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Our ref: 754-NTLEN-213472-L07 Rev 1

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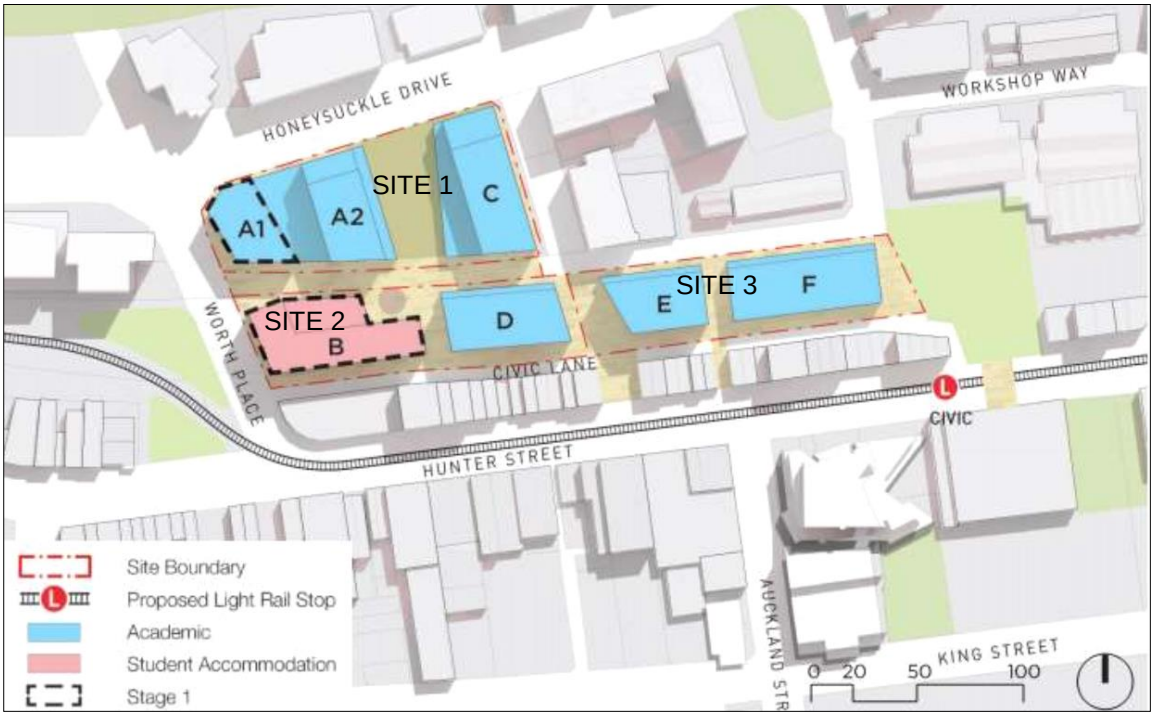
Attention: Mathew Watson (APP)

Modification of Existing Secretary's Environmental Assessment Requirements (SEARS) Documentation to Reflect Stage 1A (Site 1, Building A1) (Status of Contamination, Mine Subsidence and Groundwater)

1. Introduction

The University of Newcastle (UON) has acquired the property located at 16, 16A and 16B Honeysuckle Drive, Newcastle (Lots 1,2 and 3 DP 1163346) for the purposes of increasing the existing CBD presence of The University with the implementation of the Honeysuckle City Campus Development (HCCD). The property is defined as Site 1 of the proposed HCCD development.

Figure 1: Concept Plan University of Newcastle Proposed HCCD



The University has received Secretary's Environmental Assessment Requirements (SEARs) for Stage 1A of the HCCD project (to be constructed on Site 1), related to the current status of contamination of the site and also the status of mine subsidence at the site.

The SEARS required the following to be addressed:

- Item 13 – Contamination

  "The EIS shall:

  - *assess and quantify any soil and groundwater contamination and demonstrate that the site is suitable for the proposed use in accordance with SEPP 55*
  - *where relevant, undertake a hazardous materials survey of all existing structures and infrastructure prior to any demolition or site preparation works."*

- Item 17 – Mine Subsidence

  "The EIS shall provide a Geotechnical Investigation and Report (prepared by a recognised professional in consultation with the Mine Subsidence Board) which addresses potential subsidence risks, stabilisation works required/ undertaken and confirms suitability of the site for the proposal."

2. Objective

The objective of this letter report is to provide a response to SEARs related to the status of mine subsidence and contamination at Site 1. This response is intended to satisfy the requirements of the SEARS, highlighting whether the Site is, or can be made, suitable for the proposed Stage 1A development.

The scope of work includes:

- A summary of the outcomes of the detailed site investigation carried out on Site 1 and reported in February 2019;
- An update on mine subsidence status of Site 1 specifically related to historical assessments, identified risks, remedial grouting proposed, and numerical modelling completed for Sites 1; and
- Provision of a statement as to whether the sites can be made suitable for the future proposed HCCD from a mine subsidence and contamination perspective.

3. SEARS Response Item 13

3.1. Detailed Site Investigation Summary – Site 1

Coffey has previously identified the need to undertake further contamination assessments across Sites 1, 2 and 3 which was included in a response to SEARS for the HCCD Development Application (Coffey Ref: 754-NTLEN213472-L02, Status of Site Contamination and Mine Subsidence at Sites 1, 2 and 3, University of Newcastle Honeysuckle Campus Concept Plan Development Application (DA)). Specifically, for Site 1, the report identified that there was, at the time of reporting, seven (7) sampling locations assessed for a suite of contaminants of concern (CoCs) and an additional thirteen (13) locations were required to characterise the site in accordance with the NSW EPA Sampling Design Guidelines (1995).

Coffey recommended the undertaking of a detailed site investigation (DSI) at Site 1 to inform the University of the current contamination status. The DSI would also assess the suitability of the land for the proposed land uses (i.e. commercial/industrial, for the construction of administration and teaching buildings).

The recommended DSI has been completed (Coffey Ref: 754-NTLEN213472-R08 Rev 1, Detailed Site Investigation, Site 1, University of Newcastle HCCD, Site 1, 5 March 2019) with the following scope and summarised outcomes:

From Coffey DSI (2019):

"*The scope of work completed for this DSI included:*

- *Placement of twelve (12) boreholes, with logging of soil returns and collection of soil samples and the collection of two surface soil samples;*
- *Installation of three (3) groundwater monitoring wells at selected locations;*
- *Laboratory analysis of selected soil and water samples plus appropriate quality control samples for the contaminants of concern; and*
- *Preparation of a detailed site investigation contamination report (including a preliminary in-situ waste classification assessment).*

Soil analytical results from BHP08 – BHP20 (minus BHP17 due to Aboriginal Heritage issues) and two surface soil samples (SS1 and SS2) were compared to the site assessment and waste classification criteria. The soil results have been combined with the results of seven (7) locations previously sampled during the Coffey (2004) Waste Classification Assessment of Lot 3 (BHE1, BHE2, BHE3, BHE4, BHE5, BHE6 and BHE7).

As identified in the initial results obtained from soil locations BHE1 to BHE7 during the previous investigations on site the main contaminants of potential concern from a site suitability perspective were BaP and Lead. For the purposes of the proposed development the adopted SAC is HIL/HSL D commercial/industrial.

The highest concentrations of BaP and lead are associated with the presence of slag materials in the fill. Slag was identified in the upper 1m bgs soils at BHP08, BHP10, BHP15 and BHP19. Both Bap and lead were elevated in BHP08 and BHP10, with elevated lead also identified in BHP15 and BHP19. From previous experience with slag-based fill, the leachability of these contaminants under both acidic and neutral conditions are typically low.

The 95% UCL lead concentration using all 49 soil samples collected during both investigation phases, was calculated to be 606 mg/kg which is under the HIL D SAC (1,500mg/kg).

The 95% UCL benzo(a)pyrene TEQ collected during both investigation phases, was calculated to be 19.46 mg/kg which is under the HIL D SAC (40mg/kg).

No asbestos containing materials were identified during these works, however, considering the finds made in 2011 one cannot preclude the site is completely asbestos free. This potential for identifying ACM on site (most likely in bonded form) should be managed using an Asbestos Management Plan.

A preliminary in situ waste classification was completed in accordance with the NSW EPA Waste Classification Guidelines (2014) with the following findings:

- *95%UCL lead concentrations (606 mg/kg) for the nineteen (19) locations across the site exceeded the CT2 restricted solid waste criteria without TCLP (400 mg/kg); and*
- *95%UCL B(a)P (not TEQ) concentrations (5.2 mg/kg) for the nineteen (19) locations across the site exceeded the CT2 criteria without TCLP (3.2 mg/kg).*

Based on a comparison of the results to the waste classification guidelines and considering the results of the statistical appraisal for lead and B(a)P, fill soils have a preliminary waste classification of ***General Solid Waste (TCLP1/SCC1),*** *with the exception of soils around BHP08, BHP10 and surface soils to approximately 0.3m bgs at location BHP18.*

It is recommended that additional TCLP analysis of lead and BaP in samples exceeding the CT1/CT2 (no leach) criteria be undertaken on specific stockpiles identified for offsite disposal. Should TCLP results exceed the General Solid Waste TCLP/SCC1 criteria, delineation of the soils in the vicinity of those exceedances should be undertaken to limit the extent of soils classified as Restricted Solid Waste SCC2. Remediation and validation sampling of these areas should then be undertaken.

The results of the laboratory analysis of groundwater samples collected from monitoring wells (MW01, MW02 and MW03), reported the following exceedances of the GILs;

- *Copper (Filtered) (DGV – 0.00133µg/L) was detected at a concentration of 0.004mg/L (MW01); and*
- *Zinc (Filtered) (DGV – 0.0015µg/L) was detected at a concentration of 0.087mg/L (MW01) and 0.17mg/L (MW03) respectively.*

The results of the laboratory analysis of the Acid Sulfate Soil samples collected during the most recent site investigation indicate the following;

- *Field screening of 25 primary soil samples collected in the natural material observed on site was undertaken;*
- *Samples in a 1:5 mixture with distilled water were recorded at a pH between 8.6 to 9.6 (pH units). A pH less than or equal to 4 being potentially indicative of Actual Acid Sulfate Soils;*
- *pH_{FOX} ranging from 2.8 to 7.8 (pH units), with reactions recorded between no reaction/ slight reaction to extreme reactions with constant froth, after oxidation in hydrogen peroxide, being observed for the samples. pH_{FOX} of less than 3.5 can be indicative of Potential Acid Sulfate Soils (PASS);*
- *Chromium suite analyses was undertaken on 14 selected samples (BHP9 3.4-3.5, BHP9 3.8-3.9, BHP11 3.3-3.5, BHP13 2.5-2.6, BHP14 3.3-3.5, BHP18 3.5-3.8, BHP19 3.1-3.3, BHP20 2.9-3.0, MW01 3.8-4.0, MW02 3.8-4.0, MW02 4.8-5.0 and MW03 3.8-4.0). The samples were selected following visual and olfactory screening for Potential ASS characteristics (dark grey marine sediment, sulphurous odour);*
- *The total pH drop was in the range of 0.6 to 6.2 pH units. A drop of more than 1 unit, plus increase in temperature, effervescence, colour and odour factors can be indicative of PASS;*
- *Results indicated that 12 of the 14 samples tested (excluding BHP15 2.5-2.8 and BHP16 2.8-3.0) exceeded the adopted SAC for the site of 0.03 % S. Results ranged between 0.032 and 0.44.*
- *Coffey calculated a liming rate of between 1.5 and 20.59 kg/tonne for the samples that exceeded the above criteria.*

3.2. DSI Recommendations

The following recommendations were included in the DSI report for the management of excess spoil, groundwater quality and discharge suitability and management of potential acid sulfate soils:

From Coffey DSI (2019):

"

- *Given the identification of lead and BaP TEQ hotspots (in excess of HIL/HSL C SAC) the site requires remediation and validation of these impacted areas in order to make it suitable for the proposed development. It is recommended that delineation, remediation and validation of the identified hotspots be completed and a final 95%UCLaverage be undertaken following completion to assess the remediated site status. Coffey recommends the preparation of a remediation action plan (RAP) to address the delineation, remediation and validation of the Site to a final land use of HIL/HSL C Open Space/Recreational. The soil excavated during the remediation and trenching works can be reused as fill on site provided it is placed below 2m bgs and at least 0.5m above the standing water level. If this material is to be taken off site it is recommended that the stockpiles be assessed against the NSW EPA Waste Classification Guidelines including a TCLP for both PAH and metals (lead being the metal found to be in exceedance in the preliminary assessments). Retention of the material on site should be prioritised over export of material to landfill, regardless of the waste classification criteria obtained;*

- *Ongoing groundwater assessment during the development stages of this project is recommended. This will be used to assess whether the background levels of heavy metal contamination, or any other COPC, are affected by actions during development. The wells installed on the property during this DSI should be retained if possible and utilised for ongoing groundwater monitoring;*

- *As recommended in the Coffey 2004 report, with further confirmation during this DSI, the groundwater should be of sufficient quality to be considered suitable for stormwater discharge. Dewatering will need to be managed by undertaking a dewatering assessment and preparation of a site-specific Dewatering Management Plan (DMP). Preliminary discussions with Council regarding the requirements for discharge to stormwater during dewatering should also be undertaken prior to the commencement of early earthworks activities such as trenching for services.*

- *Future groundwater investigations (dewatering assessment) for the assessment of discharge of groundwater resulting from dewatering activities to the stormwater drains should use an expanded suite of chemicals of potential concern including cations and anions including calcium, magnesium, potassium and sodium, chloride), alkalinity, Kjeldahl nitrogen, nitrate, nitrite, total nitrogen, total phosphorus and sulfate;*

- *Potential Acid Sulfate Soils (PASS) were identified in sub-surface soil samples collected from approximately 2.5 – 4.0mbgs. Preparation of an Acid Sulfate Soils Management Plan (ASSMP) is recommended for use on site during site development works (including early trenching works for the installation of services and future bulk excavation) that are anticipated to exceed 2.5mbgs;*

- *Nine (9) soil samples (surface) were assessed for the presence of asbestos in the fill materials with no presence detected in the samples. Observation of the surface soils adjacent to the eastern boundary (where surface asbestos was identified in previous investigations) was undertaken. Three suspected pieces of material were sampled and tested for the presence of asbestos. No asbestos was found to be present in the materials sampled. No asbestos containing materials were identified during these works, however, considering the finds made in 2011 one cannot preclude the site is completely asbestos free. This potential for identifying ACM on site (most likely in bonded form) should be managed using an Asbestos Management Plan.;*

- *A preliminary classification of General Solid Waste (TCLP1/SCC1) has been assessed for the in-situ soils, primarily impacted by elevations of PAH and lead in the 0 – 1.0m bgs fill. With the exception of soils in the vicinity of BHP08, BHP10 and shallow soils (0.3m bgs) at location BHP18 which are classified as Restricted Solid Waste SCC2.*

- *It is recommended that additional TCLP analysis of lead and BaP in samples exceeding the CT1/CT2 (no leach) criteria be undertaken on all stockpiles identified for offsite disposal. Should the TCLP results exceed the General Solid Waste TCLP/SCC1 criteria, delineation of the soils in the vicinity of those exceedances should be undertaken to limit the extent of soils classified as Restricted Solid Waste SCC2. Remediation and validation sampling of these areas should then be undertaken; and*

- *Coffey also recommends that prior to the commencement of site redevelopment works, an appropriate Construction Environmental Management Plan (CEMP) is prepared by the appointed construction contractor to manage environmental risk posed to construction workers, and to the surrounding public and environment, by construction works and to manage waste in accordance with appropriate New South Wales statutes. Coffey recommends inclusion of a Contaminated Land Management Plan (CLMP) and Unexpected Finds Protocol (UFP) and Asbestos Management Plan (AMP) within the CEMP, to provide a procedure for emergency response should contaminated material or items of heritage significance be uncovered during site redevelopment."*

3.3. Site Suitability Statement (Site 1, Contamination)

Based on an assessment of data collated from previous work (Coffey 2004) and recent investigations (Coffey DSI 2019), plus observations made during the DSI, Coffey has concluded that Site 1, in its current form, can be made suitable for the proposed commercial/industrial development (administration buildings and teaching facilities, not including student accommodation and also incorporate future open space precincts), following the preparation and execution of a RAP to address the identified lead and BaP hotspots.

Following remediation and validation, unexpected finds, including contaminated materials and asbestos, should be managed using an Unexpected Finds Procedure and Asbestos Management Plan which have already been prepared and should be included in the Construction Environmental Management Plan documentation during construction phase works.

The contamination assessment undertaken in completion of the Detailed Site Investigation (Coffey 2019) was undertaken in general accordance with the relevant sections of State Planning Policy 55 (SEPP 55) Remediation of Land and the NSW OEH Guidelines for Reporting on Contaminated Sites (2011).

4. Status of Mine Subsidence (Site 1)

4.1. Site conditions

The site known as Site 1 (Formally Honeysuckle Central) is bounded by Wright lane to the south, Honeysuckle Drive to the north and an unnamed lane to the east. Topographically, the site is situated in a near level, low-lying area of reclaimed tidal flats associated with the lower Hunter River estuary. The area has been filled using dredged sand with the former Lee Wharf harbour less than 100m to the north. The current RL of the site ranges from 2.0m to 2.6m.

4.2. Mine subsidence

Coffey, using numerical modelling, has assessed the potential for mine subsidence and has developed a remediation strategy to limit potential mine subsidence at the proposed Site 1 of the Honeysuckle City Campus Development.

The details of the proposed development are still in planning; however, the initial building is to be up to five storeys in height with no basement. Two future buildings are planned up to eight stories high, also with no basements.

The site is known to be underlain by abandoned bord-and-pillar mine workings in the Borehole Seam. These workings are part of the historic Wickham and Bullock Island Colliery workings. Historic records indicate that in 1897 this section of the workings was subject to a significant pillar crush event (pillar convergence).

Between 2004 and 2005, Coffey completed two mine subsidence assessments, which included drilling to confirm the extent of crushing (N08459/04-AG dated 9 July 2004 and N08459/04-AM dated 24 February 2005). In 2007, grouting (in the form of bulk filling with ash) was completed for the Lee Wharf Stage 3 (N08459/11-AP (Revision 1) dated 22 June 2007) located on the northern side of Honeysuckle Drive from the Site. Grouting was also commenced in the area of the site (GEOTWARA20903AD-AC 5 June 2013).

A 3D numerical analysis was performed to model the historical crush event that occurred at the site at the time of active mining (August 1897) (Coffey ref: 754-NTLEN213472-R06.Rev1 dated 16 November 2018. It was assessed that the model overestimated the amount of crush that actually occurred at some locations, however this variation was likely due to the variable mined heights resulting in different amounts of pillar crushing before ‘choking’ the mine bord and preventing further convergence.

After modelling this crush event, the strength of the coal was then degraded at 5% increments until reaching approximately 33% of the original coal strength (i.e. 22 increments). At this level of degradation, a series of coal pillars located at the eastern edge of the panel could potentially fail resulting in surface settlement of approximately 120mm at the site with peak values of 200mm to the north and east of the site.

Although the original mine subsidence assessment for the area recommended bulk filling of the whole area using fly ash, during this assessment, Coffey has revised the remedial strategy to use cement stabilised grout in selected areas rather than complete bulk filling of the entire workings. The remaining work required may be summarised as follows:

- Verify borehole GH2B has been filled and fill with minimum 5MPa grout if not already;
- Complete the partially filled GH07 and GH08 with minimum 5MPa grout;
- Fill borehole GH12 with minimum 5MPa grout; and
- Fill boreholes GH14, GH15B, GH18A and GH19 with minimum 5MPa grout.

These grout locations are shown on Drawing 4 of Coffey report 754-NTLEN213472-R02.Rev6 dated 30 January 2019. Based on the void heights recorded at the borehole locations and previous grout volumes, it is estimated each borehole may require in the order of 500m^3 of grout to fill with a total of approximately 3000m^3 of 5MPa grout.

The model was reset to after initial collapse and rerun with the 5% degradation as previously completed. Although the model suggests the area should now be stable, due to difficulties in the modelling process, a conservative approach to design is to be adopted. For structural design purposes, it is recommended that some residual subsidence parameters be allowed for as provided in Table 1.

Table 1: Summary of design parameters

Parameter	At southern limit	At limit of mine workings	At 5m from northern boundary of site	At northern limit of site
Subsidence (mm)	0	20	40	50
Tilt (mm/m)	0	1	2	3
Radius of curvature concave down tensile (km)	40	10	5	3
Strain tensile (mm/m)	0.25	1	2	3
Radius of curvature concave up compressive (km)	N/A	N/A	N/A	N/A
Strain compressive (mm/m)	0	0	0	0

These parameters have been developed with reference to Figures 10a to 10b of DgS Report (COF-008-1 dated 19 October 2018. These parameters are applicable for the serviceability case. As such, should an event of this magnitude occur, the building would need to remain safe servable and repairable.

This strategy was approved by Subsidence Advisory NSW TBA18-01418 dated 18 January 2019 (Notification attached).

5. Closing remarks

The information contained in this report seeks to address the specific requirements of the SEARS in relation to contamination and mine subsidence issues identified at Site 1 related to the proposed development of Stage 1A of the HCCD.

We trust this meets your requirements at this time. If you have any questions, please do not hesitate to contact the undersigned.

This document should be read in conjunction with the attached sheet *'Information about your Coffey Report'.*

For and on behalf of Coffey Services Australia Pty Ltd



Paul Wright
Senior Associate Environmental Scientist

Attachments: Important Information about your Coffey Report
754-NTLEN213472-R08 Rev 1, Detailed Site Investigation, Site 1, University of Newcastle HCCD, Site 1, 5 March 2019;
754-NTLEN213472-R06.Rev1 dated 16 November 2018;
Subsidence Advisory NSW Notice of Determination TBA18-01418 dated 18 January 2019

Important information about your **Coffey** Environmental Report

Introduction

This report has been prepared by Coffey for you, as Coffey's client, in accordance with our agreed purpose, scope, schedule and budget.

The report has been prepared using accepted procedures and practices of the consulting profession at the time it was prepared, and the opinions, recommendations and conclusions set out in the report are made in accordance with generally accepted principles and practices of that profession.

The report is based on information gained from environmental conditions (including assessment of some or all of soil, groundwater, vapour and surface water) and supplemented by reported data of the local area and professional experience. Assessment has been scoped with consideration to industry standards, regulations, guidelines and your specific requirements, including budget and timing. The characterisation of site conditions is an interpretation of information collected during assessment, in accordance with industry practice,

This interpretation is not a complete description of all material on or in the vicinity of the site, due to the inherent variation in spatial and temporal patterns of contaminant presence and impact in the natural environment. Coffey may have also relied on data and other information provided by you and other qualified individuals in preparing this report. Coffey has not verified the accuracy or completeness of such data or information except as otherwise stated in the report. For these reasons the report must be regarded as interpretative, in accordance with industry standards and practice, rather than being a definitive record.

Your report has been written for a specific purpose

Your report has been developed for a specific purpose as agreed by us and applies only to the site or area investigated. Unless otherwise stated in the report, this report cannot be applied to an adjacent site or area, nor can it be used when the nature of the specific purpose changes from that which we agreed.

For each purpose, a tailored approach to the assessment of potential soil and groundwater contamination is required. In most cases, a key objective is to identify, and if possible quantify, risks that both recognised and potential contamination pose in the context of the agreed purpose. Such risks may be financial (for example, clean up costs or constraints on site use) and/or physical (for example, potential health risks to users of the site or the general public).

Limitations of the Report

The work was conducted, and the report has been prepared, in response to an agreed purpose and scope, within time and budgetary constraints, and in reliance on certain data and information made available to Coffey.

The analyses, evaluations, opinions and conclusions presented in this report are based on that purpose and scope, requirements, data or information, and they could change if such requirements or data are inaccurate or incomplete.

This report is valid as of the date of preparation. The condition of the site (including subsurface conditions) and extent or nature of contamination or other environmental hazards can change over time, as a result of either natural processes or human influence. Coffey should be kept appraised of any such events and should be consulted for further investigations if any changes are noted, particularly during construction activities where excavations often reveal subsurface conditions.

In addition, advancements in professional practice regarding contaminated land and changes in applicable statues and/or guidelines may affect the validity of this report. Consequently, the currency of conclusions and recommendations in this report should be verified if you propose to use this report more than 6 months after its date of issue.

The report does not include the evaluation or assessment of potential geotechnical engineering constraints of the site.

Interpretation of factual data

Environmental site assessments identify actual conditions only at those points where samples are taken and on the date collected. Data derived from indirect field measurements, and sometimes other reports on the site, are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact with respect to the report purpose and recommended actions.

