825, 711826, 711827, 711828, 711829, 711830, 711831, 711832, 711833, 711834, 711835, 711836, 711837, 711838, 711839, 711840, 711841, 711842, 711843, 711844, 711845, 711846, 711847, 711848, 711849, 711850, 711851, 711852, 711853, 711854, 711855, 711856, 711857, 711858, 711859, 711860, 711861, 711862, 711863, 711864, 711865, 711866, 711867, 711868, 711869, 711870, 711871, 711872, 711873, 711874, 711875, 711876, 711877, 711878, 711879, 711880, 711881, 711882, 711883, 711884, 711885, 711886, 711887, 711888, 711889, 711890, 711891, 711892, 711893, 711894, 711895, 711896, 711897, 711898, 711899, 711900, 711901, 711902, 711903, 711904, 711905, 711906, 711907, 711908, 711909, 711910, 711911, 711912, 711913, 711914, 711915, 711916, 711917, 711918, 711919, 711920, 711921, 711922, 711923, 711924, 711925, 711926, 711927, 711928, 711929, 711930, 711931, 711932, 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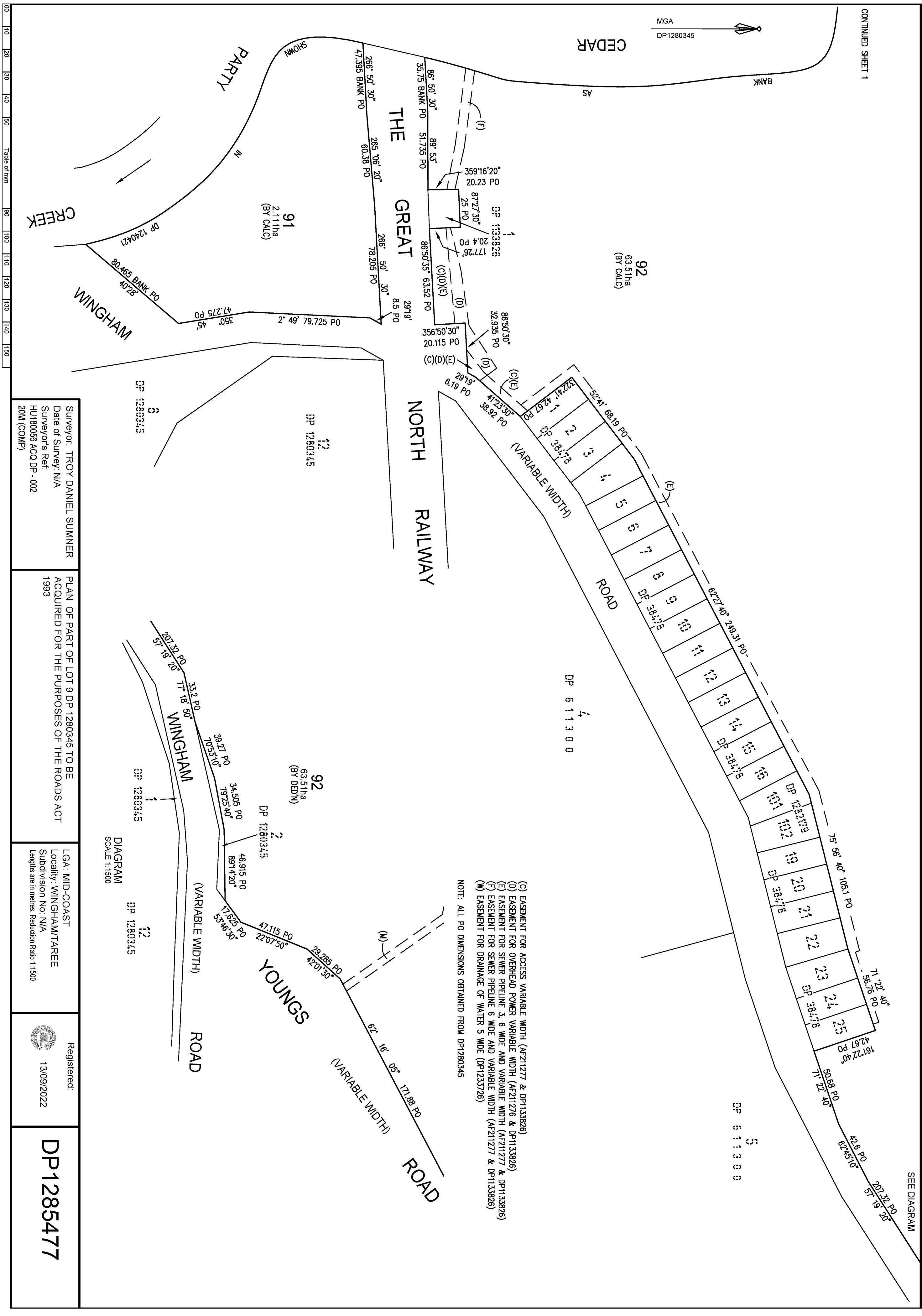


NOTE: ALL PO DIMENSIONS OBTAINED FROM DP1280345

Surveyor: TROY DANIEL SUMNER Date of Survey: N/A Surveyor's Ref: HU180056 ACQ DP - 002 20M (COMP)	PLAN OF PART OF LOT 9 DP1280345 TO BE ACQUIRED FOR THE PURPOSES OF THE ROADS ACT 1993	LGA: MID-COAST Locality: WINGHAM Subdivision No: N/A Lengths are in metres. Reduction Ratio 1:3500	Registered: 13/09/2022	DP1285477
--	---	---	---------------------------	-----------

(W) EASEMENT FOR DRAINAGE OF WATER 5 WIDE (DP1233726)

00	10	20	30	40	50	Table of mm	90	100	110	120	130	140	150
----	----	----	----	----	----	-------------	----	-----	-----	-----	-----	-----	-----



PLAN FORM 6 (2020)

WARNING: Creasing or folding will lead to rejection

DEPOSITED PLAN ADMINISTRATION SHEET

Sheet 1 of 2 sheet(s)

Registered:  13/09/2022
Title System: TORRENS

Office Use Only

Office Use Only

DP1285477

**PLAN OF PART LOT 9 DP 1280345 TO BE
ACQUIRED FOR THE PURPOSES OF THE
ROADS ACT 1993.**

LGA: MID-COAST
Locality: WINGHAM
Parish: TAREE
County: MACQUARIE

Survey Certificate

I, TROY DANIEL SUMNER of BARKER RYAN STEWART Pty. Ltd.
1/17 Babilla Close, Beresfield 2322
a surveyor registered under the *Surveying and Spatial Information Act*
2002, certify that:

~~*(a) The land shown in the plan was surveyed in accordance with the
Surveying and Spatial Information Regulation 2017, is accurate
and the survey was completed on, of~~

~~*(b) The part of the land shown in the plan (*being/*excluding **.....)
was surveyed in accordance with the *Surveying and Spatial
Information Regulation 2017*, the part surveyed is accurate and
the survey was completed on the part not
surveyed was compiled in accordance with that Regulation, or~~

~~*(c) The land shown in this plan was compiled in accordance with the
Surveying and Spatial Information Regulation 2017.~~

Datum Line: N/A

Type: *Urban/*Rural

The terrain is *Level-Undulating / *Steep-Mountainous:

Signature:  Dated: 11/3/2022

Surveyor Identification No: 8754

Surveyor registered under
the *Surveying and Spatial Information Act 2002*

*Strike out inappropriate words.

**Specify the land actually surveyed or specify any land shown in the plan that
is not the subject of the survey.

Crown Lands NSW/Western Lands Office Approval

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

Signature:

Date:

File Number:

Office:

Subdivision Certificate

I,
*Authorised Person/*General Manager/*Registered Certifier, certify that
the provisions of s.6.15 of the *Environmental Planning and Assessment
Act 1979* have been satisfied in relation to the proposed subdivision,
new road or reserve set out herein.

Signature:

Registration number:

Consent Authority:

Date of endorsement:

Subdivision Certificate number:

File number:

*Strike through if inapplicable.

Plans used in the preparation of survey/compilation.
DP1280345

Statements of intention to dedicate public roads create public reserves
and drainage reserves, acquire/resume land.

IT IS INTENDED TO ACQUIRE LOT 91 FOR ROAD
PURPOSES UNDER THE ROADS ACT 1993.

Surveyor's Reference: HU180056 ACQ DP-002 20M(COMP)

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

PLAN FORM 6A (2019)

DEPOSITED PLAN ADMINISTRATION SHEET

Sheet 2 of 2 sheet(s)

Registered:



13/09/2022

Office Use Only

Office Use Only

DP1285477

PLAN OF PART LOT 9 DP 1280345 TO BE
ACQUIRED FOR THE PURPOSES OF THE
ROADS ACT 1993.

This sheet is for the provision of the following information as required:

- A schedule of lots and addresses - See 60(c) *SSI Regulation 2017*
- Statements of intention to create and release affecting interests in accordance with section 88B *Conveyancing Act 1919*
- Signatures and seals- see 195D *Conveyancing Act 1919*
- Any information which cannot fit in the appropriate panel of sheet 1 of the administration sheets.

Subdivision Certificate number:

Date of Endorsement:

Lot Number	Address Number	Road Name	Road Type	Locality Name
91	N/A	N/A	N/A	N/A
92	967	WINGHAM	ROAD	WINGHAM

Execution by MID-COAST COUNCIL:

By its Authorised Officer Adrian Panuccio,
General Manager, pursuant to Council
Resolution 173/2022 dated 11 May 2022

in the presence of *John White*
on *24/5* /2022.

If space is insufficient use additional annexure sheet

Surveyor's Reference: HU180056 ACQ DP-002 20M(COMP)



NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE

15/2/2024 11:07AM

FOLIO: 2/1133826

First Title(s): OLD SYSTEM

Prior Title(s): 8/876062

Recorded	Number	Type of Instrument	C.T. Issue
24/2/2009	DP1133826	DEPOSITED PLAN	LOT RECORDED FOLIO NOT CREATED
4/2/2010	AF211275	TRANSFER	FOLIO CREATED CT NOT ISSUED
4/2/2010	AF211277	TRANSFER GRANTING EASEMENT	EDITION 1
3/1/2012	DP1169955	DEPOSITED PLAN	
5/4/2012	AG914770	TRANSFER	EDITION 2
18/5/2012	AG914770	DE-REGISTERED - TRANSFER	
18/5/2012	AG930198	DEPARTMENTAL DEALING	
18/5/2012	AG914770	TRANSFER	FOLIO CANCELLED
21/5/2012	AG997973	DEPARTMENTAL DEALING	
12/9/2022	AS464886	DEPARTMENTAL DEALING	

*** END OF SEARCH ***

advlegs

PRINTED ON 15/2/2024



NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE

15/2/2024 11:07AM

FOLIO: 11/1240421

First Title(s): OLD SYSTEM

Prior Title(s): 23/1169955

Recorded	Number	Type of Instrument	C.T. Issue
23/3/2018	DP1240421	DEPOSITED PLAN	FOLIO CREATED EDITION 1
13/4/2018	AN254738	TRANSFER	EDITION 2
6/9/2022	DP1280345	DEPOSITED PLAN	EDITION 3
12/9/2022	AS464886	DEPARTMENTAL DEALING	EDITION 4
13/9/2022	DP1285477	DEPOSITED PLAN	EDITION 5
7/11/2023	AT408767	TRANSFER	FOLIO CANCELLED

*** END OF SEARCH ***

advlegs

PRINTED ON 15/2/2024



NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE

15/2/2024 11:07AM

FOLIO: 23/1169955

First Title(s): OLD SYSTEM

Prior Title(s): 2/1133826

Recorded	Number	Type of Instrument	C.T. Issue
3/1/2012	DP1169955	DEPOSITED PLAN	LOT RECORDED FOLIO NOT CREATED
18/5/2012	AG914770	TRANSFER	FOLIO CREATED EDITION 1
22/9/2016	AK775148	TRANSMISSION APPLICATION (EXECUTOR, ADMINISTRATOR, TRUSTEE)	EDITION 2
4/8/2017	DP1233726	DEPOSITED PLAN	EDITION 3
23/3/2018	DP1240421	DEPOSITED PLAN	FOLIO CANCELLED
12/9/2022	AS464886	DEPARTMENTAL DEALING	

*** END OF SEARCH ***

advlegs

PRINTED ON 15/2/2024



NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 92/1285477

SEARCH DATE	TIME	EDITION NO	DATE
15/2/2024	11:07 AM	1	7/11/2023

LAND

LOT 92 IN DEPOSITED PLAN 1285477
AT WINGHAM
LOCAL GOVERNMENT AREA MID-COAST
PARISH OF TAREE COUNTY OF MACQUARIE
TITLE DIAGRAM DP1285477

FIRST SCHEDULE

MPT FARMS PTY LIMITED

SECOND SCHEDULE (7 NOTIFICATIONS)

- 1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
- 2 DP844349 RIGHT OF CARRIAGEWAY 5 METRE(S) WIDE APPURTENANT TO THE LAND ABOVE DESCRIBED
- 3 AF211276 EASEMENT FOR OVERHEAD POWER VARIABLE WIDTH AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
- 4 AF211277 EASEMENT FOR ACCESS VARIABLE WIDTH AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
- 5 AF211277 EASEMENT FOR SEWER PIPELINE 3, 6 METRE(S) WIDE AND VARIABLE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
- 6 AF211277 EASEMENT FOR SEWER PIPELINE 6 METRE(S) WIDE AND VARIABLE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
- 7 DP1233726 EASEMENT FOR DRAINAGE OF WATER 5 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

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PRINTED ON 15/2/2024



Appendix B

Results of Field Investigations



ENGINEERING LOG - BOREHOLE

BOREHOLE NO: **BH1**

CLIENT: MPT Farms Pty Ltd
PROJECT NAME: Proposed Residential Subdivision
SITE LOCATION: Lot 11 Wingham Road, Wingham
TEST LOCATION: See Figure 3

PAGE: 1 of 1
JOB NO: RGS03311.1
LOGGED BY: AH
DATE: 1/2/24

DRILL TYPE: RGS Ute Mounted Drill Rig
BOREHOLE DIAMETER: 100 mm
EASTING:
INCLINATION: 90°
NORTHING:
SURFACE RL: AHD
DATUM:

Drilling and Sampling					Material description and profile information					Field Test		Structure and additional observations		
METHOD	WATER	SAMPLES	RL (Not measured)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics, colour, minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result			
AD/T	Not Encountered					CL	TOPSOIL: Silty CLAY, low plasticity, brown/dark brown, some gravel, coarse grained, some roots	M				TOPSOIL		
		0.20m		0.2		CL	Silty Gravelly CLAY: Low plasticity, brown, gravel, coarse grained, some roots	M < w _p				Fr	SLOPEWASH	
		E		0.4		CH	Silty CLAY: Medium to high plasticity, brown/pale brown, trace roots						RESIDUAL SOIL	
			0.40m		0.6		CL						Silty CLAY: Low plasticity, pale brown/pale grey/white, some gravel, coarse grained	EXTREMELY WEATHERED SILTSTONE
					0.8									
				1.0										
				1.10m										
				1.2			Hole Terminated at 1.10 m Practical TC Bit Refusal							
				1.4										
				1.6										
				1.8										

LEGEND:

Water

 Water Level
(Date and time shown)

 Water Inflow

 Water Outflow

Strata Changes

 Gradational or transitional strata

 Definitive or distinct strata change

Notes, Samples and Tests

U₅₀ 50mm Diameter tube sample

CBR Bulk sample for CBR testing

E Environmental sample

ASS Acid Sulfate Soil Sample

B Bulk Sample

Field Tests

PID Photoionisation detector reading (ppm)

DCP(x-y) Dynamic penetrometer test (test depth interval shown)

HP Hand Penetrometer test (UCS kPa)

Consistency

VS Very Soft <25

S Soft 25 - 50

F Firm 50 - 100

St Stiff 100 - 200

VSt Very Stiff 200 - 400

H Hard >400

Fb Friable

UCS (kPa)

D Dry

M Moist

W Wet

W_p Plastic Limit

W_L Liquid Limit

Density

V Very Loose Density Index <15%

L Loose Density Index 15 - 35%

MD Medium Dense Density Index 35 - 65%

D Dense Density Index 65 - 85%

VD Very Dense Density Index 85 - 100%



ENGINEERING LOG - BOREHOLE

BOREHOLE NO: **BH2**

CLIENT: MPT Farms Pty Ltd
PROJECT NAME: Proposed Residential Subdivision
SITE LOCATION: Lot 11 Wingham Road, Wingham
TEST LOCATION: See Figure 3

PAGE: 1 of 1
JOB NO: RGS03311.1
LOGGED BY: AH
DATE: 1/2/24

DRILL TYPE: RGS Ute Mounted Drill Rig

EASTING:

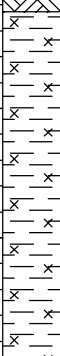
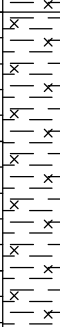
SURFACE RL:

BOREHOLE DIAMETER: 100 mm

INCLINATION: 90°

NORTHING:

DATUM: AHD

Drilling and Sampling					Material description and profile information					Field Test		Structure and additional observations
METHOD	WATER	SAMPLES	RL (Not measured)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics, colour, minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	
AD/T	Not Encountered	E		0.2		CL	TOPSOIL: Silty CLAY, low plasticity, brown/dark brown, some gravel, coarse grained, some roots	M				TOPSOIL
		0.25m			CH	Silty CLAY: Medium to high plasticity, brown, trace roots	M < w _p	RESIDUAL SOIL				
		0.80m			CL	Becoming brown/pale brown/orange Silty CLAY: Low plasticity, pale brown/orange/white	M	Fr				EXTREMELY WEATHERED SILTSTONE
				1.30m			Hole Terminated at 1.30 m Practical TC Bit Refusal					
				1.4								
				1.6								
				1.8								

LEGEND:		Notes, Samples and Tests		Consistency		UCS (kPa)	Moisture Condition	
Water		U ₅₀ 50mm Diameter tube sample		VS	Very Soft	<25	D	Dry
Water Level (Date and time shown)		CBR Bulk sample for CBR testing		S	Soft	25 - 50	M	Moist
Water Inflow		E Environmental sample		F	Firm	50 - 100	W	Wet
Water Outflow		ASS Acid Sulfate Soil Sample		St	Stiff	100 - 200	W _p	Plastic Limit
Strata Changes		B Bulk Sample		VSt	Very Stiff	200 - 400	W _L	Liquid Limit
Gradational or transitional strata		Field Tests		H	Hard	>400		
Definitive or distinct strata change		PID Photoionisation detector reading (ppm)		Fb	Friable			
		DCP(x-y) Dynamic penetrometer test (test depth interval shown)		Density	V	Very Loose	Density Index <15%	
		HP Hand Penetrometer test (UCS kPa)			L	Loose	Density Index 15 - 35%	
					MD	Medium Dense	Density Index 35 - 65%	
					D	Dense	Density Index 65 - 85%	
					VD	Very Dense	Density Index 85 - 100%	



ENGINEERING LOG - BOREHOLE

CLIENT: MPT Farms Pty Ltd
PROJECT NAME: Proposed Residential Subdivision
SITE LOCATION: Lot 11 Wingham Road, Wingham
TEST LOCATION: See Figure 3

BOREHOLE NO: BH3
PAGE: 1 of 1
JOB NO: RGS03311.1
LOGGED BY: AH
DATE: 1/2/24

DRILL TYPE: RGS Ute Mounted Drill Rig
BOREHOLE DIAMETER: 100 mm
EASTING:
INCLINATION: 90°
NORTHING:
SURFACE RL: AHD
DATUM:

Drilling and Sampling					Material description and profile information					Field Test		Structure and additional observations
METHOD	WATER	SAMPLES	RL (Not measured)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics, colour, minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	
AD/T	Not Encountered			0.2		CL	TOPSOIL: Silty CLAY, low plasticity, brown/dark brown, some gravel, coarse grained	M				TOPSOIL
		0.25m	CH	Silty CLAY: Medium to high plasticity, brown/dark brown/orange		M > w _p	RESIDUAL SOIL					
		0.30m	E	0.4		CL	Silty CLAY: Low plasticity, brown/pale brown/orange/white	M	Fr			EXTREMELY WEATHERED SILTSTONE
		0.50m		0.6								
				0.70m		Hole Terminated at 0.70 m Practical TC Bit Refusal						
				0.8								
				1.0								
				1.2								
				1.4								
				1.6								
				1.8								

LEGEND:		Notes, Samples and Tests		Consistency		UCS (kPa)	Moisture Condition	
Water		U ₅₀ 50mm Diameter tube sample		VS	Very Soft	<25	D	Dry
Water Level (Date and time shown)		CBR Bulk sample for CBR testing		S	Soft	25 - 50	M	Moist
Water Inflow		E Environmental sample		F	Firm	50 - 100	W	Wet
Water Outflow		ASS Acid Sulfate Soil Sample		St	Stiff	100 - 200	W _p	Plastic Limit
Strata Changes		B Bulk Sample		VSt	Very Stiff	200 - 400	W _L	Liquid Limit
Gradational or transitional strata		Field Tests		H	Hard	>400		
Definitive or distinct strata change		PID Photoionisation detector reading (ppm)		Fb	Friable			
		DCP(x-y) Dynamic penetrometer test (test depth interval shown)		Density	V	Very Loose	Density Index <15%	
		HP Hand Penetrometer test (UCS kPa)			L	Loose	Density Index 15 - 35%	
					MD	Medium Dense	Density Index 35 - 65%	
					D	Dense	Density Index 65 - 85%	
					VD	Very Dense	Density Index 85 - 100%	

RG 2.00.3 LIB G.L.B. Log RG NON-CORED BOREHOLE - TEST PIT RGS03311.1 BH LOGS.GPJ <<DrawingFile>> 7/2/2024 12:11 10.03.00.06 Dargel Lab and in Situ Tool - DGD Lib RG 2.00.3 2022-03-03 Proj RG 2.00.0 2021-06-30



ENGINEERING LOG - BOREHOLE

BOREHOLE NO: **BH4**

CLIENT: MPT Farms Pty Ltd
PROJECT NAME: Proposed Residential Subdivision
SITE LOCATION: Lot 11 Wingham Road, Wingham
TEST LOCATION: See Figure 3

PAGE: 1 of 1
JOB NO: RGS03311.1
LOGGED BY: AH
DATE: 1/2/24

DRILL TYPE: RGS Ute Mounted Drill Rig

EASTING:

SURFACE RL:

BOREHOLE DIAMETER: 100 mm

INCLINATION: 90°

NORTHING:

DATUM: AHD

Drilling and Sampling					Material description and profile information					Field Test		Structure and additional observations
METHOD	WATER	SAMPLES	RL (Not measured)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics, colour, minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	
AD/T	Not Encountered					CL	TOPSOIL: Silty CLAY, low plasticity, brown/dark brown, some gravel, coarse grained, some roots	M				TOPSOIL
		0.20m		0.2		CH	Silty CLAY: Medium to high plasticity, brown/dark brown/orange, trace roots	M > w _p				RESIDUAL SOIL
		E		0.4								
		0.40m		0.6								
				0.8								
				1.0		CL	Silty CLAY: Low plasticity, brown/pale brown/orange/white, some gravel, coarse grained	M	Fr			EXTREMELY WEATHERED SILTSTONE
				1.2								
				1.4								
				1.6								
				1.8								
				2.0								
				2.2								
				2.4								
				2.6								
				2.8								
				3.0								
				3.2								
				3.4								
				3.6								
				3.8								
				4.0								
				4.2								
				4.4								
				4.6								
				4.8								
				5.0								
				5.2								
				5.4								
				5.6								
				5.8								
				6.0								
				6.2								
				6.4								
				6.6								
				6.8								
				7.0								
				7.2								
				7.4								
				7.6								
				7.8								
				8.0								
				8.2								
				8.4								
				8.6								
				8.8								
				9.0								
				9.2								
				9.4								
				9.6								
				9.8								
				10.0								
				10.2								
				10.4								
				10.6								
				10.8								
				11.0								
				11.2								
				11.4								
				11.6								
				11.8								
				12.0								
				12.2								
				12.4								
				12.6								
				12.8								
				13.0								
				13.2								
				13.4								
				13.6								
				13.8								
				14.0								
				14.2								
				14.4								
				14.6								
				14.8								
				15.0								
				15.2								
				15.4								
				15.6								
				15.8								
				16.0								
				16.2								
				16.4								
				16.6								
				16.8								
				17.0								
				17.2								
				17.4								
				17.6								
				17.8								
				18.0								
				18.2								
				18.4								
				18.6								
				18.8								
				19.0								
				19.2								
				19.4								
				19.6								
				19.8								
				20.0								
				20.2								
				20.4								
				20.6								
				20.8								



ENGINEERING LOG - BOREHOLE

BOREHOLE NO: **BH5**

CLIENT: MPT Farms Pty Ltd
PROJECT NAME: Proposed Residential Subdivision
SITE LOCATION: Lot 11 Wingham Road, Wingham
TEST LOCATION: See Figure 3

PAGE: 1 of 1
JOB NO: RGS03311.1
LOGGED BY: AH
DATE: 1/2/24

DRILL TYPE: RGS Ute Mounted Drill Rig

EASTING:

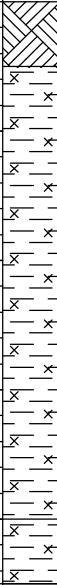
SURFACE RL:

BOREHOLE DIAMETER: 100 mm

INCLINATION: 90°

NORTHING:

DATUM: AHD

Drilling and Sampling					Material description and profile information					Field Test		Structure and additional observations
METHOD	WATER	SAMPLES	RL (Not measured)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics, colour, minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	
AD/T	Not Encountered	0.10m	E	0.10m		CL	TOPSOIL: Silty CLAY, low plasticity, brown/dark brown, some gravel, coarse grained, some roots	M	M > w _p			TOPSOIL
		CH				Silty CLAY: Medium to high plasticity, brown/orange		RESIDUAL SOIL				
		CL				Silty CLAY: Low plasticity, brown/pale brown/orange/white	Fr	EXTREMELY WEATHERED SILTSTONE				
				0.90m			Hole Terminated at 0.90 m Practical TC Bit Refusal					

LEGEND:		Notes, Samples and Tests		Consistency		UCS (kPa)	Moisture Condition	
Water		U ₅₀ 50mm Diameter tube sample		VS	Very Soft	<25	D	Dry
Water Level (Date and time shown)		CBR Bulk sample for CBR testing		S	Soft	25 - 50	M	Moist
Water Inflow		E Environmental sample		F	Firm	50 - 100	W	Wet
Water Outflow		ASS Acid Sulfate Soil Sample		St	Stiff	100 - 200	W _p	Plastic Limit
Strata Changes		B Bulk Sample		VSt	Very Stiff	200 - 400	W _L	Liquid Limit
Gradational or transitional strata		Field Tests		H	Hard	>400		
Definitive or distinct strata change		PID Photoionisation detector reading (ppm)		Fb	Friable			
		DCP(x-y) Dynamic penetrometer test (test depth interval shown)		Density	V	Very Loose	Density Index <15%	
		HP Hand Penetrometer test (UCS kPa)			L	Loose	Density Index 15 - 35%	
					MD	Medium Dense	Density Index 35 - 65%	
					D	Dense	Density Index 65 - 85%	
					VD	Very Dense	Density Index 85 - 100%	



ENGINEERING LOG - BOREHOLE

BOREHOLE NO: **BH6**

CLIENT: MPT Farms Pty Ltd
PROJECT NAME: Proposed Residential Subdivision
SITE LOCATION: Lot 11 Wingham Road, Wingham
TEST LOCATION: See Figure 3

PAGE: 1 of 1
JOB NO: RGS03311.1
LOGGED BY: AH
DATE: 1/2/24

DRILL TYPE: RGS Ute Mounted Drill Rig
BOREHOLE DIAMETER: 100 mm
EASTING:
INCLINATION: 90°
NORTHING:
SURFACE RL: AHD
DATUM:

Drilling and Sampling					Material description and profile information					Field Test		Structure and additional observations
METHOD	WATER	SAMPLES	RL (Not measured)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics, colour, minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	
AD/T	Not Encountered	E		0.20m		CL	TOPSOIL: Silty CLAY, low plasticity, brown/pale brown, some gravel, coarse grained, some roots	M				TOPSOIL
					CL	Silty CLAY: Low plasticity, pale brown/orange/white, some gravel, coarse grained, trace roots	Fr			EXTREMELY WEATHERED SILTSTONE		
				0.90m			Hole Terminated at 0.90 m Practical TC Bit Refusal					
				1.0								
				1.2								
				1.4								
				1.6								
				1.8								

LEGEND:		Notes, Samples and Tests		Consistency		UCS (kPa)	Moisture Condition	
Water		U ₅₀ 50mm Diameter tube sample		VS	Very Soft	<25	D	Dry
Water Level (Date and time shown)		CBR Bulk sample for CBR testing		S	Soft	25 - 50	M	Moist
Water Inflow		E Environmental sample		F	Firm	50 - 100	W	Wet
Water Outflow		ASS Acid Sulfate Soil Sample		St	Stiff	100 - 200	W _p	Plastic Limit
Strata Changes		B Bulk Sample		VSt	Very Stiff	200 - 400	W _L	Liquid Limit
Gradational or transitional strata		Field Tests		H	Hard	>400		
Definitive or distinct strata change		PID Photoionisation detector reading (ppm)		Fb	Friable			
		DCP(x-y) Dynamic penetrometer test (test depth interval shown)		Density		V	Very Loose	Density Index <15%
		HP Hand Penetrometer test (UCS kPa)		L	Loose			Density Index 15 - 35%
				MD	Medium Dense			Density Index 35 - 65%
				D	Dense			Density Index 65 - 85%
				VD	Very Dense			Density Index 85 - 100%



ENGINEERING LOG - BOREHOLE

BOREHOLE NO: **BH7**

CLIENT: MPT Farms Pty Ltd
PROJECT NAME: Proposed Residential Subdivision
SITE LOCATION: Lot 11 Wingham Road, Wingham
TEST LOCATION: See Figure 3

PAGE: 1 of 1
JOB NO: RGS03311.1
LOGGED BY: AH
DATE: 1/2/24

DRILL TYPE: RGS Ute Mounted Drill Rig

EASTING:

SURFACE RL:

BOREHOLE DIAMETER: 100 mm

INCLINATION: 90°

NORTHING:

DATUM:

AHD

Drilling and Sampling					Material description and profile information					Field Test		Structure and additional observations
METHOD	WATER	SAMPLES	RL (Not measured)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics, colour, minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	
AD/T	Not Encountered	E		0.2		CL	TOPSOIL: Silty CLAY, low plasticity, brown/pale brown, some gravel, coarse grained, some roots	M				TOPSOIL
		CL				Silty CLAY: Low plasticity, brown/pale brown/orange/white, some gravel, coarse grained	Fr		EXTREMELY WEATHERED SILTSTONE			
				0.4			Hole Terminated at 0.40 m Practical TC Bit Refusal					
				0.6								
				0.8								
				1.0								
				1.2								
				1.4								
				1.6								
				1.8								

LEGEND:

Water

- Water Level
(Date and time shown)
- Water Inflow
- Water Outflow

Strata Changes

- Gradational or transitional strata
- Definitive or distinct strata change

Notes, Samples and Tests

- U₅₀ 50mm Diameter tube sample
- CBR Bulk sample for CBR testing
- E Environmental sample
- ASS Acid Sulfate Soil Sample
- B Bulk Sample

Field Tests

- PID Photoionisation detector reading (ppm)
- DCP(x-y) Dynamic penetrometer test (test depth interval shown)
- HP Hand Penetrometer test (UCS kPa)

Consistency

- VS Very Soft
- S Soft
- F Firm
- St Stiff
- VSt Very Stiff
- H Hard
- Fb Friable

UCS (kPa)

- <25
- 25 - 50
- 50 - 100
- 100 - 200
- 200 - 400
- >400

Moisture Condition

- D Dry
- M Moist
- W Wet
- W_p Plastic Limit
- W_L Liquid Limit

Density

- V Very Loose
 - L Loose
 - MD Medium Dense
 - D Dense
 - VD Very Dense
- Density Index <15%
Density Index 15 - 35%
Density Index 35 - 65%
Density Index 65 - 85%
Density Index 85 - 100%



ENGINEERING LOG - BOREHOLE

BOREHOLE NO: **BH8**
PAGE: 1 of 1
JOB NO: RGS03311.1
LOGGED BY: AH
DATE: 1/2/24

CLIENT: MPT Farms Pty Ltd
PROJECT NAME: Proposed Residential Subdivision
SITE LOCATION: Lot 11 Wingham Road, Wingham
TEST LOCATION: See Figure 3

DRILL TYPE: RGS Ute Mounted Drill Rig
BOREHOLE DIAMETER: 100 mm
EASTING:
INCLINATION: 90°
NORTHING:
SURFACE RL: AHD
DATUM:

Drilling and Sampling				Material description and profile information						Field Test		Structure and additional observations
METHOD	WATER	SAMPLES	RL (Not measured)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics, colour, minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	
AD/T	Not Encountered	E 0.20m		0.2		CL	TOPSOIL: Silty CLAY, low plasticity, pale brown/brown, some gravel, coarse grained, some roots	M				TOPSOIL
						CL	Silty CLAY: Low plasticity, pale brown/orange/white, some gravel, coarse grained, trace roots		Fr			EXTREMELY WEATHERED SILTSTONE
							Hole Terminated at 0.35 m Practical TC Bit Refusal					
				0.4								
				0.6								
				0.8								
				1.0								
				1.2								
				1.4								
				1.6								
				1.8								

LEGEND:		Notes, Samples and Tests		Consistency		UCS (kPa)	Moisture Condition	
Water		U ₅₀ 50mm Diameter tube sample		VS	Very Soft	<25	D	Dry
Water Level (Date and time shown)		CBR Bulk sample for CBR testing		S	Soft	25 - 50	M	Moist
Water Inflow		E Environmental sample		F	Firm	50 - 100	W	Wet
Water Outflow		ASS Acid Sulfate Soil Sample		St	Stiff	100 - 200	W _p	Plastic Limit
Strata Changes		B Bulk Sample		VSt	Very Stiff	200 - 400	W _L	Liquid Limit
Gradational or transitional strata		Field Tests		H	Hard	>400		
Definitive or distinct strata change		PID Photoionisation detector reading (ppm)		Fb	Friable			
		DCP(x-y) Dynamic penetrometer test (test depth interval shown)		Density	V	Very Loose	Density Index <15%	
		HP Hand Penetrometer test (UCS kPa)			L	Loose	Density Index 15 - 35%	
					MD	Medium Dense	Density Index 35 - 65%	
					D	Dense	Density Index 65 - 85%	
					VD	Very Dense	Density Index 85 - 100%	



ENGINEERING LOG - BOREHOLE

BOREHOLE NO: **BH9**

CLIENT: MPT Farms Pty Ltd
PROJECT NAME: Proposed Residential Subdivision
SITE LOCATION: Lot 11 Wingham Road, Wingham
TEST LOCATION: See Figure 3

PAGE: 1 of 1
JOB NO: RGS03311.1
LOGGED BY: AH
DATE: 1/2/24

DRILL TYPE: RGS Ute Mounted Drill Rig

EASTING:

SURFACE RL:

BOREHOLE DIAMETER: 100 mm

INCLINATION: 90°

NORTHING:

DATUM: AHD

Drilling and Sampling					Material description and profile information					Field Test		Structure and additional observations	
METHOD	WATER	SAMPLES	RL (Not measured)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics, colour, minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result		
AD/T	Not Encountered	E		0.2		CL	TOPSOIL: Silty CLAY, low plasticity, brown/pale brown, some gravel, coarse grained, some roots	M					TOPSOIL
		0.20m		CL		Silty CLAY: Low plasticity, pale brown/orange/white, some gravel, coarse grained, some roots	Fr		EXTREMELY WEATHERED SILTSTONE				
				0.8			Hole Terminated at 0.80 m Practical TC Bit Refusal						
				1.0									
				1.2									
				1.4									
				1.6									
				1.8									

LEGEND:

Water

- Water Level
(Date and time shown)
- Water Inflow
- Water Outflow

Strata Changes

- Gradational or transitional strata
- Definitive or distinct strata change

Notes, Samples and Tests

- U₅₀ 50mm Diameter tube sample
- CBR Bulk sample for CBR testing
- E Environmental sample
- ASS Acid Sulfate Soil Sample
- B Bulk Sample

Field Tests

- PID Photoionisation detector reading (ppm)
- DCP(x-y) Dynamic penetrometer test (test depth interval shown)
- HP Hand Penetrometer test (UCS kPa)

Consistency

- VS Very Soft
- S Soft
- F Firm
- St Stiff
- VSt Very Stiff
- H Hard
- Fb Friable

UCS (kPa)

- <25
- 25 - 50
- 50 - 100
- 100 - 200
- 200 - 400
- >400

Moisture Condition

- D Dry
- M Moist
- W Wet
- W_p Plastic Limit
- W_L Liquid Limit

Density

- V Very Loose
 - L Loose
 - MD Medium Dense
 - D Dense
 - VD Very Dense
- Density Index <15%
Density Index 15 - 35%
Density Index 35 - 65%
Density Index 65 - 85%
Density Index 85 - 100%



ENGINEERING LOG - BOREHOLE

BOREHOLE NO: **BH10**
PAGE: 1 of 1
JOB NO: RGS03311.1
LOGGED BY: AH
DATE: 1/2/24

CLIENT: MPT Farms Pty Ltd
PROJECT NAME: Proposed Residential Subdivision
SITE LOCATION: Lot 11 Wingham Road, Wingham
TEST LOCATION: See Figure 3

DRILL TYPE: Hand Auger
BOREHOLE DIAMETER: 100 mm
INCLINATION: 90°
EASTING:
NORTHING:
SURFACE RL: AHD

Drilling and Sampling					Material description and profile information					Field Test		Structure and additional observations
METHOD	WATER	SAMPLES	RL (Not measured)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics, colour, minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	
HA	Not Encountered	E		0.2		CL	FILL: Silty Gravelly CLAY, low plasticity, brown/pale brown, gravel, coarse grained, some roots	M				FILL/TOPSOIL
		CL				Silty CLAY: Low plasticity, pale brown/orange/white, some gravel, coarse grained, trace roots	Fr		EXTREMELY WEATHERED SILTSTONE			
				0.25m			Hole Terminated at 0.30 m Practical HA Refusal					
				0.30m								
				0.4								
				0.6								
				0.8								
				1.0								
				1.2								
				1.4								
				1.6								
				1.8								

LEGEND:		Notes, Samples and Tests		Consistency		UCS (kPa)	Moisture Condition	
Water		U ₅₀ 50mm Diameter tube sample		VS	Very Soft	<25	D	Dry
Water Level (Date and time shown)		CBR Bulk sample for CBR testing		S	Soft	25 - 50	M	Moist
Water Inflow		E Environmental sample		F	Firm	50 - 100	W	Wet
Water Outflow		ASS Acid Sulfate Soil Sample		St	Stiff	100 - 200	W _p	Plastic Limit
Strata Changes		B Bulk Sample		VSt	Very Stiff	200 - 400	W _L	Liquid Limit
Gradational or transitional strata		Field Tests		H	Hard	>400		
Definitive or distinct strata change		PID Photoionisation detector reading (ppm)		Fb	Friable			
		DCP(x-y) Dynamic penetrometer test (test depth interval shown)		Density	V	Very Loose	Density Index <15%	
		HP Hand Penetrometer test (UCS kPa)			L	Loose	Density Index 15 - 35%	
					MD	Medium Dense	Density Index 35 - 65%	
					D	Dense	Density Index 65 - 85%	
					VD	Very Dense	Density Index 85 - 100%	



Appendix C

Laboratory Test Result Sheets



Client: MPT Farms Pty Ltd
Job No. RG503311.1
Project: Proposed Residential Subdivision
Location: Cedar Creek Estate, Wingham

Comparison of Contamination Analysis Results with Adopted Investigation Levels (Results in mg/kg)

SAMPLE	DEPTH (m)	MATERIAL	ASBESTOS	TOTAL RECOVERABLE HYDROCARBONS					PAH		Pesticides Total		BTEX		PCBs	Heavy Metals							
				C6-C10	C10-C16	C16-C34	C34-C40	TOTAL 10-40	Total	b-a-p (TEQ)	OCF	OPP	Sum	Napthalene		As	Cd	Cr (total)#	Cu	Pb	Ni	Zn	Hg
BH1	0.2 - 0.4	Slopewash	No	<10	<50	<100	<100	<50	<0.5	<0.5	<0.2	<0.2	<0.2	<1	<0.1	7	<1	12	16	30	5	75	<0.1
BH2	0.0 - 0.2	Topsoil	No	<10	<50	<100	<100	<50	<0.5	<0.5	<0.2	<0.2	<0.2	<1	<0.1	20	1	16	11	41	3	202	<0.1
BH3	0.3 - 0.5	Residual Soil	No	<10	<50	<100	<100	<50	<0.5	<0.5	<0.2	<0.2	<0.2	<1	<0.1	27	<1	12	15	25	4	45	<0.1
BH4	0.2 - 0.4	Residual Soil	No	<10	<50	<100	<100	<50	<0.5	<0.5	<0.2	<0.2	<0.2	<1	<0.1	<5	<1	18	13	10	5	20	<0.1
BH5	0.1 - 0.3	Residual Soil	No	<10	<50	<100	<100	<50	<0.5	<0.5	<0.2	<0.2	<0.2	<1	<0.1	<5	<1	16	13	10	5	19	<0.1
BH6	0.0 - 0.2	Topsoil	No	<10	<50	<100	<100	<50	<0.5	<0.5	<0.2	<0.2	<0.2	<1	<0.1	<5	<1	9	16	64	6	50	<0.1
BH7	0.0 - 0.2	Topsoil	No	<10	<50	<100	<100	<50	<0.5	<0.5	<0.2	<0.2	<0.2	<1	<0.1	11	<1	8	9	36	4	47	<0.1
BH8	0.0 - 0.2	Topsoil	No	<10	<50	<100	<100	<50	<0.5	<0.5	<0.2	<0.2	<0.2	<1	<0.1	13	<1	9	<5	17	4	18	<0.1
BH9	0.0 - 0.2	Topsoil	No	<10	<50	<100	<100	<50	<0.5	<0.5	<0.2	<0.2	<0.2	<1	<0.1	9	<1	6	<5	11	<2	12	<0.1
BH10	0.0 - 0.2	Fill	No	<10	<50	<100	<100	<50	<0.5	<0.5	<0.2	<0.2	<0.2	<1	<0.1	10	<1	15	12	37	6	98	<0.1
AS1	0.0 - 0.2	Topsoil	No	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
D1 (duplicate of BH2 0.0 - 0.2m)	0.0 - 0.2	Topsoil	----	----	----	----	----	----	----	----	----	----	----	----	----	<5	<1	9	17	36	4	259	<0.1
RINSATE (mg/L)		Water	----	----	----	----	----	----	----	----	----	----	----	----	----	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.0001
D1RPD%				-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	120.0	100.0	56.0	7.1	13.0	28.6	24.7	0.0
CRITERIA (NEPM 2013)																							
Health Investigation Level (HIL)*:				0.001% (w/w)					300	3	240	6			1	100	20	100#	6000	300	400	7400	40
Health Screening Level (HSL)**					50	110	NL	NL	NL														
Ecological Screening Level (ESL)***					280	120	1300	5600	NL				45-125										
Ecological Investigation Level (EIL)@											180			170		100			1100				

CRITERIA:

* Health Based Investigation Levels for Residential A (NEPM 2013)