Variations in soil and groundwater conditions may occur between test or sample locations and actual conditions may differ from those inferred to exist. No environmental assessment program, no matter how comprehensive, can reveal all subsurface details and anomalies. Similarly, no professional, no matter how well qualified, can reveal what is hidden by earth, rock or changed through time.

The actual interface between different materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but

steps can be taken to reduce the impact of unexpected conditions.

For this reason, parties involved with land acquisition, management and/or redevelopment should retain the services of a suitably qualified and experienced environmental consultant through the development and use of the site to identify variances, conduct additional tests if required, and recommend solutions to unexpected conditions or other unrecognised features encountered on site. Coffey would be pleased to assist with any investigation or advice in such circumstances.

Recommendations in this report

This report assumes, in accordance with industry practice, that the site conditions recognised through discrete sampling are representative of actual conditions throughout the investigation area. Recommendations are based on the resulting interpretation.

Should further data be obtained that differs from the data on which the report recommendations are based (such as through excavation or other additional assessment), then the recommendations would need to be reviewed and may need to be revised.

Report for benefit of client

Unless otherwise agreed between us, the report has been prepared for your benefit and no other party. Other parties should not rely upon the report or the accuracy or completeness of any recommendation and should make their own enquiries and obtain independent advice in relation to such matters.

Coffey assumes no responsibility and will not be liable to any other person or organisation for, or in relation to, any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report.

To avoid misuse of the information presented in your report, we recommend that Coffey be consulted before the report is provided to another party who may not be familiar with the background and the purpose of the report. In particular, an environmental disclosure report for a property vendor may not be suitable for satisfying the needs of that property's purchaser. This report should not be applied for any purpose other than that stated in the report.

Interpretation by other professionals

Costly problems can occur when other professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, a suitably qualified and experienced environmental consultant should be retained to explain the implications of the report to other professionals referring to the report and then review plans and specifications produced to see how other professionals have incorporated the report findings.

Given Coffey prepared the report and has familiarity with the site, Coffey is well placed to provide such assistance. If another party is engaged to interpret the recommendations of the report, there is a risk that the contents of the report may be misinterpreted and Coffey disowns any responsibility for such misinterpretation.

Data should not be separated from the report

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way. Logs, figures, laboratory data, drawings, etc. are customarily included in our reports and are developed by scientists or engineers based on their interpretation of field logs, field testing and laboratory evaluation of samples. This information should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

This report should be reproduced in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties.

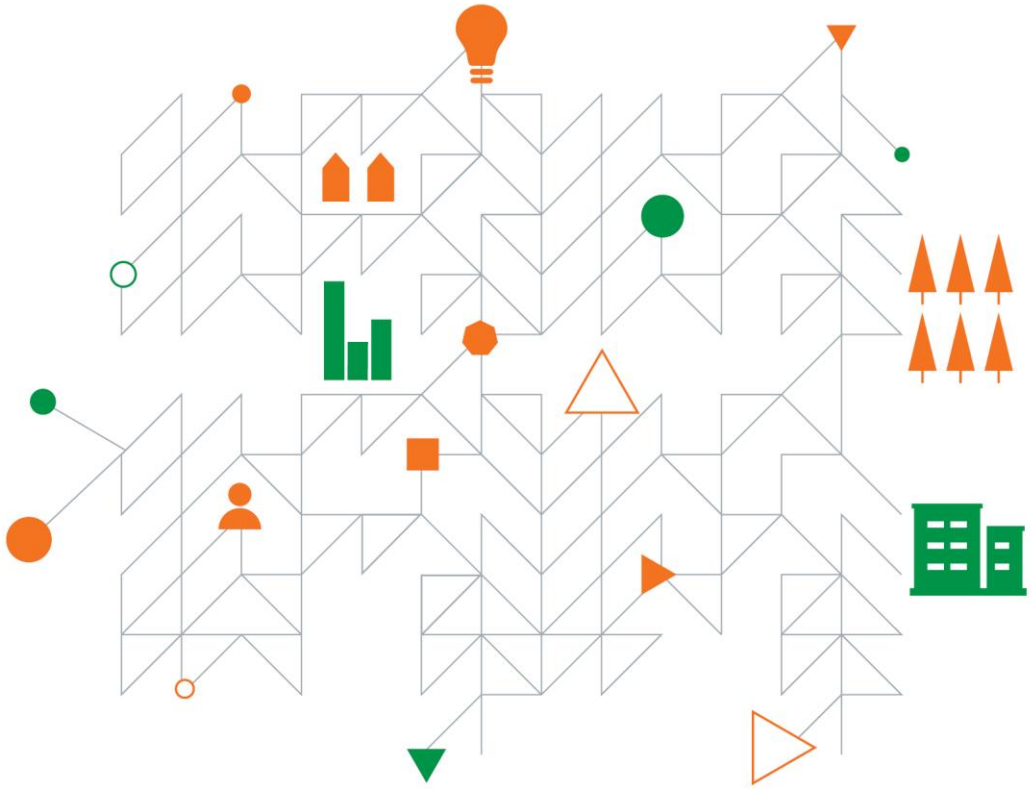
Responsibility

Environmental reporting relies on interpretation of factual information using professional judgement and opinion and has a level of uncertainty attached to it, which is much less exact than other design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. As noted earlier, the recommendations and findings set out in this report should only be regarded as interpretive and should not be taken as accurate and complete information about all environmental media at all depths and locations across the site.

University of Newcastle
Honeysuckle City Campus Development (HCCD) Project

Detailed Site Investigation, Site 1, University of Newcastle HCCD, Site 1

5 March 2019



When the world is at your feet it pays to tread carefully

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University of Newcastle HCCD Project

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Detailed Site Investigation, Site 1

754-NTLEN213472-R08 Rev 1

Quality information

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Executive Summary

The University of Newcastle (The University) is preparing a development application to the Newcastle City Council (NCC) for a proposed building development located at Lot 1 DP 1163346. The building forms part of a larger plan to establish the University of Newcastle, Honeysuckle City Campus across Lots 1, 2 and 3 DP 1163346; with the proposed development area referred to as "Site 1" (the Site, in this report). The Site will be developed over time to include three multi-storey campus buildings that comprise office and classroom spaces along with a communal open space area. No residential areas are proposed for the Site.

This Detailed Site Investigation (DSI) was requested by the University based on a request from NCC to complete the recommendations made in the previous reports on the Site. The reports included:

- Summary of Previous Contamination Assessments Honeysuckle Central, Coffey (2013); and
- Site Wide Remedial Concept Plan (extract p128-144), JBS&G (2016).

Coffey has previously completed a waste classification assessment across the Site (Coffey Ref: Waste Classification Assessment of Lot 3 – Proposed Temporary Carpark, ref: N8459/02-AS dated 15 June 2004). The assessment included 7 locations across the Site. In order to complete a DSI in general accordance with the NSW EPA Sampling Design Guidelines 1995, an additional 13 locations were required.

The scope of work completed for this DSI included:

- Placement of twelve (12) boreholes, with logging of soil returns and collection of soil samples and the collection of two surface soil samples;
- Installation of three (3) groundwater monitoring wells at selected locations;
- Laboratory analysis of selected soil and water samples plus appropriate quality control samples for the contaminants of concern; and
- Preparation of a detailed site investigation contamination report (including a preliminary in-situ waste classification assessment).

Soil analytical results from BHP08 – BHP20 (minus BHP17 due to Aboriginal Heritage issues) and two surface soil samples (SS1 and SS2) were compared to the site assessment and waste classification criteria. The soil results have been combined with the results of seven (7) locations previously sampled during the Coffey (2004) Waste Classification Assessment of Lot 3 (BHE1, BHE2, BHE3, BHE4, BHE5, BHE6 and BHE7).

As identified in the initial results obtained from soil locations BHE1 to BHE7 during the previous investigations on site the main contaminants of potential concern from a site suitability perspective were BaP and Lead. For the purposes of the proposed development the adopted SAC is HIL/HSL C open space/recreational to support the inclusion of an open space communal area within the development.

The highest concentrations of BaP and lead are associated with the presence of slag materials in the fill. Slag was identified in the upper 1m bgs soils at BHP08, BHP10, BHP15 and BHP19. Both Bap and lead were elevated in BHP08 and BHP10, with elevated lead also identified in BHP15 and BHP19. From previous experience with slag-based fill, the leachability of these contaminants under both acidic and neutral conditions are typically low.

A comparison of the analytical results against health-based investigation and screening levels reported eight (8) exceedances of the adopted Site Assessment Criteria (SAC) for Lead (600mg/kg HIL C). These included 1,800mg/kg (BHE7 0.5 – 0.6m), 740mg/kg (BHP8 0.2-0.3), 640mg/kg (BHP8 0.9-1.0), 2,200mg/kg (BHP15 0.2-0.3m), 1,800mg/kg (BHP15 0.9-1.0m), 1,100mg/kg (BHP16 0.0-0.2), 1,100mg/kg (BHP18 0.2-0.3) and 1,000mg/kg (BHP19 0.1-0.3). Five (5) exceedances of the

SAC for Bap TEQ (3mg/kg) were recorded for BHP8 0.2 – 0.3 (45mg/kg), BHP8 0.9-1.0 (31mg/kg), BHP10 0.2-0.3 (61mg/kg), BHP15 0.9-1.0 (6.9mg/kg) and BHP18 0.2-0.3 (7.4mg/kg).

Three (3) samples are a Lead hotspot based on the SAC used. These include BHE7 0.5-0.6, BHP15 0.2-0.3 and BHP15 0.9-1.0. Three (3) samples are BaP hotspots based on the SAC used. These include BHP8 0.2 – 0.3, BHP8 0.9-1.0, BHP10 0.2-0.3. Given the identified hotspots a 95% UCLaverage calculation is not valid for the assessment of overall lead and BaP average concentrations.

No asbestos containing materials were identified during these works, however, considering the finds made in 2011 one cannot preclude the site is completely asbestos free. This potential for identifying ACM on site (most likely in bonded form) should be managed using an Asbestos Management Plan.

A preliminary in situ waste classification was completed in accordance with the NSW EPA Waste Classification Guidelines (2014) with the following findings:

- 95%UCL lead concentrations (606 mg/kg) for the nineteen (19) locations across the site exceeded the CT2 restricted solid waste criteria without TCLP (400 mg/kg); and
- 95%UCL B(a)P (not TEQ) concentrations (5.2 mg/kg) for the nineteen (19) locations across the site exceeded the CT2 criteria without TCLP (3.2 mg/kg).

Based on a comparison of the results to the waste classification guidelines and considering the results of the statistical appraisal for lead and B(a)P, fill soils have a preliminary waste classification of **General Solid Waste (TCLP1/SCC1),** with the exception of soils around BHP08, BHP10 and surface soils to approximately 0.3m bgs at location BHP18.

It is recommended that additional TCLP analysis of lead and BaP in samples exceeding the CT1/CT2 (no leach) criteria be undertaken on specific stockpiles identified for offsite disposal. Should TCLP results exceed the General Solid Waste TCLP/SCC1 criteria, delineation of the soils in the vicinity of those exceedances should be undertaken to limit the extent of soils classified as Restricted Solid Waste SCC2. Remediation and validation sampling of these areas should then be undertaken.

The results of the laboratory analysis of groundwater samples collected from monitoring wells (MW01, MW02 and MW03), reported the following exceedances of the GILs:

- Copper (Filtered) *(DGV – 0.00133µg/L)* was detected at a concentration of 0.004mg/L (MW01); and
- Zinc (Filtered) *(DGV – 0.0015µg/L)* was detected at a concentration of 0.087mg/L (MW01) and 0.17mg/L (MW03) respectively.

The results of the laboratory analysis of the Acid Sulfate Soil samples collected during the most recent site investigation indicate the following;

- Field screening of 25 primary soil samples collected in the natural material observed on site was undertaken;
- Samples in a 1:5 mixture with distilled water were recorded at a pH between 8.6 to 9.6 (pH units). A pH less than or equal to 4 being potentially indicative of Actual Acid Sulfate Soils;
- pH_{FOX} ranging from 2.8 to 7.8 (pH units), with reactions recorded between no reaction/ slight reaction to extreme reactions with constant froth, after oxidation in hydrogen peroxide, being observed for the samples. pH_{FOX} of less than 3.5 can be indicative of Potential Acid Sulfate Soils (PASS);
- Chromium suite analyses was undertaken on 14 selected samples (BHP9 3.4-3.5, BHP9 3.8-3.9, BHP11 3.3-3.5, BHP13 2.5-2.6, BHP14 3.3-3.5, BHP18 3.5-3.8, BHP19 3.1-3.3, BHP20 2.9-3.0, MW01 3.8-4.0, MW02 3.8-4.0, MW02 4.8-5.0 and MW03 3.8-4.0). The samples were selected following visual and olfactory screening for Potential ASS characteristics (dark grey marine sediment, sulphurous odour);

- The total pH drop was in the range of 0.6 to 6.2 pH units. A drop of more than 1 unit, plus increase in temperature, effervescence, colour and odour factors can be indicative of PASS;

- Results indicated that 12 of the 14 samples tested (excluding BHP15 2.5-2.8 and BHP16 2.8-3.0) exceeded the adopted SAC for the site of 0.03 % S. Results ranged between 0.032 and 0.44.

- Coffey calculated a liming rate of between 1.5 and 20.59 kg/tonne for the samples that exceeded the above criteria.

Based on a review of available data from previous and recent investigations, and observations made during fieldwork, Coffey concludes that the Site in its current form is not suitable for the proposed development, with remediation required for the BaP and lead hotspots identified, to satisfy a HIL/HSL C SAC. Coffey notes that the site is however compliant with HIL/HSL D Commercial/Industrial land use criteria.

The following recommendations have been included for the remediation of the site, management of excess spoil, groundwater and potential acid sulfate soils:

- Given the identification of lead and BaP TEQ hotspots (in excess of HIL/HSL C SAC) the site requires remediation and validation of these impacted areas in order to make it suitable for the proposed development. It is recommended that delineation, remediation and validation of the identified hotspots be completed and a final 95%UCLaverage be undertaken following completion to assess the remediated site status. Coffey recommends the preparation of a remediation action plan (RAP) to address the delineation, remediation and validation of the Site to a final land use of HIL/HSL C Open Space/Recreational. The soil excavated during the remediation and trenching works can be reused as fill on site provided it is placed below 2m bgs and at least 0.5m above the standing water level. If this material is to be taken off site it is recommended that the stockpiles be assessed against the NSW EPA Waste Classification Guidelines including a TCLP for both PAH and metals (lead being the metal found to be in exceedance in the preliminary assessments). Retention of the material on site should be prioritised over export of material to landfill, regardless of the waste classification criteria obtained;

- Ongoing groundwater assessment during the development stages of this project is recommended. This will be used to assess whether the background levels of heavy metal contamination, or any other COPC, are affected by actions during development. The wells installed on the property during this DSI should be retained if possible and utilised for ongoing groundwater monitoring;

- As recommended in the 2004 with further confirmation during this DSI, the groundwater should be of sufficient quality to be considered suitable for stormwater discharge. Dewatering will need to be managed by undertaking a dewatering assessment and preparation of a site-specific Dewatering Management Plan (DMP). Preliminary discussions with Council regarding the requirements for discharge to stormwater during dewatering should also be undertaken prior to the commencement of early earthworks activities such as trenching for services.

- Future groundwater investigations (dewatering assessment) for the assessment of discharge of groundwater resulting from dewatering activities to the stormwater drains should use an expanded suite of chemicals of potential concern including cations and anions including calcium, magnesium, potassium and sodium, chloride), alkalinity, Kjeldahl nitrogen, nitrate, nitrite, total nitrogen, total phosphorus and sulfate;

- Potential Acid Sulfate Soils (PASS) were identified in sub-surface soil samples collected from approximately 2.5 – 4.0mbgs. Preparation of an Acid Sulfate Soils Management Plan (ASSMP) is recommended for use on site during site development works (including early trenching works for the installation of services and future bulk excavation) that are anticipated to exceed 2.5mbgs;

- Nine (9) soil samples (surface) were assessed for the presence of asbestos in the fill materials with no presence detected in the samples. Observation of the surface soils adjacent to the eastern boundary (where surface asbestos was identified in previous investigations) was undertaken. Three suspected pieces of material were sampled and tested for the presence of asbestos. No asbestos was found to present in the materials sampled. No asbestos containing materials were

identified during these works, however, considering the finds made in 2011 one cannot preclude the site is completely asbestos free. This potential for identifying ACM on site (most likely in bonded form) should be managed using an Asbestos Management Plan.;

- A preliminary classification of General Solid Waste (TCLP1/SCC1) has been assessed for the in-situ soils, primarily impacted by elevations of PAH and lead in the 0 – 1.0m bgs fill. With the exception of soils in the vicinity of BHP08, BHP10 and shallow soils (0.3m bgs) at location BHP18 which are classified as Restricted Solid Waste SCC2.

- It is recommended that additional TCLP analysis of lead and BaP in samples exceeding the CT1/CT2 (no leach) criteria be undertaken on all stockpiles identified for offsite disposal; and

- Coffey also recommends that prior to the commencement of site redevelopment works, an appropriate Construction Environmental Management Plan (CEMP) is prepared by the appointed construction contractor to manage environmental risk posed to construction workers, and to the surrounding public and environment, by construction works and to manage waste in accordance with appropriate New South Wales statutes. Coffey recommends inclusion of a Contaminated Land Management Plan (CLMP) and Unexpected Finds Protocol (UFP) within the CEMP, to provide a procedure for emergency response should contaminated material (including asbestos) or items of heritage significance be uncovered during site redevelopment.

1. Introduction

1.1. General

University of Newcastle (The University) is preparing a mixed-use development application to the Newcastle City Council (NCC) for a proposed building development located at Lot 1 DP 1163346. The building forms part of a larger plan to establish the University of Newcastle, Honeysuckle City Campus across Lots 1, 2 and 3 DP 1163346; with the proposed development area referred to as "Site 1" (the Site, in this report). The Site will be developed over time to include three multi-storey campus buildings that comprise office and classroom spaces along with a communal open space area. No residential areas are proposed for the Site.

This Detailed Site Investigation (DSI) was requested by The University based on a request from NCC to complete the recommendations made in the previous reports on the Site. The reports included:

- Summary of Previous Contamination Assessments Honeysuckle Central, Coffey (2013);
- Waste Classification Assessment of Lot 3 – Proposed Temporary Carpark, Coffey (2004); and
- Site Wide Remedial Concept Plan (extract p128-144), JBS&G (2016).

This report has been prepared in accordance with the relevant sections of Chapter 7 in Schedule B2, Guideline on Site Characterisation, in the National Environment Protection (Assessment of Site Contamination) Measure (NEPM 1999 (2013)) and State Environmental Planning Policy 55 – Remediation of Land (SEPP 55).

1.2. Objectives

The objectives of the DSI were to:

Undertake a contamination assessment of the Site as recommended in the previous assessments completed across the Site;

Provide an understanding of the contamination status of the fill and natural soils encountered on Site;

Report on the waste classification status of the fill soils;

Report on the presence/ absence of acid sulfate soils in the natural soils encountered;

Report on the status of the groundwater encountered on site; and

Provide recommendations for further assessment and or management, as required.

1.3. Scope of Works

In order to meet the objectives, the following scope of works was undertaken:

- Development of a site safety plan;

- Placement of twelve (12) boreholes[1], with logging of soil returns and collection of soil samples. Two additional locations were sampled for surface soils only;
- Installation of three (3) groundwater monitoring wells at selected locations;
- Laboratory analysis of selected soil and water samples plus appropriate quality control samples for the contaminants of concern; and
- Preparation of a detailed site investigation contamination report (including a preliminary in-situ waste classification assessment).

[1] Thirteen (13) borehole locations were originally targeted, however, one location (BHP17) had to be abandoned due to the risk of disturbing Aboriginal heritage. Two (2) surface locations along the eastern boundary were added to ensure compliance with minimum sampling design guidelines.

2. Site background

2.1. Site Identification

The site location and sample location plan are shown in Figures 1 and Figure 2 (Appendices) respectively. Site identification details are provided in Table 2-1.

Table 2-1: Site Identification

Site Address	16, 16A and 16B Honeysuckle Drive, Newcastle NSW 2300
Approximate Site Area	Approximately 8,546m^2
Title Identification Details	Lot 1, 2 & 3 DP1163346
Current Land Zoning	B4 Mixed Zone Uses
Current Land use	The site comprises a vacant block with access via Wright Lane.
Proposed Land use	Commercial-Industrial (Offices and academic facilities) and Open space/Recreational (Proposed communal open area space)
Adjoining Site Uses	• North – Honeysuckle Drive, Lee Wharf Commercial Buildings; • South – Wright Lane, Wright Lane Car Park, Former Rail Corridor; • East – Settlement Way, Chifley Apartments, Commercial Offices; • West – Worth Place, Commercial Offices.
Site Coordinates	The centre of the site is located approximately at 32.926210646, 151.768890977

2.2. Site Topography and drainage

2.2.1. Geology and Soils

Reference to the 1:100,000 scale Newcastle Coalfields Regional Geology Map indicates that the site is underlain by fill, alluvial / estuarine soils that are in turn underlain by rock belonging to the Lambton Subgroup of the Newcastle Coal Measures. This subgroup comprises siltstone, sandstone and coal seams. The top of rock occurs at approximately -20m AHD and the anticipated presence of suitable founding conditions in the Unit 3 sand between approximately -5m and -10m AHD.

2.2.2. Acid Sulfate Soils

Reference to the Newcastle 1:25,000 Acid Sulfate Soil Risk Map indicates that the site is in an area of "High Probability" of Acid Sulfate Soils (ASS) between 1 and 3 metres below the ground surface. The Site was also classified as Class 3[2] in the Newcastle City Council, Local Environment Plan, Map 4, 2012.

[2] Works more than 1 metre below the natural ground surface and works by which the water table is likely to be lowered more than 1 metre below natural ground surface may require a Management Plan or Preliminary Assessment prior to development consent being issued

2.2.3. Hydrogeology

Groundwater was observed during site investigations at depths between 2.0m and 3.8m below ground surface (bgs).

A search of the NSW Office of Water for registered groundwater bores located within a 500m radius of the site was undertaken. The search revealed that there are three groundwater bores registered within this radius. A summary of the groundwater search is included in Table 2-2 and a copy of the search is attached in Appendix E.

Table 2-2 - Groundwater Bore Search Results Summary

Monitoring Well ID	Purpose of bore	Distance and direction from site	Water Bearing Zones
GW201489	Monitoring Bore	421m South East	2.00 – 5.00m bgs
GW201490	Monitoring Bore	479m South East	2.00 – 4.50m bgs
GW201491	Monitoring Bore	434m South East	2.00 – 4.50m bgs

3. Desktop review and site observations

A desktop study and site observations were conducted for this assessment and included:

Findings of previous assessments;

A historical title search dating back 100 years;

A review of aerial photography from the past 60 years;

A review of the Section 10.7 Planning Certificates for the Site held by Council;

A review of NSW EPA notices applying to the Site and nearby properties; and

Site walkover to assess the current site conditions compared to historical information.

The information provided from the above reviews are summarised in the following sections.

3.1. Summary of previous assessments

Historical contamination assessments were summarised in a report produced by Coffey in 2013 for the University of Newcastle (Coffey Ref: Summary of Previous Contamination Assessments Honeysuckle Central, 754-NTLGE198271-AB, Coffey (2013)).

The Coffey (2013) Report was based on the review of the following contamination assessment reports:

- Waste Classification Assessment of Lot 3 – Proposed Temporary Carpark, ref: N8459/02-AS dated 15 June 2004, Coffey (2004a);
- Waste Classification of Proposed Roadway (Part Lot 3 and Part Lot 24), ref: N8459/02-AT dated 16 June 2004 (Coffey 2004b);
- Water Quality Assessment Lot 4, Lot 24 and Lot 3, ref: N8459/02-BE dated 21 July 2004 (Coffey 2004c);
- Lee Wharf Development – Contamination Assessment, ref: N8459/05-AD 6 July 2004 (Coffey 2004d);
- Lee Wharf Development – Responses to Mallesons Queries Regarding Contamination Matter, ref: N8459/05-AF 2 June 2004, Coffey (2004e);
- Honeysuckle Central Contamination Assessment, ref: GEOTWARA20903AA-AE, dated 17 December 2008 (Coffey, 2008); and
- Data from fieldwork completed but not reported in 2011

The summary found that based on the location of Site 1, there was a high probability of Acid Sulfate Soils (ASS) being present at the site (ASRIS 2015) as it was located within an area categorised as Class 3 for the probability of occurrence of ASS/Potential ASS. As such, development consent was required for works more than 1 m below ground surface or works by which the water table is likely to be lowered more than 1 m below natural ground surface.