** Health Screening Level (F2) for residential land use and fine grained soil (clay), 0 - 1m depth

*** Ecological Screening Level for residential land use

@ Ecological Investigation Level - aged (>2 years) for residential landuse

Chromium VI

Speciation testing confirmed only Chromium III present

<LOR - Below the laboratory limit of reporting

Summary Table - Comparison of Contamination Analysis Results With Waste Classification Threshold Limits (Results in mg/kg)																			
		Client: MPT Farms Pty Ltd Job No. RGS03311.1 Project: Proposed Residential Subdivision Location: Cedar Creek Estate, Wingham																	
SAMPLE	MATERIAL	DEPTH (m)	ASBESTOS	TOTAL PETROLEUM HYDROCARBONS					PAH	PCBs (Total)	OC/OP Pesticides	HEAVY METALS							
				C6-C9	C10-C14	C15-C28	C29-C36	TOTAL				Arsenic	TCLP	Cadmium	TCLP	Nickel	TCLP	Lead	TCLP
BH1	Slopewash	0.2 - 0.4	No	<10	<50	<100	<100	<50	<0.5	<0.1	<0.2	7		<1		5		30	<0.1
BH2	Topsoil	0.0 - 0.2	No	<10	<50	<100	<100	<50	<0.5	<0.1	<0.2	20		1		3		41	<0.1
BH3	Residual Soil	0.3 - 0.5	No	<10	<50	<100	<100	<50	<0.5	<0.1	<0.2	27		<1		4		25	<0.1
BH4	Residual Soil	0.2 - 0.4	No	<10	<50	<100	<100	<50	<0.5	<0.1	<0.2	<5		<1		5		10	<0.1
BH5	Residual Soil	0.1 - 0.3	No	<10	<50	<100	<100	<50	<0.5	<0.1	<0.2	<5		<1		5		10	<0.1
BH6	Topsoil	0.0 - 0.2	No	<10	<50	<100	<100	<50	<0.5	<0.1	<0.2	<5		<1		6		64	<0.1
BH7	Topsoil	0.0 - 0.2	No	<10	<50	<100	<100	<50	<0.5	<0.1	<0.2	11		<1		4		36	<0.1
BH8	Topsoil	0.0 - 0.2	No	<10	<50	<100	<100	<50	<0.5	<0.1	<0.2	13		<1		4		17	<0.1
BH9	Topsoil	0.0 - 0.2	No	<10	<50	<100	<100	<50	<0.5	<0.1	<0.2	9		<1		<2		11	<0.1
BH10	Fill	0.0 - 0.2	No	<10	<50	<100	<100	<50	<0.5	<0.1	<0.2	10		<1		6		37	<0.1
THRESHOLD LIMITS																			
GENERAL SOLID WASTE		CT1										100		20		40		100	
		SCC1		650				10000	200	<50	250	500		100		1050		1500	50
		TCLP1										5		1		2		5	0.2
RESTRICTED SOLID WASTE		CT2										400		80		160		400	16
		SCC2		2600				40000	800	<50	1000	2000		400		4200		6000	200
		TCLP2										20		4		8		20	0.8

NOTES

CT	Contaminant Threshold (without TCLP)
SCC	Specific Contaminant Concentrations (used with TCLP)
TCLP	Toxicity Characteristics Leaching Procedure (used with SCC)
Shaded	Exceeds General Solid Waste Threshold = Restricted Solid Waste
BOLD and Shaded	Exceeds Restricted Solid Waste Threshold = Hazardous Waste

CRITERIA:

Waste Classification - Classifying Waste, Part 1 (NSW EPA 2014)



CERTIFICATE OF ANALYSIS

Work Order : **ES2403516**
Client : **REGIONAL GEOTECHNICAL SOLUTION**
Contact : ANDREW HILLS
Address : 44 BENT STREET
WINGHAM NSW, AUSTRALIA 2429
Telephone : ----
Project : RGS03311.1 Proposed Residential Subdivision
Order number : ----
C-O-C number : ----
Sampler : ----
Site : Lot 11 Wingham Road, Wingham
Quote number : EN/222
No. of samples received : 13
No. of samples analysed : 13

Page : 1 of 15
Laboratory : Environmental Division Sydney
Contact : Customer Services ES
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61-2-8784 8555
Date Samples Received : 05-Feb-2024 12:23
Date Analysis Commenced : 06-Feb-2024
Issue Date : 12-Feb-2024 15:43



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, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive 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
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Brendan Schrader	Laboratory Technician	Newcastle - Asbestos, Mayfield West, NSW
Dian Dao	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
John Williams	Lab Technician	Newcastle - Asbestos, Mayfield West, NSW



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the 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 Contract 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) per the NEPM (2013) 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.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP068: Where reported, Total Chlordane (sum) is the sum of the reported concentrations of cis-Chlordane and trans-Chlordane at or above the LOR.
- EP068: Where reported, Total OCP is the sum of the reported concentrations of all Organochlorine Pesticides at or above LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2
- EA200: 'Yes' - Asbestos detected by polarised light microscopy including dispersion staining.
- EA200: 'No*' - No asbestos found, at the reporting limit of 0.1g/kg, by polarised light microscopy including dispersion staining. Asbestos material was detected and positively identified at concentrations estimated to be below 0.1g/kg.
- EA200: 'No' - No asbestos found at the reporting limit 0.1g/kg, by polarised light microscopy including dispersion staining.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH1 0.2-0.4	BH2 0.0-0.2	BH3 0.3-0.5	BH4 0.2-0.4	BH5 0.1-0.3
Sampling date / time					02-Feb-2024 00:00	02-Feb-2024 00:00	02-Feb-2024 00:00	02-Feb-2024 00:00	02-Feb-2024 00:00
Compound	CAS Number	LOR	Unit		ES2403516-001	ES2403516-002	ES2403516-003	ES2403516-004	ES2403516-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	-----	1.0	%		10.4	15.2	14.0	23.5	24.6
EA200: AS 4964 - 2004 Identification of Asbestos in Soils									
Asbestos Detected	1332-21-4	0.1	g/kg		No	No	No	No	No
Asbestos (Trace)	1332-21-4	-	-		No	No	No	No	No
Asbestos Type	1332-21-4	-	--		-	-	-	-	-
Synthetic Mineral Fibre	-----	-	--		No	No	No	No	No
Organic Fibre	-----	-	--		No	No	No	No	No
Sample weight (dry)	-----	0.01	g		245	255	209	274	308
APPROVED IDENTIFIER:	-----	-	--		J. WILLIAMS	J. WILLIAMS	J. WILLIAMS	J. WILLIAMS	J. WILLIAMS
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		7	20	27	<5	<5
Cadmium	7440-43-9	1	mg/kg		<1	1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		12	16	12	18	16
Copper	7440-50-8	5	mg/kg		16	11	15	13	13
Lead	7439-92-1	5	mg/kg		30	41	25	10	10
Nickel	7440-02-0	2	mg/kg		5	3	4	5	5
Zinc	7440-66-6	5	mg/kg		75	202	45	20	19
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	-----	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				BH1 0.2-0.4	BH2 0.0-0.2	BH3 0.3-0.5	BH4 0.2-0.4	BH5 0.1-0.3
Sampling date / time				02-Feb-2024 00:00	02-Feb-2024 00:00	02-Feb-2024 00:00	02-Feb-2024 00:00	02-Feb-2024 00:00
Compound	CAS Number	LOR	Unit	ES2403516-001	ES2403516-002	ES2403516-003	ES2403516-004	ES2403516-005
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
[^] Total Chlordane (sum)	-----	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
[^] Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
[^] Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
[^] Sum of DDD + DDE + DDT	72-54-8/72-55-9/5-0-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				BH1 0.2-0.4	BH2 0.0-0.2	BH3 0.3-0.5	BH4 0.2-0.4	BH5 0.1-0.3
Sampling date / time				02-Feb-2024 00:00	02-Feb-2024 00:00	02-Feb-2024 00:00	02-Feb-2024 00:00	02-Feb-2024 00:00
Compound	CAS Number	LOR	Unit	ES2403516-001	ES2403516-002	ES2403516-003	ES2403516-004	ES2403516-005
				Result	Result	Result	Result	Result
EP068B: Organophosphorus Pesticides (OP) - Continued								
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
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	<0.5	<0.5	<0.5	<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	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH1 0.2-0.4	BH2 0.0-0.2	BH3 0.3-0.5	BH4 0.2-0.4	BH5 0.1-0.3
Sampling date / time				02-Feb-2024 00:00	02-Feb-2024 00:00	02-Feb-2024 00:00	02-Feb-2024 00:00	02-Feb-2024 00:00	
Compound	CAS Number	LOR	Unit	ES2403516-001	ES2403516-002	ES2403516-003	ES2403516-004	ES2403516-005	
				Result	Result	Result	Result	Result	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<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	<0.5	<0.5	<0.5	<0.5	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	0.6	0.6	0.6	0.6	
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	1.2	1.2	1.2	1.2	
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	
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<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	<100	<100	<100	<100	
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100	
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<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	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH1 0.2-0.4	BH2 0.0-0.2	BH3 0.3-0.5	BH4 0.2-0.4	BH5 0.1-0.3
Sampling date / time					02-Feb-2024 00:00	02-Feb-2024 00:00	02-Feb-2024 00:00	02-Feb-2024 00:00	02-Feb-2024 00:00
Compound	CAS Number	LOR	Unit		ES2403516-001	ES2403516-002	ES2403516-003	ES2403516-004	ES2403516-005
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
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
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		83.0	79.5	69.2	103	90.1
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		73.3	76.6	63.7	73.9	90.4
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		75.7	75.9	64.9	71.3	88.9
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		112	107	104	106	112
2-Chlorophenol-D4	93951-73-6	0.5	%		109	105	99.8	101	107
2,4,6-Tribromophenol	118-79-6	0.5	%		96.0	94.8	91.7	92.4	96.5
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		106	102	97.9	100	104
Anthracene-d10	1719-06-8	0.5	%		121	117	117	123	111
4-Terphenyl-d14	1718-51-0	0.5	%		119	115	113	116	121
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		89.1	99.0	87.4	84.2	82.0
Toluene-D8	2037-26-5	0.2	%		89.0	92.9	84.5	80.7	81.0
4-Bromofluorobenzene	460-00-4	0.2	%		92.4	79.4	88.2	86.4	89.4



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH6 0.0-0.2	BH7 0.0-0.2	BH8 0.0-0.2	BH9 0.0-0.2	BH10 0.0-0.2
Sampling date / time					02-Feb-2024 00:00	02-Feb-2024 00:00	02-Feb-2024 00:00	02-Feb-2024 00:00	02-Feb-2024 00:00
Compound	CAS Number	LOR	Unit		ES2403516-006	ES2403516-007	ES2403516-008	ES2403516-009	ES2403516-010
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		10.7	6.1	5.0	11.2	8.8
EA200: AS 4964 - 2004 Identification of Asbestos in Soils									
Asbestos Detected	1332-21-4	0.1	g/kg		No	No	No	No	No
Asbestos (Trace)	1332-21-4	-	-		No	No	No	No	No
Asbestos Type	1332-21-4	-	--		-	-	-	-	-
Synthetic Mineral Fibre	----	-	--		No	No	No	No	No
Organic Fibre	----	-	--		No	No	No	No	No
Sample weight (dry)	----	0.01	g		291	314	368	296	340
APPROVED IDENTIFIER:	----	-	--		J. WILLIAMS	J. WILLIAMS	B.SCHRADER	J. WILLIAMS	B.SCHRADER
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	11	9	13	10
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		9	8	6	9	15
Copper	7440-50-8	5	mg/kg		16	9	<5	<5	12
Lead	7439-92-1	5	mg/kg		64	36	11	17	37
Nickel	7440-02-0	2	mg/kg		6	4	<2	4	6
Zinc	7440-66-6	5	mg/kg		50	47	12	18	98
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				BH6 0.0-0.2	BH7 0.0-0.2	BH8 0.0-0.2	BH9 0.0-0.2	BH10 0.0-0.2
Sampling date / time				02-Feb-2024 00:00	02-Feb-2024 00:00	02-Feb-2024 00:00	02-Feb-2024 00:00	02-Feb-2024 00:00
Compound	CAS Number	LOR	Unit	ES2403516-006	ES2403516-007	ES2403516-008	ES2403516-009	ES2403516-010
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
[^] Total Chlordane (sum)	-----	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
[^] Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
[^] Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
[^] Sum of DDD + DDE + DDT	72-54-8/72-55-9/5-0-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				BH6 0.0-0.2	BH7 0.0-0.2	BH8 0.0-0.2	BH9 0.0-0.2	BH10 0.0-0.2
Sampling date / time				02-Feb-2024 00:00	02-Feb-2024 00:00	02-Feb-2024 00:00	02-Feb-2024 00:00	02-Feb-2024 00:00
Compound	CAS Number	LOR	Unit	ES2403516-006	ES2403516-007	ES2403516-008	ES2403516-009	ES2403516-010
				Result	Result	Result	Result	Result
EP068B: Organophosphorus Pesticides (OP) - Continued								
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
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	<0.5	<0.5	<0.5	<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	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Sample ID

				BH6 0.0-0.2	BH7 0.0-0.2	BH8 0.0-0.2	BH9 0.0-0.2	BH10 0.0-0.2
Sampling date / time				02-Feb-2024 00:00	02-Feb-2024 00:00	02-Feb-2024 00:00	02-Feb-2024 00:00	02-Feb-2024 00:00
Compound	CAS Number	LOR	Unit	ES2403516-006	ES2403516-007	ES2403516-008	ES2403516-009	ES2403516-010
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<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	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	0.6	0.6	0.6	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	1.2	1.2	1.2	1.2
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
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<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	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<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



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID				
Sampling date / time				BH6 0.0-0.2	BH7 0.0-0.2	BH8 0.0-0.2	BH9 0.0-0.2	BH10 0.0-0.2
Compound				ES2403516-006	ES2403516-007	ES2403516-008	ES2403516-009	ES2403516-010
CAS Number LOR Unit				Result	Result	Result	Result	Result
EP080: BTEXN - Continued								
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
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	66.1	69.0	116	77.2	103
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	71.6	92.8	84.6	94.5	78.0
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	64.7	56.3	67.3	92.5	80.6
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	114	108	92.2	109	100
2-Chlorophenol-D4	93951-73-6	0.5	%	111	105	99.1	107	97.2
2,4,6-Tribromophenol	118-79-6	0.5	%	96.4	90.4	57.7	94.0	63.4
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	108	102	83.9	104	81.6
Anthracene-d10	1719-06-8	0.5	%	112	117	99.6	122	106
4-Terphenyl-d14	1718-51-0	0.5	%	122	115	102	118	97.6
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.2	%	91.6	88.1	85.1	93.3	84.7
Toluene-D8	2037-26-5	0.2	%	92.4	107	83.9	106	80.1
4-Bromofluorobenzene	460-00-4	0.2	%	95.2	123	90.2	122	84.6



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	AS1 0.0-0.2	D1	----	----	----
Sampling date / time					02-Feb-2024 00:00	02-Feb-2024 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES2403516-011	ES2403516-012	-----	-----	-----
					Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		----	15.6	----	----	----
EA200: AS 4964 - 2004 Identification of Asbestos in Soils									
Asbestos Detected	1332-21-4	0.1	g/kg		No	----	----	----	----
Asbestos (Trace)	1332-21-4	-	-		No	----	----	----	----
Asbestos Type	1332-21-4	-	--		-	----	----	----	----
Synthetic Mineral Fibre	----	-	--		No	----	----	----	----
Organic Fibre	----	-	--		No	----	----	----	----
Sample weight (dry)	----	0.01	g		254	----	----	----	----
APPROVED IDENTIFIER:	----	-	--		J. WILLIAMS	----	----	----	----
EG005(ED093)T: 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		----	9	----	----	----
Copper	7440-50-8	5	mg/kg		----	17	----	----	----
Lead	7439-92-1	5	mg/kg		----	36	----	----	----
Nickel	7440-02-0	2	mg/kg		----	4	----	----	----
Zinc	7440-66-6	5	mg/kg		----	259	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		----	<0.1	----	----	----



Analytical Results

Sub-Matrix: **WATER**
 (Matrix: **WATER**)

Sample ID

				RINSATE	----	----	----	----
Sampling date / time				02-Feb-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES2403516-013	-----	-----	-----	-----
Result				----	----	----	----	----
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----

Analytical Results

Descriptive Results

Sub-Matrix: **SOIL**

Method: Compound	Sample ID - Sampling date / time	Analytical Results
EA200: AS 4964 - 2004 Identification of Asbestos in Soils		
EA200: Description	BH1 0.2-0.4 - 02-Feb-2024 00:00	A soil sample.
EA200: Description	BH2 0.0-0.2 - 02-Feb-2024 00:00	A soil sample.
EA200: Description	BH3 0.3-0.5 - 02-Feb-2024 00:00	A soil sample.
EA200: Description	BH4 0.2-0.4 - 02-Feb-2024 00:00	A soil sample.
EA200: Description	BH5 0.1-0.3 - 02-Feb-2024 00:00	A soil sample.
EA200: Description	BH6 0.0-0.2 - 02-Feb-2024 00:00	A soil sample.
EA200: Description	BH7 0.0-0.2 - 02-Feb-2024 00:00	A soil sample.
EA200: Description	BH8 0.0-0.2 - 02-Feb-2024 00:00	A soil sample.
EA200: Description	BH9 0.0-0.2 - 02-Feb-2024 00:00	A soil sample.
EA200: Description	BH10 0.0-0.2 - 02-Feb-2024 00:00	A soil sample.
EA200: Description	AS1 0.0-0.2 - 02-Feb-2024 00:00	A soil sample.



Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	39	149
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143
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	63	125
Toluene-D8	2037-26-5	67	124
4-Bromofluorobenzene	460-00-4	66	131

Inter-Laboratory Testing

Analysis conducted by ALS Newcastle, NATA accreditation no. 825, site no. 1656 (Chemistry) 9854 (Biology).

(SOIL) EA200: AS 4964 - 2004 Identification of Asbestos in Soils



Appendix D

PID Calibration Certificate



Calibration Record Form

MiniRAE 3000+

2 Instrument:

Date:	29/01/2024
Model:	RAE, MINIRAE3000+
Description:	MiniRAE 3000+ PID for VOC detection
Asset #:	203938
Serial #:	592-927167
Worksheet #:	625771
Location:	TR MEL
Completed By:	ADA
Comments:	Battery fully charged, data log cleared
Moisture test	pass
High alarm	100,000 ppb
Low alarm	50,000 ppb
STEL	25,000 ppb
TWA	10,000 ppb
Alarm mode	Latch
Buzzer and Light	Both ON
Datalog	Cleared
Interval	60 sec
Data selection	Average
Data type	Auto
Radio power	ON
Op mode	Hygiene
Pump duty cycle	100%
Pump speed	High
Temp unit	°C
Real time protocol	P2P (cable)
Power on zero	OFF
LCD contrast	31
Lamp ID	10.6 eV
Bump test	98.3 ppm

Calibration Report:

Range	Source	Tolerance	Reading	Pass/Fail
-	Fresh Air 60 sec	-	0.0 ppm	Pass
100ppm Isobutylene	Lot No: 103DS100ISOA Exp Date: 9 Dec 2026 30 sec	± 2%	99.9 ppm	Pass

Technician: ADA

Date: 29/01/2024



Appendix E

Letter from Dr David Tully CEnvP SC

Contaminated Land Solutions

23 February 2024

Ref: CLS0308.L01

Regional Geotechnical Solutions Pty Ltd
44 Brent Street
Wingham
NSW 2429

For the attention of Andrew Hills

Dear Andrew,

RE: Report Review: Preliminary Site Investigation – Contamination Assessment Proposed Residential Subdivision Lot 11 DP1240421 Wingham Road, Wingham

I, Dr David Tully of Contaminated Land Solutions Pty Ltd, am a Certified Environmental Practitioner Site Contamination Specialist (General Certified Environmental Practitioner certification no. 1138 and Site Contamination Specialist certification no. SC40084).

I confirm I have reviewed the Regional Geotechnical Solutions report entitled "*Preliminary Site Investigation – Contamination Assessment Proposed Residential Subdivision Lot 11 DP1240421 Wingham Road, Wingham*" (Ref: RGS03311.1-AE), dated 23 February 2024 and a copy of which I have retained.

I can confirm that on the basis of the information contained within the report, I support the conclusions and recommendations provided therein.

Should the client, regulator or local authority have any queries regarding the report review, I can be contacted by e-mail via david.tully@contaminatedlandsolutions.com.au. Specific queries regarding the content of the report should be addressed to Andrew Hills at Regional Geotechnical Solutions.

For and on behalf of

Contaminated Land Solutions Pty Ltd

Dr David Tully CEnvP SC
Director

Contaminated Land Solutions Pty Ltd



Contaminated Land Solutions Pty Ltd
10 Heath Road
Crafrs West SA 5152
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GEOTECHNICAL INVESTIGATION

LIMITED GEOTECHNICAL ENGINEERS INVESTIGATION

at

LOT 92 DP1285477 WINGHAM ROAD, WINGHAM

for

HAMPSTEAD PROPERTY

Project No. 233307.Rev C

8th May 2024

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1. INTRODUCTION

DRB Consulting Engineers (DRB) were engaged by Hampstead Property to undertake a Limited Geotechnical Engineers Investigation at Lot 92, DP1285477 Wingham Road, Wingham.

The purpose of the investigation was to:

- Assess the existing subsurface conditions across the site and provide engineering logs of encountered strata;
- Determine the General Site Classification in accordance with AS2870 “Residential Slabs and Footings”;
- Provide CBR and Atterberg Limit laboratory test results,
- Provide advice on soil dispersity; and
- Determine the presence of Acid Sulfate Soils and/or Aggressive Soils.
- Consider the suitability of the site for residential development.

Note, this report has been prepared to support a Rezoning Planning Proposal for the site only. As such, the information contained herein is considered as preliminary only, further geotechnical investigations are likely required to support subsequent approval and construction phases of the project.

2. EXISTING SITE DESCRIPTION

The site is located at Lot 92, DP1285477 Wingham Road, Wingham and is currently zoned *RU1 – Primary Production*. The site is bound by Wingham Road and existing residential allotments to the south, Youngs Road for a portion of the site to the east and Cedar Party Creek to the remaining sides.

At the time of investigation the site was undeveloped and did not support any structures. Vegetation across the site consisted of an unkept pasture grass ground cover with scattered mature trees, with a higher density of tree coverage noted adjacent to Cedar Creek generally. Topographically the site sloped down from the south towards Cedar Creek at slopes between 5%, with localised increases up to 10% adjacent to existing drainage lines.

The existing site features can be seen in Photographs 1 - 3 below and on the Site Plan in the Attachments section of this report.



Photograph 1 – Panoramic image taken from adjacent to the sites southern boundary panning west through east



Photograph 2 – taken in the northern portion of the site noting tree density adjacent to Cedar Party Creek



Photograph 3 – taken in the western portion of the site looking east across existing bordering residential Lots – note Wingham Road to the right

3. PROPOSED DEVELOPMENT

It is DRBs understanding that the proposed development includes rezoning part of the existing allotment to support a new residential subdivision. A concept lot layout and planning diagrams were provided to DRB prior to fieldwork to assist the site investigation.

4. DESKTOP STUDY

Prior to committing resources to a field investigation, a desktop study was undertaken to understand any historical or recorded information that may be useful in the geotechnical investigation, or the proposed development itself. This investigation consisted of a review of:

- Office of Environmental and Heritage Soil and Landscape eSpade Portal and local mapping.
- Department of Land and Water Conservation Acid Sulfate Soil Risk Maps for Wingham.

4.1 GEOLOGY

Reference to NSW Department of Primary Industries 1:100,000 'Coastal Quaternary Geology' map of the Taree area denotes the site as being underlain by Carboniferous and Permian sedimentary rocks and minor volcanic rock of the Palaeozoic era.

Reference to NSW Department of Mineral Resources Compilation Study data defines the site as being located within the Manning River catchment the New England Geosyncline, a Paleozoic sedimentary basin, which lies between Port Stephens and Queensland. Catchment geology is characterised by a range of sediments and metamorphic rocks overlain by further sediments. Extensive faulting and folding of the Paleozoic sediments has produced the complex drainage patterns and steep landforms evident in the catchment.

4.2 SOIL LANDSCAPE

Reference to the Office of Environmental and Heritage Soil and Landscape 1:100,000 series indicates that the site falls within the Cedar Party soil landscape.

The Cedar Party Landscape is a residual landscape characterised by undulating rises on low ridges, dominated by crests and upper slopes, on Permian limestones in the northeast Hunter Region. Topographically, the Cedar Party Landscape contains slope gradients 3-10% on elevations ranging between 30 – 50m. Soils consist of moderately deep (50 - <150cm) well-drained sub-plastic brown and red dermosols and shallow (25 - <50cm) acidic lithic tenosols to deep (100 - <150cm) melacic red dermosols. The Cedar Party landscape is limited by shallow soils, localised rock outcrops and localised sheet erosion.

4.3 ACID SULFATE SOIL RISK MAPS

The site has been assessed for Acid Sulfate Soils to confirm if site specific measures are required through construction. Reference to the MidCoast Councils online mapping tool suggests that the upper reaches of the site may be considered as a Class 5 Acid Sulphate Soil zone, see screen extract below.

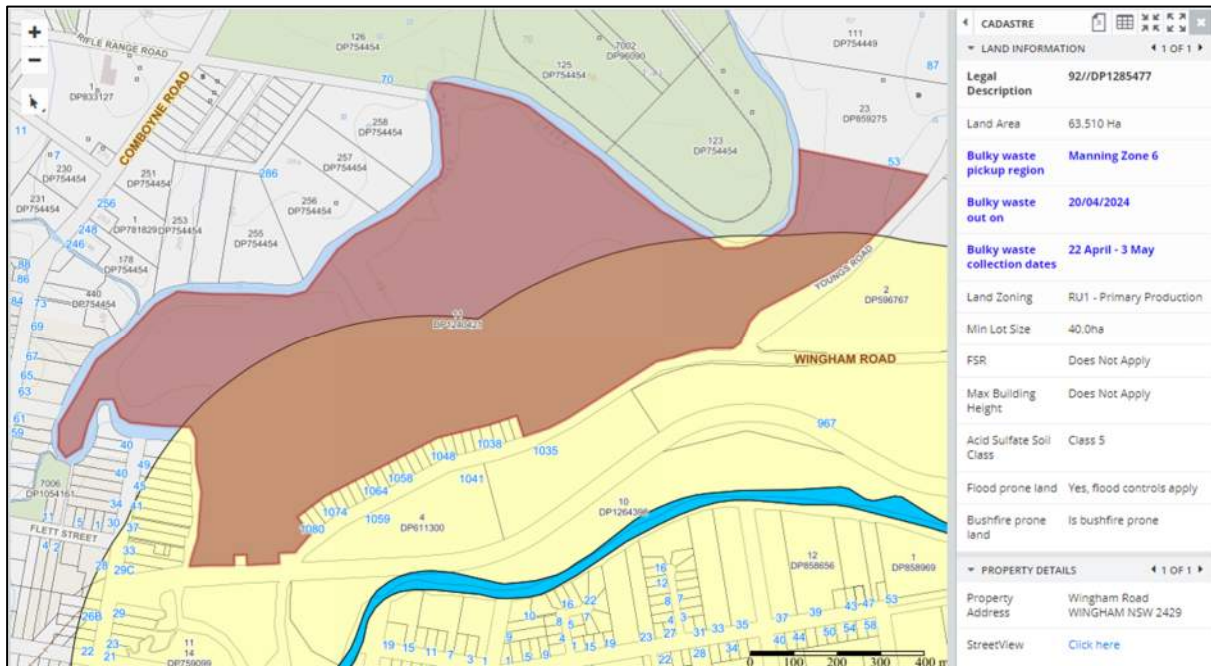


Figure 1 - An extract of the MidCoast Council Online Mapping Tool denoting the site.

Acid Sulfate Soils are not typically encountered in Class 5 areas

A desktop study was undertaken using the Department of Land and Water Conservation's "Acid Sulfate Soil Risk Map" for Wingham. The map indicated that the site has no known occurrences of acid sulfate soils.

Figure 2 below shows an extract of the Department of Land and Water Conservation's "Acid Sulfate Soil Risk Map" for Wingham. The approximate location of the site has been shown.

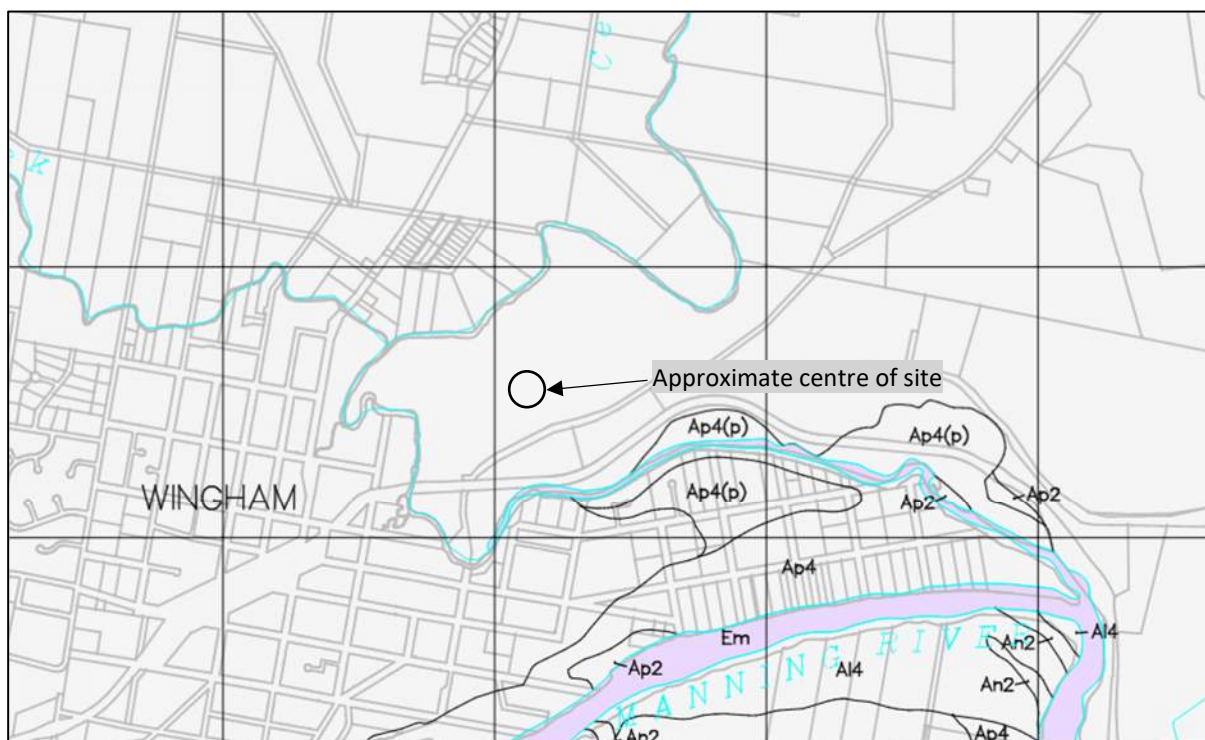


Figure 2 - An extract of the Department of Land and Water Conservation's "Acid Sulfate Soil Risk Map" for Wingham.

5. FIELDWORK

The limited geotechnical investigation was undertaken on 24th February 2024. The fieldwork comprised a visual assessment of the development area and surrounding area, the excavation of fourteen (14) boreholes (BH) and the driving of fourteen (14) dynamic cone penetrometer probes (DCP). Boreholes BH1-14 were excavated via a ø100mm solid flight continuous auger from a ute mounted drill rig to a maximum depth of approximately 2.0m below existing surface levels.

Soil sampling for laboratory analysis included -

- Seven (7) U50 undisturbed samples were recovered from BH1, 3, 5, 7, 8, 10 & 12 for laboratory shrink swell analysis;
- Four (4) bulk samples were recovered from BH2, 4, 9 & 14 for CBR testing;
- Four (4) bulk samples were recovered from BH2, 4, 9 & 14 for Atterberg Limit testing;
- Four (4) bulk samples were recovered from BH2, 4, 7 & 13 for Emerson Aggregate testing;
- Four (4) bulk samples were recovered from BH2, 4, 7 & 13 for Soil Aggressivity and Salinity testing; and
- Six (6) bulk samples were recovered from BH1, 4, 7, 11, 12 & 14 for Acid Sulfate Soil testing

The location of the boreholes and DCPs can be seen on the Site Plan in the Attachments section of this report.

6. SUBSURFACE PROFILE

The subsurface soil conditions encountered cross the site have been summarised into the following units:

UNIT 1 – TOPSOIL/ALLUVIUM

- Silty Sand, Brown, Dense, Dry/Slightly Moist
- Silty Sand with Rock Floaters, Brown, Dense, Dry

UNIT 2 – RESIDUAL

- Silty Clay Brown/Grey, Firm/Stiff, Dry to Moist
- Clay with fine sand, Brown, Stiff/Very Stiff, Dry/Slightly Moist
- Silty Sandy Clay, Light Grey/Orange/Brown, Stiff/Very Stiff, Slightly Moist
- Silty Gravel, Weathered, Orange/Brown, Dense – Very Dense, Dry
- Silty Sand, Brown/Grey, Dense, Slightly Moist
- Silty Gravelly Sand, Grey/Brown, Dense, Dry

UNIT 3 – ROCK

- Extremely Weathered Sandstone, Silty with rock/gravel inclusions, Light Orange, Dense, Dry
- Weathered Sandstone/Siltstone, Light Grey, Dry
- Weathered Sandstone, Light Orange, Dry

A summary of the soil unit depths at each borehole location is presented in Table 1 below.

Table 1: - Subsurface Soil Profile - Boreholes

Borehole	Depth (m)	Depth Range (m)		
		Unit 1	Unit 2	Unit 3
BH1	2.00 (Practical refusal)	0.0 – 0.15	0.10 – 0.60	0.60 – 2.00
BH2	1.50 (Practical refusal)	0.0 – 0.10	0.10 – 0.30	0.30 – 1.50
BH3	1.30 (Practical refusal)	0.0 – 0.10	0.1 – 0.40	0.40 – 1.30
BH4	1.00 (Practical refusal)	0.0 – 0.05	0.05 – 0.40	0.40 – 1.00
BH5	0.80 (Practical refusal)	0.0 – 0.10	0.10 – 0.60	0.60 – 0.80
BH6	0.70 (Practical refusal)	0.0 – 0.10	0.10 – 0.40	0.40 – 0.70
BH7	0.60 (Practical refusal)	0.0 – 0.15	0.15 – 0.40	0.40 – 0.60
BH8	1.00 (Practical refusal)	0.0 – 0.20	0.20 – 0.40	0.40 – 1.00
BH9	0.60 (Practical refusal)	0.0 – 0.15	0.15 – 0.40	0.40 – 0.60
BH10	0.60 (Practical refusal)	0.0 – 0.10	0.10 – 0.40	0.40 – 0.60
BH11	1.00 (Practical refusal)	0.0 – 0.10	0.10 – 0.50	0.50 – 1.00
BH12	0.60 (Practical refusal)	0.0 – 0.10	0.10 – 0.35	0.35 – 0.60
BH13	0.50 (Practical refusal)	0.0 – 0.15	0.15 – 0.35	0.35 – 0.50
BH14	0.60 (Practical refusal)	0.0 – 0.10	0.10 – 0.30	0.30 – 0.60

Dynamic Cone Penetrometers P1 – P14 were driven across the site to help approximate the consistency of the Soil Layers encountered. The Dynamic Cone Penetrometer Logs can be seen in the Attachments section of this report.

7. LABORATORY TEST RESULTS

Laboratory test results recovered during fieldwork were transported to relevant laboratories for soil analysis. The results of the lab tests have been attached to this report and are summarised in Tables 2-5 below.

Table 2 – Shrink Swell Test results

Borehole	Depth (m)	Soil Description	I _{ss} (%)	Characteristic Surface Movement (Y _s) (mm)
BH1	0.30 – 0.50	Unit 2 – Silty Gravelly Clay	1.55	14.6
BH3	0.20 – 0.40	Unit 2 – Clay with fine Sand	1.93	19.4
BH5	0.30 – 0.55	Unit 2 – Silty Clay	3.81	38.4
BH7	0.20 – 0.40	Unit 2 – Silty Sandy Clay	0.33	4.2
BH8	0.20 – 0.40	Unit 2 – Silty Sandy Clay	0.75	9.5
BH10	0.20 – 0.35	Unit 2 – Silty Clay	3.12	31.4
BH12	0.20 – 0.35	Unit 2 – Silty Sandy Clay	1.67	16.9

Table 3 – CBR, Atterberg Limit & Emerson Aggregate Test Results

Borehole	Depth (m)	Soil Description	CBR (%)	Plasticity Index (%)	Linear Shrinkage (%)	Emerson Class
BH2	0.40 – 0.80	Unit 2 – Silty Sand	25.0	14.0	3.0	4
BH4	0.02 – 0.40	Unit 2 – Silty Clay	1.0	45.0	16.5	4
BH7	0.20 – 0.40	Unit 2 – Silty Sandy Clay	-	-	-	4
BH9	0.20 – 0.40	Unit 2 – Clayey Gravelly Silt/Silty Clay	11.0	32.0	13.0	-
BH13	0.20 – 0.30	Unit 2 – Clayey Silty Sand	-	-	-	4
BH14	0.10 – 0.25	Unit 2 – Clayey Silty Sand	8.0	19	5.0	-

Table 4 – Soil Aggressivity & Salinity Test Results

Borehole	Depth (m)	Soil Description	pH Sat	Cl (ppm)	SO ₄ (ppm)	Resis (ohm.cm)
BH2	0.40 – 0.80	Unit 2 – Silty Sand	5.6	10	15	>10,000
BH4	0.02 – 0.40	Unit 2 – Silty Clay	4.1	10	10	>10,000
BH7	0.20 – 0.40	Unit 2 – Silty Sandy Clay	4.8	5	5	>10,000
BH13	0.20 – 0.30	Unit 2 – Clayey Silty Sand	4.2	15	10	>10,000

Soil samples recovered for Acid Sulfate Soil analysis were tested in accordance with SPOCAS method 23. The test results are summarised in Table 5 below.

Limit of Results is the smallest measurable threshold value achievable for the test methods. If test results fall below the Limit of Results value, the analysed chemicals may or may not be present in the test sample, and if present are below measurable values.

Table 5 – Laboratory Results

Test	Limit of Results	BH1 0.3 – 0.5m	BH4 0.2 – 0.4m	BH7 0.2 – 0.4m	BH11 0.2 – 0.4m	BH12 0.2 – 0.35	BH14 0.1 – 0.25
Texture	-	Medium	Fine	Fine	Fine	Fine	Medium
SPOCAS A _{TAA} (mol H ⁺ /t)	2	22	150	25	44	120	81
SPOCAS A _{TPA} (mol H ⁺ /t)	2	6.6	240	24	37	130	220
SPOCAS A _{TSA} (mol H ⁺ /t)	2	<2	91	< 2	< 2	< 2	140
S _{POS} (%)	0.005	0.013	0.012	< 0.005	< 0.005	0.006	0.013
pH KCL	0.1	4.8	4.1	4.7	4.6	4.3	4.8
pH ox	0.1	5.2	4.1	4.5	4.6	4.7	3.8

* highlighted cells note samples which exceeded the action criteria for Acid Sulfate Soils – refer to section 8.5 for further details

8. INTERPRETATION OF RESULTS

8.1 SHRINK SWELL TESTING (SITE CLASSIFICATION)

8.1.1 GENERAL

Section 2 of AS2870-2011 'Residential Slabs and Footings' provides guidance on classifying a site. It describes the Site Classification as being a combination of the expected ground surface movement and the depth to which this movement extends. However, the final classification of a site is either based on the soil reactivity or can be classified as a **Class P**, should other factors dictate.

8.1.2 SITE CLASSIFICATION BASED ON SOIL REACTIVITY

Classification of sites where ground movement is predominantly due to soil reactivity under normal moisture conditions shall be classified based on the expected level of ground movement. Table 6 below describes each of the Site Classification Classes, excluding Class P sites which are discussed in Section 8.1.3 below.

Table 6: - Subsurface Soil Profile - Boreholes

Class	Soil Layer Encountered	Y _s (mm)
A	Most sand and rock sites with little or no ground movement from moisture changes.	N/A
S	Slightly reactive clay sites, which may experience only slight ground movement from moisture changes.	0 – 20
M	Moderately reactive clay or silt sites, which may experience moderate ground movement from moisture changes.	20 – 40
H1	Highly reactive clay sites, which may experience high ground movement from moisture changes.	40 – 60
H2	Highly reactive clay sites, which may experience very high ground movement from moisture changes.	60 – 75
E	Extremely reactive sites, which may experience extreme ground movement from moisture changes.	> 75

Y_s – Refers to Characteristic Surface Movement as per Section 2.2.3 of AS2870

For Classes M, H1, H2 and E, further classification may be required, based on the depth of the expected moisture change. For sites with deep-seated moisture changes characteristic of dry climates and corresponding to a design depth of suction change (H_s) equal to or greater than 3 m, the classification shall be M-D, H1-D, H2-D or E-D as appropriate.

8.1.3 SITE CLASSIFICATION OF OTHER SITES (CLASS P)

Sites with inadequate bearing strength or where ground movement may be significantly affected by factors other than reactive soil movements due to normal moisture conditions shall be classified as **Class P**. **Class P** sites include soft or unstable foundations such as soft clay or silt or loose sands, landslip, mine subsidence, collapsing soils and soils subject to erosion, reactive sites subject to abnormal moisture conditions and sites that cannot be classified in accordance with Clause 2.1.2 of AS2870.

A site shall be classified as **Class P** if—

- the bearing strength is less than that specified in Clause 2.4.5 of AS2870;
- excessive foundation settlement may occur due to loading on the foundation;
- the site contains uncontrolled or controlled fill as identified in Clause 2.5.3 of AS2870;
- the site may be subject to mine subsidence, landslip, collapse activity or coastal erosion;
- the site may be subject to moisture changes due to site conditions more severe than the normal site conditions described in Clause 1.3.2 of AS2870; or
- the site may be subject to other factors resulting in foundation movement beyond the reactive soil movements resulting from moisture changes due to the normal site conditions described in Clause 1.3.2.

8.1.4 SITE CLASSIFICATION

Laboratory Shrink Swell testing determined that a Characteristic surface movement between **4.2 – 38.4mm** could be expected across the site. Referring to Table 6 above, this provides a general site classification of **Class S (Slightly Reactive)** to **Class M (Moderately Reactive)** subject to testing locations.

Penetrometer probes P1 – P14 encountered competent material with an allowable soil bearing capacity of 100kPa within 0.5m of the existing surface level in all testing locations.

Based on the above analysis the site, as presented at the time of investigation, is considered suitable for residential development with footing systems designed in accordance with the standard requirements of AS2870 – Residential Slabs and Footings. Note individual footing recommendations and individual lot classification will be required following the completion of bulk earthworks.

8.2 CBR, ATTERBERG LIMITS AND EMERSON AGGREGATE TEST

The recorded CBR values and associated Atterberg limits are considered typical for the material encountered and generally suitable for public road construction except for material encountered within BH4 which recorded a CBR value of 1%. It is noted that BH4 was completed within an existing overland drainage path, where the subsurface profile is dominated by highly plastic silty clays. As such localised subgrade improvement will be required through this zone in order to provide a suitable subgrade formation for future pavement construction. Give the likely scale of earthworks across the site, subgrade improvement through this area is expected to be a simple task via removal and replacement with competent site won materials.

The site is considered geotechnically suitable for future residential road construction.

The soil has displayed high clay dispersion properties, which can lead to the blockage of pores by the dispersed clay particles, reducing the soil permeability and increasing erosion potential. This is not considered to be a major limitation to general bulk filling activities, however it is considered to be a major limitation to the perimeter of the site where flood waters and drainage infrastructure (drainage swales, water quality and detention basins) can be expected. Soil dispersivity may be overcome by an applying gypsum to the material during bulk earthworks activities. In addition it is recommended that suitable erosion protection measures be applied to proposed fill batters, particularly where rising flood waters and drainage infrastructure is anticipated.

8.3 SOIL AGGRESSIVITY

Soil Aggressivity is an important factor for determining the durability of in ground concrete and steel pile foundations. AS2159 – Piling Design and Installation provides guidance on the exposure classification of aggressive and non-aggressive soils such that appropriate management measures can be included in structural footing designs.

Table 6.4.2 (C) and Table 6.5.2 (C) from AS2159 – Piling - Design and installation (extracts below) provide assessment criteria for aggressive soil classification for both concrete and steel pile foundation design.

TABLE 6.4.2(C)
EXPOSURE CLASSIFICATION FOR CONCRETE PILES—PILES IN SOIL

Exposure conditions				Exposure classification	
Sulfates (expressed as SO ₄ *)		pH	Chlorides in groundwater ppm	Soil conditions A†	Soil conditions B‡
In soil ppm	In groundwater ppm				
<5000	<1000	>5.5	<6000	Mild	Non-aggressive
5000–10 000	1000–3000	4.5–5.5	6000–12 000	Moderate	Mild
10 000–20 000	3000–10 000	4–4.5	12 000–30 000	Severe	Moderate
>20 000	>10 000	<4	>30 000	Very severe	Severe

* Approximately 100 ppm SO₄ = 80 ppm SO₃

† Soil conditions A—high permeability soils (e.g., sands and gravels) which are in groundwater

‡ Soil conditions B—low permeability soils (e.g., silts and clays) or all soils above groundwater

TABLE 6.5.2(C)
EXPOSURE CLASSIFICATION FOR STEEL PILES—PILES IN SOIL

Exposure conditions				Exposure classification	
pH	Chlorides Cl		Resistivity ohm.cm	Soil condition A*	Soil condition B†
	In soil ppm	In groundwater ppm			
>5	<5000	<1 000	>5 000	Non-aggressive	Non-aggressive
4–5	5000–20,000	1 000–10 000	2 000–5 000	Mild	Non-aggressive
3–4	20,000–50,000	10 000–20 000	1 000–2 000	Moderate	Mild
<3	>50,000	>20 000	<1 000	Severe	Moderate

* Soil conditions A—high permeability soils (e.g., sands and gravels) that are in groundwater

† Soil conditions B—low permeability soils (e.g., silts and clays) or all soils above groundwater

Referring to Table 4 above, all of the samples recovered for testing are considered to be Soil Condition B – ie. Low permeability soils above groundwater. Laboratory results confirm that the tested soils can be considered to be **Non-Aggressive** for steel piles and **Mild to Moderately Aggressive** for concrete piles.