Historically, the site contained an electrician shop, boiler shop, blacksmiths, locomotive/machine shop, carpenters' shop, electrical substation, and the Bullock Island causeway. In 1993, there was an electrical substation, railway lines, carriage repair sheds, railway goods loading area, and a plumber's shop located at the site.

The main contaminants of potential concern (COPC) include petroleum hydrocarbons, PAHs, heavy metals, asbestos. It is noted that an electrical substation was present at the site in 1993. Although Coffey reported PCB concentrations below the LOR, there was the potential that these samples were not collected from the area near the former substation. As such, PCB remained a COPC in the former electrical substation areas.

Findings and recommendations provided in the previous assessments undertaken on Site 1 included:

- Based on the location of Site 1, there was a high probability of Acid Sulfate Soils (ASS) being present at the site as it was located within an area categorised as Class 3 for the probability of occurrence of Actual ASS (AASS) / Potential ASS (PASS). Investigation and classification of AASS/ PASS on site should be carried out and if encountered, an Acid Sulfate Soil Management Plan may be required depending on depth of disturbance;
- The main contaminants of potential concern (COPC) include petroleum hydrocarbons, PAHs, heavy metals, PCBs and asbestos. Waste classification and onsite reuse of fill and natural material should be undertaken;
- Asbestos was detected in two samples along the eastern boundary at 0.1m depth, it was unknown if asbestos impact was present in fill in other parts of the site. An asbestos management plan may be required, and areas identified as asbestos impacted may require delineation and removal and disposal; and
- Groundwater at the site had previously contained heavy metal impacts, including copper, zinc, manganese and lead. Therefore, additional assessment of groundwater would be required in order to update the status of contamination in line with current guidelines and regulations.

3.2. Site History Review

3.2.1. Historical Title Search

- The title history for the Site shows ownership of Lots 1, 2 and3 DP 1163346 to be under the control of the Commissioner of Railways and Tramways (CRT) up until 1995 following which the lands were owned by the Hunter Development Corporation. The ownership of all 3 lots were transferred to the University of Newcastle in 2018. The historical titles showed ownership of Lots 1, 2 and 3 by the CRT from 1854 and 1916.
- Historical mapping (1916) and aerial images from 1954 show that the site was previously used for the purposes of heavy rail services and related activities. The rail operation and infrastructure were in place up until the mid-1990's with historical imagery confirming rail activity in 1987.
- Following the removal of the rail infrastructure, the site was used primarily for construction material laydown and site sheds for at least two construction projects, the most recent being the Newcastle Light Rail Project undertaken by Downer for Transport for New South Wales. The summary of titled ownership across the three Lots have been included in Table 3-1, Table 3-2 and Table 3-3, with title search results included in Appendix A.

Table 3-1 – Title Summary of Proprietors (Lot 1 DP 1163346)

Year	*Proprietors*
2018 to Date	University of Newcastle
	(Lot 1 DP 1163346)
2011 – to 2018	Hunter Development Corporation
	(Lot 25 DP 1096520)
2008 – 2011	Hunter Development Corporation *(formerly Honeysuckle Development Corporation)*
2006 – 2008	Honeysuckle Development Corporation
	(Lot 73 DP 1087271)
2005 – 2006	Honeysuckle Development Corporation

Year	*Proprietors*
	(Lot 21 DP 1051525)
2003 – 2005	Honeysuckle Development Corporation
	(Lot 3 DP 883474)
1999 – 2003	Honeysuckle Development Corporation
	(Lot 3 DP 839050)
1995 – 1999	Honeysuckle Development Corporation
1995 – 1995	State Rail Authority of New South Wales
	(Lot 1 DP 828817)
1993 – 1995	State Rail Authority of New South Wales
	(Land in Parish Newcastle – Area 6 Acres 0 Roods 28 Perches)
1916 – 1993	Commissioner of Railways and Tramways *(Acquired for Railway Purposes vide Government Gazette 26th May 1916)*
	(Lot 9 DP 883474)
1999 – 2003	Honeysuckle Development Corporation
	(Lot 3 DP 856783)
1996 – 1999	Honeysuckle Development Corporation
	(Lot 3 DP 839050)
1995 – 1996	Honeysuckle Development Corporation
1995 – 1995	State Rail Authority of New South Wales
	(Lot 1 DP 828817)
1993 – 1995	State Rail Authority of New South Wales
	(Land in Parish Newcastle – Area 6 Acres 0 Roods 28 Perches)
1916 – 1993	Commissioner of Railways and Tramways *(Acquired for Railway Purposes vide Government Gazette 26th May 1916)*

Table 3-2 - Title Summary of Proprietors (Lot 2 DP 1163346)

Year	*Proprietors*
2018 to Date	University of Newcastle
	(Lot 2 DP 1163346)
2011 – 2018	Hunter Development Corporation
	(Lot 25 DP 1096520)
2008 – 2011	Hunter Development Corporation
2006 – 2008	Honeysuckle Development Corporation
	(Lot 73 DP 1087271)
2005 – 2006	Honeysuckle Development Corporation
	(Lot 21 DP 1051525)
2003 – 2005	Honeysuckle Development Corporation
	(Lot 3 DP 883474)

Year	*Proprietors*
1999 – 2003	Honeysuckle Development Corporation
	(Lot 3 DP 839050)
1995 – 1999	Honeysuckle Development Corporation
1995 – 1995	State Rail Authority of New South Wales
	(Lot 1 DP 828817)
1993 – 1995	State Rail Authority of New South Wales
	(Land in Parish Newcastle – Area 21 Acres 3 Roods 20 Perches)
1854 – 1993	Commissioner for Railways *(Acquired for Railway Purposes vide Government Gazette 4th July 1854)*
	(Land in Parish Newcastle – Area 6 Acres 0 Roods 28 Perches)
1916 – 1993	Commissioner of Railways and Tramways *(Acquired for Railway Purposes vide Government Gazette 26th May 1916)*
	(Lot 9 DP 883474)
1999 – 2003	Honeysuckle Development Corporation
	(Lot 3 DP 856783)
1996 – 1999	Honeysuckle Development Corporation
	(Lot 3 DP 839050)
1995 – 1996	Honeysuckle Development Corporation
1995 – 1995	State Rail Authority of New South Wales
	(Lot 1 DP 828817)
1993 – 1995	State Rail Authority of New South Wales
	(Land in Parish Newcastle – Area 21 Acres 3 Roods 20 Perches)
1854 – 1993	Commissioner for Railways *(Acquired for Railway Purposes vide Government Gazette 4th July 1854)*
	(Land in Parish Newcastle – Area 6 Acres 0 Roods 28 Perches)
1916 – 1993	Commissioner of Railways and Tramways *(Acquired for Railway Purposes vide Government Gazette 26th May 1916)*

Table 3-3 - Title Summary of Proprietors (Lot 3 DP 1163346)

Year	*Proprietors*
2018 to Date	University of Newcastle
	(Lot 3 DP 1163346)
2011 – to date	Hunter Development Corporation
	(Lot 25 DP 1096520)
2008 – 2011	Hunter Development Corporation
2006 – 2008	Honeysuckle Development Corporation
	(Lots 71 & 72 DP 1087271)

Year	*Proprietors*
2005 – 2006	Honeysuckle Development Corporation
	(Lot 21 DP 1051525)
2003 – 2005	Honeysuckle Development Corporation
	(Lot 3 DP 883474)
1999 – 2003	Honeysuckle Development Corporation
	(Lot 3 DP 839050)
1995 – 1999	Honeysuckle Development Corporation
1995 – 1995	State Rail Authority of New South Wales
	(Lot 1 DP 828817)
1993 – 1995	State Rail Authority of New South Wales
	(Land in Parish Newcastle – Area 6 Acres 28 Perches)
1854 – 1993	Commissioner for Railways *(Acquired for Railway Purposes vide Government Gazette 4th July 1854)*
	(Land in Parish Newcastle – Area 21 Acres 3 Roods 20 Perches)
1854 – 1993	Commissioner for Railways *(Acquired for Railway Purposes vide Government Gazette 4th July 1854)*
	(Land in Parish Newcastle – Area 6 Acres 0 Roods 28 Perches)
1916 – 1993	Commissioner of Railways and Tramways *(Acquired for Railway Purposes vide Government Gazette 26th May 1916)*
	(Lot 9 DP 883474)
1999 – 2003	Honeysuckle Development Corporation
	(Lot 3 DP 856783)
1996 – 1999	Honeysuckle Development Corporation
	(Lot 3 DP 839050)
1995 – 1996	Honeysuckle Development Corporation
1995 – 1995	State Rail Authority of New South Wales
	(Lot 1 DP 828817)
1993 – 1995	State Rail Authority of New South Wales
	(Land in Parish Newcastle – Area 6 Acres 28 Perches)
1854 – 1993	Commissioner for Railways *(Acquired for Railway Purposes vide Government Gazette 4th July 1854)*
	(Land in Parish Newcastle – Area 21 Acres 3 Roods 20 Perches)
1854 – 1993	Commissioner for Railways *(Acquired for Railway Purposes vide Government Gazette 4th July 1854)*
	(Land in Parish Newcastle – Area 6 Acres 0 Roods 28 Perches)
1916 – 1993	Commissioner of Railways and Tramways *(Acquired for Railway Purposes vide Government Gazette 26th May 1916)*

3.2.2. Aerial Photograph Review

Aerial photographs of the site were obtained from the Department of Land and Property Information and assessed by a Coffey Environmental Scientist. The results of the historical aerial photography review are summarised below in Table 3-4. The aerial photographs are presented in Appendix B.

Table 3-4 - Historical Aerial Summary

Date	Site	Surrounding Land
1954	The site is located in the centre of a heavy rail service area. Several large sheds are present on the east and west boundaries of the site. There is a smaller shed present in the centre of the site. The majority of the site appears to be paved and/or contain rail tracks and service related facilities.	Multiple large industrial sheds lie to the east, north and west of the site boundary and appear to be heavy rail service facilities. The rail line is observed to the immediate south of the site, followed by commercial/ residential properties.
1966	One shed has been removed from the north west corner of the site, upgrades to the western portion of the site have occurred. The remainder of the site appears relatively unchanged to the 1954 aerial photograph.	Upgrades to rail facilities to the immediate west of the site have occurred. Development of commercial/ residential properties on the southern border of the rail line have been established.
1976	The site appears relatively unchanged to the 1966 aerial photograph.	The rail service facilities surrounding the site appear to be relatively unchanged to the 1966 aerial photograph.
1987	The large shed on the south east corner of the site has been removed along with several smaller surrounding sheds and amenities. The small shed in the centre of the site has been removed.	Several large sheds, smaller structures and related infrastructure have been removed from the area to the immediate east of the site.
1993	One large structure remains in the western portion of the site. The rest of the site has been cleared of structures and has been left vacant.	Further clearing of the facilities to the east of the site has occurred. Buildings to the north and west have also been removed. Several larger structures remain to the east and appear to be operational.
2004	The large structure in the western portion of the site has been removed, the site is relatively cleared block. Regeneration of grass vegetation covering the former rail service area has occurred. There is one small structure present in the south east corner of the site.	Two of the former structures associated with the rail infrastructure and harbour facilities have been retained. The remainder of the industrial sheds and related rail infrastructure to the west, north and east, have been removed. Honeysuckle Drive to the north of the site and Wright Lane to the south of the site have been developed. A car park is visible in the eastern extent of Wright Lane. Regeneration of grass vegetation covering the former rail infrastructure footprint has occurred. Residential apartments/ commercial offices have been constructed to the east of the site.
2018	The site appears to be used as a storage area/ site office for the Newcastle Light Rail Project undertaken by Downer for Transport for New South Wales. Vehicle parking in the eastern portion of the site and material storage in the central and western portion of the site is apparent.	The rail corridor to the south of the site has been decommissioned. Wright Lane car park has been expanded to the west. Several high-rise apartment buildings have been constructed to the north and west of the site. A large car park has been constructed to the north west of the site past the roundabout.

3.2.3. Section 10.7 Planning Certificate

The section 10.7 Certificates for Lots 1, 2 and 3 DP 1163346 were obtained from the Newcastle City Council. Copies of the certificates have been provided in Appendix D. Table 3-5 summarises the information contained within the certificates.

Table 3-5 - Section 10.7 Summary

Address/Allotment	Current Zoning	Critical Habitats	Conservation Areas	Hazard Risk Restrictions	Site Contamination Notices
16 Honeysuckle Drive, Newcastle (Lot 3 DP 1163346)	(B4) Mixed Use	None	None	Potential Acid Sulfate Soils Land Contamination	None
16A Honeysuckle Drive, Newcastle (Lot 2 DP 1163346)	(B4) Mixed Use	None	None	Potential Acid Sulfate Soils Land Contamination	None
16B Honeysuckle Drive, Newcastle (Lot 1 DP 1163346)	(B4) Mixed Use	None	None	Potential Acid Sulfate Soils Land Contamination	None

3.3. NSW EPA Records

A search of the NSW EPA database identified two (2) sites within the Newcastle City (Newcastle City Council) on the contaminated land register as having current and/or former notices. A copy of the search is provided in Appendix F with a summary provided in Table 3-6.

Table 3-6 - Contaminated Land Register Search Results

Suburb	Address/Site name	Notices related to site	Distance from site
Newcastle	Reclaimed Land - 26-28 Honeysuckle Drive	1 former notice	250 m
Newcastle	BHP Steelworks (Closure site) - Bound by Hunter River, Selwyn Street & Industrial Drive	9 current and 13 former notices	2.8 km

4. Sampling, Analysis and Quality Plan

4.1. Project Data Quality Objectives

As stated in Section 4 of the *Contaminated Land Management Guidelines for the NSW Site Auditor Scheme 3rd ed.* (NSW EPA 2017) and ASC NEPM *Schedule B2 Appendix B*, the DQO process is used to "define the type, quantity and quality of data needed to support decisions relating to the environmental condition of a site".

The seven-step DQO process adopted for this assessment is provided below:

4.1.1. Step 1: State the Problem

The objectives of the ESA will be to:

- Identify/establish potential contamination in soil and groundwater at the site that may be attributable to current and historical activities on the site;
- Assess whether the site is suitable for future mixed-uses including both commercial/industrial and open space/recreational use (assessment SAC based on the more sensitive land use);

The main problems are:

- How many soil and groundwater samples should be collected?
- What sample layout should be used to achieve the above objectives?
- What analytes should be tested?
- Will contamination, if left in place, pose an unacceptable risk to human health or the environment?

4.1.2. Step 2: Identify the Decision

The site will be suitable for intended use if the 95% UCL on the mean concentrations for chemicals of potential concern are less than the site assessment criteria.

4.1.3. Step 3: Identify Inputs to the Decision

The primary inputs to assessing the above include:

- A review of site history information and previous environmental assessments undertaken at the site (Refer to Section 3 and Section 6).
- Laboratory will be NATA accredited for the analysis to be undertaken and the laboratory analytical methods will conform to relevant Australian and/or international methods (e.g. USEPA, APHA/AWWA etc).
- Outcome of quality assessment of relevant data.
- Applicable contaminated land guidelines endorsed by NSW EPA and relevant planning guidelines (listed in Section 0).

4.1.4. Step 4: Define the Study Boundaries

The study boundaries are defined by the boundaries of the site as shown in Figure 2. Vertically, the site boundary will generally be to 4mbgs to characterise the fill and groundwater across the site.

4.1.5. Step 5: Develop a Decision Rule

The decision rule for soil for each chemical/layer to assess the suitability of the site will be as follows:

- QA/QC assessment indicates that the data is usable;

- Where contaminant concentrations for each sample are below the adopted investigation levels, then no further assessment/remediation is required with respect to that chemical/media/area; and
- Where contaminant concentrations are reported to exceed the adopted investigation levels, the 95% UCL of all samples analysed will be assessed provided none of the identified exceedances are greater than 2.5 times the SAC (indicating a hotspot). Identified hotspots will be subject to management or remediation and validation prior to a recommendation of the site as suitable for the required land use;
- Decisions on laboratory data are discussed in Step 7 and included as data quality indicators (DQIs).

4.1.6. Step 6: Specify Limits of Decision Errors

There are two types of decision errors:

- Sampling errors, which occur when the samples collected are not representative of the conditions within the investigation area; and
- Measurement errors, which occur during sample collection, handling, preparation, analysis and data reduction.

These errors may lead the decision maker to make the following errors:

- Deciding that the site is not contaminated and, therefore, the site is suitable for open space/recreational use when the reverse is true; and
- Deciding that the site is contaminated and, therefore, the site is not suitable for open space/recreational use when the reverse is true.

The null hypothesis for this study is:

- Contaminant concentrations within the soil and groundwater beneath the site are more than the adopted SAC.

An assessment will be made as to the likelihood of a decision error being made based on the results of a QA/QC assessment and the closeness of the data to assessment criteria. Additionally, statistical assessment may be used, where applicable, such as 95% Upper Confidence Limit (UCL) calculations, to manage potential of error in decision making.

The investigation levels for assessment are nominated in Section 4.5.

4.1.7. Step 7: Optimise the Design for Obtaining Data

Based on the previous Steps 1 to 6 of the DQO process, the optimal design for obtaining the required data is presented in the following sections (i.e. proposed field and laboratory programs).

4.2. Sampling Plan and Rationale

When formulating the scope of intrusive works, Coffey referred to the ASC NEPM 1999 (2013), Schedule B2 – Site Characterisation.

Seven (7) boreholes had been excavated at the site in a previous investigation, and thirteen (13) new sampling locations were selected based on the NSW EPA (1995) *Sampling Design Guidelines.* The NSW EPA (1995) recommends 20 sampling points to characterise a site of 8,546m^2 (0.88 ha) using a systematic approach for hotspot detection. The investigation used a grid-based sampling pattern supplemented with locations targeting the Areas of Environmental Concern (AECs) as identified during the site history investigation.

Sampling locations are shown on Figure 2.

Assessment of potential contamination within soil included the placement of boreholes at twelve (12) locations using an excavator fitted with a 350mm auger attachment to a maximum depth of 4.0 metre below ground level (mBGL). One sample location was abandoned due to the risk of encountering

Aboriginal history (artefacts). In order to maintain the appropriate sample density, two surface locations were added along the eastern boundary (where asbestos was previously identified in surface samples). Drilling and surface sampling were completed over two mobilisations on 18 and 19 December 2018. Groundwater inflow was observed during the drilling of boreholes and ranged between 2.0 and 2.8 mBGL.

Three groundwater monitoring wells were installed at selected locations on 9th January 2019. The monitoring wells were drilled to a maximum depth of 6 mBGL. Groundwater levels recorded during the installation of the groundwater wells ranged between 3.65 and 3.8 mBGL.

The sampling locations (identified by the green icons and prefixed with "P") and surface samples SS1 and SS2 are included in Figure 2.

For the boreholes, a maximum of two soil samples were analysed from each sampling location for the contaminant/s of potential concern, as listed in Table 4 of this document. Sample selection will be based on:

- Proximity of sample location to an AEC;
- Headspace screening of soil samples for the presence of volatile organic compounds (VOCs) using a photoionisation detector (PID);
- The presence of odours, staining or discolouration;
- The presence of anthropogenic material, including fill; and
- Changes in lithology.

The remainder of the soil samples will be held in reserve by the laboratory, should further analysis be required to assist with the assessment (pending outcome of initial analysis).

Based on the actual drilling of 12 boreholes, two surface sample locations and sampling of 3 groundwater monitoring wells, the analytical schedule presented in Tables 4-1 and 4-2 was adopted. Further detail on soil bore and monitoring well locations is presented in Appendix C.

Table 4-1 - Schedule of Analysis for Soil

Chemicals of Potential Concern (COPC)	Total Primary
No of locations	14
Total samples	26
Heavy Metals	26
TRH/BTEX	26
PAHs	26
PCB's	26
Asbestos	9
PASS Screening	24
Chromium Suite Testing	12

Table 4-2 - Schedule of Analysis for Groundwater

Chemicals of Potential Concern (COPC)	New wells (3 total)
Heavy Metals	3
TRH/BTEX	3
PAHs	3
OCP	3
PCB	3

NOTE: The number of soil and groundwater samples listed above does not include QA/QC samples. These were collected and analysed as described in Section 4.4.2.

4.3. Field Methods and Procedures

4.3.1. Sampling Methodology

Sample collection was conducted in general accordance with relevant Coffey Standard Operating Procedures (SOPs) which are based on:

- *National Environment Protection (Assessment of Contamination) Measure* 1999 as amended 2013 (NEPC, 2013), Schedules B1 and B2;
- Australian Standards AS4482.1 and AS4482.2, *Guide to Investigation and Sampling of Sites with Potentially Contaminated Soil (Part 1 Non-volatile and semi-volatile compounds; and Part 2 Volatile Substances)*.
- Australian/New Zealand Standard AS/NZS 5667.1:1998, *Water quality – Sampling, Part 1 – Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples*;
- Australian/New Zealand Standard AS/NZS 5667.11:1998, *Water quality – Sampling, Part 11 – Guidance on sampling of groundwaters*.

Soil and groundwater sampling were undertaken by an appropriately qualified and experienced scientist/engineer.

4.3.2. Fieldwork Methodologies

Field work methodologies are provided in Table 13.

Table 4-3 - Fieldwork Methodologies

Item	Methodology Description
Underground Services location	Prior to the commencement of intrusive works, Dial-Before-You-Dig (DBYD) plans of the site were reviewed to assess the location of above ground and underground services and utilities coming onto the site. Where required, sampling locations were moved to avoid buried cables and other services.
Borehole drilling	The boreholes were drilled using a 3.5 tonne excavator fitted with a 350mm auger. Samples were collected directly from the auger. All boreholes were advanced to a maximum 4m depth. The main objective of the soil investigation was to characterise assess the contamination status of the fill and natural materials and assess the presence of acid sulfate soils in the natural materials.
Soil Sampling and PID screening	Soil samples were collected at 0.5m intervals to the maximum depth. Discrete samples were collected directly from the auger with care taken to minimise cross contamination. A portion of each soil sample collected from each soil bore was placed into a zip-lock plastic bag and screened for the presence of VOCs using a PID. The PID was calibrated daily to 100ppm iso-butylene gas. Each PID reading was recorded on the bore logs.
Groundwater sampling	Groundwater samples were collected using a peristaltic pump.

4.3.3. Sample Storage and Preservation

Samples for chemical analysis were placed into labelled, laboratory supplied and prepared sample containers (either jars for soil or bottles for water, which were supplied as new by the analytical laboratory).

Each sample container was labelled with the project number, collection date, individual sampling location number and the depth of sample collection. Each sample was uniquely identified.

Sample containers were placed directly into a cooler with ice in preparation for transport to the primary or secondary laboratory under chain of custody control.

4.3.4. Waste Management

Uncontaminated consumables and materials were collected and disposed of in offsite waste bins at the end of each day.

Recyclable materials were placed in appropriate recycling containers, where available.

Rinse water generated from the decontamination of field equipment were examined for contamination (i.e. odours/sheen); if no contamination was apparent the rinse water was released onsite in an unsealed area. If there were signs of contamination it was be placed into a container or drum for subsequent offsite disposal, in accordance with relevant regulatory requirements.

4.4. Quality Assurance / Quality Control

The QA/QC plan was designed to achieve predetermined data quality indicators (DQIs) that will demonstrate accuracy, precision, comparability, representativeness and completeness of the data generated.

4.4.1. Quality Assurance

All fieldwork was undertaken by experienced and appropriately qualified environmental scientists/engineers following written field procedures.

Field procedures were consistent with relevant Coffey Standard Operating Procedures which are based on general industry standards including:

- *National Environment Protection (Assessment of Contamination) Measure* 1999 as amended 2013, Schedules B2 and B3;
- Australian Standards AS4482.1 and AS4482.2, *Guide to Investigation and Sampling of Sites with Potentially Contaminated Soil (Part 1 Non-volatile and semi-volatile compounds; and Part 2 Volatile Substances)*.
- Australian/New Zealand Standard AS/NZS 5667.1:1998, *Water quality – Sampling, Part 1 – Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples*;
- Australian/New Zealand Standard AS/NZS 5667.11:1998, *Water quality – Sampling, Part 11 – Guidance on sampling of groundwaters*.

4.4.2. Field Quality Control Samples

During each round of soil and groundwater sampling, the following additional quality control samples were collected and analysed:

- Intra-laboratory duplicate samples were collected at the rate of 10% of the number of primary samples scheduled for chemical analysis, excluding samples for asbestos analysis;
- Inter-laboratory triplicate samples were collected at the rate of 5% of the total number of primary samples scheduled for chemical analysis, excluding samples for asbestos analysis; and
- Trip blanks and trip spikes were collected at a rate of one per day (where volatile compounds are COPC).

4.4.3. Laboratory Quality Control Samples

Laboratory quality control will include the following:

- The laboratory analysis of samples was undertaken by NATA accredited environmental testing laboratories;
- The NATA accredited environmental testing laboratories have both implemented quality control plans conforming to Schedule B3 ‘Guideline on Laboratory Analysis of Potentially Contaminated Soils’ of the *National Environment Protection (Assessment of Site Contamination Measure) 1999 as amended 2013* (NEPC, 2013); and
- The laboratories performed reagent blanks, spike samples, duplicate spikes, matrix spikes, surrogate spikes and duplicates to assess laboratory quality control.

4.5. Soil Investigation Levels

The soil investigation levels are based on:

- National Environmental Protection Council (NEPC) National Environmental Protection (Assessment of Site Contamination) Measure (ASC NEPM), Schedule B1 (NEPC, 2013).

The NEPC (2013) Schedule B1 presents health-based investigation levels for different generic exposure settings (e.g. industrial / commercial, residential, recreational, etc.) as well as ecological investigation levels for three ecological settings.

Based on information provided by the University of Newcastle, it is understood that the future use of the site is intended to be commercial/industrial (multi-storey buildings (no residential occupancy)).

The following assessment criteria were adopted for soil:

- Health screening level (HSL) for open space/recreational land use for hydrocarbons (TRH and BTEX) via vapour intrusion (Table 1A (3) HSL C);
- Health investigation level (HIL) for open space/recreational land use for remaining COPCs (Table 1A (1) HIL C); and
- Management Limits for TRH fractions in soil (Table 1 B (7)).

Health Screening Levels/Health Investigation Levels

The HSLs and HILs are applicable for assessing human health risk via relevant exposure pathways. The HSLs have been developed for selected petroleum compounds and fractions and are applicable to assessing human health risk via the inhalation pathway. These HSLs depend on specific soil physicochemical properties and land use scenarios. HILs were developed for a broad range of metals and organic substances. These are generic to all soil types and apply generally to a depth of 3m below the soil surface.

Management Limits

The purpose of the Management Limits is to *"avoid or minimise"* potential effects of petroleum hydrocarbons. ASC NEPM (2013) Schedule B1 provides these as an interim Tier 1 guidance to manage potential effects of:

Formation of observable Non-Aqueous Phase Liquid (NAPL);

Fire and explosive hazards; and

Effects on buried infrastructure.

The application of the management limits requires the consideration of site-specific factors such as the depth of building services and depth to groundwater, to assess the maximum depth to which the limits should apply.

Ecological Screening Levels/Ecological Investigation Levels

To assess the potential impact on terrestrial ecosystems from contamination within the upper 2m of soil / fill material, the ASC NEPM (2013) presents ecological investigation levels (EILs) and ecological screening levels (ESLs) for different settings (e.g. areas of ecological significance, urban residential / public open space, commercial).

Section 3.5.1 of NEPM Schedule B5a states that the aim of the EILs is that varying levels of protection will be provided to the following ecological receptors at all sites:

- "Biota supporting ecological processed including microorganisms and soil invertebrates
- Native flora and fauna
- Introduced flora and fauna

- Transitory or permanent wildlife."

Further, ASC NEPM (2013) states: "*Commercial and industrial land, particularly in long-established industrial areas, is often heavily contamination by past activities or fill materials used to level the area. In these cases, jurisdictions may determine that HILs are the most appropriate soil quality criteria and that EILs are not applicable. In many cases, the only generic ecological value for this land use will be 'transitory wildlife'.*"

The site is within an area that has a long history of industrial land use including rail use and filling. The site will ultimately comprise mainly impervious materials such as buildings, concrete hardstand and bitumen covering the site, providing limited opportunity for plant life and for permanent or transitory wildlife to access soils. Based on the proposed land use, and industrial historical use, it is considered unlikely transitory wildlife would reside for long periods in contact with site soils. Based on site history information and site conditions for the site, HILs are considered more appropriate to assess soil quality for commercial / industrial land uses.

Based on the above, EILs and ESLs have not been adopted.

4.5.2. Health-based Criteria

The "HIL C" exposure scenario described in Schedule B7 of the ASC NEPM has been selected for the site to reflect the most conservative intended site use. The ground floor of the buildings on site will comprise academic facilities and offices. The proposed development includes a communal open space area with a final configuration still yet to be finalised.

Chemicals with sufficient volatility to pose potential health risks via vapour inhalation pathway; namely TRH F1 and F2 fractions, BTEX and naphthalene concentrations were compared to the soil Health Screening Levels (HSLs) for vapour intrusion applicable to residential (i.e. HSL D) listed in Table 1A (3) in Schedule B1 of the ASC NEPM.

The adopted screening levels apply to sandy soil (<1.0m depth).

The Health Investigation Levels (HILs) for heavy metals, PAH and pesticides in soils are selected from relevant values in Table 1A (1) in Schedule B1 of the ASC NEPM. Adopted values for health-based criteria are summarised in Table 4-4.

Table 4-4: Summary of Adopted Health Investigation Levels in Soil

Analyte	HILs for Open Space/Recreational (mg/kg)
Arsenic (total)	300
Cadmium	90
Chromium (VI)[1]	300
Copper	17,000
Lead	600
Mercury (inorganic)	80
Nickel	1200
Zinc	30,000
Carcinogenic PAHs as B(a)P TEQ[2]	3
Total PAHs	300
Phenol	40,000
Cresols	4,000
Pentochlorophenol	120

Analyte	HILs for Open Space/Recreational (mg/kg)
DDT+DDD+DDE	400
Aldrin + Dieldrin	10
Chlordane	70
Endosulfan	340
Endrin	20
Heptachlor	10
HCB	10
Methoxychlor	400
PCBs	1

[1] Laboratory Total Chromium results (or Total Chromium minus Chromium III) will be assessed against the HIL for Chromium VI as an initial screening assessment.
[2] TEQ = Toxicity Equivalent Quotient

The HSLs for TRH, BTEX and naphthalene in soils are summarised in Table 4-5.

HSLs for sandy soils have been adopted based on the dominant soil texture. HSL C for recreational/open space are all non-limiting, however the HSL D's have been included given the mainly commercial/industrial (buildings) usage of the Site.

Table 4-5: Summary of Health Screening Levels in Soil

Chemical	HSL D – Commercial/ Industrial (Sand) (mg/kg)[1]		
	0m to <1m	1m to <2m	2m to <4m
Benzene	3	3	3
Toluene	NL	NL	NL
Ethylbenzene	NL	NL	NL
Xylenes	230	NL	NL
Naphthalene	3	NL	NL
F1 (TPH C_6-C_{10} – BTEX)	260	370	630
F2 (TPH >C_{10}-C_{16} – Naphthalene)	NL	NL	NL

NL: non-limiting (i.e. contaminant is not considered to pose a risk to human health through vapour inhalation regardless of concentration).
Soil type is assumed to be sandy soils based on site assessment works.
1. *Table 1A(3) – Soil Health Screening Levels for Vapour Intrusion (NEPC, 2013);*
2. *Table A4 - Soil Health Screening levels for Direct Contact for commercial/ industrial (CRC CARE, 2011);*
3. *Table A3 – Soil Health Screening Levels for Vapour Intrusion (Intrusive Maintenance Worker) (CRC CARE, 2011).*

4.6. Waste Classification Criteria

Threshold concentrations listed in Tables 1 and 2 in NSW EPA (2014) Waste Classification Guidelines: Part 1 Classifying Waste are considered appropriate for waste classification of soils which exceed the adopted assessment criteria.

4.7. Acid Sulfate Soils

Coastal Acid Sulfate Soils

Coastal ASS are soils which contain significant concentrations of iron sulphide or pyrite which, when exposed to oxygen in the presence of sufficient moisture, oxidises, resulting in the generation of sulfuric acid. Unoxidised pyritic soils are referred to as potential ASS. When the soils are exposed, the oxidation of pyrite occurs, and sulfuric acids are generated, and the soils are said to be actual ASS.

Pyritic soils typically form in waterlogged, saline sediments rich in iron and sulfate. Typical environments for the formation of these soils include tidal flats, salt marshes and mangrove swamps below about RL 5m AHD. They can also form as bottom sediments in coastal rivers and creeks.

Pyritic soils of concern on low lying NSW and coastal lands have mostly formed in the Holocene period, (i.e. 10,000 years ago to present day) predominantly in the 7,000 years since the last rise in sea level. It is generally considered that pyritic soils which formed prior to the Holocene period (i.e. > 10,000 years ago) would already have oxidised and leached during periods of low sea level which occurred during ice ages, exposing pyritic coastal sediments to oxygen. There is still some potential for these older soils to contain stored acidity that could be released on exposure.

Significance of Coastal Acid Sulfate Soils

Disturbance or poorly managed development and use of coastal ASS can generate significant amounts of sulfuric acid, which can lower soil and water pH to extreme levels (generally <4) and produce acid salts, resulting in high salinity.

The low pH, high salinity soils can reduce or altogether preclude vegetation growth and can produce aggressive soil conditions which may be detrimental to concrete and steel components of structures, foundations, pipelines and other engineering works.

Generation of the acid conditions often releases aluminium, iron and other naturally occurring elements from the otherwise stable soil matrices. High concentrations of some such elements, coupled with low pH and alterations to salinity can be detrimental to aquatic life. In severe cases, affected waters flowing off-site into aquatic ecosystems can have a detrimental effect on aquatic ecosystems.

ASS Action Criteria

Action criteria define the acidity levels beyond which ASS requires management, in conjunction with the volumes of disturbance involved (Table 4-6). Soils with existing plus potential acidity below the action criteria may still be ASS but may not require management.

Action criteria are based on the sum of existing plus potential acidity. This is usually calculated in units of percent-sulfur equivalents (e.g. s-TAA + s-SNAS + SCR in % S units) or equivalent acidity (e.g. TAA + a-SRAS + a-SPOS in mol H+/tonne units)[2]. The percentage clay influences the natural buffering capacity of soil. As such, the action criteria for smaller disturbances (≤ 1000 tonnes) are grouped into three broad texture categories − coarse, medium and fine. The action criteria for disturbances >1000 tonnes of soil are set at the lowest value, irrespective of texture. A detailed ASS management plan will be required for these disturbances.

Table 4-6 outlines the adopted action criteria for Acid Sulfate Soils (Texture Based Acid Sulfate Soil Criteria.

Table 4-6 - Texture Based Acid Sulfate Soils Action Criteria

Type of Material		Sum of existing and potential acidity			
Texture Range (NCST, 2009)	Approximate Clay Content (%)	1 – 1000T Material Disturbed		> 1000T Material Disturbed	
		% S-equiv. (oven dried basis)	Mol H+/t (oven dried basis)	% S-equiv. (oven dried basis)	Mol H+/t (oven dried basis)
Fine Medium to Heavy Clays and Silty Clays	>40	0.1	62	0.03	18
Medium Sands to loamy sands and peat	5-40	0.06	36		
Coarse Sands to loamy sands and peat	<5	0.03	18		
Draft Action Criteria for Poorly Buffered Sands					
Coarse sands, poorly buffered	<5	0.01	6	0.01	6

Notes: The highest laboratory result(s) should always be used to decide if the relevant action criterion level has been met or exceeded; using the average or mean of a set of results is not appropriate or acceptable. The action criteria are based on the existing plus potential acidity**, not net acidity**.

4.8. Groundwater Investigation Levels

For assessing groundwater quality, it is necessary to assess the beneficial uses and environmental values of groundwater down-gradient of the site. Given the proximity to the harbour and resulting elevated salinity, there are minimal opportunities for the beneficial reuse of groundwater. Given the sandy subsoils and proximity to the harbour, groundwater will discharge ultimately into the estuarine zone of the Hunter River.

The default guideline values (DGV's) presented in the Australian & New Zealand Guidelines for Fresh and Marine Water Quality ANZECC (2018) guidelines are considered applicable for the protection of marine water ecosystems of the receiving waters. As these guidelines apply to receiving waters, it is generally conservative to apply these to groundwater discharging to receiving waters.

DGVs for toxicants have been derived using the species sensitivity distribution (SSD) approach, using methods described in the ANZECC & ARMCANZ (2000) guidelines for DGVs published in 2000 and Warne et al. (2018) for all DGVs published since 2000. Where the SSD approach could not be used, the less preferred 'assessment-factor approach' was used, following the method described in the ANZECC & ARMCANZ (2000) guidelines.

Where DGVs have been derived using the SSD method, guideline values are provided for 99, 95, 90 and 80% species protection. The DGV that is applicable to your situation depends on the current or

desired condition of the ecosystem and the associated level of protection that is assigned. In most cases:

high ecological/conservation value system — apply 99% species protection DGV

slightly to moderately disturbed system — apply 95% species protection DGV

highly disturbed system — apply 90 or 80% species protection DGV.

Guideline values derived using the less preferred assessment-factor method cannot be related to a percentage of species protected; they are assigned an 'unknown' level of species protection.

Assessment of Vapour Risks from Groundwater Contamination

To assess potential risks to human health from inhalation of indoor air affected by intrusion of petroleum hydrocarbon vapours from groundwater contamination, TPH, BTEX and naphthalene concentrations have been assessed using the groundwater HSLs for vapour intrusion reported in the ASC NEPM (2013) Schedule B1. The following groundwater assessment criteria for vapour intrusion will be adopted:

- Table 1A(5) Groundwater HSLs for vapour intrusion for Commercial Industrial land (HSL D)

5. Quality Assurance/ Quality Control

5.1.1. Data Quality Indicators for Sampling and Analysis

DQIs for the project were based on the field and laboratory considerations in ASC NEPM Schedule B2 Appendix B, (ASC NEPM 1999 (2013), which include:

- Completeness – a measure of the amount of useable data (expressed as %) from a data collection activity;
- Comparability – the confidence (expressed qualitatively) that data may be considered to be equivalent for each sampling and analytical event;
- Representativeness – the confidence (expressed qualitatively) that data are representative of each media present on the site;
- Precision – A quantitative measure of the variability (or reproducibility) of data; and
- Accuracy – a quantitative measure of the closeness of reported data to the true value.
- The QA review will include a check of performance against the DQIs.
- The DQIs adopted for this investigation and means by which they will be assessed are discussed in Tables 5-1 to 5-5.

Table 5-1 - Data Quality Indicators (DQIs) - Completeness

Completeness			
Field considerations	DQI	Laboratory considerations	DQI
All critical locations sampled	Samples were collected as per Section 4.2 and 4.3	**All critical samples analysed according to sampling plan presented in Section 4.2.**	Samples were analysed as per in Section 4.2.
All samples collected	Samples were collected as per Section 4.3	**All identified COPCs identified in Table 4.**	As above
SOPs appropriate and complied with	Coffey SOPs were implemented	**Appropriate methods and LORs**	Samples were analysed by laboratories NATA accredited for the analyses to be performed and appropriate methods were used. LORs were less than assessment criteria
Experienced sampler	An experienced Coffey Environmental scientist conducted the sampling	**Sample documentation complete**	COCs were returned, signed and dated by laboratory. NATA endorsed laboratory certificates were completed in accordance with NEPC (2013). Field logs were completed in accordance with Coffey SOPs

Completeness			
Field considerations	DQI	Laboratory considerations	DQI
Documentation correct	Samples were handled and transported under appropriate chain of custody (COC) control. Sample Receipt Notifications (SRN) from the laboratory were reviewed to assess that samples were received cool and in good condition. Calibration certificates for the PID were provided on a daily basis	**Sample holding times will be met**	Samples were analysed within holding times specified by NEPC (2013)

Table 5-2 - Data Quality Indicators (DQIs) - Comparability

Comparability			
Field considerations	DQI	Laboratory considerations	DQI
Same sampling procedures used on each occasion	Coffey SOPs were implemented	**Same sample analytical methods used**	The same NATA accredited laboratory was used to undertake analyses of primary and duplicate samples collected for this study. The laboratory used the same analytical methods for each sample for each analytical parameter
Experienced sampler	An experienced Coffey Environmental scientist conducted the sampling	**Same sample LORs**	As above
Climatic conditions (temperature, rainfall, wind…)	Sampling for this work was of a short duration. Climatic conditions did not cause issues for comparability of data	**Same laboratories (justify/quantify if different)**	As above
Same types of samples collected	Samples were collected in the appropriate laboratory supplied container specific to the analyses performed.	**Same units (justify/quantify if different)**	As above

Table 5-3 - Data Quality Indicators (DQIs) - Representativeness

Representativeness			
Field considerations	**DQI**	**Laboratory considerations**	**DQI**
Appropriate media sampled according to sample plan	Samples were collected and analysed as per Section 4.3.	**All samples analysed according to Section 4.2.**	Samples were collected and analysed as in Sections 4.2 and 4.3.
All media identified in sample plan.	Samples were collected and analysed as per Section 4.3		

Table 5-4 - Data Quality Indicators (DQIs) - Precision

Precision			
Field considerations	DQI	Laboratory considerations	DQI
Sampling procedures appropriate and complied with	Coffey SOPs were implemented	**Analysis of laboratory duplicates**	Laboratory duplicates were analysed in general accordance with NEPC (2013)
		Analysis of field duplicates	Duplicates were analysed at a frequency of 10% for intra-laboratory duplicate samples and 5% for inter-laboratory duplicates. RPDs were calculated and compared to relevant acceptance criteria: Soil (Organics and metals): 30% for concentrations more than 10 times the LOR and 50% for concentrations less than 10 times the LOR (Standards Australia 1997).
		Analysis of laboratory-prepared volatile trip spikes	A laboratory prepared BTEX trip spike was analysed for soil sampling per batch submitted to the laboratory (as defined in AS4482.2-1999 and NEPC (2013). Recovery results were assessed against the respective acceptance limits (i.e. 70 – 130%)

Table 5-5 - Data Quality Indicators (DQIs) - Accuracy

Accuracy			
Field considerations	**DQI**	**Laboratory considerations**	**DQI**
Sampling procedures appropriate and complied with	Coffey SOPs were implemented	**Analysis of:**	
Rinsate sample	Where sampling equipment was re-used (if any) a rinsate sample was collected analysed. Result was expected to be less than the LOR.	**field blanks**	A laboratory prepared trip blank was analysed for soil sampling one trip spike per sample set (i.e. esky) submitted to the laboratory (as defined in AS4482.2-1999 and NEPC (2013). Results were less than the LOR
		method blank	Method blanks were analysed as per NEPC (2013). Results to be less than LOR
		matrix spike	Matrix spike was analysed as per NEPC (2013). Results were within laboratory acceptance limits based on NEPC (1999, amended 2013)
		matrix spike duplicate	Matrix spikes were analysed as per NEPC (2013). Results were within laboratory acceptance limits based on NEPC (2013)

5.2. Field QA/QC

Field QA/QC procedures implemented for this project included:

- Sampling performed by qualified Coffey environmental professionals in accordance with Coffey's SOPs which are based on industry accepted protocols for environmental sampling and are consistent with Schedule B2 of the ASC NEPM;
- The following intra-laboratory (blind duplicate) and inter-laboratory (split duplicate) samples were collected and submitted for laboratory analysis as listed in Table 5-6.

Table 5-6: Summary of Duplicate Samples

Primary Sample	Sample Medium	Blind Duplicate	Split Duplicate
BHP8_0.2 - 0.3	Soil	QC1	QC2
BHP13_0.2 - 0.3	Soil	QC3	QC4

Primary Sample	Sample Medium	Blind Duplicate	Split Duplicate
BHP19_0.1 - 0.3	Soil	QC5	-
MW02	Water	QWC1	-

In summary, these intra and inter-laboratory duplicate samples scheduled for analysis equate to 19% in total, achieving the target of 5% for intra and inter-laboratory samples.

Calculated RPD values from collected primary, intra and inter-laboratory duplicate QC samples and are listed in Table LR3 (Soil) and LR8 (Groundwater) of Appendix H.

A review of soil QA/QC results generally reported RPDs below the control limits except for arsenic, cadmium, copper, lead, mercury, multiple TPH compounds and multiple components of the total PAH were above the adopted RPD acceptance limits. A review of water QA/QC results reported RPDs below the control limits.

These RPD exceedances are characteristic of localised heterogeneity of fill material as observed during field work. Coffey notes that the samples collected from filling material, containing sandy gravels with dark brown fine to coarse grained sands. The discrepancy in concentrations, particularly heavy metals and PAHs is likely to be associated with the following:

- Differing abundances of coarse fractions; and
- Variability in composition of the primary and QC samples collected in the field and potentially in the laboratory sub-samples taken from field samples for analysis could also contribute to the variation in RPD;

Coffey accepts the variability and notes that several factors, including some beyond Coffey's control, are likely to have influenced the observed differences in RPD results.

5.3. Laboratory QA/ QC

In accordance with NATA endorsed quality plans, the project laboratories performed internal QA/QC assessment which includes laboratory duplicates, method blanks, matrix spikes and surrogate spikes.

Laboratory QC analytical results are summarised below:

- Analysis of samples was undertaken by NATA accredited environmental laboratories;
- Samples were extracted and analysed within acceptable holding times;
- No target analytes were detected in the method blanks;
- RPDs for the laboratory duplicate samples were within the acceptable range, with the exception of Total Recoverable Hydrocarbons fractions in batch 634424-S. The laboratory flagged qualifier code Q15 which indicated the RPD reported passes Eurofins │ mgt's QC – Acceptance Criteria as defined in the Internal Quality Control Review and Glossary Page of the lab report. Details of the RPD exceedances are provided in Appendix H;
- Percentage recovery results for laboratory control samples were within the acceptable range;
- Percentage recovery results for surrogate samples were within the acceptable range; and
- Percentage recovery results for matrix spikes were within the acceptable range with the exception of some components of the Phenols in batch 634424-S. The laboratory flagged qualifier code Q08 which indicated that the matrix spike recovery was outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference.

5.4. Data Quality Assessment

Coffey considers that the data presented is usable and representative of the sampling locations at the time of sampling. DQI's (completeness, comparability, representativeness, precision and accuracy) were complied with and completed consistently during the assessment, with the exception of field duplicates. While RPDs were outside acceptance limits, Coffey consider that the field and laboratory data assessed was reliable with consideration to the following:

- Critical sample locations sampled;
- Each sample was collected;
- SOP's appropriate and complied with;
- Fieldwork and sampling completed by a suitably qualified Environmental Scientist;
- Sampling procedures were appropriate, complied with and completed consistently during the assessment works, with exception of collection of disturbed samples directly from the auger causing a potential loss in volatiles (PID readings and analytical results confirmed that volatiles were not detected in the soils samples);
- Sampling completed in optimal weather;
- The laboratory analysed samples as per the COC;
- Sample documentation was completed;
- Appropriate laboratory testing methods and LORs were implemented;
- The same laboratory was engaged to complete the testing of primary samples;
- The laboratory undertook the analysis of laboratory prepared duplicates; and
- Laboratory QA/QC procedure implemented and considered appropriate.

Therefore, based on the above discussion, the data assessed comprising field and laboratory influences on results as part of quality assurance are considered to be accurate, reliable and suitable for the purpose of this assessment.

6. Results

6.1. Subsurface Conditions

Coffey observed the following soil profile during fieldworks:

Fill – Gravelly Sand/ Sandy Gravel/ Sandy Clay

Fill/ Reclaimed – Sand – Fine to coarse grained, pale brown, sea shells present

Natural Sand – Fine to coarse grained, pale brown, sea shells present

Natural Clayey Sand – Fine to coarse grained, dark grey, presence of shells

6.2. Summary of Previous Analytical Data (Coffey 2013)

As reported in the summary report (Coffey, 2013) outlined in Section 3.1, Coffey previously carried out sampling in 2004 from seven (7) locations directly relevant to the Site with a data set inclusive of TPH, BTEX, PAH and metals (Coffey 2004a). Five (5) sites were further sampled along the eastern boundary in 2011 (unreported data), focused on asbestos, OCP's and PCB's.

In 2013, Coffey summarised the combined soil analysis data from 2004 and 2011 and compared them to the updated HIL/HSL's contained in NEPM 1999 (2013). The comparison of results showed that the concentrations of contaminants were generally below the adopted criteria (HIL B and HIL D), except for lead in two samples at depths of 0.1m to 0.5m, and asbestos detected in two samples along the eastern boundary at 0.1m depth.