8.4 SOIL SALINITY

Soil Salinity describes the naturally occurring salt content of a soil, the process of increasing soil salt content is known as salinization. Salinization can impact the ability of a soil to support vegetation, increasing the risk of erosion and decreasing crop production. Soil salinity levels are measured by Electrical Conductivity (EC), as salts increase the ability of a soil to conduct an electrical current, a high EC value indicates a high salinity level.

Electrical Conductivity for the site, being the inverse of the Electrical Resistivity values noted in Table 4 above, are measured as **0.08 dS/m** (including Light Clay correction factor of 8 and unit correction). Reference to Table 6 of NSW Dept of Primary Industries 'Book 2 Dryland Salinity: Identifying Saline Sites' suggests that the site contains very low levels of soil salinity and would be suitable for growing sensitive pastures.

Table 6: Salinity levels at which production begins to decline.

Salinity tolerance levels - crop species	Salinity tolerance levels - pasture species	Level of soil salinity (ECe) at which plants begin to decline	Soil Salinity Class
Sensitive crops turnip, strawberry, beans, carrot	Sensitive pastures	0 - 1 dS/m	0
Moderately sensitive crops potato, grapes, corn, cowpea, linseed	Moderately sensitive pastures most clovers, medics,	1 - 2 dS/m	0
Moderately tolerant crops grain sorghum, rice	Moderately tolerant pastures lucerne, 'salt tolerant' lucerne, kikuyu, phalaris	2 - 4 dS/m	1
Tolerant crops oats, sorghum, wheat, canola, safflower, soybean, sunflower	Tolerant pastures couch, oats, fescue, phalaris, perennial ryegrass, balansa clover, burmuda grass, Pioneer rhodes grass buffel grass	4 - 8 dS/m	2
Very tolerant crops barley, cotton	Very tolerant pastures tall wheat grass, dundas wheat grass, puccinellia, palastine, strawberry clover,	8 - 16 dS/m	3
Generally too saline for crops	Very tolerant pastures (for extreme conditions) salt bush, blue bush, distichlis	> 16 dS/m	4

When assessed against the above criteria, the site is not considered to be constrained by saline soils.

8.5 ACID SULFATE SOILS

Table 4.4 of the Acid Sulfate Soils Management Advisory Committee's "Acid Sulfate Soils Planning Guidelines" indicates the Action Criteria that triggers the need to prepare a management plan. Table 4.4 extract can be seen below.

Table 4.4. Action criteria based on ASS soil analysis for three broad texture categories

<i>Type of Material</i>		<i>Action Criteria</i> <i>1-1000 tonnes disturbed</i>		<i>Action Criteria if more than</i> <i>1000 tonnes disturbed</i>	
<i>Texture range. McDonald et al. (1990)</i>	<i>Approx. clay content (% < 0.002 mm)</i>	<i>Sulfur trail</i> <i>% S oxidisable (oven-dry basis)</i> <i>eg S_{tos} or S_{pos}</i>	<i>Acid trail</i> <i>mol H⁺ / tonne (oven-dry basis)</i> <i>eg, TPA or TSA</i>	<i>Sulfur trail</i> <i>% S oxidisable (oven-dry basis)</i> <i>eg S_{tos} or S_{pos}</i>	<i>Acid trail</i> <i>mol H⁺ / tonne (oven-dry basis)</i> <i>eg, TPA or TSA</i>
Coarse Texture Sands to loamy sands	≤5	0.03	18	0.03	18
Medium Texture Sandy loams to light clays	5 - 40	0.06	36	0.03	18
Fine Texture Medium to heavy clays and silty clays	≥40	0.1	62	0.03	18

When assessed against the Action Criteria for the greater than 1000 tonnes of soil disturbance category, ALL of the tested samples exceeded the action criteria for either Acid Trail or Sulfur Trail.

Note: All samples tested were considered to be moderately acidic prior to oxidation, the only sample which notably increased in acidity following oxidation was the sample from BH14 which is considered to be highly acidic post oxidation.

When assessing the potential for acid sulfate soils being disturbed during construction the building techniques and footing systems proposed to be used must be reviewed to ascertain the likelihood of disturbing and uncovering actual or potential acid sulfate soils. It is understood that the proposed development will be located predominantly in FILL material, suggesting that only minor disturbance of existing soils is to be expected across the majority of the site. Extensive site excavation is anticipated through the zone of BH4, 7 & 12, the acidity of these samples are noted to remain generally unchanged from pre to post oxidation (presenting as moderately acidic), and as such are considered to be managed onsite during construction.

As such the site is considered suitable for the proposed development, an Acid Sulfate Soil Management Plan should be provided as part of the construction phase of the project.

9. REPORT LIMITATIONS

The information contained within this report, including interpretation of site conditions and project specific recommendations have been determined based on the limited and specific sampling and testing during the site investigation.

The existing subsurface site soil conditions can vary significantly across a site, and over periods of time. If conditions are encountered during construction that are not representative of the information contained within this report, please contact DRB Consulting Engineers immediately for site reassessment and/or modifications to the recommendations provided above.

Should you require any further advice or clarification of any of the above, please do not hesitate to contact us.

Yours faithfully

DRB CONSULTING ENGINEERS PTY LIMITED

A handwritten signature in black ink, appearing to read 'Chris Smith', is positioned above the printed name.

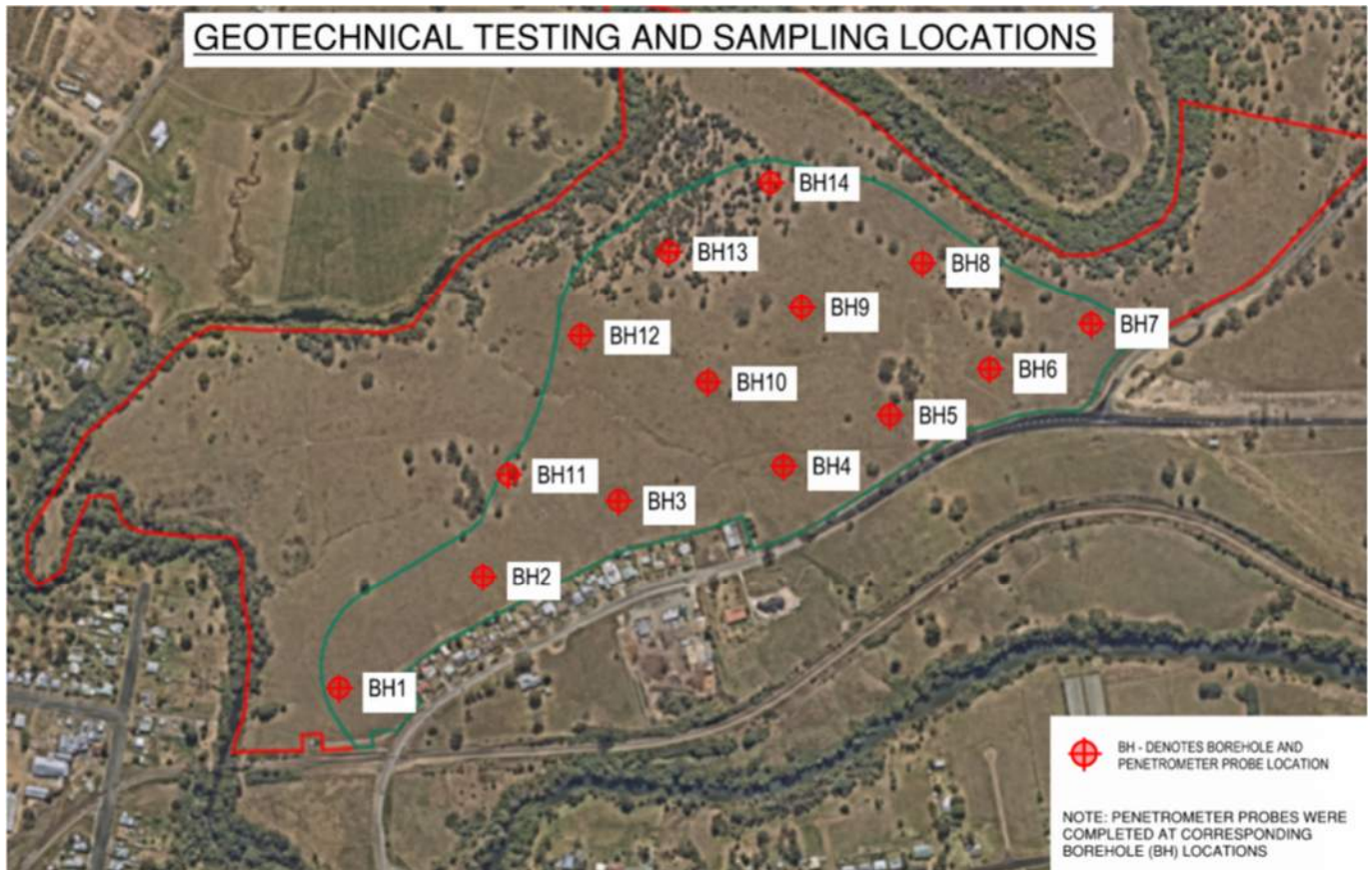
Chris Smith

BEng (Civil) CPEng MIE Aust

Attachments

- (i) Site Plan
- (ii) Engineering Log Sheets
- (iii) Dynamic Cone Penetrometer Probe Logs
- (iv) Laboratory Test Results
- (v) Site Class - CSIRO BFT18 - Foundation Maintenance and Footing Performance
- (vi) General Notes

ATTACHMENTS



Site Plan (NTS) - Image courtesy of NearMap

Engineering Log



BH1	100mm CONTINUOUS FLIGHT AUGERED BOREHOLE			
Depth (mm)	Material	Colour	Density	Moisture
0 to 150	TOPSOIL, (SM)SILTY SAND, Non Plastic, with grass root inclusions	BR	D	D
150 to 600	(GM)SILTY GRAVELLY CLAY, Weathered, Low Plasticity	O-BR	D-VD	D
600 to 2000	WEATHERED SANDSTONE, with Gravel	O-BR		D
2000	Practical Refusal in WEATHERED SANDSTONE, with Gravel			

Groundwater: Nil mm

Sample: Remould u50 - 0.3/0.5m

BH2	100mm CONTINUOUS FLIGHT AUGERED BOREHOLE			
Depth (mm)	Material	Colour	Density	Moisture
0 to 100	TOPSOIL, (SM)SILTY SAND, Non Plastic, with grass root inclusions	BR	D	D-SM
100 to 300	(SM)SILTY SAND, Low Plasticity	BR-G	D	SM
300 to 1000	EXTREMELY WEATHERED SANDSTONE, Silty, with Gravel/Rock	Lt-O	D-VD	D
1000 to 1500	WEATHERED SANDSTONE, Silty	Lt-O		D
1500	Practical Refusal in WEATHERED ROCK			

Groundwater: Nil mm

Sample: Bulk - 0.4/0.8m

BH3	100mm CONTINUOUS FLIGHT AUGERED BOREHOLE			
Depth (mm)	Material	Colour	Density	Moisture
0 to 100	TOPSOIL, (SM)SILTY SAND, Non Plastic, with grass root inclusions	BR	D	D-SM
100 to 150	(SP)SILTY GRAVELLY SAND, Low Plasticity	G-BR	D	D
150 to 400	(CH)CLAY, with fine sand, Medium to High Plasticity	BR	ST-VST	D-SM
400 to 1300	WEATHERED SANDSTONE, Silty, with Gravel	O		D
1300	Practical Refusal in WEATHERED ROCK			

Groundwater: Nil mm

Sample: u50 - 0.2/0.4m

Additional comments:

Legend

Colour:	Red (R), Yellow (Y), Pink (P), Orange (O), White (W), Grey (G), Brown (Br), Black (Bl), Cream (C), Mottled (Mt), Dark (Dk), Light (Lt)
Relative Density / Consistency	Very Soft (VS), Soft (S), Firm (F), Stiff (St), Very Stiff (VSt), Hard (H), Very Loose (VL), Loose (L), Medium Dense (MD), Dense (D), Very Dense (VD)
Moisture:	Dry (D), Slightly Moist (SM), Moist (M), Wet (W), Saturated (S)

Project Number:	233307	Site Address:	Lot 92 DP 1285477 Cedar Creek Estate, Wingham
Report Date:	28/01/2024	Fieldwork By:	Richard Badior
Fieldwork Date:	22/01/2024	Test Location:	See Site Plan

Engineering Log



BH4	100mm CONTINUOUS FLIGHT AUGERED BOREHOLE			
Depth (mm)	Material	Colour	Density	Moisture
0 to 50	TOPSOIL, (SM)SILTY SAND, Non Plastic, with grass root inclusions	BR	D	SM-M
50 to 400	(CH)SILTY CLAY, Medium to High Plasticity, some fine orange weathered inclusions	BR-G	F-ST	M
400 to 1000	WEATHERED SANDSTONE, Silty	Lt-O		D
1000	Practical Refusal in WEATHERED ROCK			

Groundwater: Nil mm

Sample: Bulk - 0.2/0.4m

BH5	100mm CONTINUOUS FLIGHT AUGERED BOREHOLE			
Depth (mm)	Material	Colour	Density	Moisture
0 to 100	TOPSOIL, (SM)SILTY SAND, Non Plastic, with grass root inclusions	BR	D	D
100 to 600	(CH)SILTY CLAY, Medium to High Plasticity, with fine sand	BR	ST-VST	SM
600 to 800	WEATHERED SANDSTONE/SHALESTONE	G-BR		D
800	Practical Refusal in WEATHERED ROCK			

Groundwater: Nil mm

Sample: u50 - 0.3/0.55m

BH6	100mm CONTINUOUS FLIGHT AUGERED BOREHOLE			
Depth (mm)	Material	Colour	Density	Moisture
0 to 100	TOPSOIL, (SM)SILTY SAND, Non Plastic, with grass root inclusions	BR	D	D-SM
100 to 400	(CL)SILTY SANDY CLAY, Low to Medium Plasticity	BR	ST	D-SM
400 to 700	WEATHERED SANDSTONE, Silty	Lt-O		D
700	Practical Refusal in WEATHERED ROCK			

Groundwater: Nil mm

Sample: -

Additional comments:

Legend

Colour:	Red (R), Yellow (Y), Pink (P), Orange (O), White (W), Grey (G), Brown (Br), Black (Bl), Cream (C), Mottled (Mt), Dark (Dk), Light (Lt)
Relative Density / Consistency	Very Soft (VS), Soft (S), Firm (F), Stiff (St), Very Stiff (VSt), Hard (H), Very Loose (VL), Loose (L), Medium Dense (MD), Dense (D), Very Dense (VD)
Moisture:	Dry (D), Slightly Moist (SM), Moist (M), Wet (W), Saturated (S)

Project Number:	233307	Site Address:	Lot 92 DP 1285477 Cedar Creek Estate, Wingham
Report Date:	24/01/2024	Fieldwork By:	Richard Bador
Fieldwork Date:	22/01/2024	Test Location:	See Site Plan

Engineering Log



BH7 100mm CONTINUOUS FLIGHT AUGERED BOREHOLE				
Depth (mm)	Material	Colour	Density	Moisture
0 to 150	TOPSOIL, (SM)SILTY SAND, with gravel, Non Plastic, with grass root inclusions	BR	D	D
150 to 400	(CL)SILTY SANDY CLAY, Low to Medium Plasticity, with fine to coarse sand	G	S	W
400 to 600	WEATHERED SANDSTONE, with Gravel	W		D
600	Practical Refusal in WEATHERED ROCK			
Groundwater: Nil mm		Sample: u50 & Bulk - 0.2/0.4m		

BH8 100mm CONTINUOUS FLIGHT AUGERED BOREHOLE				
Depth (mm)	Material	Colour	Density	Moisture
0 to 200	TOPSOIL, (SM)SILTY SAND, with Rock Floaters, Non Plastic, with grass root inclusions	BR	D	D-SM
200 to 400	(CL)SILTY SANDY CLAY, Low to Medium Plasticity	BR-G	S-F	SM
400 to 1000	WEATHERED SANDSTONE, Silty, with gravel	Lt-O		D
1000	Practical Refusal in WEATHERED ROCK			
Groundwater: Nil mm		Sample: u50 - 0.2/0.4m		

BH9 100mm CONTINUOUS FLIGHT AUGERED BOREHOLE				
Depth (mm)	Material	Colour	Density	Moisture
0 to 150	TOPSOIL, (SM)SILTY SAND, some gravel, Non Plastic, with grass root inclusions	BR	D	D-SM
150 to 400	(GC)CLAYEY GRAVELLY SILT/SILTY CLAY with Rock, Low to Medium Plasticity	G	ST	D-SM
400 to 600	Practical Refusal in WEATHERED ROCK			
600				
Groundwater: Nil mm		Sample: Bulk - 0.2/0.4m		

Additional comments:

Legend	
Colour:	Red (R), Yellow (Y), Pink (P), Orange (O), White (W), Grey (G), Brown (Br), Black (Bl), Cream (C), Mottled (Mt), Dark (Dk), Light (Lt)
Relative Density / Consistency	Very Soft (VS), Soft (S), Firm (F), Stiff (St), Very Stiff (VSt), Hard (H), Very Loose (VL), Loose (L), Medium Dense (MD), Dense (D), Very Dense (VD)
Moisture:	Dry (D), Slightly Moist (SM), Moist (M), Wet (W), Saturated (S)

Project Number:	233307	Site Address:	Lot 92 DP 1285477 Cedar Creek Estate, Wingham
Report Date:	26/01/2024	Fieldwork By:	Richard Badior
Fieldwork Date:	22/01/2024	Test Location:	See Site Plan

Engineering Log



BH10	100mm CONTINUOUS FLIGHT AUGERED BOREHOLE			
Depth (mm)	Material	Colour	Density	Moisture
0 to 100	TOPSOIL, (SM)SILTY SAND, Non Plastic, with grass root inclusions	BR	D	D
100 to 400	(CH)SILTY CLAY, Medium to High Plasticity, some fine orange weathered inclusions	BR-G	ST-VST	SM
400 to 600	Practical Refusal in WEATHERED ROCK			
600				

Groundwater: Nil mm

Sample: u50 - 0.2/0.35m

BH11	100mm CONTINUOUS FLIGHT AUGERED BOREHOLE			
Depth (mm)	Material	Colour	Density	Moisture
0 to 100	TOPSOIL, (SM)SILTY SAND, Non Plastic, with grass root inclusions	BR	D	D
100 to 500	(CH)SILTY CLAY, Medium to High Plasticity, with fine sand	BR	ST-VST	D
500 to 1000	WEATHERED SANDSTONE/SILTSTONE	Lt-G		D
1000	Practical Refusal in WEATHERED ROCK			

Groundwater: Nil mm

Sample: Bulk - 0.2/0.4m

BH12	100mm CONTINUOUS FLIGHT AUGERED BOREHOLE			
Depth (mm)	Material	Colour	Density	Moisture
0 to 100	TOPSOIL, (SM)SILTY SAND, Non Plastic, with grass root inclusions	BR	D	D
100 to 200	(GC)CLAYEY GRAVELLY SAND, Low Plasticity	G-BR	D	D
200 to 350	(CL)SILTY SANDY CLAY, with weathered inclusions, Low to Medium Plasticity	Lt-G-O	ST	SM
350 to 600	WEATHERED SANDSTONE, Silty, with gravel	Lt-O		D
600	Practical Refusal in WEATHERED ROCK			

Groundwater: Nil mm

Sample: u50 & Bulk - 0.2/0.35m

Additional comments:

Legend

Colour:	Red (R), Yellow (Y), Pink (P), Orange (O), White (W), Grey (G), Brown (Br), Black (Bl), Cream (C), Mottled (Mt), Dark (Dk), Light (Lt)
Relative Density / Consistency	Very Soft (VS), Soft (S), Firm (F), Stiff (St), Very Stiff (VSt), Hard (H), Very Loose (VL), Loose (L), Medium Dense (MD), Dense (D), Very Dense (VD)
Moisture:	Dry (D), Slightly Moist (SM), Moist (M), Wet (W), Saturated (S)

Project Number:	233307	Site Address:	Lot 92 DP 1285477 Cedar Creek Estate, Wingham
Report Date:	26/01/2024	Fieldwork By:	Richard Bador
Fieldwork Date:	22/01/2024	Test Location:	See Site Plan

Engineering Log



BH13	100mm CONTINUOUS FLIGHT AUGERED BOREHOLE			
Depth (mm)	Material	Colour	Density	Moisture
0 to 150	TOPSOIL, (SM)SILTY SAND, with gravel, Non Plastic, with grass root inclusions	BR	D	D
150 to 350	(CL)SILTY SANDY CLAY, Low to Medium Plasticity, with fine to coarse sand	G-BR	F-ST	D-SM
350 to 500	Practical Refusal in WEATHERED ROCK	G		D
500				

Groundwater: Nil mm

Sample: Bulk - 0.2/0.3m

BH14	100mm CONTINUOUS FLIGHT AUGERED BOREHOLE			
Depth (mm)	Material	Colour	Density	Moisture
0 to 100	TOPSOIL, (SM)SILTY SAND, with Rock Floaters, Non Plastic, with grass root inclusions	BR	D	D-SM
100 to 300	(GC)CLAYEY SILTY SAND, with Rock/Gravel, Low Plasticity	BR-G	D	D-SM
300 to 600	WEATHERED SANDSTONE, Silty, with gravel	Lt-O		D
600	Practical Refusal in WEATHERED ROCK			

Groundwater: Nil mm

Sample: Bulk - 0.1/0.25m

BH	100mm CONTINUOUS FLIGHT AUGERED BOREHOLE			
Depth (mm)	Material	Colour	Density	Moisture

Sample: -

Additional comments:

Legend

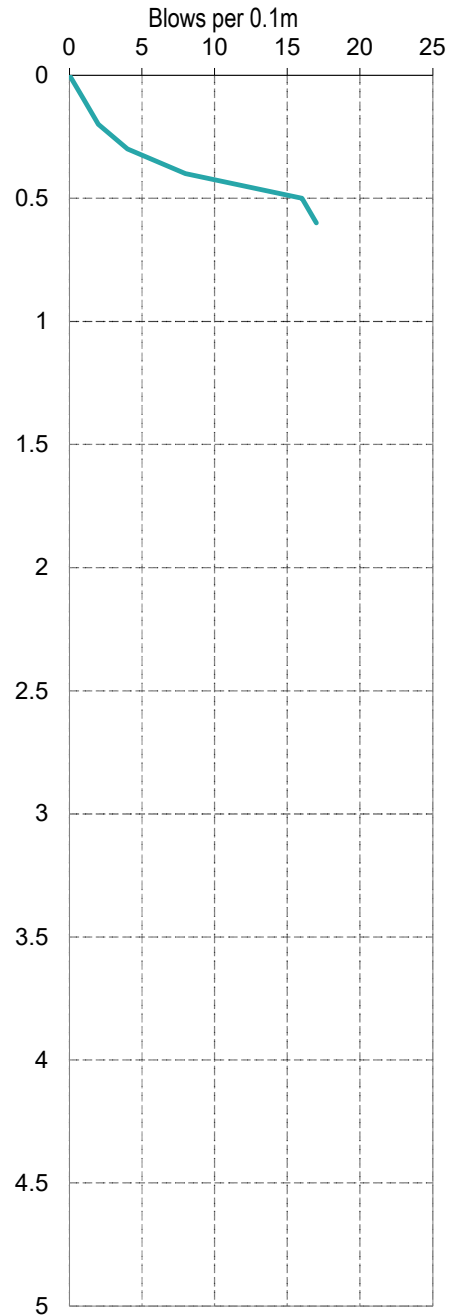
Colour:	Red (R), Yellow (Y), Pink (P), Orange (O), White (W), Grey (G), Brown (Br), Black (Bl), Cream (C), Mottled (Mt), Dark (Dk), Light (Lt)
Relative Density / Consistency	Very Soft (VS), Soft (S), Firm (F), Stiff (St), Very Stiff (VSt), Hard (H), Very Loose (VL), Loose (L), Medium Dense (MD), Dense (D), Very Dense (VD)
Moisture:	Dry (D), Slightly Moist (SM), Moist (M), Wet (W), Saturated (S)

Project Number:	233307	Site Address:	Lot 92 DP 1285477 Cedar Creek Estate, Wingham
Report Date:	26/01/2024	Fieldwork By:	Richard Badior
Fieldwork Date:	22/01/2024	Test Location:	See Site Plan

Dynamic Cone Penetrometer Log



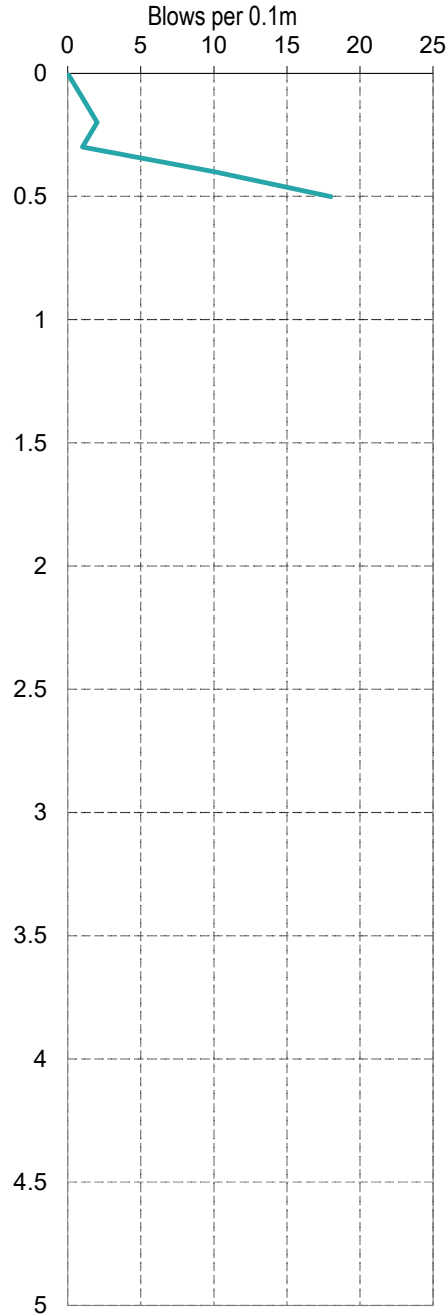
Penetrometer: P1



Terminated @

0.6

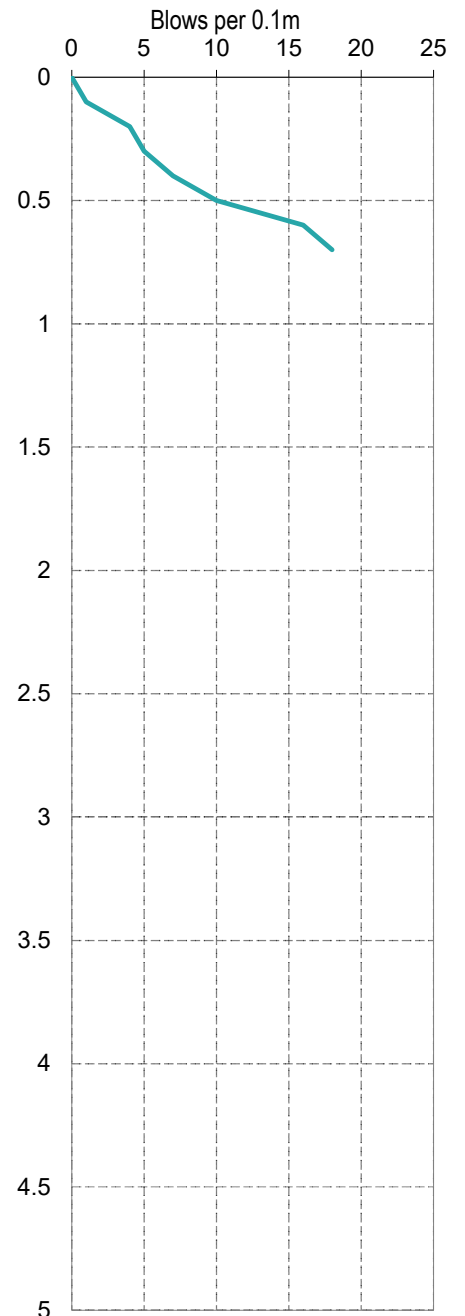
Penetrometer: P2



Terminated @

0.5

Penetrometer: P3



Terminated @

0.7

Project Number: 233307
Report Date: 24/01/2024
Fieldwork Date: 22/01/2024

Site Address: Lot 92 DP 1285477 Cedar Creek Estate, Wingham
Fieldwork By: Richard Badior
Test Location: See Site Plan

Dynamic Cone Penetrometer Log



Penetrometer: P4		Penetrometer: P5		Penetrometer: P6	
Blows per 0.1m		Blows per 0.1m		Blows per 0.1m	
Terminated @	0.8	Refusal @	0.6	Refusal @	0.4
Project Number: 233307 Site Address: Lot 92 DP 1285477 Cedar Creek Estate, Wingham Report Date: 24/01/2024 Fieldwork By: Richard Badior Fieldwork Date: 22/01/2024 Test Location: See Site Plan					

Dynamic Cone Penetrometer Log



Penetrometer: P7		Penetrometer: P8		Penetrometer: P9	
Blows per 0.1m		Blows per 0.1m		Blows per 0.1m	
Refused @	0.4	Terminated @	0.6	Terminated @	0.5
Project Number: 233307 Report Date: 26/01/2024 Fieldwork Date: 22/01/2024 Site Address: Lot 92 DP 1285477 Cedar Creek Estate, Wingham Fieldwork By: Richard Badior Test Location: See Site Plan					

Dynamic Cone Penetrometer Log

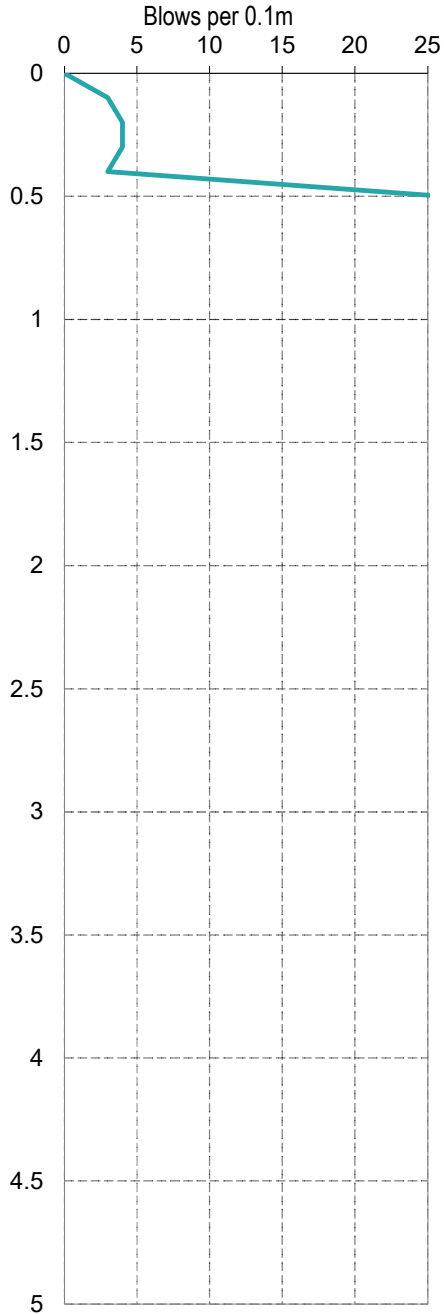


Penetrometer: P10		Penetrometer: P11		Penetrometer: P12	
Blows per 0.1m		Blows per 0.1m		Blows per 0.1m	
Terminated @	0.5	Terminated @	0.7	Refusal @	0.5
Project Number: 233307 Report Date: 26/01/2024 Fieldwork Date: 22/01/2024 Site Address: Lot 92 DP 1285477 Cedar Creek Estate, Wingham Fieldwork By: Richard Badior Test Location: See Site Plan					

Dynamic Cone Penetrometer Log



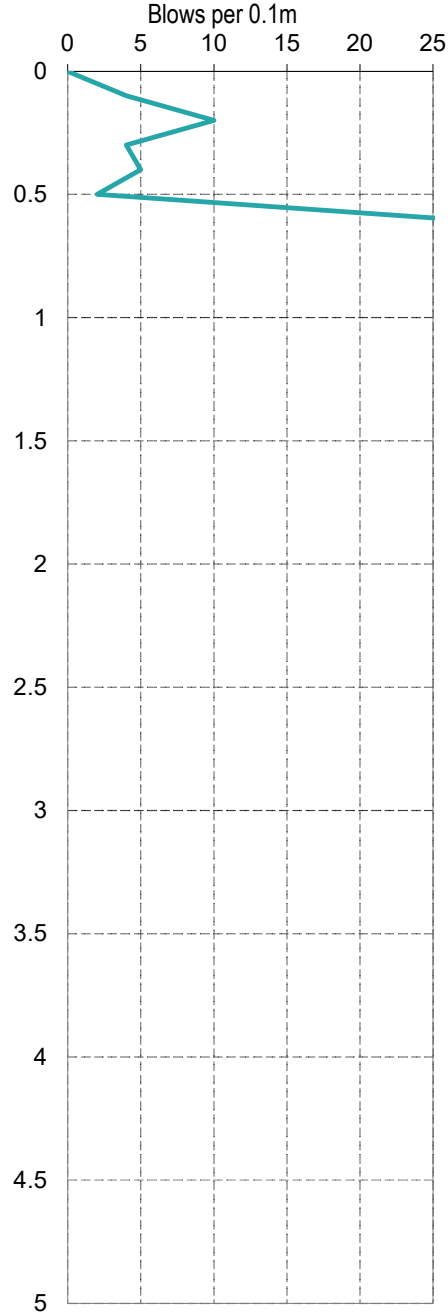
Penetrometer: P13



Refused @

0.4

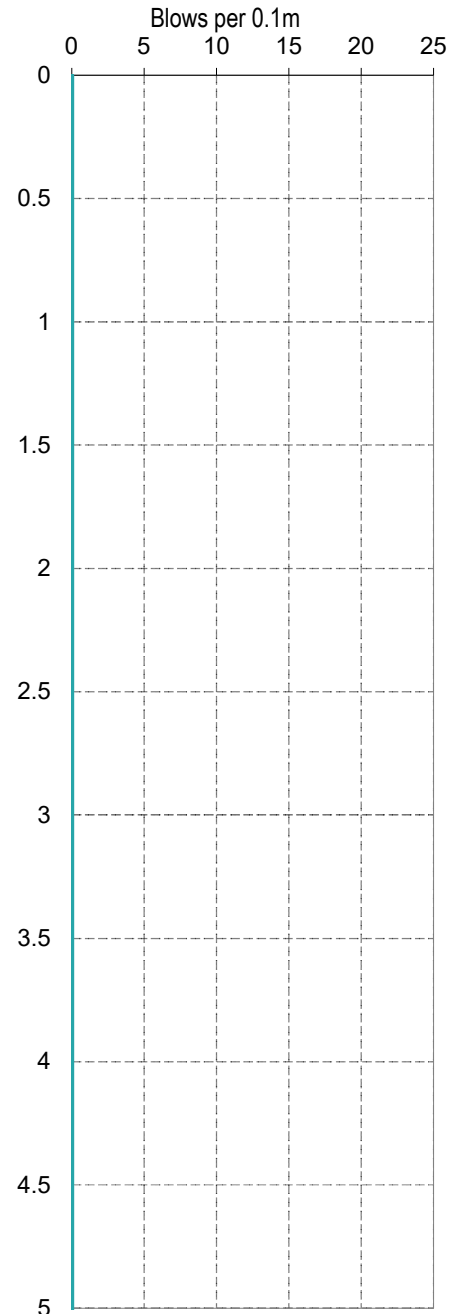
Penetrometer: P14



Refused @

0.5

Penetrometer: P



Project Number: 233307
Report Date: 26/01/2024
Fieldwork Date: 22/01/2024

Site Address: Lot 92 DP 1285477 Cedar Creek Estate, Wingham
Fieldwork By: Richard Badior
Test Location: See Site Plan

Shrink Swell Calculations



Borehole / Testpit	BH1
Depth	Remould u50 - 0.3/0.5m
Date Tested	23/01/2024
Pocket Penetrometer (Before)	-
Pocket Penetrometer (After)	-
Shrinkage - Moisture Content	16.77%
Shrinkage	2.07%
Swell - Moisture Content (Before)	18.20%
Swell - Moisture Content (After)	18.49%
Swell	0.00%
Shrink Swell Index (Iss)	1.15

Change in Soil Suction (Δu)	1.2
Suction Depth (Hs)	1.8

Characteristic Surface Movement (Ys)	14.6
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Change in Soil Suction (Δu)	0.6
Extra Suction Change (Δu base)	0.33
Suction Depth (Ht)	2.7
Depth of Soil Cracking	2.7

Maximum Potential Surface Movement (Ytmax)	4.3
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Additional comments:

Field Moisture Content' 11.1%

Project Number:	233307	Site Address:	Lot 92 DP 1285477 Cedar Creek Estate, Wingham
Report Date:	26/01/2024	Fieldwork By:	Richard Badior
Fieldwork Date:	22/01/2024	Test Location:	See Site Plan

Shrink Swell Calculations



Borehole / Testpit	BH3
Depth	<i>u50 - 0.2/0.4m</i>
Date Tested	22/01/2024
Pocket Penetrometer (Before)	600kPa
Pocket Penetrometer (After)	350kPa
Shrinkage - Moisture Content	15.16%
Shrinkage	1.83%
Swell - Moisture Content (Before)	16.26%
Swell - Moisture Content (After)	26.04%
Swell	3.28%
Shrink Swell Index (Iss)	1.93

Change in Soil Suction (Δu)	1.2
Suction Depth (H_s)	1.8

Characteristic Surface Movement (Y_s)	19.4
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Change in Soil Suction (Δu)	0.6
Extra Suction Change (Δu base)	0.33
Suction Depth (H_t)	2.7
Depth of Soil Cracking	2.7

Maximum Potential Surface Movement (Y_{tmax})	4.1
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Additional comments:

Project Number:	233307	Site Address:	Lot 92 DP 1285477 Cedar Creek Estate, Wingham
Report Date:	28/01/2024	Fieldwork By:	Richard Badior
Fieldwork Date:	22/01/2024	Test Location:	See Site Plan

Shrink Swell Calculations



Borehole / Testpit	BH5
Depth	<i>u50 - 0.3/0.55m</i>
Date Tested	22/01/2024
Pocket Penetrometer (Before)	600kPa
Pocket Penetrometer (After)	300kPa
Shrinkage - Moisture Content	21.71%
Shrinkage	5.64%
Swell - Moisture Content (Before)	20.95%
Swell - Moisture Content (After)	25.01%
Swell	2.44%
Shrink Swell Index (Iss)	3.81

Change in Soil Suction (Δu)	1.2
Suction Depth (H_s)	1.8

Characteristic Surface Movement (Y_s)	38.4
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Change in Soil Suction (Δu)	0.6
Extra Suction Change (Δu base)	0.4
Suction Depth (H_t)	3.3
Depth of Soil Cracking	3.3

Maximum Potential Surface Movement (Y_{tmax})	9.5
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Additional comments:

Project Number:	233307	Site Address:	Lot 92 DP 1285477 Cedar Creek Estate, Wingham
Report Date:	28/01/2024	Fieldwork By:	Richard Badior
Fieldwork Date:	22/01/2024	Test Location:	See Site Plan

Shrink Swell Calculations



Borehole / Testpit	BH7
Depth	<i>u50 & Bulk - 0.2/0.4m</i>
Date Tested	22/01/2024
Pocket Penetrometer (Before)	100kPa
Pocket Penetrometer (After)	100kPa
Shrinkage - Moisture Content	15.01%
Shrinkage	0.59%
Swell - Moisture Content (Before)	15.33%
Swell - Moisture Content (After)	16.41%
Swell	0.00%
Shrink Swell Index (Iss)	0.33

Change in Soil Suction (Δu)	1.2
Suction Depth (H_s)	1.8

Characteristic Surface Movement (Y_s)	4.2
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Change in Soil Suction (Δu)	0.6
Extra Suction Change (Δu base)	0.33
Suction Depth (H_t)	2.7
Depth of Soil Cracking	2.7

Maximum Potential Surface Movement (Y_{tmax})	1.2
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Additional comments:

Project Number:	233307	Site Address:	Lot 92 DP 1285477 Cedar Creek Estate, Wingham
Report Date:	26/01/2024	Fieldwork By:	Richard Badior
Fieldwork Date:	22/01/2024	Test Location:	See Site Plan

Shrink Swell Calculations



Borehole / Testpit	BH8
Depth	<i>u50 - 0.2/0.4m</i>
Date Tested	23/01/2024
Pocket Penetrometer (Before)	100kPa
Pocket Penetrometer (After)	100kPa
Shrinkage - Moisture Content	14.57%
Shrinkage	1.35%
Swell - Moisture Content (Before)	16.04%
Swell - Moisture Content (After)	16.57%
Swell	0.00%
Shrink Swell Index (Iss)	0.75

Change in Soil Suction (Δu)	1.2
Suction Depth (H_s)	1.8

Characteristic Surface Movement (Y_s)	9.5
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Change in Soil Suction (Δu)	0.6
Extra Suction Change (Δu base)	0.33
Suction Depth (H_t)	2.7
Depth of Soil Cracking	2.7

Maximum Potential Surface Movement (Y_{tmax})	2.8
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Additional comments:

Project Number:	233307	Site Address:	Lot 92 DP 1285477 Cedar Creek Estate, Wingham
Report Date:	26/01/2024	Fieldwork By:	Richard Badior
Fieldwork Date:	22/01/2024	Test Location:	See Site Plan

Shrink Swell Calculations



Borehole / Testpit	BH10
Depth	<i>u50 - 0.2/0.35m</i>
Date Tested	22/01/2024
Pocket Penetrometer (Before)	250kPa
Pocket Penetrometer (After)	230kPa
Shrinkage - Moisture Content	23.60%
Shrinkage	5.32%
Swell - Moisture Content (Before)	27.15%
Swell - Moisture Content (After)	36.04%
Swell	0.60%
Shrink Swell Index (Iss)	3.12

Change in Soil Suction (Δu)	1.2
Suction Depth (H_s)	1.8

Characteristic Surface Movement (Y_s)	31.4
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Change in Soil Suction (Δu)	0.6
Extra Suction Change (Δu base)	0.33
Suction Depth (H_t)	2.7
Depth of Soil Cracking	2.7

Maximum Potential Surface Movement (Y_{tmax})	6.6
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Additional comments:

Project Number:	233307	Site Address:	Lot 92 DP 1285477 Cedar Creek Estate, Wingham
Report Date:	26/01/2024	Fieldwork By:	Richard Badior
Fieldwork Date:	22/01/2024	Test Location:	See Site Plan

Shrink Swell Calculations



Borehole / Testpit	BH12
Depth	<i>u50 & Bulk - 0.2/0.35m</i>
Date Tested	22/01/2024
Pocket Penetrometer (Before)	350kPa
Pocket Penetrometer (After)	250kPa
Shrinkage - Moisture Content	16.76%
Shrinkage	2.89%
Swell - Moisture Content (Before)	18.87%
Swell - Moisture Content (After)	19.35%
Swell	0.24%
Shrink Swell Index (Iss)	1.67

Change in Soil Suction (Δu)	1.2
Suction Depth (H_s)	1.8

Characteristic Surface Movement (Y_s)	16.9
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Change in Soil Suction (Δu)	0.6
Extra Suction Change (Δu base)	0.33
Suction Depth (H_t)	2.7
Depth of Soil Cracking	2.7

Maximum Potential Surface Movement (Y_{tmax})	3.6
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Additional comments:

Project Number:	233307	Site Address:	Lot 92 DP 1285477 Cedar Creek Estate, Wingham
Report Date:	26/01/2024	Fieldwork By:	Richard Badior
Fieldwork Date:	22/01/2024	Test Location:	See Site Plan

ATTERBERG LIMITS REPORT

Client:	DRB Consulting Engineers	Report Number:	16822/R/46294-1
Client Address:	260 Maitland Rd, Mayfield	Project Number:	16822/P/236
Project:	Construction Materials Testing - Newcastle / Hunter Valley	Lot Number:	233307
Location:	NSW	Internal Test Request:	16822/T/26423
Component:	BH Samples	Client Reference/s:	233307
Area Description:	Cedar Creek Estate, Wingham.	Report Date / Page:	6/02/2024 Page 1 of 4