The following was surmised from Coffey (2013):

"

Sampling and analysis carried out by Coffey in 2004 showed that the fill material (0.0m to 1.9m bgs) in the southeast corner and the eastern boundary was contaminated with lead, at levels in exceedance of the health criteria applicable to residential with minimal access to soil and commercial/industrial land use (HIL B and HIL D). Taking into consideration the 95% UCL calculation for lead, a value of 711.9 mg/kg was obtained, resulting in a concentration within the criteria for both residential with minimal access to soils (HIL-B) and commercial / industrial (HIL-D);

Based on the samples assessed (Coffey 2004), the remainder of the site showed concentrations below the adopted criteria for residential with minimal access to soil and commercial/industrial land use; and

Sampling and analysis carried out in 2011 by Coffey showed that there was asbestos impact (free fibres) in fill material along the eastern boundary. It was not known if asbestos impact was present in fill on other parts of the site."

Soil Waste Classification

The analytical data from the soil analysis collected in 2004 results were compared to the to the NSW EPA (2014) Waste Classification Guidelines.

The following was surmised from Coffey (2013:

"The results showed that the soils on site classified as general solid waste, except for soils near the eastern Site 1 boundary) at a depth of 0.0m to 1.9m which were classified as restricted solid waste. In addition, soils which were impacted with asbestos (two samples on the eastern boundary) are

required to be managed as asbestos waste. As asbestos was only detected in two of the samples form 2011, further delineation of the extent of the asbestos may be required depending on the extent of excavations in that area."

6.3. Field Screening Results (Current Assessment)

Soil samples were screened for presence of volatile petroleum hydrocarbons using a PID. The PID readings were reported between 0.0 ppm and 15.1 ppm, indicating that volatile petroleum hydrocarbons were unlikely to be present at reportable concentrations.

Individual PID readings are reported on the log sheets for boreholes presented in Appendix G.

6.4. Combined Soil Results (2019 and 2004)

Soil analytical results from BHP08 – BHP20 (minus BHP17 due to Aboriginal Heritage issues) were compared to the site criteria and waste classification criteria provided in Tables LR1, LR2 and LR5 of Appendix H respectively. Copies of the NATA endorsed laboratory reports are provided in Appendix I. Sampling locations are shown in Figure 2. The soil results have been combined with the results of seven (7) locations previously sampled during the Coffey (2004) Waste Classification Assessment of Lot 3 (BHE1, BHE2, BHE3, BHE4, BHE5, BHE6 and BHE7).

6.4.1. Health Based Investigation and Screening Levels (Soil)

A comparison of the analytical results against health-based investigation and screening levels reported eight (8) exceedances of the adopted Site Assessment Criteria (SAC) for Lead (600mg/kg HIL C). These included 1,800mg/kg (BHE7 0.5 – 0.6m), 740mg/kg (BHP8 0.2-0.3), 640mg/kg (BHP8 0.9-1.0), 2,200mg/kg (BHP15 0.2-0.3m), 1,800mg/kg (BHP15 0.9-1.0m), 1,100mg/kg (BHP16 0.0-0.2), 1,100mg/kg (BHP18 0.2-0.3) and 1,000mg/kg (BHP19 0.1-0.3). Five (5) exceedances of the SAC for Bap TEQ (3mg/kg) were recorded for BHP8 0.2 – 0.3 (45mg/kg), BHP8 0.9-1.0 (31mg/kg), BHP10 0.2-0.3 (61mg/kg), BHP15 0.9-1.0 (6.9mg/kg) and BHP18 0.2-0.3 (7.4mg/kg).

Three (3) samples are a Lead hotspot based on the SAC used. These include BHE7 0.5-0.6, BHP15 0.2-0.3 and BHP15 0.9-1.0. Three (3) samples are BaP hotspots based on the SAC used. These include BHP8 0.2 – 0.3, BHP8 0.9-1.0, BHP10 0.2-0.3. Given the identified hotspots a 95% $UCL_{average}$ calculation is not valid for the assessment of overall lead and BaP average concentrations.

A summary of the analytical results is provided in Table LR1 of Appendix H.

6.4.2. Preliminary in Situ Waste Classification

A preliminary in situ waste classification was made using analytical results for soil and comparing to the NSW EPA Waste Classification Guidelines (2014) with the following findings:

- 95%$UCL_{average}$ lead concentrations (606 mg/kg) for the nineteen (19) locations across the site exceeded the CT2 restricted solid waste criteria without TCLP (400 mg/kg); and
- 95%$UCL_{average}$ B(a)P (not TEQ) concentrations (5.2 mg/kg) for the nineteen (19) locations across the site exceeded the CT2 criteria without TCLP (3.2 mg/kg).

Due to the CT2 exceedances, Toxicity Characteristic Leaching Procedure (TCLP) analysis of Lead was carried out on samples BHP14_0.2-0.3, BHP15_0.2-0.3, BHP16_0.0-0.2 and BHP18_0.2-0.3. TCLP analysis for BaP was carried out on samples BHP08_0.2-0.3, BHP15_0.2-0.3 and BHP18_0.2-0.3.

TCLP results indicated that concentrations were recorded below the **General Solid Waste TCLP1/SCC1** for all Lead samples analysed, with the exception of BHP18_0.2-0.3 which is classified as **Restricted Solid Waste SCC2/TCLP2**.

TCLP analysis of BaP were recorded below the limit of reporting (<0.001) for all benzo(a)pyrene samples analysed.

Based on a comparison of the results to the waste classification guidelines and considering the results of the statistical appraisal for B(a)P, fill soils in the vicinity of BHP08 and BHP10 have a preliminary waste classification of **Restricted Solid Waste SCC2**. Fill soils at shallow depth to approximately 0.3m bgs located around location BHP18 have a classification of **Restricted Solid Waste SCC2** due to leachable results of lead**.** The remainder of soils on site have a preliminary classification of **General Solid Waste TCLP/SCC1.**

Coffey notes that the in-situ waste classification is preliminary only. Excavations during redevelopment works may reveal soil conditions that differ from those encountered during the in-situ assessment, which may require further assessment prior to offsite disposal. An unexpected finds protocol should be implemented during excavation works at the Site.

Analytical results tables for the waste classification summary above are provided in Table LR5 of Appendix H.

6.4.3. Groundwater Analytical Results

Summary of Previous Groundwater Assessment (Coffey 2013)

From Coffey (2013):

"Groundwater quality assessment was carried out in 2004 (Coffey 2004c) with the results compared to relevant criteria:

- *ANZECC (2000) Australian and New Zealand Guidelines for Fresh and Marine Water Quality - Table 5.2.3 water quality guidelines for recreational purposes;*
- *ANZECC (2000) Australian and New Zealand Guidelines for Fresh and Marine Water Quality – Table 3.4.1 Protection of 95% of species, marine water.*
- *The results showed concentrations of contaminants below adopted criteria, with the exception of:*
  - *Copper exceedance of the protection of 95% of species in a marine ecosystem guideline (1.3µg/L) in two samples (2µg/L and 3µg/L respectively);*
  - *Zinc exceedance pf the protection of 95% of species in a marine ecosystem guideline (15µg/L) in one sample (145µg/L);*
  - *Manganese exceedance of the recreational water use guideline (100µg/L) in one sample (295µg/L).*

It was noted that groundwater conditions and concentrations of contaminants could have changed since the sampling carried out in 2004. The report concluded that the groundwater from the subject sites should be suitable for discharge to stormwater, and ultimately Newcastle Harbour during site dewatering.

The report also recommended:

- *Daily monitoring for pH, electrical conductivity, and visual or olfactory condition should be undertaken during the dewatering process;*
- *Sampling of Newcastle Harbour at the mixing zone (25m from the discharge point) after the first week of discharge; and*
- *Groundwater sampling and analysis on a fortnightly basis through the dewatering process."*

Current Assessment

A summary of the analytical results of samples collected during this current assessment is presented in Table LR7 in Appendix H. Laboratory reports are provided in Appendix I.

The results of the laboratory analysis of groundwater samples collected from monitoring wells (MW01, MW02 and MW03), reported the following exceedances of the GILs and ANZECC (2018) 95% of species in a marine ecosystem DGV:

- Copper (Filtered) *(DGV – 0.00133µg/L)* was detected at a concentration of 0.004mg/L (MW01); and
- Zinc (Filtered) *(DGV – 0.0015µg/L)* was detected at a concentration of 0.087mg/L (MW01) and 0.17mg/L (MW03) respectively.

6.4.4. Acid Sulfate Soil Assessment

A summary of the analytical results is presented in Table LR6 in Appendix H. Laboratory reports are provided in Appendix I.

The results of the laboratory analysis of the Acid Sulfate Soil samples collected during the most recent site investigation indicate the following;

- Field screening of 25 primary soil samples collected in the natural material observed on site was undertaken by NATA accredited laboratory Eurofins Mgt;
- Samples in a 1:5 mixture with distilled water were recorded at a pH between 8.6 to 9.6 (pH units). A pH less than or equal to 4 is likely to indicate the presence of Actual Acid Sulfate Soils;
- pH_{FOX} ranging from 2.8 to 7.8 (pH units), with reactions recorded between no reaction/ slight reaction to extreme reactions with constant froth, after oxidation in hydrogen peroxide, were observed for the samples. pH_{FOX} of less than 3.5 can be indicative of Potential Acid Sulfate Soils (PASS);
- The total pH drop was in the range of 0.6 to 6.2 pH units. A drop of more than 1 unit, plus increase in temperature, effervescence, colour and odour factors can be indicative of PASS;
- Chromium suite analysis was undertaken on 14 selected samples which were visually and olfactory assessed to contain Potential ASS characteristics. The samples included: (BHP9 3.4-3.5, BHP9 3.8-3.9, BHP11 3.3-3.5, BHP13 2.5-2.6, BHP14 3.3-3.5, BHP18 3.5-3.8, BHP19 3.1-3.3, BHP20 2.9-3.0, MW01 3.8-4.0, MW02 3.8-4.0, MW02 4.8-5.0 and MW03 3.8-4.0). The resulst indicated
- 12 of the 14 samples tested (excluding BHP15 2.5-2.8 and BHP16 2.8-3.0) exceeded the adopted SAC for the site of 0.03 % S. Results ranged between 0.032 and 0.44.
- Coffey calculated a liming rate for the samples that exceeded the above criteria. A liming rate of between 1.5 and 20.59 kg/tonne was calculated for the above stated samples.

6.4.5. Asbestos

As reported in Coffey 2013, asbestos was identified in two surface soil samples collected along the eastern boundary. This area was therefore examined visually with suspected ACM identified in a pile of material along the boundary. Both the suspected ACM and the soils they were found in (SS1 and SS2) were sampled and analysed for the presence of asbestos. Seven (7) soil samples were also analysed taken from locations across the Site.

Nine soil samples in total were assessed for asbestos presence/absence. These samples included BHP08 0.2 – 0.3, BHP09 0.2-0.5, BHP10 0.2-0.3, BHP12 0.2-0.3, BHP13 0.2-0.3, BHP15 0.2-0.3,

BHP20 0.2-0.3, SS1 and SS2. None of the soil samples tested positive for the presence of asbestos. Three (3) samples of suspected asbestos containing materials were collected along the eastern boundary and analysed for the presence of asbestos. None of the materials analysed returned a positive asbestos result.

7. Discussion

7.1. Conceptual site model

Based on the results of this DSI, the conceptual site model (CSM) has been included in Table 7-1.

Table 7-1 - Potential Areas and Chemicals of Environmental Concern

AEC	Contaminating Activity	Potential COCs	Likelihood of Contamination*	Relevant Samples Targeting AEC
Entire Site	Impacted fill of unknown origin	Heavy Metals, Asbestos, OCPs, PCBs, PAH, BTEX and TRH	Medium to High (Heavy metals, PAH) low for all other COPC	BHE1 to BHE7, BHP08 to BHP16, BHP18 to BHP20, SS1 and SS2
Entire Site	Presence of Acid Sulfate Soils below the fill	Potential or Actual Acid Sulfate Soils	Medium to High	BHP9, BHP11, BHP13, BHP14, BHP15, BHP16, BHP18, BHP19, BHP20, MW01, MW02 and MW03
Ground Water	Impacted Groundwater from former practices on site	Heavy Metals, OCP, PCB, TRH, BTEX and PAH	Low to Medium	MW01, MW02 and MW03

Table 7-2 - Potentially affected media, receptors and transport mechanisms

Consideration	Information
Affected Media	Shallow soil – fill material.
Potential Transport Mechanisms & Exposure Pathways	Direct dermal contact with contaminated soil Direct dermal contact with groundwater Ingestion of contaminated soil and groundwater Inhalation of airborne dusts
Potential Receptors of Contamination	***Construction/maintenance workers*** Potential exposure via dermal contact with soil and ingestion of soil. Potential exposure via secondary inhalation of airborne dusts (lead). Potential exposure to groundwater during dewatering activities ***Future Site Users*** Potential exposure via dermal contact, and ingestion/inhalation of soil and dust. Contact with groundwater is considered unlikely due to no identified beneficial use of groundwater. ***Groundwater*** Leaching of contaminants is not expected into groundwater as the primary contaminants identified are typically relatively non-leachable (lead and BaP sourced from slag fill). ***Surface Water – Hunter River*** Lateral transport of surface water and discharge of stormwater at the nearest surface water receptor – Hunter River 500m North of site.

Table 7-3 - Summary of identified key potential exposure pathways

Receptor	Exposure Pathway	Comment
Construction/ Maintenance Workers	Potentially Complete	There is a potential for workers conducting subsurface works to be exposed to soils containing potential contaminants via dermal contact, ingestion of soils and groundwater.
Future site users	Potentially Complete	There is a potential for future site users to be exposed to soils containing potential contaminants via dermal contact, ingestion and inhalation pathways.
Groundwater	Potentially complete	Given the limited leachability (typically a characteristic of slag materials) of the lead and BaP identified, the potential for groundwater contamination is low.
Surface Water	Complete	Stormwater runoff will enter the surrounding Council drainage systems ultimately entering the Hunter River.

7.2. Land Use Suitability

7.2.1. Coffey 2013 Recommendations

Based on a limited dataset (7 samples), Coffey 2013 summarised the following with regards to the suitability of land for the proposed residential B or commercial/industrial development:

"Coffey recommends that no remediation should be undertaken for the site. Instead, contamination should be managed by capping and a site management plan, provided there is no deep excavation or basement level planned. If deep excavations are planned a comprehensive waste classification exercise should be conducted in situ to better understand the disposal requirements.

Groundwater at the site contained heavy metal impacts, including copper, zinc, manganese and lead. An additional assessment of groundwater may be required depending on whether basements are proposed to be developed on the site.

The site can be made suitable for residential with minimal access to soils and / or commercial industrial use via capping and the implementation of a site management plan. It must be noted that if any cuts are required to level the site, waste classification of the material to be excavated should be carried out in order to assess management options. It is noted that asbestos is reported to be present in the shallow fill material. As such, these impacts will need to be considered prior to using the site for any purpose. In addition, given the ecological exceedances in the fill material, this material should not be used in landscaped or vegetated areas.

Should the asbestos impacts be managed / remediated, the site can be made suitable for residential with minimal access to soils and / or commercial / industrial use. As such, the fill material at the site can be re-used as backfill in areas that will be used for high-density residential or commercial / industrial developments. It is noted however, that given the ecological exceedances in this material, this material should not be used in landscaped or vegetated areas.

Subject to chemical assessment for potential contaminants and acid sulfate soils, the underlying natural material may be classified as Virgin Excavated Natural Material (VENM). In this case, the VENM material can be used as backfill on the proposed development site. The fill materials should

not be used for landscaping or vegetated areas. Groundwater is not to be used on site unless it is demonstrated to be suitable for its intended use."

7.2.2. Current Assessment

As identified in the initial results obtained from soil locations BHE1 to BHE7 during the previous investigations on site the main contaminants of potential concern, from a site suitability perspective, were BaP and Lead. For the purposes of the proposed development (which includes a proposed open space communal area) the adopted SAC is taken from the most conservative land use of HIL C open space/recreational.

For this DSI a total of 21 sample locations were utilised to complete the assessment including previously collected data from the 7 locations in 2004 and 14 sample locations sampled in this DSI. The combined results indicate that the Benzo(a)Pyrene and lead impacted soil is relatively confined to the upper 1.0m of the soil across the site. In total, the volume of impacted fill material should be approximately 9,000m^3. This is an estimate only and does not include a bulking factor.

The highest concentrations of BaP and lead are associated with the presence of slag materials in the fill. Slag was identified in the upper 1m bgs soils at BH08, BHP10, BHP15 and BHP19. Both Bap and lead were elevated in BHP08 and BHP10, with elevated lead also identified in BHP15 and BHP19. From previous experience with slag-based fill, the leachability of these contaminants under both acidic and neutral conditions are typically low.

A comparison of the analytical results against health-based investigation and screening levels reported eight (8) exceedances of the adopted Site Assessment Criteria (SAC) for Lead (600mg/kg HIL C). These included 1,800mg/kg (BHE7 0.5 – 0.6m), 740mg/kg (BHP8 0.2-0.3), 640mg/kg (BHP8 0.9-1.0), 2,200mg/kg (BHP15 0.2-0.3m), 1,800mg/kg (BHP15 0.9-1.0m), 1,100mg/kg (BHP16 0.0-0.2), 1,100mg/kg (BHP18 0.2-0.3) and 1,000mg/kg (BHP19 0.1-0.3). Five (5) exceedances of the SAC for Bap TEQ (3mg/kg) were recorded for BHP8 0.2 – 0.3 (45mg/kg), BHP8 0.9-1.0 (31mg/kg), BHP10 0.2-0.3 (61mg/kg), BHP15 0.9-1.0 (6.9mg/kg) and BHP18 0.2-0.3 (7.4mg/kg).

Three (3) samples are a Lead hotspot based on the SAC used. These include BHE7 0.5-0.6, BHP15 0.2-0.3 and BHP15 0.9-1.0. Three (3) samples are BaP hotspots based on the SAC used. These include BHP8 0.2 – 0.3, BHP8 0.9-1.0, BHP10 0.2-0.3. Given the identified hotspots a (95% $UCL_{average}$) was not possible.

No asbestos containing materials were identified during these works, however, considering the finds made in 2011 one cannot preclude the site is completely asbestos free. This potential for identifying ACM on site (most likely in bonded form) should be managed using an Asbestos Management Plan.

Given the identification of lead and BaP TEQ hotspots the site requires remediation and validation of these impacted areas in order to make it suitable for the proposed development in line with HIL/HSL C requirements. It is recommended that delineation, remediation and validation of the identified hotspots be completed and a final 95%UCLaverage be undertaken following completion to assess the remediated site status. Coffey notes that the site is however compliant with HIL/HSL D Commercial/Industrial land use criteria.

Following remediation and validation, unexpected finds including contaminated materials and asbestos should be managed using an Unexpected Finds Procedure and Asbestos Management Plan to be prepared and included in the Construction Environmental Management Plan documentation during construction phase works.

7.3. Suitability of Groundwater for Discharge to Stormwater

Similar to the data collected during the GME undertaken in 2004, the groundwater assessment undertaken during this DSI identified exceedances of heavy metals in some of the groundwater samples as follows:

- Copper (Filtered) *(DGV – 0.00133µg/L)* was detected at a concentration of 0.004mg/L (MW01); and
- Zinc (Filtered) *(DGV – 0.0015µg/L)* was detected at a concentration of 0.087mg/L (MW01) and 0.17mg/L (MW03) respectively.

There were no other exceedances of the respective SAC for the other COPC's measured. The measured heavy metal impact is most likely reflective of the regional groundwater quality given the extensive industrial and fill history of the area as a whole and not a result of specific historical activities on site. There is currently no beneficial use of groundwater in the immediate area given the high salinities/conductivities of the groundwater.

Future interaction with groundwater will most likely occur during services trenching works at the Site (communications, power, water and sewer (indicated to be the deepest at 4m bgs in the design plans). As a result, there will be a need for dewatering of these services trenches during the early works which should be guided by a site-specific dewatering management plan.

As recommended in the 2004 with further confirmation during this DSI, the groundwater should be of sufficient quality to be considered suitable for stormwater discharge. Dewatering will need to be managed by undertaking a dewatering assessment and preparation of a site-specific Dewatering Management Plan (DMP). Preliminary discussions with Council regarding the requirements for discharge to stormwater during dewatering should also be undertaken prior to the commencement of early earthworks activities such as trenching for services.

7.4. Preliminary in Situ Waste Classification

Both lead and BaP exceed the respective CT2 criteria (no leach) in the Waste Classification Guidelines 2014. As a result, Toxicity Characteristic Leaching Procedure (TCLP) tests were undertaken on selected samples and results were compared to the TCLP1/SCC1 criteria.

Results indicated that soils in the vicinity of BHP08 and BHP10 is classified as **Restricted Solid Waste** due to the concentration of Benzo(a)pyrene.

Following TCLP analysis on sample BHP18_0.2-0.3 indicated that soils to a depth approximately 0.3 bgs have been classified as **Restricted Solid Waste (TCLP2/SCC2).** Soils in the vicinity of boreholes BHP08, BHP10 and BHP18 (to 0.3m bgs), have been classified as suitable to be re-used on site if stored at least 0.5m above the standing water level.

The remainder of the soils on site have a preliminary classification of **General Solid Waste (TCLP1/SCC1).**

Excavation and stockpiling of fill materials to an approximate depth of 1.0mbgs, followed by reassessment of the stockpile may reduce the preliminary classification of the fill material.

7.5. Acid Sulfate Soils

Potential acid sulfate soils have been identified in soils between 2.5m – 4.0m bgs at sites BHP9, BHP11, BHP13, BHP14, BHP15, BHP16, BHP18, BHP19, BHP20, MW01, MW02 and MW03 with further confirmation below 4.0m at MW02. A preliminary liming rate has been established based on the highest concentration of %S obtained at BHP18 3.5-3.8 (0.44%S) of 20.6 kg $CaCO_3$ per tonne with an included safety factor of 1.5.

8. Conclusions and Recommendations

Based on a review of available data from previous and recent investigations, and observations made during fieldwork, Coffey concludes that the Site in its current form is not suitable for the proposed development, with remediation required for the BaP and lead hotspots to satisfy a HIL/HSL C SAC. Coffey notes that the site is however compliant with HIL/HSL D Commercial/Industrial land use criteria.

The following recommendations have been included for the remediation of the site, management of excess spoil, groundwater and potential acid sulfate soils:

- Given the identification of lead and BaP TEQ hotspots (in excess of HIL/HSL C SAC) the site requires remediation and validation of these impacted areas in order to make it suitable for the proposed development. It is recommended that delineation, remediation and validation of the identified hotspots be completed and a final 95%UCLaverage be undertaken following completion to assess the remediated site status. Coffey recommends the preparation of a remediation action plan (RAP) to address the delineation, remediation and validation of the Site to a final land use of HIL/HSL C Open Space/Recreational. The soil excavated during the remediation and trenching works can be reused as fill on site provided it is placed below 2m bgs and at least 0.5m above the standing water level. If this material is to be taken off site it is recommended that the stockpiles be assessed against the NSW EPA Waste Classification Guidelines including a TCLP for both PAH and metals (lead being the metal found to be in exceedance in the preliminary assessments). Retention of the material on site should be prioritised over export of material to landfill, regardless of the waste classification criteria obtained;

- Ongoing groundwater assessment during the development stages of this project is recommended. This will be used to assess whether the background levels of heavy metal contamination, or any other COPC, are affected by actions during development. The wells installed on the property during this DSI should be retained if possible and utilised for ongoing groundwater monitoring;

- As recommended in the 2004 with further confirmation during this DSI, the groundwater should be of sufficient quality to be considered suitable for stormwater discharge. Dewatering will need to be managed by undertaking a dewatering assessment and preparation of a site-specific Dewatering Management Plan (DMP). Preliminary discussions with Council regarding the requirements for discharge to stormwater during dewatering should also be undertaken prior to the commencement of early earthworks activities such as trenching for services.