Test Procedures:	AS1289.3.1.2, AS 1289.3.3.1, AS1289.3.2.1, AS1289.3.4.1, AS1289.2.1.1		
Sample Number	16822/S/141624	Sample Location	
Sampling Method	Tested As Received	Bore No.	BH2
Date Sampled	22/01/2024	Sample Type	Bulk
Sampled By	Client Sampled	Sample Depth m	0.4 - 0.8
Date Tested	30/01/2024		
Drying / Prep Method	Oven Dried / Dry Sieved	Material Source	In situ
LL Water Type	Potable	Material Type	Insitu
LL Device Type	Cassagrande	Specification	-
Client Reference	233307	Prep Mat > 53mm (%)	-

Material Description	-
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Atterberg Limit	Specification Minimum	Test Result	Specification Maximum
Liquid Limit (%)		31	
Plastic Limit (%)		17	
Plasticity Index (%)		14	
Linear Shrinkage (%)		3.0	
Linear Shrinkage Mould Length / Defects:	Mould Length: 254.0mm / None		

Remarks

Accredited for compliance with ISO/IEC 17025 – Testing		
	Accreditation Number: 1986 Corporate Site Number: 16822	
		Approved Signatory: Eric Foster Form ID: W11bRep Rev 2

ATTERBERG LIMITS REPORT

Client:	DRB Consulting Engineers	Report Number:	16822/R/46294-1
Client Address:	260 Maitland Rd, Mayfield	Project Number:	16822/P/236
Project:	Construction Materials Testing - Newcastle / Hunter Valley	Lot Number:	233307
Location:	NSW	Internal Test Request:	16822/T/26423
Component:	BH Samples	Client Reference/s:	233307
Area Description:	Cedar Creek Estate, Wingham.	Report Date / Page:	6/02/2024 Page 2 of 4

Test Procedures:	AS1289.3.1.2, AS 1289.3.3.1, AS1289.3.2.1, AS1289.3.4.1, AS1289.2.1.1		
Sample Number	16822/S/141625	Sample Location	
Sampling Method	Tested As Received	Bore No.	BH4
Date Sampled	22/01/2024	Sample Type	Bulk
Sampled By	Client Sampled	Sample Depth m	0.2 - 0.4
Date Tested	2/02/2024		
Drying / Prep Method	Oven Dried / Dry Sieved	Material Source	In situ
LL Water Type	Potable	Material Type	Insitu
LL Device Type	Cassagrande	Specification	-
Client Reference	233307	Prep Mat > 53mm (%)	-

Material Description	-
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Atterberg Limit	Specification Minimum	Test Result	Specification Maximum
Liquid Limit (%)		71	
Plastic Limit (%)		26	
Plasticity Index (%)		45	
Linear Shrinkage (%)		16.5	
Linear Shrinkage Mould Length / Defects:	Mould Length: 253.9mm / Curling		

Remarks

Accredited for compliance with ISO/IEC 17025 – Testing		
	Accreditation Number: 1986 Corporate Site Number: 16822	
		Approved Signatory: Eric Foster Form ID: W11bRep Rev 2

ATTERBERG LIMITS REPORT

Client:	DRB Consulting Engineers	Report Number:	16822/R/46294-1
Client Address:	260 Maitland Rd, Mayfield	Project Number:	16822/P/236
Project:	Construction Materials Testing - Newcastle / Hunter Valley	Lot Number:	233307
Location:	NSW	Internal Test Request:	16822/T/26423
Component:	BH Samples	Client Reference/s:	233307
Area Description:	Cedar Creek Estate, Wingham.	Report Date / Page:	6/02/2024 Page 3 of 4

Test Procedures:	AS1289.3.1.2, AS 1289.3.3.1, AS1289.3.2.1, AS1289.3.4.1, AS1289.2.1.1		
Sample Number	16822/S/141626	Sample Location	
Sampling Method	Tested As Received	Bore No.	BH9
Date Sampled	22/01/2024	Sample Type	Bulk
Sampled By	Client Sampled	Sample Depth m	0.2 - 0.4
Date Tested	30/01/2024		
Drying / Prep Method	Oven Dried / Dry Sieved	Material Source	In situ
LL Water Type	Potable	Material Type	Insitu
LL Device Type	Cassagrande	Specification	-
Client Reference	233307	Prep Mat > 53mm (%)	-

Material Description	-
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Atterberg Limit	Specification Minimum	Test Result	Specification Maximum
Liquid Limit (%)		52	
Plastic Limit (%)		20	
Plasticity Index (%)		32	
Linear Shrinkage (%)		13.0	
Linear Shrinkage Observations:	Curling		

Remarks

Accredited for compliance with ISO/IEC 17025 – Testing		
	Accreditation Number: 1986 Corporate Site Number: 16822	
		Approved Signatory: Eric Foster Form ID: W11bRep Rev 2

ATTERBERG LIMITS REPORT

Client:	DRB Consulting Engineers	Report Number:	16822/R/46294-1
Client Address:	260 Maitland Rd, Mayfield	Project Number:	16822/P/236
Project:	Construction Materials Testing - Newcastle / Hunter Valley	Lot Number:	233307
Location:	NSW	Internal Test Request:	16822/T/26423
Component:	BH Samples	Client Reference/s:	233307
Area Description:	Cedar Creek Estate, Wingham.	Report Date / Page:	6/02/2024 Page 4 of 4

Test Procedures:	AS1289.3.1.2, AS 1289.3.3.1, AS1289.3.2.1, AS1289.3.4.1, AS1289.2.1.1		
Sample Number	16822/S/141627	Sample Location	
Sampling Method	Tested As Received	Bore No.	BH14
Date Sampled	22/01/2024	Sample Type	Bulk
Sampled By	Client Sampled	Sample Depth m	0.1 - 0.25
Date Tested	30/01/2024		
Drying / Prep Method	Oven Dried / Dry Sieved	Material Source	In situ
LL Water Type	Potable	Material Type	Insitu
LL Device Type	Cassagrande	Specification	-
Client Reference	233307	Prep Mat > 53mm (%)	-

Material Description	-
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Atterberg Limit	Specification Minimum	Test Result	Specification Maximum
Liquid Limit (%)		36	
Plastic Limit (%)		17	
Plasticity Index (%)		19	
Linear Shrinkage (%)		5.0	
Linear Shrinkage Mould Length / Defects:	Mould Length: 250.3mm / None		

Remarks

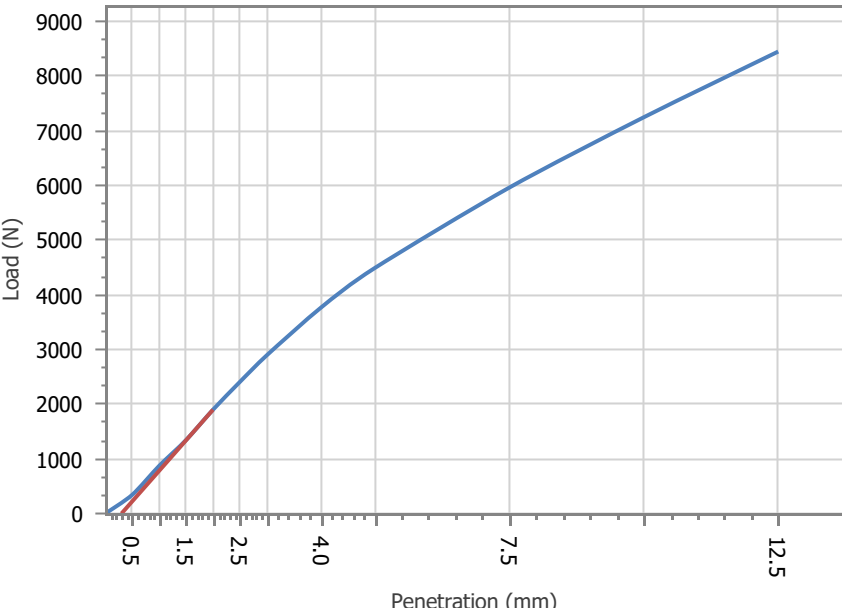
Accredited for compliance with ISO/IEC 17025 – Testing		
	Accreditation Number: 1986 Corporate Site Number: 16822	
		Approved Signatory: Eric Foster Form ID: W11bRep Rev 2

CALIFORNIA BEARING RATIO REPORT

Client:	DRB Consulting Engineers	Report Number:	16822/R/46295-1
Client Address:	260 Maitland Rd, Mayfield	Project Number:	16822/P/236
Project:	Construction Materials Testing - Newcastle / Hunter Valley	Lot Number:	233307
Location:	NSW	Internal Test Request:	16822/T/26423
Component:	BH Samples	Client Reference/s:	233307
Area Description:	Cedar Creek Estate, Wingham.	Report Date / Page:	6/02/2024 Page 1 of 4

Test Procedures	TS 02795.11, T105, TS 02795.06, TS 02795.14		
Sample Number	16822/S/141632	Bore No.	BH2
Sampling Method	Tested As Received	Sample Type	Bulk
Date Sampled	22/01/2024	Sample Depth	m 0.4 - 0.8
Sampled By	Client Sampled	Prep Material > 53mm (%)	-
Date Tested	29/01/2024	Material Limit Start	-
Material Source	In situ	Material Limit End	-
Material Type	Insitu	Compactive Effort	Standard
Client Reference	233307		

Material Description	Gravelly Sandy Silt
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Maximum Dry Density (t/m³):	1.698	CBR PENETRATION PLOT 
Optimum Moisture Content (%):	16.9	
Field Moisture Content (%):	14.5	
Oversize (100mm/53mm/19mm) (%):	0 / 0 / 4	
Oversize Included / Excluded	-	
Target Density Ratio (%):	100	
Target Moisture Ratio (%):	100	
Placement Dry Density (t/m³):	1.696	
Placement Dry Density Ratio (%):	100	
Placement Moisture Content (%):	17.0	
Placement Moisture Ratio (%):	101	
Test Condition / Soaking Period:	Soaked / 4 Days	
CBR Surcharge (kg)	4.5	
Dry Density After Soak (t/m³):	1.696	
Moisture (top 30mm) After Soak (%)	19.7	
Moisture (full depth) After Soak (%)	19.1	
CBR Swell (%):	0.0	
Minimum CBR Specification (%):	-	
CBR Value @ 5.0mm (%):	25	

Remarks

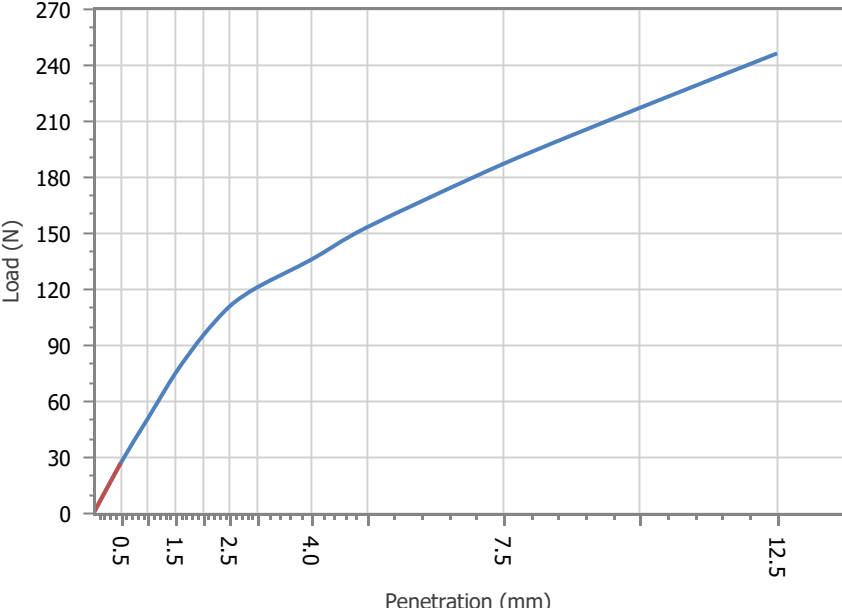
Accredited for compliance with ISO/IEC 17025 – Testing		
	Accreditation Number: 1986 Corporate Site Number: 16822	
		Approved Signatory: Eric Foster Form ID: W2ASRep Rev 3

CALIFORNIA BEARING RATIO REPORT

Client:	DRB Consulting Engineers	Report Number:	16822/R/46295-1
Client Address:	260 Maitland Rd, Mayfield	Project Number:	16822/P/236
Project:	Construction Materials Testing - Newcastle / Hunter Valley	Lot Number:	233307
Location:	NSW	Internal Test Request:	16822/T/26423
Component:	BH Samples	Client Reference/s:	233307
Area Description:	Cedar Creek Estate, Wingham.	Report Date / Page:	6/02/2024 Page 2 of 4

Test Procedures	TS 02795.11, T105, TS 02795.06, TS 02795.14		
Sample Number	16822/S/141633	Bore No.	BH4
Sampling Method	Tested As Received	Sample Type	Bulk
Date Sampled	22/01/2024	Sample Depth	m 0.2 - 0.4
Sampled By	Client Sampled		
Date Tested	29/01/2024	Prep Material > 53mm (%)	0
Material Source	In situ	Material Limit Start	-
Material Type	Insitu	Material Limit End	-
Client Reference	233307	Compactive Effort	Standard

Material Description	Silty CLAY
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Maximum Dry Density (t/m³):	1.451	CBR PENETRATION PLOT 
Optimum Moisture Content (%):	27.1	
Field Moisture Content (%):	5.4	
Oversize (100mm/53mm/19mm) (%):	0 / 0 / 0	
Oversize Included / Excluded	Excluded	
Target Density Ratio (%):	100	
Target Moisture Ratio (%):	100	
Placement Dry Density (t/m³):	1.454	
Placement Dry Density Ratio (%):	100	
Placement Moisture Content (%):	27.4	
Placement Moisture Ratio (%):	101	
Test Condition / Soaking Period:	Soaked / 4 Days	
CBR Surcharge (kg)	4.5	
Dry Density After Soak (t/m³):	1.384	
Moisture (top 30mm) After Soak (%)	44.7	
Moisture (full depth) After Soak (%)	35.3	
CBR Swell (%):	5.1	
Minimum CBR Specification (%):	-	
CBR Value @ 5.0mm (%):	1.0	

Remarks

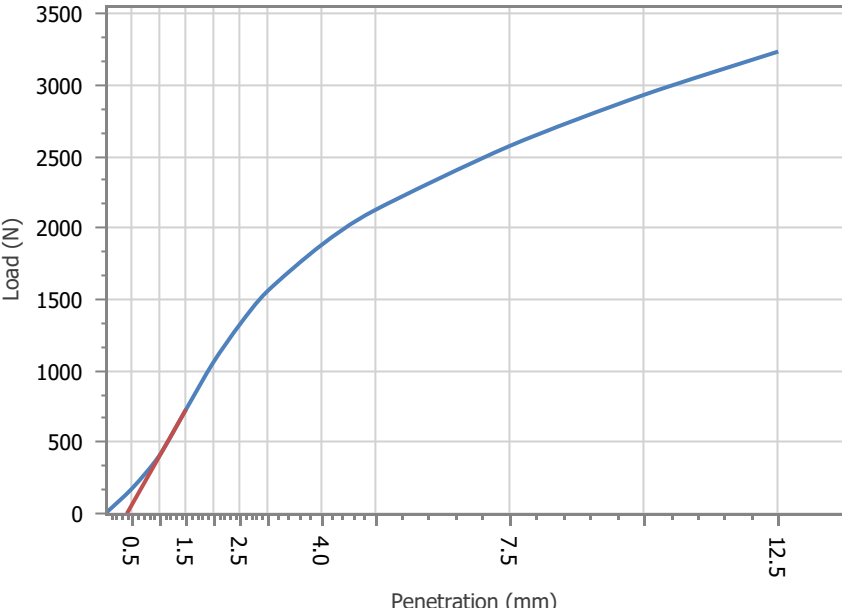
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	Accreditation Number: 1986 Corporate Site Number: 16822	
		Approved Signatory: Eric Foster Form ID: W2ASRep Rev 3

CALIFORNIA BEARING RATIO REPORT

Client:	DRB Consulting Engineers	Report Number:	16822/R/46295-1
Client Address:	260 Maitland Rd, Mayfield	Project Number:	16822/P/236
Project:	Construction Materials Testing - Newcastle / Hunter Valley	Lot Number:	233307
Location:	NSW	Internal Test Request:	16822/T/26423
Component:	BH Samples	Client Reference/s:	233307
Area Description:	Cedar Creek Estate, Wingham.	Report Date / Page:	6/02/2024 Page 3 of 4

Test Procedures	TS 02795.11, T105, TS 02795.06, TS 02795.14		
Sample Number	16822/S/141634	Bore No.	BH9
Sampling Method	Tested As Received	Sample Type	Bulk
Date Sampled	22/01/2024	Sample Depth	m 0.2 - 0.5
Sampled By	Client Sampled	Prep Material > 53mm (%)	-
Date Tested	29/01/2024	Material Limit Start	-
Material Source	In situ	Material Limit End	-
Material Type	Insitu	Compactive Effort	Standard
Client Reference	233307		

Material Description	Silty Gravel
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Maximum Dry Density (t/m ³):	1.651	CBR PENETRATION PLOT 
Optimum Moisture Content (%):	18.5	
Field Moisture Content (%):	19.5	
Oversize (100mm/53mm/19mm) (%):	0 / 0 / 5	
Oversize Included / Excluded	-	
Target Density Ratio (%):	100	
Target Moisture Ratio (%):	100	
Placement Dry Density (t/m ³):	1.651	
Placement Dry Density Ratio (%):	100	
Placement Moisture Content (%):	18.4	
Placement Moisture Ratio (%):	100	
Test Condition / Soaking Period:	Soaked / 4 Days	
CBR Surcharge (kg)	4.5	
Dry Density After Soak (t/m ³):	1.647	
Moisture (top 30mm) After Soak (%)	24.6	
Moisture (full depth) After Soak (%)	20.1	
CBR Swell (%):	0.3	
Minimum CBR Specification (%):	-	
CBR Value @ 2.5mm (%):	11	

Remarks

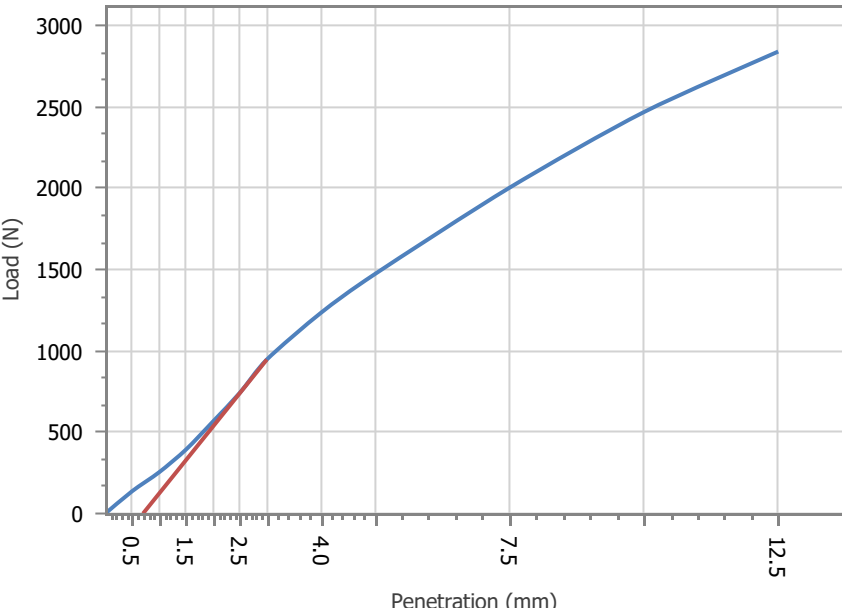
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	Accreditation Number: 1986 Corporate Site Number: 16822	
		Approved Signatory: Eric Foster Form ID: W2ASRep Rev 3

CALIFORNIA BEARING RATIO REPORT

Client:	DRB Consulting Engineers	Report Number:	16822/R/46295-1
Client Address:	260 Maitland Rd, Mayfield	Project Number:	16822/P/236
Project:	Construction Materials Testing - Newcastle / Hunter Valley	Lot Number:	233307
Location:	NSW	Internal Test Request:	16822/T/26423
Component:	BH Samples	Client Reference/s:	233307
Area Description:	Cedar Creek Estate, Wingham.	Report Date / Page:	6/02/2024 Page 4 of 4

Test Procedures	TS 02795.11, T105, TS 02795.06, TS 02795.14		
Sample Number	16822/S/141635	Bore No.	BH14
Sampling Method	Tested As Received	Sample Type	Bulk
Date Sampled	22/01/2024	Sample Depth	m 0.1 - 0.25
Sampled By	Client Sampled	Prep Material > 53mm (%)	0
Date Tested	29/01/2024	Material Limit Start	-
Material Source	In situ	Material Limit End	-
Material Type	Insitu	Compactive Effort	Standard
Client Reference	233307		

Material Description	SILT with gravel
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Maximum Dry Density (t/m³):	1.571	CBR PENETRATION PLOT 
Optimum Moisture Content (%):	22.5	
Field Moisture Content (%):	21.7	
Oversize (100mm/53mm/19mm) (%):	0 / 0 / 19	
Oversize Included / Excluded	Excluded	
Target Density Ratio (%):	100	
Target Moisture Ratio (%):	100	
Placement Dry Density (t/m³):	1.570	
Placement Dry Density Ratio (%):	100	
Placement Moisture Content (%):	22.7	
Placement Moisture Ratio (%):	101	
Test Condition / Soaking Period:	Soaked / 4 Days	
CBR Surcharge (kg)	4.5	
Dry Density After Soak (t/m³):	1.567	
Moisture (top 30mm) After Soak (%)	28.2	
Moisture (full depth) After Soak (%)	24.8	
CBR Swell (%):	0.2	
Minimum CBR Specification (%):	-	
CBR Value @ 5.0mm (%):	8	

Remarks

Accredited for compliance with ISO/IEC 17025 – Testing		
	Accreditation Number: 1986 Corporate Site Number: 16822	
		Approved Signatory: Eric Foster Form ID: W2ASRep Rev 3

EMERSON CLASS NUMBER REPORT

Client:	DRB Consulting Engineers	Report Number:	16822/R/46296-1
Client Address:	260 Maitland Rd, Mayfield	Project Number:	16822/P/236
Project:	Construction Materials Testing - Newcastle / Hunter Valley	Lot Number:	233307
Location:	NSW	Internal Test Request:	16822/T/26423
Component:	BH Samples	Client Reference/s:	233307
Area Description:	Cedar Creek Estate, Wingham.	Report Date / Page:	6/02/2024

Page 1 of 1

Test Procedures:	AS1289.3.8.1
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Sample Number	16822/S/141628	16822/S/141629	16822/S/141630	16822/S/141631
ID / Client ID	233307	233307	233307	233307
Lot Number	233307	233307	233307	233307
Date / Time Sampled	22/01/2024	22/01/2024	22/01/2024	22/01/2024
Date Tested	24/01/2024	24/01/2024	24/01/2024	24/01/2024
Material Source	In situ	In situ	In situ	In situ
Material Type	Insitu	Insitu	Insitu	Insitu
Sampling Method	Tested As Received	Tested As Received	Tested As Received	Tested As Received
Prep Material > 53mm (%)	-	-	-	-
Water Type	Potable	Potable	Potable	Potable
Water Temperature (°C)	23	23	23	23
Bore No.	BH2	BH4	BH7	BH13
Sample Type m	Bulk	Bulk	Bulk	Bulk
Sample Depth m	0.5 - 0.8	0.2 - 0.4	0.2 - 0.4	0.2 - 0.3
Soil Description	Silty Gravelly CLAY	CLAY	Silty Gravelly CLAY	CLAY
Emerson Class Description	Slakes. No dispersion Calcite or gypsum present	Slakes. No dispersion Calcite or gypsum present	Slakes. No dispersion Calcite or gypsum present	Slakes. No dispersion Calcite or gypsum present
Emerson Class Number	4	4	4	4

Remarks

Accredited for compliance with ISO/IEC 17025 – Testing


 Accreditation Number: 1986
 Corporate Site Number: 16822



 Approved Signatory: Eric Foster
 Form ID: W22Rep Rev 4

DRB Consulting Engineers
27 Dunkley Ave
New Lambton
NSW 2305



NATA Accredited
Accreditation Number 1261
Site Number 20794

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, proficiency testing scheme providers and
 reference materials producers reports and certificates.

Attention: **Chris Smith**

Report **1061556-S**

Project name

Project ID **233307**

Received Date Jan 23, 2024

Client Sample ID			BH4 0.2-0.4	BH1 0.3-0.5	BH7 0.2-0.4	BH11 0.2-0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			N24-Ja0032093	N24-Ja0032094	N24-Ja0032095	N24-Ja0032096
Date Sampled			Jan 22, 2024	Jan 22, 2024	Jan 22, 2024	Jan 22, 2024
Test/Reference	LOR	Unit				
SPOCAS Suite						
pH-KCL (NLM-3.1)	0.1	pH Units	4.1	4.8	4.7	4.6
pH-OX	0.1	pH Units	4.1	5.2	4.5	4.7
Titratable Actual Acidity (NLM-3.2)	2	mol H+/t	150	22	25	44
Titratable Peroxide Acidity (a-TPA)	2	mol H+/t	240	6.6	24	37
Titratable Sulfidic Acidity (a-TSA)	2	mol H+/t	91	< 2	< 2	< 2
Titratable Actual Acidity (NLM-3.2)	0.003	% pyrite S	0.24	0.036	0.040	0.070
Titratable Peroxide Acidity (s-TPA)	0.02	% pyrite S	0.38	< 0.02	0.04	0.06
Titratable Sulfidic Acidity (s-TSA)	0.02	% pyrite S	0.15	< 0.02	< 0.02	< 0.02
Sulfur - KCl Extractable	0.005	% S	< 0.005	0.006	< 0.005	< 0.005
Peroxide Extractable Sulfur	0.005	% S	0.012	0.013	< 0.005	0.009
Peroxide Oxidisable Sulfur (s-SPOS) (NLM 2.2)	0.005	% S	0.012	0.007	< 0.005	0.009
Peroxide Oxidisable Sulfur (a-SPOS) (NLM 2.2)	2	mol H+/t	7.5	4.6	< 2	5.5
HCl Extractable Sulfur Correction Factor	1	factor	2.0	2.0	2.0	2.0
HCl Extractable Sulfur	0.005	% S	0.007	N/A	N/A	N/A
Net Acid soluble sulfur (a-SNAS) NLM-4.1	2	mol H+/t	6.4	N/A	N/A	N/A
Net Acid soluble sulfur (s-SNAS) NLM-4.1 ^{S02}	0.005	% S	0.010	N/A	N/A	N/A
Calcium - KCl Extractable	0.005	% Ca	0.14	0.013	0.029	0.021
Calcium - Peroxide	0.005	% Ca	0.14	0.013	0.030	0.023
Calcium - Acid Reacted	0.005	% Ca	< 0.005	< 0.005	< 0.005	< 0.005
Calcium - Acid Reacted (a-aCa)	0.005	mol H+/t	< 0.005	< 0.005	< 0.005	< 0.005
Calcium - Acid Reacted (s-aCa)	0.005	% S	< 0.005	< 0.005	< 0.005	< 0.005
Magnesium - KCl Extractable	0.005	% Mg	0.091	0.17	0.077	0.11
Magnesium - Peroxide	0.005	% Mg	0.089	0.17	0.079	0.11
Magnesium - Acid Reacted	0.005	% Mg	< 0.005	0.006	< 0.005	< 0.005
Magnesium - Acid Reacted (a-aCa)	0.005	mol H+/t	< 0.005	4.7	< 0.005	< 0.005
Magnesium - Acid Reacted (s-aCa)	0.005	% S	< 0.005	0.008	< 0.005	< 0.005
Acid Neutralising Capacity - (ANCE)	0.02	% CaCO3	N/A	N/A	N/A	N/A
Acid Neutralising Capacity - (a-ANCE)	10	mol H+/t	n/a	n/a	n/a	n/a
Acid Neutralising Capacity - (s-ANCE)	0.02	% S	N/A	N/A	N/A	N/A
ANC Fineness Factor		factor	1.5	1.5	1.5	1.5
SPOCAS - Net Acidity - ASSMAC (Sulfur Units)	0.02	% S	0.26	0.04	0.04	0.08
SPOCAS - Net Acidity - ASSMAC (Acidity Units)	10	mol H+/t	160	27	25	49
SPOCAS - Liming rate - ASSMAC	1	kg CaCO3/t	12	2.0	1.9	3.7

Client Sample ID			BH4 0.2-0.4	BH1 0.3-0.5	BH7 0.2-0.4	BH11 0.2-0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			N24-Ja0032093	N24-Ja0032094	N24-Ja0032095	N24-Ja0032096
Date Sampled			Jan 22, 2024	Jan 22, 2024	Jan 22, 2024	Jan 22, 2024
Test/Reference	LOR	Unit				
Extraneous Material						
<2mm Fraction	0.005	g	90	82	150	120
>2mm Fraction	0.005	g	< 0.005	< 0.005	< 0.005	< 0.005
Analysed Material	0.1	%	100	100	100	100
Extraneous Material	0.1	%	< 0.1	< 0.1	< 0.1	< 0.1
Sample Properties						
% Moisture	1	%	25	9.5	20	15

Client Sample ID			BH12 0.2-0.35	BH14 0.11-0.25
Sample Matrix			Soil	Soil
Eurofins Sample No.			N24-Ja0032097	N24-Ja0032098
Date Sampled			Jan 22, 2024	Jan 22, 2024
Test/Reference	LOR	Unit		
SPOCAS Suite				
pH-KCL (NLM-3.1)	0.1	pH Units	4.3	4.8
pH-OX	0.1	pH Units	4.7	3.8
Titrateable Actual Acidity (NLM-3.2)	2	mol H+/t	120	81
Titrateable Peroxide Acidity (a-TPA)	2	mol H+/t	130	220
Titrateable Sulfidic Acidity (a-TSA)	2	mol H+/t	< 2	140
Titrateable Actual Acidity (NLM-3.2)	0.003	% pyrite S	0.19	0.13
Titrateable Peroxide Acidity (s-TPA)	0.02	% pyrite S	0.21	0.35
Titrateable Sulfidic Acidity (s-TSA)	0.02	% pyrite S	< 0.02	0.22
Sulfur - KCl Extractable	0.005	% S	< 0.005	< 0.005
Peroxide Extractable Sulfur	0.005	% S	0.006	0.013
Peroxide Oxidisable Sulfur (s-SPOS) (NLM 2.2)	0.005	% S	0.006	0.013
Peroxide Oxidisable Sulfur (a-SPOS) (NLM 2.2)	2	mol H+/t	3.5	8.1
HCl Extractable Sulfur Correction Factor	1	factor	2.0	2.0
HCl Extractable Sulfur	0.005	% S	0.005	N/A
Net Acid soluble sulfur (a-SNAS) NLM-4.1	2	mol H+/t	5.0	N/A
Net Acid soluble sulfur (s-SNAS) NLM-4.1 ^{S02}	0.005	% S	0.008	N/A
Calcium - KCl Extractable	0.005	% Ca	0.025	0.046
Calcium - Peroxide	0.005	% Ca	0.027	0.051
Calcium - Acid Reacted	0.005	% Ca	< 0.005	< 0.005
Calcium - Acid Reacted (a-aCa)	0.005	mol H+/t	< 0.005	< 0.005
Calcium - Acid Reacted (s-aCa)	0.005	% S	< 0.005	< 0.005
Magnesium - KCl Extractable	0.005	% Mg	0.14	0.036
Magnesium - Peroxide	0.005	% Mg	0.15	0.039
Magnesium - Acid Reacted	0.005	% Mg	0.008	< 0.005
Magnesium - Acid Reacted (a-aCa)	0.005	mol H+/t	6.6	< 0.005
Magnesium - Acid Reacted (s-aCa)	0.005	% S	0.011	< 0.005
Acid Neutralising Capacity - (ANCE)	0.02	% CaCO3	N/A	N/A
Acid Neutralising Capacity - (a-ANCE)	10	mol H+/t	n/a	n/a
Acid Neutralising Capacity - (s-ANCE)	0.02	% S	N/A	N/A
ANC Fineness Factor		factor	1.5	1.5
SPOCAS - Net Acidity - ASSMAC (Sulfur Units)	0.02	% S	0.20	0.14
SPOCAS - Net Acidity - ASSMAC (Acidity Units)	10	mol H+/t	130	89
SPOCAS - Liming rate - ASSMAC	1	kg CaCO3/t	9.6	6.7

Client Sample ID			BH12 0.2-0.35	BH14 0.11-0.25
Sample Matrix			Soil	Soil
Eurofins Sample No.			N24-Ja0032097	N24-Ja0032098
Date Sampled			Jan 22, 2024	Jan 22, 2024
Test/Reference	LOR	Unit		
Extraneous Material				
<2mm Fraction	0.005	g	61	100
>2mm Fraction	0.005	g	< 0.005	< 0.005
Analysed Material	0.1	%	100	100
Extraneous Material	0.1	%	< 0.1	< 0.1
Sample Properties				
% Moisture	1	%	15	16

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
SPOCAS Suite			
SPOCAS Suite	Brisbane	Jan 31, 2024	6 Week
- Method: LTM-GEN-7050			
Extraneous Material	Brisbane	Jan 31, 2024	6 Week
- Method: LTM-GEN-7050/7070			
% Moisture	Brisbane	Jan 23, 2024	14 Days
- Method: LTM-GEN-7080 Moisture			



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ABN: 50 005 085 521

ABN: 91 05 0159 898

NZBN: 9429046024954

Melbourne 6 Monterey Road Dandenong South VIC 3175 +61 3 8564 5000 NATA# 1261 Site# 1254	Geelong 19/8 Lewalan Street Grovedale VIC 3216 +61 3 8564 5000 NATA# 1261 Site# 25403	Sydney 179 Magowar Road Girraween NSW 2145 +61 2 9900 8400 NATA# 1261 Site# 18217	Canberra Unit 1,2 Dacre Street Mitchell ACT 2911 +61 2 6113 8091 NATA# 1261 Site# 25466	Brisbane 1/21 Smallwood Place Murarie QLD 4172 T: +61 7 3902 4600 NATA# 1261 Site# 20794	Newcastle 1/2 Frost Drive Mayfield West NSW 2304 +61 2 4968 8448 NATA# 1261 Site# 25079 & 25289
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Perth 46-48 Banksia Road Welshpool WA 6106 +61 8 6253 4444 NATA# 2377 Site# 2370	Auckland 35 O'Rorke Road Penrose, Auckland 1061 +64 9 526 4551 IANZ# 1327	Auckland (Asb) Unit C1/4 Pacific Rise, Mount Wellington, Auckland 1061 +64 9 525 0568 IANZ# 1308	Christchurch 43 Detroit Drive Rolleston, Christchurch 7675 +64 3 343 5201 IANZ# 1290	Tauranga 1277 Cameron Road, Gate Pa, Tauranga 3112 +64 9 525 0568 IANZ# 1402
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Company Name:	DRB Consulting Engineers	Order No.:	233307	Received:	Jan 23, 2024 8:26 AM
Address:	27 Dunkley Ave New Lambton NSW 2305	Report #:	1061556	Due:	Jan 31, 2024
		Phone:	0401 542 446	Priority:	5 Day
		Fax:		Contact Name:	Chris Smith
Project Name:					
Project ID:	233307				
Eurofins Analytical Services Manager : Ursula Long					

Sample Detail						SPOCAS Suite	Moisture Set
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
External Laboratory							
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	BH4 0.2-0.4	Jan 22, 2024		Soil	N24-Ja0032093	X	X
2	BH1 0.3-0.5	Jan 22, 2024		Soil	N24-Ja0032094	X	X
3	BH7 0.2-0.4	Jan 22, 2024		Soil	N24-Ja0032095	X	X
4	BH11 0.2-0.4	Jan 22, 2024		Soil	N24-Ja0032096	X	X
5	BH12 0.2-0.35	Jan 22, 2024		Soil	N24-Ja0032097	X	X
6	BH14 0.11-0.25	Jan 22, 2024		Soil	N24-Ja0032098	X	X
Test Counts						6	6

Internal Quality Control Review and Glossary

General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
- All soil/sediment/solid results are reported on a dry weight basis unless otherwise stated.
- All biota/food results are reported on a wet weight basis on the edible portion unless otherwise stated.
- For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
- Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- Information identified in this report with **blue** colour indicates data provided by customers that may have an impact on the results.
- This report replaces any interim results previously issued.

Holding Times

Please refer to the '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 before sample receipt deadlines as stated on the SRA.

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

Holding times apply from the date of sampling; therefore, compliance with 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, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	mg/L: milligrams per litre	ppm: parts per million
µg/L: micrograms per litre	ppb: parts per billion	%: Percentage
org/100 mL: Organisms per 100 millilitres	NTU: Nephelometric Turbidity Units	MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit	Colour: Pt-Co Units	

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - 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.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria.
TBTO	Tributyltin oxide (<i>bis</i> -tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however, free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should only be used as a guide and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

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%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%, VOC recoveries 70 – 130%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 5.4, where no positive PFAS results have been reported or reviewed, and no data was affected.

QC Data General Comments

- Where a result is reported as 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.
- 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 are not data from your samples.
- 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.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
- For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
- 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
LCS - % Recovery										
SPOCAS Suite										
pH-KCL (NLM-3.1)				%	99			80-120	Pass	
HCl Extractable Sulfur				%	107			80-120	Pass	
Test	Lab Sample ID	QA Source		Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate										
SPOCAS Suite					Result 1	Result 2	RPD			
pH-KCL (NLM-3.1)	M24-Ja0032476	NCP	pH Units		7.3	7.3	<1	20%	Pass	
pH-OX	M24-Ja0032476	NCP	pH Units		3.0	3.0	<1	20%	Pass	
Titratable Actual Acidity (NLM-3.2)	M24-Ja0032476	NCP	mol H+/t		< 2	< 2	<1	20%	Pass	
Titratable Peroxide Acidity (a-TPA)	M24-Ja0032476	NCP	mol H+/t		< 2	< 2	<1	20%	Pass	
Titratable Sulfidic Acidity (a-TSA)	M24-Ja0032476	NCP	mol H+/t		< 2	< 2	<1	30%	Pass	
Titratable Actual Acidity (NLM-3.2)	M24-Ja0032476	NCP	% pyrite S		< 0.003	< 0.003	<1	30%	Pass	
Titratable Peroxide Acidity (s-TPA)	M24-Ja0032476	NCP	% pyrite S		< 0.02	< 0.02	<1	30%	Pass	
Titratable Sulfidic Acidity (s-TSA)	M24-Ja0032476	NCP	% pyrite S		< 0.02	< 0.02	<1	30%	Pass	
Sulfur - KCl Extractable	M24-Ja0032476	NCP	% S		0.019	0.019	1.8	30%	Pass	
Peroxide Extractable Sulfur	M24-Ja0032476	NCP	% S		0.086	0.087	<1	20%	Pass	
Peroxide Oxidisable Sulfur (s-SPOS) (NLM 2.2)	M24-Ja0032476	NCP	% S		0.067	0.068	1.3	30%	Pass	
Peroxide Oxidisable Sulfur (a-SPOS) (NLM 2.2)	M24-Ja0032476	NCP	mol H+/t		42	42	1.3	30%	Pass	
HCl Extractable Sulfur	M24-Ja0032476	NCP	% S		N/A	N/A	N/A	20%	Pass	
Net Acid soluble sulfur (a-SNAS) NLM-4.1	M24-Ja0032476	NCP	mol H+/t		N/A	N/A	N/A	30%	Pass	
Net Acid soluble sulfur (s-SNAS) NLM-4.1	M24-Ja0032476	NCP	% S		N/A	N/A	N/A	30%	Pass	
Calcium - KCl Extractable	M24-Ja0032476	NCP	% Ca		0.031	0.031	<1	30%	Pass	
Calcium - Peroxide	M24-Ja0032476	NCP	% Ca		0.035	0.034	2.9	20%	Pass	
Calcium - Acid Reacted	M24-Ja0032476	NCP	% Ca		< 0.005	< 0.005	<1	30%	Pass	
Calcium - Acid Reacted (a-aCa)	M24-Ja0032476	NCP	mol H+/t		< 0.005	< 0.005	<1	30%	Pass	
Calcium - Acid Reacted (s-aCa)	M24-Ja0032476	NCP	% S		< 0.005	< 0.005	<1	30%	Pass	
Magnesium - KCl Extractable	M24-Ja0032476	NCP	% Mg		0.008	0.008	<1	30%	Pass	
Magnesium - Peroxide	M24-Ja0032476	NCP	% Mg		0.009	0.009	1.9	20%	Pass	
Magnesium - Acid Reacted	M24-Ja0032476	NCP	% Mg		< 0.005	< 0.005	<1	30%	Pass	
Magnesium - Acid Reacted (a-aCa)	M24-Ja0032476	NCP	mol H+/t		< 0.005	< 0.005	<1	30%	Pass	
Magnesium - Acid Reacted (s-aCa)	M24-Ja0032476	NCP	% S		< 0.005	< 0.005	<1	30%	Pass	
Acid Neutralising Capacity - (ANCE)	M24-Ja0032476	NCP	% CaCO3		N/A	N/A	N/A	30%	Pass	
Acid Neutralising Capacity - (a-ANCE)	M24-Ja0032476	NCP	mol H+/t		n/a	n/a	N/A	30%	Pass	
ANC Fineness Factor	M24-Ja0032476	NCP	factor		1.5	1.5	<1	30%	Pass	
SPOCAS - Net Acidity - ASSMAC (Sulfur Units)	M24-Ja0032476	NCP	% S		0.02	0.02	1.3	30%	Pass	
SPOCAS - Net Acidity - ASSMAC (Acidity Units)	M24-Ja0032476	NCP	mol H+/t		14	14	1.3	30%	Pass	
SPOCAS - Liming rate - ASSMAC	M24-Ja0032476	NCP	kg CaCO3/t		1.0	1.1	1.3	30%	Pass	
Duplicate										
Sample Properties					Result 1	Result 2	RPD			
% Moisture	N24-Ja0032094	CP	%		9.5	10	5.9	30%	Pass	

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
S02	Retained Acidity is Reported when the pHKCl is less than pH 4.5

Authorised by:

Andrew Black	Analytical Services Manager
Jonathon Angell	Senior Analyst-Sample Properties
Jonathon Angell	Senior Analyst-SPOCAS



Glenn Jackson
Managing Director

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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SYDNEY ANALYTICAL LABORATORIES

Page 1 of 3

Office:
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Laboratory:
1/4 ABBOTT ROAD
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Telephone: (02) 9838 8903
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A.C.N. 003 614 695
A.B.N. 81 829 182 852
NATA No: 1884

ANALYTICAL REPORT for:

DRB CONSULTING ENGINEERS

260 MAITLAND ROAD
MAYFIELD, NSW, 2304

ATTN: RICHARD BADIOR

JOB NO: SAL28804
CLIENT ORDER: 233307
DATE RECEIVED: 29/01/24
DATE COMPLETED: 09/02/24
TYPE OF SAMPLES: SOILS
NO OF SAMPLES: 4




.....
Issued on 27/02/24
Lance Smith
(Chief Chemist)

ANALYTICAL REPORT

**JOB NO: SAL28804
CLIENT ORDER: 233307**

SAMPLES	pH Sat.	Cl mg/kg	SO4 mg/kg	*RESIS. ohm.m
1 BH2_0.4-0.8m	5.6	10	15	>100
2 BH4_0.2-0.4m	4.1	10	10	>100
3 BH7_0.2-0.4m	4.8	5	5	>100
4 BH13_0.2-0.3m	4.2	15	10	>100
MDL	0.1	5	5	1
Method Code	C23	C24	C6	C21
Preparation	P4	P4	P4	P8

RESULTS ON DRY BASIS, DATE OF COLLECTION: 22/01/24
PROJECT: CEDAR CREEK ESTATE, WINGHAM

ANALYTICAL REPORT

JOB NO: SAL28804

CLIENT ORDER: 233307

METHODS OF PREPARATION AND ANALYSIS

The tests contained in this report have been carried out on the samples as received by the laboratory. In the case where an analyte or group of analytes are received outside of recommended holding times, the analysis will proceed and the report annotated. Analysis is carried out within analyte holding times where possible.

P4	Sample dried, sieved at 9.5mm, split and crushed to -425um
P8	Sample dried and crushed to pass 6.7mm sieve
C23	pH - TfNSW T123
C24	Water Soluble Chloride - TfNSW T1010
C6	Water Soluble Sulphate - AS1289.4.2.1 Determined by APHA 4110B
*C21	Electrical Resistivity - RMS T185

*The laboratory's NATA accreditation does not cover performance of this test