- Future groundwater investigations (dewatering assessment) for the assessment of discharge of groundwater resulting from dewatering activities to the stormwater drains should use an expanded suite of chemicals of potential concern including cations and anions including calcium, magnesium, potassium and sodium, chloride), alkalinity, Kjeldahl nitrogen, nitrate, nitrite, total nitrogen, total phosphorus and sulfate;

- Potential Acid Sulfate Soils (PASS) were identified in sub-surface soil samples collected from approximately 2.5 – 4.0mbgs. Preparation of an Acid Sulfate Soils Management Plan (ASSMP) is recommended for use on site during site development works (including early trenching works for the installation of services and future bulk excavation) that are anticipated to exceed 2.5mbgs;

- Nine (9) soil samples (surface) were assessed for the presence of asbestos in the fill materials with no presence detected in the samples. Observation of the surface soils adjacent to the eastern boundary (where surface asbestos was identified in previous investigations) was undertaken. Three suspected pieces of material were sampled and tested for the presence of asbestos. No asbestos was found to present in the materials sampled. No asbestos containing materials were identified during these works, however, considering the finds made in 2011 one cannot preclude the site is completely asbestos free. This potential for identifying ACM on site (most likely in bonded form) should be managed using an Asbestos Management Plan.;

- A preliminary classification of General Solid Waste (TCLP1/SCC1) has been assessed for the in-situ soils, primarily impacted by elevations of PAH and lead in the 0 – 1.0m bgs fill. With the

exception of soils in the vicinity of BHP08, BHP10 and shallow soils (0.3m bgs) at location BHP18 which are classified as Restricted Solid Waste SCC2.

- It is recommended that additional TCLP analysis of lead and BaP in samples exceeding the CT1/CT2 (no leach) criteria be undertaken on all stockpiles identified for offsite disposal; and

- Coffey also recommends that prior to the commencement of site redevelopment works, an appropriate Construction Environmental Management Plan (CEMP) is prepared by the appointed construction contractor to manage environmental risk posed to construction workers, and to the surrounding public and environment, by construction works and to manage waste in accordance with appropriate New South Wales statutes. Coffey recommends inclusion of a Contaminated Land Management Plan (CLMP) and Unexpected Finds Protocol (UFP) within the CEMP, to provide a procedure for emergency response should contaminated material (including asbestos) or items of heritage significance be uncovered during site redevelopment.

9. Closing remarks

The contamination assessment undertaken in completion of this Detailed Site Investigation has been undertaken in general accordance with the requirements of State Planning Policy 55 (SEPP 55) Remediation of Land and the NSW OEH Guidelines for Reporting on Contaminated Sites (2011). Reviewed assessments were undertaken in accordance with the relevant NSW EPA and NSW DEC guidance's for detailed site investigations.

This document should be read in conjunction with the attached sheet *'Information about your Coffey Report'.*

10. References

- Coffey Services Australia Pty Ltd (2018) *Status of Site Contamination and Mine Subsidence at Sites 1, 2 and 3, University of Newcastle Honeysuckle Campus Concept Plan Development Application (DA) – Response to Secretary's Environmental Assessment Requirements (SEARs)* (Reference: 754-NTLEN213472-L02);
- Coffey Services Australia Pty Ltd (2013) *Summary of Previous Contamination Assessments Honeysuckle Central*
- JBS&G (2016), Site Wide Remedial Concept Plan (extract p128-144)
- *National Environment Protection (Assessment of Site Contamination) Measure (ASC NEPM)* 2013;
- NSW EPA (1995) *Contaminated Sites: Sampling Design Guidelines*;
- NSW EPA (2014) *Waste Classification Guidelines: Part 1 Classifying Waste*;
- NSW OEH (2011) *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites*;
- Dear, S-E., Ahern, C. R., O'Brien, L. E., Dobos, S. K., McElnea, A. E., Moore, N. G. & Watling, K. M., 2014. *Queensland Acid Sulfate Soil Technical Manual: Soil Management Guidelines. Brisbane: Department of Science, Information Technology, Innovation and the Arts, Queensland Government*
- SEPP 55 *State Environmental Planning Policy 55 – Remediation of Land*.

Important information about your **Coffey** Environmental Report

Introduction

This report has been prepared by Coffey for you, as Coffey's client, in accordance with our agreed purpose, scope, schedule and budget.

The report has been prepared using accepted procedures and practices of the consulting profession at the time it was prepared, and the opinions, recommendations and conclusions set out in the report are made in accordance with generally accepted principles and practices of that profession.

The report is based on information gained from environmental conditions (including assessment of some or all of soil, groundwater, vapour and surface water) and supplemented by reported data of the local area and professional experience. Assessment has been scoped with consideration to industry standards, regulations, guidelines and your specific requirements, including budget and timing. The characterisation of site conditions is an interpretation of information collected during assessment, in accordance with industry practice,

This interpretation is not a complete description of all material on or in the vicinity of the site, due to the inherent variation in spatial and temporal patterns of contaminant presence and impact in the natural environment. Coffey may have also relied on data and other information provided by you and other qualified individuals in preparing this report. Coffey has not verified the accuracy or completeness of such data or information except as otherwise stated in the report. For these reasons the report must be regarded as interpretative, in accordance with industry standards and practice, rather than being a definitive record.

Your report has been written for a specific purpose

Your report has been developed for a specific purpose as agreed by us and applies only to the site or area investigated. Unless otherwise stated in the report, this report cannot be applied to an adjacent site or area, nor can it be used when the nature of the specific purpose changes from that which we agreed.

For each purpose, a tailored approach to the assessment of potential soil and groundwater contamination is required. In most cases, a key objective is to identify, and if possible quantify, risks that both recognised and potential contamination pose in the context of the agreed purpose. Such risks may be financial (for example, clean up costs or constraints on site use) and/or physical (for example, potential health risks to users of the site or the general public).

Limitations of the Report

The work was conducted, and the report has been prepared, in response to an agreed purpose and scope, within time and budgetary constraints, and in reliance on certain data and information made available to Coffey.

The analyses, evaluations, opinions and conclusions presented in this report are based on that purpose and scope, requirements, data or information, and they could change if such requirements or data are inaccurate or incomplete.

This report is valid as of the date of preparation. The condition of the site (including subsurface conditions) and extent or nature of contamination or other environmental hazards can change over time, as a result of either natural processes or human influence. Coffey should be kept appraised of any such events and should be consulted for further investigations if any changes are noted, particularly during construction activities where excavations often reveal subsurface conditions.

In addition, advancements in professional practice regarding contaminated land and changes in applicable statues and/or guidelines may affect the validity of this report. Consequently, the currency of conclusions and recommendations in this report should be verified if you propose to use this report more than 6 months after its date of issue.

The report does not include the evaluation or assessment of potential geotechnical engineering constraints of the site.

Interpretation of factual data

Environmental site assessments identify actual conditions only at those points where samples are taken and on the date collected. Data derived from indirect field measurements, and sometimes other reports on the site, are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact with respect to the report purpose and recommended actions.

Variations in soil and groundwater conditions may occur between test or sample locations and actual conditions may differ from those inferred to exist. No environmental assessment program, no matter how comprehensive, can reveal all subsurface details and anomalies. Similarly, no professional, no matter how well qualified, can reveal what is hidden by earth, rock or changed through time.

The actual interface between different materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but

steps can be taken to reduce the impact of unexpected conditions.

For this reason, parties involved with land acquisition, management and/or redevelopment should retain the services of a suitably qualified and experienced environmental consultant through the development and use of the site to identify variances, conduct additional tests if required, and recommend solutions to unexpected conditions or other unrecognised features encountered on site. Coffey would be pleased to assist with any investigation or advice in such circumstances.

Recommendations in this report

This report assumes, in accordance with industry practice, that the site conditions recognised through discrete sampling are representative of actual conditions throughout the investigation area. Recommendations are based on the resulting interpretation.

Should further data be obtained that differs from the data on which the report recommendations are based (such as through excavation or other additional assessment), then the recommendations would need to be reviewed and may need to be revised.

Report for benefit of client

Unless otherwise agreed between us, the report has been prepared for your benefit and no other party. Other parties should not rely upon the report or the accuracy or completeness of any recommendation and should make their own enquiries and obtain independent advice in relation to such matters.

Coffey assumes no responsibility and will not be liable to any other person or organisation for, or in relation to, any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report.

To avoid misuse of the information presented in your report, we recommend that Coffey be consulted before the report is provided to another party who may not be familiar with the background and the purpose of the report. In particular, an environmental disclosure report for a property vendor may not be suitable for satisfying the needs of that property's purchaser. This report should not be applied for any purpose other than that stated in the report.

Interpretation by other professionals

Costly problems can occur when other professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, a suitably qualified and experienced environmental consultant should be retained to explain the implications of the report to other professionals referring to the report and then review plans and specifications produced to see how other professionals have incorporated the report findings.

Given Coffey prepared the report and has familiarity with the site, Coffey is well placed to provide such assistance. If another party is engaged to interpret the recommendations of the report, there is a risk that the contents of the report may be misinterpreted and Coffey disowns any responsibility for such misinterpretation.

Data should not be separated from the report

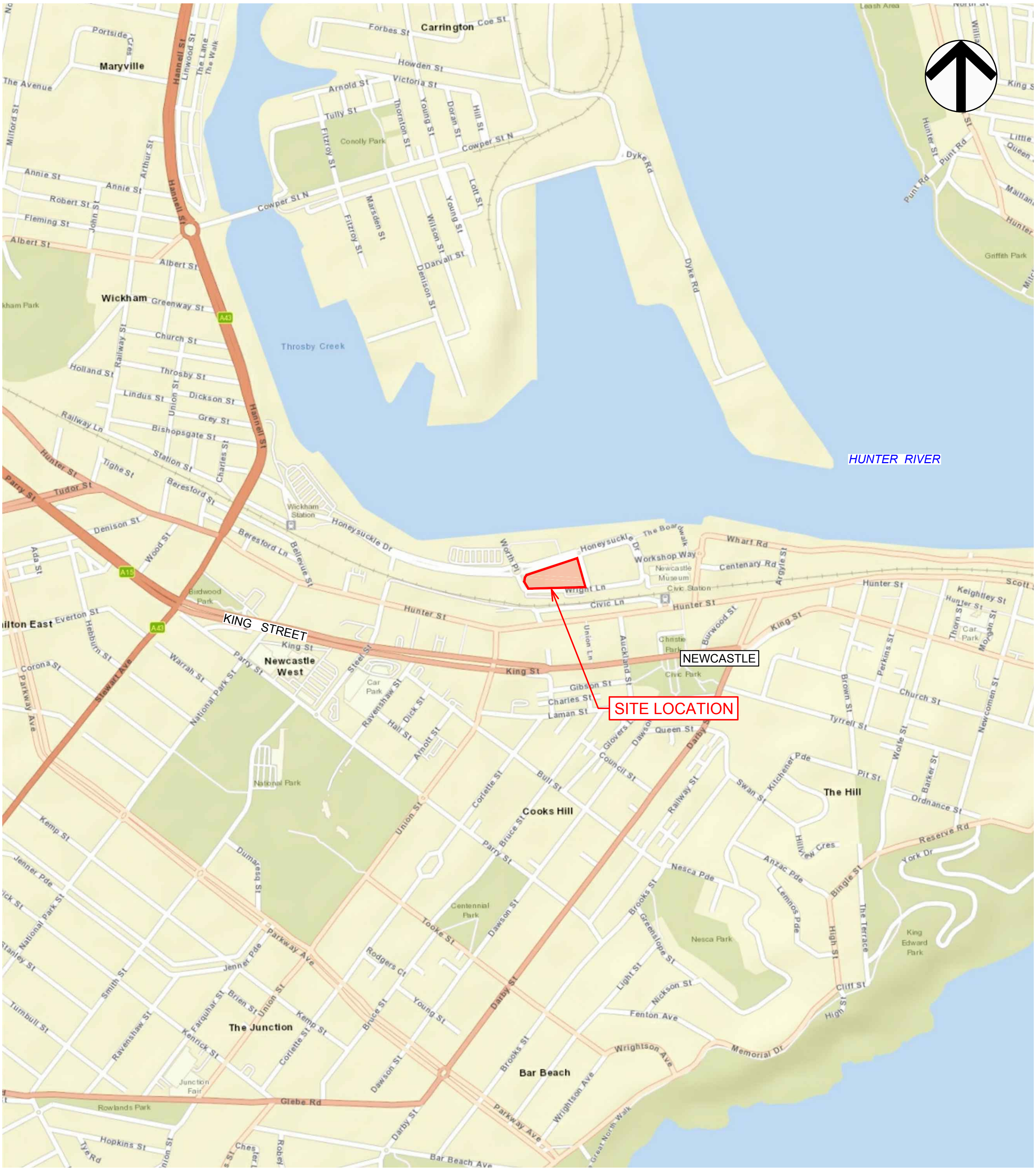
The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way. Logs, figures, laboratory data, drawings, etc. are customarily included in our reports and are developed by scientists or engineers based on their interpretation of field logs, field testing and laboratory evaluation of samples. This information should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

This report should be reproduced in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties.

Responsibility

Environmental reporting relies on interpretation of factual information using professional judgement and opinion and has a level of uncertainty attached to it, which is much less exact than other design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. As noted earlier, the recommendations and findings set out in this report should only be regarded as interpretive and should not be taken as accurate and complete information about all environmental media at all depths and locations across the site.

Figures



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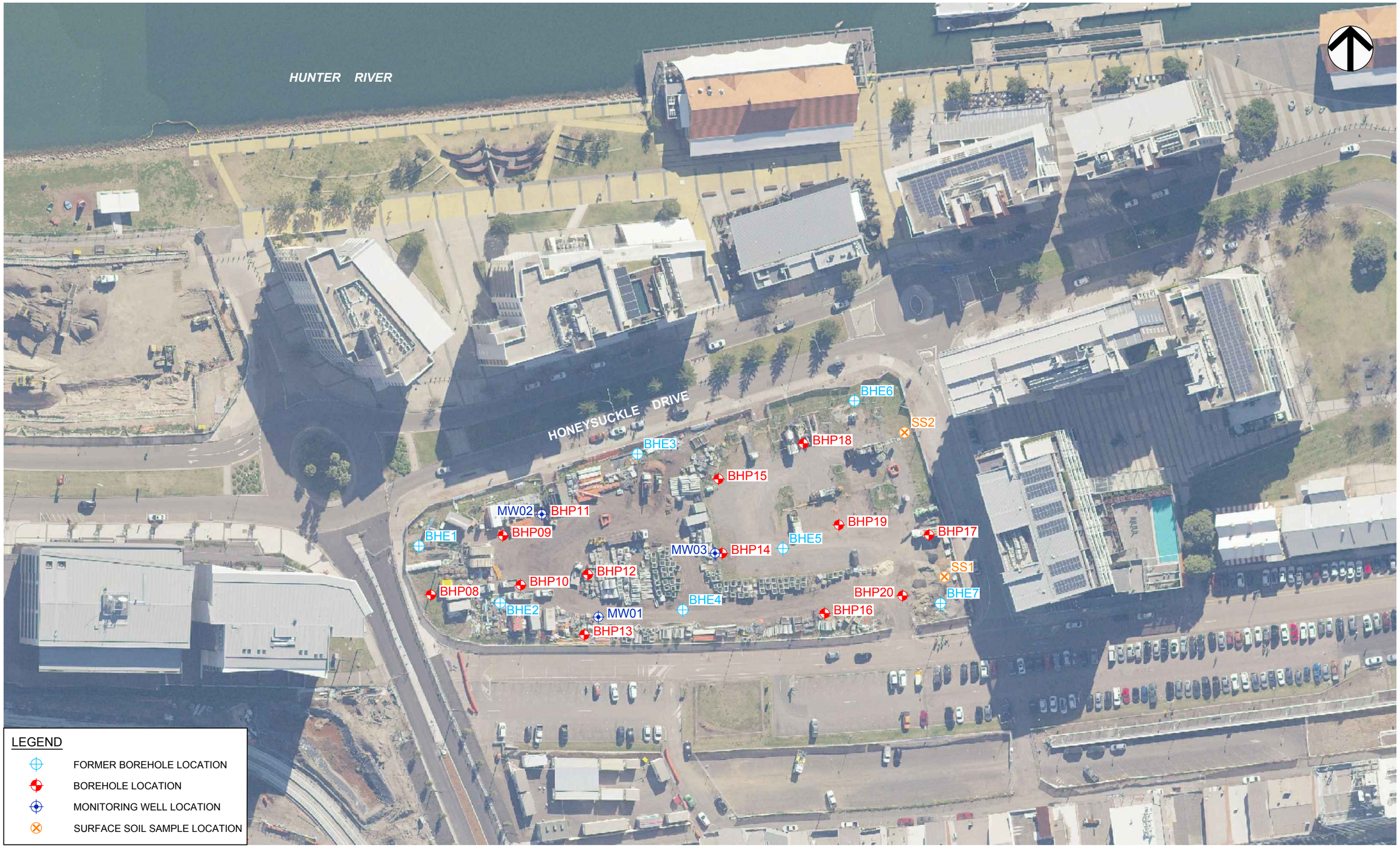
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IMAGERY SOURCE: WORLD STREET MAP
SOURCES: ESRI, HERE, GARMIN, USGS, INTERMAP, INCREMENT P, NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI KOREA, ESRI (THAILAND), NGCC, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY

drawn	SR / AW	client: UNIVERSITY OF NEWCASTLE
approved	-	project: HONEYSUCKLE CITY CAMPUS DEVELOPMENT 16 HONEYSUCKLE DRIVE, NEWCASTLE, NSW
date	22 / 01 / 19	
scale	AS SHOWN	title: SITE LOCATION PLAN
original size	A4	project no: 754-NTLEN213472-AA; figure no: FIGURE 1; rev: A

coffey
A TETRA TECH COMPANY

PLOT DATE: 22/01/2019 9:29:12 AM DWG FILE: \\TTS779FS1.TT.LOCAL\DATA1. PROJECTS\1. SYDENEN\OTHER OFFICES\NTL-ENN\NTLEN213472\CAD\754-NTLEN213472-AA.DWG



revision no.	description	drawn	approved	date
A	ORIGINAL ISSUE			

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Scale (metres) 1:1000

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drawn	SR / AW
approved	-
date	23 / 01 / 19
scale	AS SHOWN
original size	A3

coffey
A TETRA TECH COMPANY

client: UNIVERSITY OF NEWCASTLE

project: HONEYSUCKLE CITY CAMPUS DEVELOPMENT
16 HONEYSUCKLE DRIVE, NEWCASTLE, NSW

title: BOREHOLE LOCATION PLAN

project no: 754-NTLEN213472-AA | figure no: FIGURE 2 | rev: A

PLOT DATE: 23/01/2019 9:20:17 AM DWG FILE: \\TST79FS1.TT.LOCAL\DATA\1. PROJECTS\1. SYDENEN\OTHER OFFICES\NTL-EN\NTLEN213472\CAD\754-NTLEN213472-AA.DWG

Appendix A – Title Search

ADVANCE LEGAL SEARCHERS PTY LTD

(ACN 147 943 842)
ABN 82 147 943 842

18/36 Osborne Road,
Manly NSW 2095

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

18th December 2018

COFFEY ENVIRONMENTS PTY LTD
19 Warabrook Boulevard,
WARABROOK NSW 2304

Attention: Paul Wright

RE: **16, 16A & 16B Honeysuckle Drive, Newcastle**
Purchase Order: WARA18-1362

Note 1:	**Lot 1**	**DP 1163346**	(page 1)
Note 2:	**Lot 2**	**DP 1163346**	(page 5)
Note 3:	**Lot 3**	**DP 1163346**	(page 8)

Note 1:

Current Search

Folio Identifier 1/1163346 (title attached)
DP 1163346 (plan attached)
Dated 14th December 2018
Registered Proprietor:
HUNTER DEVELOPMENT CORPORATION

Title Tree
Lot 1 DP 1163346

Folio Identifier 1/1163346

Folio Identifier 25/1096520

Folio Identifier 73/1087271

Folio Identifier 21/1051525

(a)

Folio Identifier 3/883474

Folio Identifier 3/839050

Folio Identifier 1/828817

Crown Land

****

(b)

Folio Identifier 9/883474

Folio Identifier 3/856783

Folio Identifier 3/839050

Folio Identifier 1/828817

Crown Land

****

Summary of proprietor(s)
Lot 1 DP 1163346

Year	Proprietor(s)
	(**Lot 1 DP 1163346)**
2011 – todate	Hunter Development Corporation
	(Lot 25 DP 1096520)
2008 – 2011	Hunter Development Corporation *(formerly Honeysuckle Development Corporation)*
2006 – 2008	Honeysuckle Development Corporation
	(Lot 73 DP 1087271)
2005 – 2006	Honeysuckle Development Corporation
	(Lot 21 DP 1051525)
2003 – 2005	Honeysuckle Development Corporation

See Notes (a) & (b)

Note (a)

	(Lot 3 DP 883474)
1999 – 2003	Honeysuckle Development Corporation
	(Lot 3 DP 839050)
1995 – 1999	Honeysuckle Development Corporation
1995 – 1995	State Rail Authority of New South Wales
	(Lot 1 DP 828817)
1993 – 1995	State Rail Authority of New South Wales
	(Land in Parish Newcastle – Area 6 Acres 0 Roods 28 Perches)
1916 – 1993	Commissioner of Railways and Tramways *(Acquired for Railway Purposes vide Government Gazette 26th May 1916)*

****

Note (b)

	(Lot 9 DP 883474)
1999 – 2003	Honeysuckle Development Corporation
	(Lot 3 DP 856783)
1996 – 1999	Honeysuckle Development Corporation
	(Lot 3 DP 839050)
1995 – 1996	Honeysuckle Development Corporation
1995 – 1995	State Rail Authority of New South Wales
	(Lot 1 DP 828817)
1993 – 1995	State Rail Authority of New South Wales
	(Land in Parish Newcastle – Area 6 Acres 0 Roods 28 Perches)
1916 – 1993	Commissioner of Railways and Tramways *(Acquired for Railway Purposes vide Government Gazette 26th May 1916)*

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Note 2:

Current Search

Folio Identifier 2/1163346 (title attached)
DP 1163346 (plan attached)
Dated 14th December 2018
Registered Proprietor:
HUNTER DEVELOPMENT CORPORATION

Title Tree
Lot 2 DP 1163346

Folio Identifier 2/1163346

Folio Identifier 25/1096520

Folio Identifier 73/1087271

Folio Identifier 21/1051525

(a)	**(b)**
Folio Identifier 3/883474	Folio Identifier 9/883474
Folio Identifier 3/839050	Folio Identifier 3/856783
Folio Identifier 1/828817	Folio Identifier 3/839050
Crown Land	Folio Identifier 1/828817
****	Crown Land
	****

Summary of proprietor(s)
Lot 2 DP 1163346

Year	Proprietor(s)
	(**Lot 2 DP 1163346)**
2011 – todate	Hunter Development Corporation
	(Lot 25 DP 1096520)
2008 – 2011	Hunter Development Corporation
2006 – 2008	Honeysuckle Development Corporation
	(Lot 73 DP 1087271)
2005 – 2006	Honeysuckle Development Corporation
	(Lot 21 DP 1051525)
2003 – 2005	Honeysuckle Development Corporation

See Notes (a) & (b)

Note (a)

	(Lot 3 DP 883474)
1999 – 2003	Honeysuckle Development Corporation
	(Lot 3 DP 839050)
1995 – 1999	Honeysuckle Development Corporation
1995 – 1995	State Rail Authority of New South Wales
	(Lot 1 DP 828817)
1993 – 1995	State Rail Authority of New South Wales

See Notes (ai) & (aii)

Note (ai)

	(Land in Parish Newcastle – Area 21 Acres 3 Roods 20 Perches)
1854 – 1993	Commissioner for Railways *(Acquired for Railway Purposes vide Government Gazette 4th July 1854)*

****

Note (aii)

	(Land in Parish Newcastle – Area 6 Acres 0 Roods 28 Perches)
1916 – 1993	Commissioner of Railways and Tramways *(Acquired for Railway Purposes vide Government Gazette 26th May 1916)*

****

Note (b)

	(Lot 9 DP 883474)
1999 – 2003	Honeysuckle Development Corporation
	(Lot 3 DP 856783)
1996 – 1999	Honeysuckle Development Corporation
	(Lot 3 DP 839050)
1995 – 1996	Honeysuckle Development Corporation
1995 – 1995	State Rail Authority of New South Wales
	(Lot 1 DP 828817)
1993 – 1995	State Rail Authority of New South Wales

See Notes (bi) & (bii)

Note (bi)

	(Land in Parish Newcastle – Area 21 Acres 3 Roods 20 Perches)
1854 – 1993	Commissioner for Railways *(Acquired for Railway Purposes vide Government Gazette 4th July 1854)*

****

Note (bii)

	(Land in Parish Newcastle – Area 6 Acres 0 Roods 28 Perches)
1916 – 1993	Commissioner of Railways and Tramways *(Acquired for Railway Purposes vide Government Gazette 26th May 1916)*

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Note 3:

Current Search

Folio Identifier 3/1163346 (title attached)
DP 1163346 (plan attached)
Dated 14th December 2018
Registered Proprietor:
HUNTER DEVELOPMENT CORPORATION

Title Tree
Lot 3 DP 1163346

Folio Identifier 3/1163346

Folio Identifier 25/1096520

Folio Identifier 71 & 72/1087271

Folio Identifier 21/1051525

(a)	**(b)**
Folio Identifier 3/883474	Folio Identifier 9/883474
Folio Identifier 3/839050	Folio Identifier 3/856783
Folio Identifier 1/828817	Folio Identifier 3/839050
Crown Land	Folio Identifier 1/828817
****	Crown Land
	****

Summary of proprietor(s)
Lot 3 DP 1163346

Year	Proprietor(s)
	(**Lot 3 DP 1163346)**
2011 – todate	Hunter Development Corporation
	(Lot 25 DP 1096520)
2008 – 2011	Hunter Development Corporation
2006 – 2008	Honeysuckle Development Corporation
	(Lots 71 & 72 DP 1087271)
2005 – 2006	Honeysuckle Development Corporation
	(Lot 21 DP 1051525)
2003 – 2005	Honeysuckle Development Corporation

See Notes (a) & (b)

Note (a)

	(Lot 3 DP 883474)
1999 – 2003	Honeysuckle Development Corporation
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1995 – 1999	Honeysuckle Development Corporation
1995 – 1995	State Rail Authority of New South Wales
	(Lot 1 DP 828817)
1993 – 1995	State Rail Authority of New South Wales
	(Land in Parish Newcastle – Area 6 Acres 28 Perches)
1854 – 1993	Commissioner for Railways *(Acquired for Railway Purposes vide Government Gazette 4th July 1854)*

See Notes (ai) & (aii)

Note (ai)

	(Land in Parish Newcastle – Area 21 Acres 3 Roods 20 Perches)
1854 – 1993	Commissioner for Railways *(Acquired for Railway Purposes vide Government Gazette 4th July 1854)*

****

Note (aii)

	(Land in Parish Newcastle – Area 6 Acres 0 Roods 28 Perches)
1916 – 1993	Commissioner of Railways and Tramways *(Acquired for Railway Purposes vide Government Gazette 26th May 1916)*

****

Note (b)

	(Lot 9 DP 883474)
1999 – 2003	Honeysuckle Development Corporation
	(Lot 3 DP 856783)
1996 – 1999	Honeysuckle Development Corporation
	(Lot 3 DP 839050)
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See Notes (bi) & (bii)

Note (bi)

	(Land in Parish Newcastle – Area 21 Acres 3 Roods 20 Perches)
1854 – 1993	Commissioner for Railways *(Acquired for Railway Purposes vide Government Gazette 4th July 1854)*

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Note (bii)

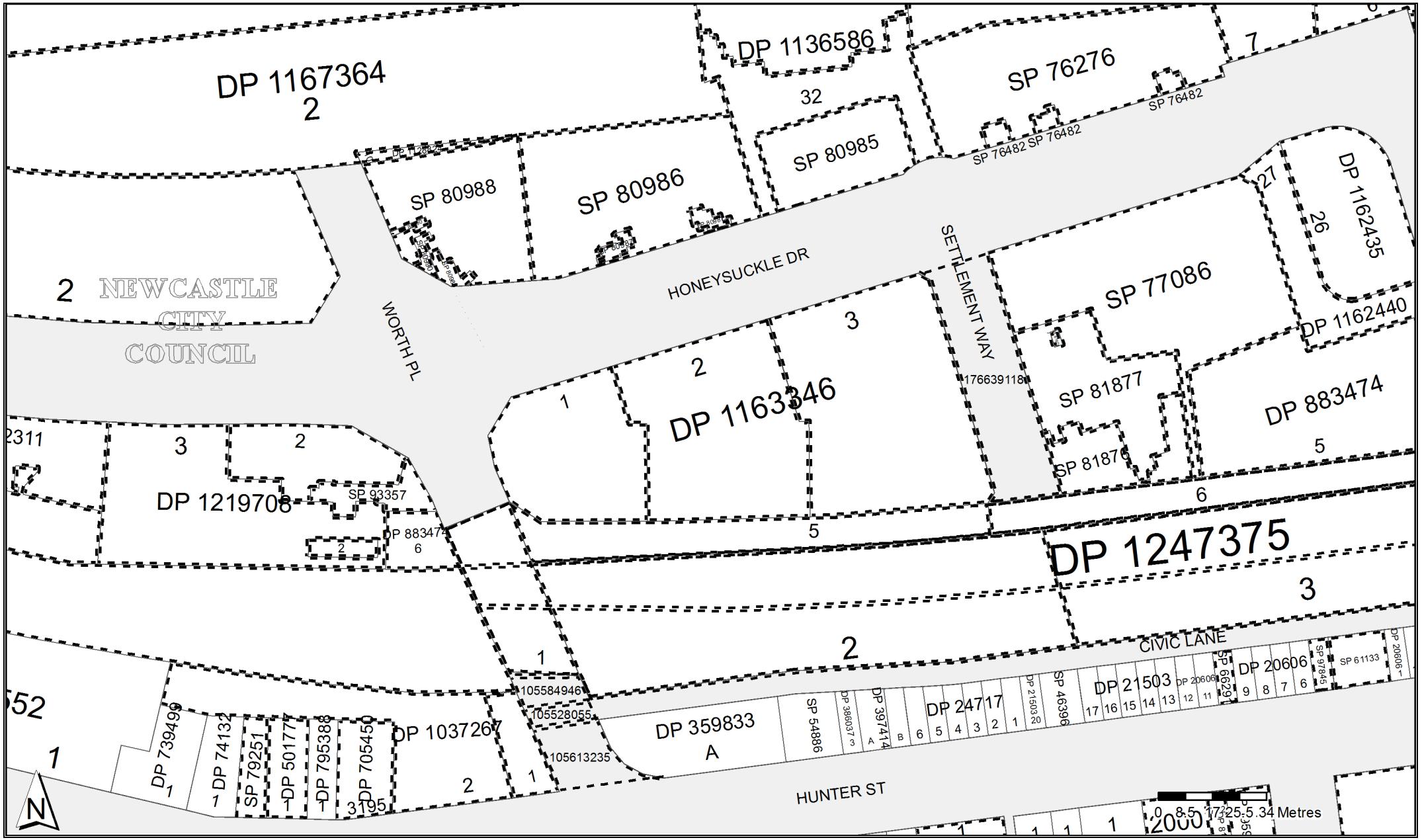
	(Land in Parish Newcastle – Area 6 Acres 0 Roods 28 Perches)
1916 – 1993	Commissioner of Railways and Tramways *(Acquired for Railway Purposes vide Government Gazette 26th May 1916)*

****

Cadastral Records Enquiry Report : Lot 2 DP 1163346

Ref : NOUSER

Locality : NEWCASTLE
Parish : NEWCASTLE
LGA : NEWCASTLE
County : NORTHUMBERLAND



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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
DP195914			
Lot(s): 1			
DP1012572	REGISTERED	SURVEY	CONSOLIDATION
DP501777			
Lot(s): 1			
DP1107411	REGISTERED	SURVEY	REDEFINITION
DP705450			
Lot(s): 3195			
NSW GAZ. 19-10-2001 ASSIGNMENT OF NAME TO RESERVE TRUST			Folio : 8665
DP814154			
Lot(s): 752			
DP1012572	REGISTERED	SURVEY	CONSOLIDATION
DP883474			
Lot(s): 6			
DP1222101	REGISTERED	SURVEY	EASEMENT
Lot(s): 5			
DP1030264	REGISTERED	SURVEY	SUBDIVISION
DP1012572			
Lot(s): 2000			
DP73364	HISTORICAL	SURVEY	UNRESEARCHED
DP542360	HISTORICAL	SURVEY	OLD SYSTEM CONVERSION
DP551868	HISTORICAL	SURVEY	OLD SYSTEM CONVERSION
DP1037267			
Lot(s): 2			
DP1107411	REGISTERED	SURVEY	REDEFINITION
Lot(s): 1, 2			
DP839050	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
DP1096520			
Lot(s): 21			
DP883474	HISTORICAL	SURVEY	SUBDIVISION
DP1051525	HISTORICAL	SURVEY	SUBDIVISION
DP1087271	HISTORICAL	SURVEY	SUBDIVISION
SP77086	REGISTERED	COMPILATION	PART STRATA
DP1108096			
Lot(s): 2311			
DP1132335	REGISTERED	SURVEY	EASEMENT
Lot(s): 2311, 2312			
DP883474	HISTORICAL	SURVEY	SUBDIVISION
DP1015391	HISTORICAL	SURVEY	SUBDIVISION
DP1027135	HISTORICAL	SURVEY	SUBDIVISION
DP1072217	HISTORICAL	SURVEY	SUBDIVISION
DP1094812	HISTORICAL	SURVEY	SUBDIVISION
DP1117964	REGISTERED	SURVEY	EASEMENT
DP1130456	REGISTERED	SURVEY	EASEMENT
DP1128824			
Lot(s): 10			
DP883474	HISTORICAL	SURVEY	SUBDIVISION
DP1128830	REGISTERED	SURVEY	SUBDIVISION
DP1167364	REGISTERED	SURVEY	SUBDIVISION

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	Status	Surv/Comp	Purpose
DP1136586			
Lot(s): 31, 32			
DP851289	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
DP883474	HISTORICAL	SURVEY	SUBDIVISION
DP1015073	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
DP1029089	HISTORICAL	SURVEY	SUBDIVISION
DP1030264	HISTORICAL	SURVEY	SUBDIVISION
DP1036132	HISTORICAL	SURVEY	SUBDIVISION
DP1091706	HISTORICAL	SURVEY	SUBDIVISION
DP1106617	HISTORICAL	SURVEY	SUBDIVISION
DP1111305	HISTORICAL	SURVEY	SUBDIVISION
DP1128824	HISTORICAL	SURVEY	SUBDIVISION
DP1154680	REGISTERED	SURVEY	EASEMENT
DP1137661			
Lot(s): 6, 7			
DP851289	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
DP883474	HISTORICAL	SURVEY	SUBDIVISION
DP1015073	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
DP1029089	HISTORICAL	SURVEY	SUBDIVISION
DP1030264	HISTORICAL	SURVEY	SUBDIVISION
DP1036132	HISTORICAL	SURVEY	SUBDIVISION
DP1091706	HISTORICAL	SURVEY	SUBDIVISION
DP1106617	HISTORICAL	SURVEY	SUBDIVISION
DP1111305	HISTORICAL	SURVEY	SUBDIVISION
DP1128824	HISTORICAL	SURVEY	SUBDIVISION
DP1162435			
Lot(s): 26			
DP883474	HISTORICAL	SURVEY	SUBDIVISION
DP1162440			
Lot(s): 27			
DP839050	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
NSW GAZ. 13-05-2011 Folio : 2849 CLOSED ROAD LOT 27 DP1162440. ERRATUM GAZ. 20-5-2011 FOL. 2975			
DP1163346			
Lot(s): 1, 2, 3			
DP883474	HISTORICAL	SURVEY	SUBDIVISION
DP1051525	HISTORICAL	SURVEY	SUBDIVISION
DP1087271	HISTORICAL	SURVEY	SUBDIVISION
DP1096520	HISTORICAL	SURVEY	SUBDIVISION
Lot(s): 3			
DP1162440	REGISTERED	SURVEY	CROWN FOLIO CREATION
DP1167364			
Lot(s): 2			
DP851289	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
DP883474	HISTORICAL	SURVEY	SUBDIVISION
DP1015073	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
DP1029089	HISTORICAL	SURVEY	SUBDIVISION
DP1030264	HISTORICAL	SURVEY	SUBDIVISION
DP1036132	HISTORICAL	SURVEY	SUBDIVISION
DP1091706	HISTORICAL	SURVEY	SUBDIVISION
DP1106617	HISTORICAL	SURVEY	SUBDIVISION
DP1111305	HISTORICAL	SURVEY	SUBDIVISION
DP1128824	HISTORICAL	SURVEY	SUBDIVISION
DP1128829	HISTORICAL	SURVEY	SUBDIVISION
DP1128830	HISTORICAL	SURVEY	SUBDIVISION
SP80988	HISTORICAL	COMPILATION	STRATA PLAN

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	Status	Surv/Comp	Purpose
DP1188877			
Lot(s): 1			
DP62977	HISTORICAL	SURVEY	UNRESEARCHED
DP66936	HISTORICAL	SURVEY	UNRESEARCHED
DP573072	HISTORICAL	SURVEY	OLD SYSTEM CONVERSION
DP574935	HISTORICAL	SURVEY	CONSOLIDATION
DP707750	HISTORICAL	SURVEY	OLD SYSTEM CONVERSION
DP1093432	HISTORICAL	SURVEY	OLD SYSTEM CONVERSION
DP1226991	REGISTERED	SURVEY	EASEMENT
DP1227136	REGISTERED	SURVEY	EASEMENT
DP1233311	REGISTERED	SURVEY	SURVEY INFORMATION ONLY
PA82030 - LOT 100 DP1093432			
DP1195231			
Lot(s): 4			
DP871235	HISTORICAL	SURVEY	SUBDIVISION
DP883474	HISTORICAL	SURVEY	SUBDIVISION
DP1008759	HISTORICAL	SURVEY	SUBDIVISION
DP1015391	HISTORICAL	SURVEY	SUBDIVISION
DP1077608	HISTORICAL	SURVEY	SUBDIVISION
DP1080482	HISTORICAL	SURVEY	SUBDIVISION
DP1104195	HISTORICAL	SURVEY	SUBDIVISION
DP1131347	WITHDRAWN	UNAVAILABLE	SUBDIVISION
DP1143277	HISTORICAL	SURVEY	SUBDIVISION
DP1191911	HISTORICAL	SURVEY	SUBDIVISION
DP1219708			
Lot(s): 3			
DP1228013	REGISTERED	SURVEY	LEASE
Lot(s): 2, 3			
DP883474	HISTORICAL	SURVEY	SUBDIVISION
DP1015391	HISTORICAL	SURVEY	SUBDIVISION
DP1027135	HISTORICAL	SURVEY	SUBDIVISION
DP1072217	HISTORICAL	SURVEY	SUBDIVISION
DP1094812	HISTORICAL	SURVEY	SUBDIVISION
DP1113281	HISTORICAL	SURVEY	SUBDIVISION
SP93357	REGISTERED	COMPILATION	PART STRATA
DP1226145			
Lot(s): 1			
DP856783	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
DP1165985	HISTORICAL	SURVEY	SUBDIVISION
DP1234665	PRE-ALLOCATED	SURVEY	SURVEY INFORMATION ONLY

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	Status	Surv/Comp	Purpose
DP1236735			
Lot(s): 2			
DP194070	HISTORICAL	COMPILATION	DEPARTMENTAL
DP755247	HISTORICAL	COMPILATION	CROWN ADMIN NO.
DP883474	HISTORICAL	SURVEY	SUBDIVISION
DP997745	HISTORICAL	COMPILATION	DEPARTMENTAL
DP1009228	HISTORICAL	COMPILATION	LIMITED FOLIO CREATION
DP1015391	HISTORICAL	SURVEY	SUBDIVISION
DP1027135	HISTORICAL	SURVEY	SUBDIVISION
DP1072217	HISTORICAL	SURVEY	SUBDIVISION
DP1086794	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
DP1094812	HISTORICAL	SURVEY	SUBDIVISION
DP1113281	HISTORICAL	SURVEY	SUBDIVISION
DP1119844	HISTORICAL	SURVEY	ROADS ACT, 1993
DP1143960	HISTORICAL	SURVEY	SUBDIVISION
DP1145678	HISTORICAL	COMPILATION	CONSOLIDATION
CA104770 - NPW			
CA104811 - NPW			
DP1239066			
Lot(s): 1			
DP82129	HISTORICAL	SURVEY	UNRESEARCHED
DP1247375			
Lot(s): 1, 2, 3			
DP856783	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
DP1165985	HISTORICAL	SURVEY	SUBDIVISION
DP1226145	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
Lot(s): 1, 5, 6			
DP883474	HISTORICAL	SURVEY	SUBDIVISION
DP1051525	HISTORICAL	SURVEY	SUBDIVISION
DP1111305	HISTORICAL	SURVEY	SUBDIVISION
Lot(s): 1, 2, 3, 5, 6			
DP1234665	PRE-ALLOCATED	SURVEY	SURVEY INFORMATION ONLY
Road			
Polygon Id(s): 176639118			
NSW GAZ. 02-03-2018 Folio : 869			
DEDICATED PUBLIC ROAD			
LOT 21 DP1096520. ERRATUM GOV. GAZ. 20-04-2018 FOL. 2683			
SP61133			
SP76849	REGISTERED	COMPILATION	STRATA SUBDIVISION PLAN
SP66291			
DP20606	HISTORICAL	SURVEY	UNRESEARCHED
SP76276			
DP883474	HISTORICAL	SURVEY	SUBDIVISION
DP1091706	HISTORICAL	SURVEY	SUBDIVISION
SP76482	REGISTERED	COMPILATION	PART STRATA
SP84978	REGISTERED	COMPILATION	STRATA SUBDIVISION PLAN
SP76482			
DP883474	HISTORICAL	SURVEY	SUBDIVISION
DP1091706	HISTORICAL	SURVEY	SUBDIVISION
SP77086			
DP883474	HISTORICAL	SURVEY	SUBDIVISION
DP1051525	HISTORICAL	SURVEY	SUBDIVISION
DP1087271	HISTORICAL	SURVEY	SUBDIVISION
DP1096520	HISTORICAL	SURVEY	SUBDIVISION
SP77087	REGISTERED	COMPILATION	STRATA PLAN
SP79251			
DP723460	HISTORICAL	COMPILATION	DEPARTMENTAL
DP1107411	HISTORICAL	SURVEY	REDEFINITION

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	Status	Surv/Comp	Purpose
SP80985			
DP883474	HISTORICAL	SURVEY	SUBDIVISION
DP1091706	HISTORICAL	SURVEY	SUBDIVISION
DP1128824	HISTORICAL	SURVEY	SUBDIVISION
DP1154680	REGISTERED	SURVEY	EASEMENT
SP80986			
DP851289	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
DP883474	HISTORICAL	SURVEY	SUBDIVISION
DP1015073	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
DP1029089	HISTORICAL	SURVEY	SUBDIVISION
DP1030264	HISTORICAL	SURVEY	SUBDIVISION
DP1036132	HISTORICAL	SURVEY	SUBDIVISION
DP1091706	HISTORICAL	SURVEY	SUBDIVISION
DP1106617	HISTORICAL	SURVEY	SUBDIVISION
DP1111305	HISTORICAL	SURVEY	SUBDIVISION
DP1128824	HISTORICAL	SURVEY	SUBDIVISION
DP1128829	HISTORICAL	SURVEY	SUBDIVISION
SP85291	REGISTERED	COMPILATION	STRATA SUBDIVISION PLAN
SP80987			
DP851289	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
DP883474	HISTORICAL	SURVEY	SUBDIVISION
DP1015073	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
DP1029089	HISTORICAL	SURVEY	SUBDIVISION
DP1030264	HISTORICAL	SURVEY	SUBDIVISION
DP1036132	HISTORICAL	SURVEY	SUBDIVISION
DP1091706	HISTORICAL	SURVEY	SUBDIVISION
DP1106617	HISTORICAL	SURVEY	SUBDIVISION
DP1111305	HISTORICAL	SURVEY	SUBDIVISION
DP1128824	HISTORICAL	SURVEY	SUBDIVISION
DP1128829	HISTORICAL	SURVEY	SUBDIVISION
SP80988			
DP851289	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
DP883474	HISTORICAL	SURVEY	SUBDIVISION
DP1015073	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
DP1029089	HISTORICAL	SURVEY	SUBDIVISION
DP1030264	HISTORICAL	SURVEY	SUBDIVISION
DP1036132	HISTORICAL	SURVEY	SUBDIVISION
DP1091706	HISTORICAL	SURVEY	SUBDIVISION
DP1106617	HISTORICAL	SURVEY	SUBDIVISION
DP1111305	HISTORICAL	SURVEY	SUBDIVISION
DP1128824	HISTORICAL	SURVEY	SUBDIVISION
DP1128829	HISTORICAL	SURVEY	SUBDIVISION
DP1128830	HISTORICAL	SURVEY	SUBDIVISION
DP1167364	REGISTERED	SURVEY	SUBDIVISION

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	Status	Surv/Comp	Purpose
SP80989			
DP851289	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
DP883474	HISTORICAL	SURVEY	SUBDIVISION
DP1015073	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
DP1029089	HISTORICAL	SURVEY	SUBDIVISION
DP1030264	HISTORICAL	SURVEY	SUBDIVISION
DP1036132	HISTORICAL	SURVEY	SUBDIVISION
DP1091706	HISTORICAL	SURVEY	SUBDIVISION
DP1106617	HISTORICAL	SURVEY	SUBDIVISION
DP1111305	HISTORICAL	SURVEY	SUBDIVISION
DP1128824	HISTORICAL	SURVEY	SUBDIVISION
DP1128829	HISTORICAL	SURVEY	SUBDIVISION
DP1128830	HISTORICAL	SURVEY	SUBDIVISION
SP80990			
DP851289	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
DP883474	HISTORICAL	SURVEY	SUBDIVISION
DP1015073	HISTORICAL	SURVEY	RESUMPTION OR ACQUISITION
DP1029089	HISTORICAL	SURVEY	SUBDIVISION
DP1030264	HISTORICAL	SURVEY	SUBDIVISION
DP1036132	HISTORICAL	SURVEY	SUBDIVISION
DP1091706	HISTORICAL	SURVEY	SUBDIVISION
DP1106617	HISTORICAL	SURVEY	SUBDIVISION
DP1111305	HISTORICAL	SURVEY	SUBDIVISION
DP1128824	HISTORICAL	SURVEY	SUBDIVISION
DP1128829	HISTORICAL	SURVEY	SUBDIVISION
DP1128830	HISTORICAL	SURVEY	SUBDIVISION
SP81876			
DP883474	HISTORICAL	SURVEY	SUBDIVISION
DP1051525	HISTORICAL	SURVEY	SUBDIVISION
DP1087271	HISTORICAL	SURVEY	SUBDIVISION
DP1096520	HISTORICAL	SURVEY	SUBDIVISION
DP1134500	HISTORICAL	SURVEY	SUBDIVISION
SP84190	REGISTERED	COMPILATION	STRATA SUBDIVISION PLAN
SP84271	REGISTERED	COMPILATION	STRATA SUBDIVISION PLAN
SP81877			
DP883474	HISTORICAL	SURVEY	SUBDIVISION
DP1051525	HISTORICAL	SURVEY	SUBDIVISION
DP1087271	HISTORICAL	SURVEY	SUBDIVISION
DP1096520	HISTORICAL	SURVEY	SUBDIVISION
DP1134500	HISTORICAL	SURVEY	SUBDIVISION
SP83767	REGISTERED	COMPILATION	STRATA SUBDIVISION PLAN
SP91396	REGISTERED	COMPILATION	STRATA SUBDIVISION PLAN
SP93357			
DP883474	HISTORICAL	SURVEY	SUBDIVISION
DP1015391	HISTORICAL	SURVEY	SUBDIVISION
DP1027135	HISTORICAL	SURVEY	SUBDIVISION
DP1072217	HISTORICAL	SURVEY	SUBDIVISION
DP1094812	HISTORICAL	SURVEY	SUBDIVISION
DP1113281	HISTORICAL	SURVEY	SUBDIVISION
DP1219708	HISTORICAL	SURVEY	SUBDIVISION
SP97845			
DP20606	HISTORICAL	SURVEY	UNRESEARCHED
DP1244192	HISTORICAL	SURVEY	REDEFINITION
Road			
Polygon Id(s): 105528055, 105613235			
DP1234665	PRE-ALLOCATED	SURVEY	SURVEY INFORMATION ONLY

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Plan	Surv/Comp	Purpose
DP18256	SURVEY	UNRESEARCHED
DP20606	SURVEY	UNRESEARCHED
DP21503	SURVEY	UNRESEARCHED
DP24717	SURVEY	UNRESEARCHED
DP74132	COMPILATION	UNRESEARCHED
DP75468	SURVEY	UNRESEARCHED
DP195914	COMPILATION	DEPARTMENTAL
DP214443	SURVEY	OLD SYSTEM CONVERSION
DP359833	SURVEY	UNRESEARCHED
DP386037	SURVEY	UNRESEARCHED
DP397414	SURVEY	UNRESEARCHED
DP501777	SURVEY	OLD SYSTEM CONVERSION
DP705450	SURVEY	CROWN FOLIO CREATION
DP739499	SURVEY	OLD SYSTEM CONVERSION
DP795388	COMPILATION	DEPARTMENTAL
DP814154	SURVEY	PRIMARY APPLN NON SUBDIVISION
DP829178	COMPILATION	CONSOLIDATION
DP852552	SURVEY	PRIMARY APPLN NON SUBDIVISION
DP883474	SURVEY	SUBDIVISION
DP1012572	SURVEY	CONSOLIDATION
DP1037267	SURVEY	SUBDIVISION
DP1108096	SURVEY	SUBDIVISION
DP1136586	SURVEY	SUBDIVISION
DP1137661	SURVEY	SUBDIVISION
DP1162435	SURVEY	SUBDIVISION
DP1162440	SURVEY	CROWN FOLIO CREATION
DP1163346	SURVEY	SUBDIVISION
DP1167364	SURVEY	SUBDIVISION
DP1188877	SURVEY	SUBDIVISION
DP1195231	SURVEY	SUBDIVISION
DP1195231	UNRESEARCHED	LEASE
DP1226145	SURVEY	RESUMPTION OR ACQUISITION
DP1226145	UNRESEARCHED	RESUMPTION OR ACQUISITION
DP1236735	SURVEY	SUBDIVISION
DP1239066	SURVEY	CONSOLIDATION
DP1247375	SURVEY	SUBDIVISION
SP46396	COMPILATION	STRATA PLAN
SP54886	COMPILATION	STRATA PLAN
SP61133	COMPILATION	STRATA PLAN
SP66291	COMPILATION	STRATA PLAN
SP76276	COMPILATION	STRATA PLAN
SP76276	COMPILATION	PART STRATA
SP76482	COMPILATION	PART STRATA
SP77086	COMPILATION	STRATA PLAN
SP77086	COMPILATION	PART STRATA
SP79251	COMPILATION	STRATA PLAN
SP80985	UNRESEARCHED	STRATA PLAN
SP80985	COMPILATION	PART STRATA
SP80986	COMPILATION	STRATA PLAN
SP80986	UNRESEARCHED	STRATA PLAN
SP80987	COMPILATION	STRATA PLAN
SP80987	UNRESEARCHED	STRATA PLAN
SP80988	COMPILATION	STRATA PLAN
SP80988	UNRESEARCHED	STRATA PLAN
SP80989	COMPILATION	STRATA PLAN
SP80989	UNRESEARCHED	STRATA PLAN
SP80990	COMPILATION	STRATA PLAN
SP80990	UNRESEARCHED	STRATA PLAN
SP81876	COMPILATION	STRATA PLAN
SP81876	UNRESEARCHED	STRATA PLAN
SP81877	COMPILATION	STRATA PLAN
SP81877	UNRESEARCHED	STRATA PLAN
SP93357	COMPILATION	PART STRATA
SP93357	UNRESEARCHED	PART STRATA
SP97845	COMPILATION	STRATA PLAN

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PLAN

Shewing land to be acquired for Railway purposes

HONEYSUCKLE - NEWCASTLE

Parish of Newcastle County of Northumberland

Scale 4 Chs to 1 inch

Acquired for Railway Purposes Gaz. 26.5.16

THROSBY

Line of

Future

C.K

wharf

LEE

ROAD

WHARF

1 CH. WIDE

170

25A

N8 - 1090

Railway Property

No deed issued

2A 3R 20P

Proclaimed 4th July 1854

10.2.6

9A 0R 16P

6A 0R 28P (total)

5A 3R 31P ex. road

Ms 1108 Md

Reclamation

9ac

Ms 1179 Md

Resumed for Tramway Purposes Gaz of 30-12-14

7A HONEYSUCKLE 6A STATION

R.11 FOR RAILWAY PURPOSES

Notd 20th Oct. 71

HUNTER St

WEST St

Cottage

Bridge

COTTAGE

PLAN MICROFILMED

NO ADDITIONS OR AMENDMENTS TO BE MADE

B. F. Telfer

21 Sep '16

2141-3070

Ms 2141 Md

Req:R733173 /Doc:CP 02141-3070 p /Rev:30-Nov-2012 /Sts:OK.OK /Prt:14-Dec-2018 16:24 /Seq:1
Ref:advlegs /Src:P

Req:R729689 /Doc:CT 10259-119 CT /Rev:18-Feb-2008 /Sts:NO.OK /Pgs:ALL /Prt:14-Dec-2018 10:29 /Seq:1 of 6
Ref:advlegs /Src:P

CANCELLED

G. 1

NEW SOUTH WALES

CERTIFICATE OF TITLE

REAL PROPERTY ACT, 1900, as amended.

Application No. 38393

Prior Title Vol. 6955 Fol. 40

Vo 10259119

EH

Edition issued 16-3-1966

K200842

I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Witness D. O'Sullivan.

Registrar-General.

ESTATE AND LAND REFERRED TO

Estate in Fee Simple in the land shown in plan lodged with Primary Application No. 38393 being the land resumed for Railway purposes by Notice in Government Gazette dated 23-11-1951 page 3426 in the City of Newcastle Parish of Newcastle and County of Northumberland, excepting thereout the mines and deposits specified in Section 141 of the Public Works Act, 1912.

Registrar General.

FIRST SCHEDULE (continued overleaf)

~~THE COMMISSIONER FOR RAILWAYS~~

Registrar General.

SECOND SCHEDULE (continued overleaf)

1. Lease No.H39137 of part to Shortland County Council. Entered 5-2-1959.
2. Lease No.H262302 of part to Mark Pears, of Newcastle, Gentleman. Entered 13-7-1960.
3. Lease No.H268569 of part to Newcastle Automobile Exchange Pty. Limited. Entered 13-7-1960.
4. Lease No.H268571 of part to Newcastle Photographic Co. Pty. Limited. Entered 13-7-1960.
5. Lease No.H279183 of part together with right of carriageway over another part of the land within described to Hazell & Moore Industries Pty. Limited. Entered 13-7-1960.
6. Lease No.H291743 of part to P. & R. Williams Pty. Limited. Entered 13-7-1960.
7. Lease No.H346858 of part to Dangar Gedye & Malloch Limited. Entered 13-7-1960.
8. Lease No.H[illegible]9445 of part to Mark Pears, of Newcastle, Storekeeper. Entered 21-11-1960.
9. ~~Lease No.H666536 of part together with right of carriageway to Televendors P/y. Limited. Entered 10-5-1[illegible]~~ Re. entered K471512
10. ~~Lease No.H838725 of Lot 1 in Deposited Plan 261480 together with right of carriageway to Cyril Albert Murphy and Harold Clyde Wells, both of Newcastle, Hotel Brokers and Auctioneers. Entered 5-4-1962.~~ Expired 9.9.1971
11. Lease No.H916936 of Lot 1 in Deposited Plan 203657 together with right of carriageway to Hislop Lloyd (N) Pty. Limited. Entered [illegible]-4-1962.
12. Lease No.J90800 of the land edged blue on plan in J90800 together with right of carriageway to Taylor Cycle & Motor Co. Pty. Limited. Entered 1-3-1963.
13. Lease No.J120397 of Lot 1 in Deposited Plan 203653 together with right of carriageway to V.G. Hodges & Co. Pty. Limited. Entered 1-3-1963.
14. Lease No.J607317 of the land edged blue on plan in Lease No.H368612 to Mark Pears of Newcastle, Dealer. Entered 18-8-1964.
15. Lease No.J824440 of the land edged red in plan in Lease No.H746669 to N.J. Ure Pty. Limited. Entered 12-5-1965. Expired 20.9.2014.
16. Lease No.K73489 of Lot 2 in Deposited Plan 512468 together with roadway to Bradley Bros. Limited. Entered 7-10-1965.
17. Lease No.K80667 of Lot 1 in Deposited Plan 514412 together with rights to Newcastle Photographic Co. Pty. Limited. Entered 7-10-1965.

Registrar General.

21135 89 (72)

(Page 1) Vol 10259 Fol 119

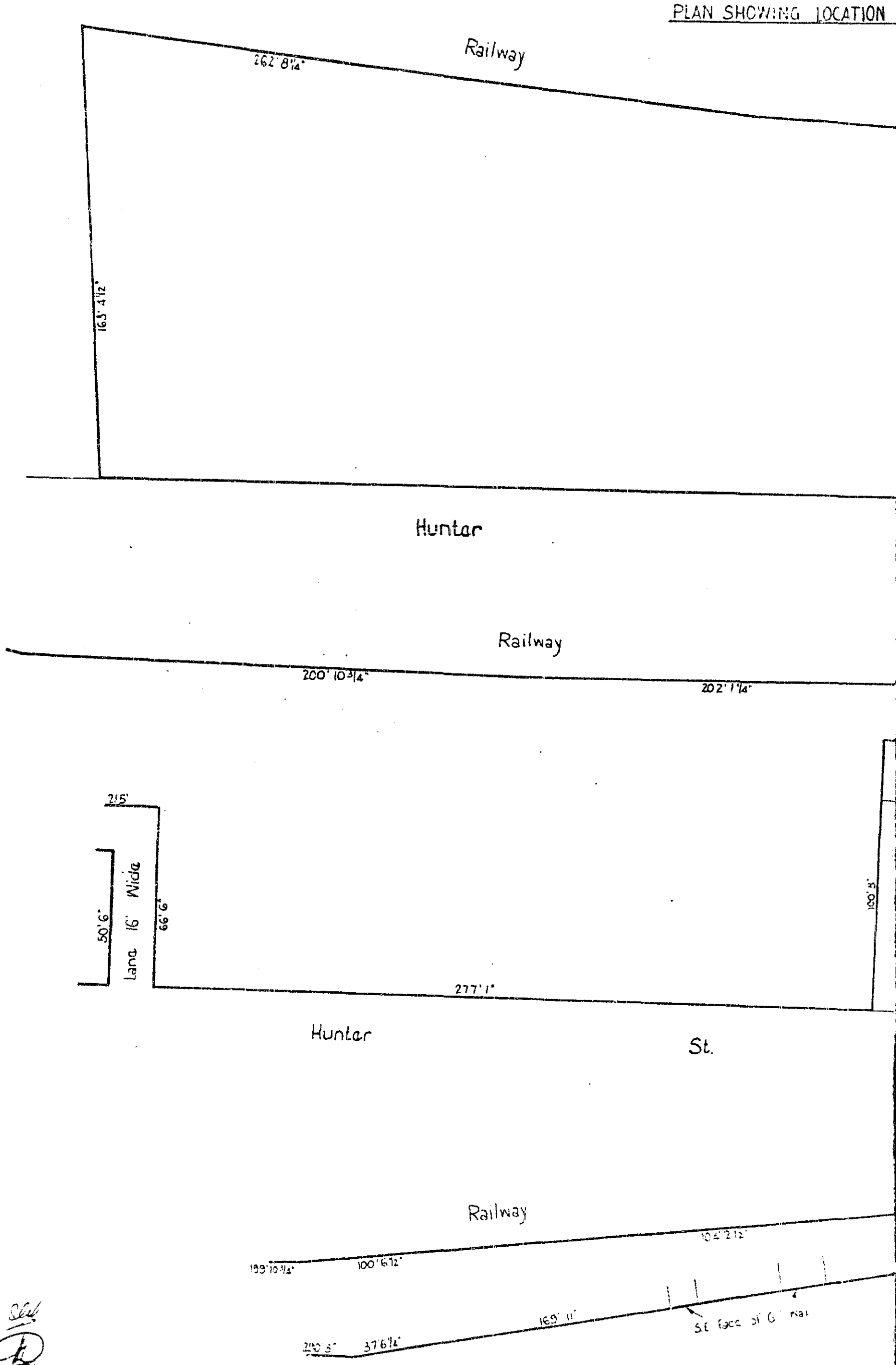
PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON

WARNING: THIS DOCUMENT MUST NOT BE REMOVED FROM THE LAND TITLES OFFICE.

Req:R729689 /Doc:CT 10259-119 CT /Rev:18-Feb-2008 /Sts:NO.OK /Pgs:ALL /Prt:14-Dec-2018 10:29 /Seq:2 of 6
Ref:advlegs /Src:P

Vol. 10259 Fol. 119

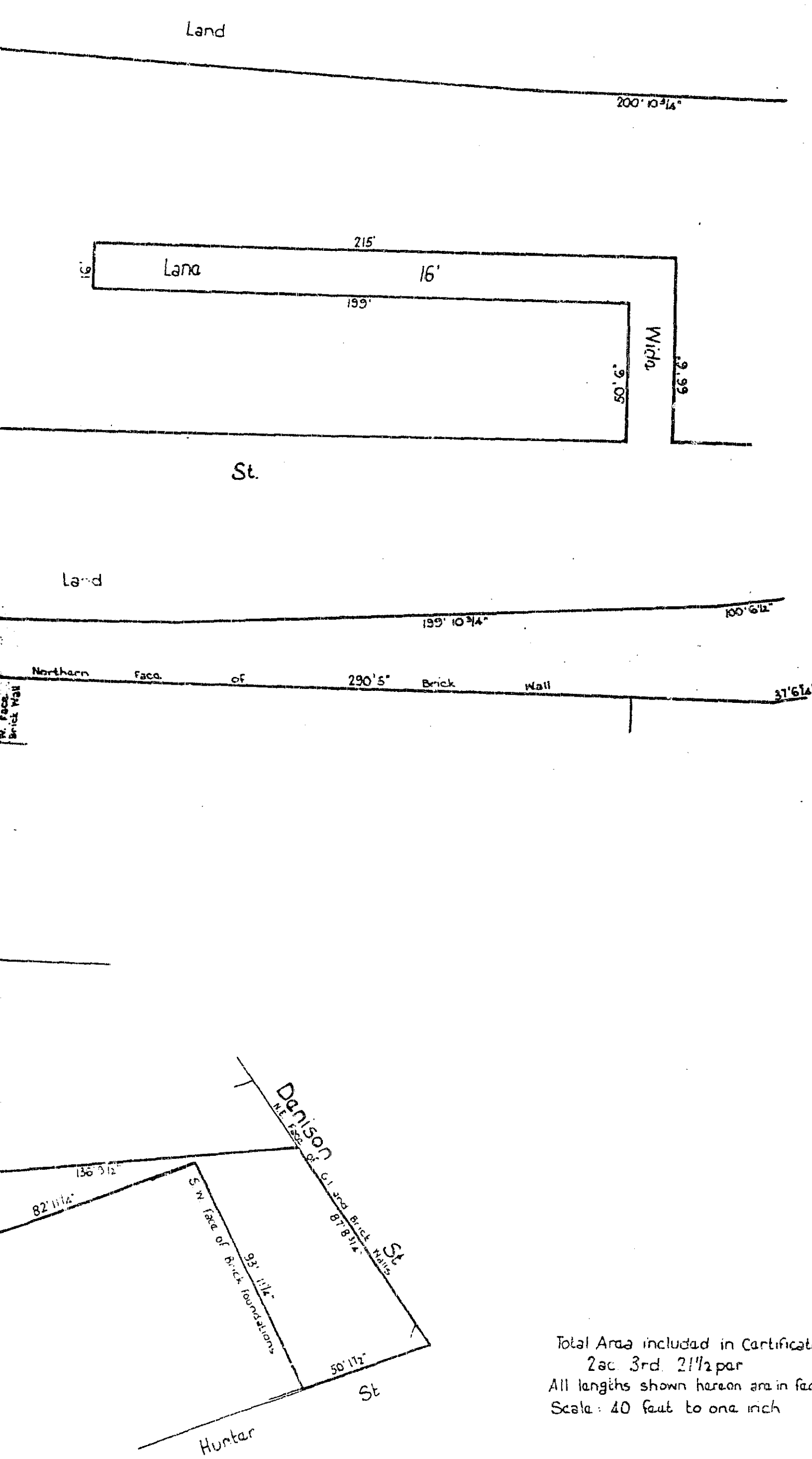
PLAN SHOWING LOCATION



K200842

Vol. 10259 Fol. 119

OF LAND



Total Area included in Certificate
2ac 3rd 21½ par
All lengths shown hereon are in feet and inches
Scale : 40 feet to one inch

Req:R729689 /Doc:CT 10259-119 CT /Rev:18-Feb-2008 /Sts:NO.OK /Pgs:ALL /Prt:14-Dec-2018 10:29 /Seq:4 of 6
Ref:advlegs /Src:P (pages)

Vol. 10259 Fol. 119

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	ENTERED	Signature of Registrar-General
~~Public Transport Commission of New South Wales~~ ~~State Rail Authority of New South Wales by Application W446 Registered 12-8-1986~~ Honeysuckle Development Corporation as to part being lots 1, 2, & 3 & 6 in DP839050 & State Rail Authority of NSW as to part being lots 4, 5, ~~7 & 8~~ in DP. 839050 by Transfer 045853 Registered 20-3-93	~~Application~~ Section 46A	K660665	~~8-11-1974~~	~~12-2-1974~~	

3.7.1997

THIS FOLIO IS CANCELLED - NOW BEING LOT(S) 1-6# inclusive IN DEPOSITED PLAN 839050 SEE NEW FOLIO(S) 1-6#/839050.

3.7.1997

THIS FOLIO IS CANCELLED AS TO PART BEING LOT'S 2 TO 5 IN DEPOSITED PLAN 828817 SEE NEW FOLIO(S) 2-5/828817

3.7.1997

SECOND SCHEDULE (continued)

INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	PARTICULARS	ENTERED	Signature of Registrar-General	CANCELLATION		
~~Lease~~	K132908	14-9-1965	~~of Lot 1 DP 513468 together with Rights of Carriageway to~~ Bradley Bros Limited	30-8-1966		Expired	16-12-1971	
~~Lease~~	~~K360660~~	~~12-6-1968~~	~~of Lots 3 and 4 in Deposited Plan No 518210 together with rights and rig of Carriageway to Canberra Television Services Pty Limited~~	~~27-10-1966~~				
~~Lease~~ Lease	~~M364000~~ M199114	~~24-12-1970~~	Of Lot 1 in Deposited Plan No. 544920 to Olympia Enterprises Pty. Limited.	3-5-1971		Expired	16-12-1971	
~~Lease~~	~~M392892~~	~~6-5-1971~~	~~of part being Lots 1, 2, 3 and 4 in D.P. 518210 together with right of carriageway to Canberra Television Services Proprietary Limited~~	~~7-9-1971~~				
Lease	M496509	26-7-1971	of part being Lots 1, 2, 3 and 4 in D.P. 518210 together with right of carriageway to Canberra Television Services Proprietary Limited	16-12-1971		Expired	13-7-1977	
Lease	N609668	27-9-1973	of part being the whole of the shop premises Nos 680-682 Hunter Street, Newcastle to Noel Hilary Slade of Adamstown, upholsterer	12-3-1974				
Lease	R 118393		of part being those premises known as 674-678 Hunter Street Newcastle to Duncan Properties Pty Limited EXPIRES 21-11-1981.	13-7-1977				

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR-GENERAL ARE CANCELLED

SECOND SCHEDULE (continued)

INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	PARTICULARS	ENTERED	Signature of Registrar General	CANCELLATION		
Lease	Q 118395	——	of part being lot 1 in DP 201480 (together with right of carriageway) to Cyril Albert Murphy of Newcastle Business Proprietor Expires 27-8-1981	13-7-1977				
~~Lease~~	~~J120391~~ ~~R300070~~	——	~~affected by R300070 Sub-Lease of premises being 616 Hunter Street Newcastle to Bos. Bros Newcastle Pty. Limited Expires 3.7.1981~~	~~3-8-1979~~		Surrendered	R780863	
Lease	~~H291743~~ R514617	—	~~Received by 5.5.1978 Sub-Lease of Newcastle Aqua-Dive Pty Limited of all that of premises known as 656-658 Hunter Street Newcastle to Newcastle Aqua Divers Pty Limited~~	~~19-11-1979~~ 19-11-1979				
Lease	K733489	——	affected by R553672 Sub-Lease of premises known as No 614 Hunter Street Newcastle to Cerco Computer Systems Pty Limited Date of Expiry 13.8.1982.	18.12.1979.				
Lease	H268514	—	Affected by R668570 Sub-Lease Lessee now R.V. Appliances Sales Pty. Limited.	18-2-1980				
Lease	R746058	——	of part being Lot 1 in plan with R746056 to Olympia Enterprises Pty Limited. Expires 30-9-2003	15-8-1980				
S194531	Lease to Taylor Cycle and Motor Co. Pty. Limited of shop premises situated at 616 Hunter Street, Newcastle, together with right. Expires 30-5-1986. Registered 15-4-1981.							
~~S194531~~	~~Lease to Taylor Cycle and Motor Co. Pty. Limited of shop~~							
J120391	Lease. S482662 Sub-Lease to Luxaflor Pty. Limited of shop premises known as 618-620 Hunter Street, Newcastle, together withrights. Expires 30-5-1986. Registered 5-6-1981							
Lease	H291743	—	Lessee is now Duncan Properties Pty Ltd. See Transfer P409431.	24-10-1975				
Lease	H265569	—	Lessee is now Duncan Properties Pty Ltd. See Transfer P409431.	24-10-1975				
Lease	H916936	—	Lessee is now ~~Subway Cycles Limited~~ Duncan Properties Pty Limited. See Transfer No Q165174	27.4.1977				
~~J824440~~	~~Lease~~	~~R62441~~	~~Caveat by Marie Rachel Segal Registered~~	——		Withdrawn	S625317.	
J824440	Lease 16-9-1981.	Lessee:	Heather Jean Ure by transfers S625318, S625319. registered					
~~J607317~~	~~Lease.~~	Lessee:	May Joyce ~~Pears by Application T931997 and Transmission T931998. Registered 3-2-1984~~					

FORM No. RG2/73 **NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY SEAL OF THE REGISTRAR GENERAL ARE CANCELLED** 79663 10.84 V. C. N. Blight, Government Printer

N851278 Lease H265569 H291743 K733489 R746058 J120391 R514617 pages 1 to 6

P284712 T/L2 Clse H916936

P409431 T/L (H291743 H265569)

P409429 Sub. Lse R173685 09

P409430 Sub. Lse R173683

DP583077

Q 718600 Sub Lse P409429

Q 718599 NOP

Sub Lse P409430 Surrendered 5.3.84

Lot 1 DP 583077 Sub Lse P409430 Withdrawn 5.3.84

Req:R729689 /Doc:CT 10259-119 CT /Rev:18-Feb-2008 /Sts:NO.OK /Pgs:ALL /Prt:14-Dec-2018 10:29 /Seq:5 of 6 Ref:advlegs /Src:P

Req:R729689 /Doc:CT 10259-119 CT /Rev:18-Feb-2008 /Sts:NO.OK /Pgs:ALL /Prt:14-Dec-2018 10:29 /Seq:6 of 8
Ref:advlegs /Src:P
Vol. 10259 Fol. 119

SECOND SCHEDULE (continued)

INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	PARTICULARS	ENTERED	Signature of Registrar General	CANCELLATION		
~~Lease~~	J120391	—	affected by R300070 Sub-Lease of premises ~~known as~~ being 616 Hunter Street, Newcastle to Box Bros Newcastle Pty. Limited. Expires 3.7.1981	1-8-1979				
~~Lease~~	R746056		of part being Lot 1 in plan with R746056. to ~~Olympia Enterprises~~ ~~Expires 30-9-2003~~ Pty Limited.	~~15-8-1989~~				
~~Lease~~	R746056	—	of part being Lot 1 in plan with R746056 to Olympia Enterprises Pty Limited Expires 30-9-2003	15-8-1989				

H346858 Lease. Lessee: Markham Gene Pears, by Transfer J418179. Registered 26-8-1963.

H262302 Lease. Lessee: May Joyce Pears, by Transmission S949856. Registered 12-3-1982

H346858 Lease. Lessee: May Joyce Pears, by Transmission S949856. Registered 12-3-1982

H609445 Lease. Lessee: May Joyce Pears by Transmission S949856. ~~12-3-1982~~ Registered 12-3-1982

H916936 Lease. T262246 Lease to James Hardie & Co. Pty. Limited of premises known as No. 628 Hunter Street, Newcastle, together with an Option of Renewal. Expires: 14.2.1984. Registered 13.10.1982.

H279183 Lease. Lessee: The Waterbed Shop Pty. Limited by Application T694116 & Transfer T694117. Registered 26-8-1983.

T880851 Lease to Taylor Cycle and Motor Co.Pty.Ltd. of shop premises known as 614 Hunter Street, Newcastle. Expires 30-6-1985. Registered 28-12-1983

T607317 Lease. Lessee: May Joyce Pears by Application T931997 and Transmission T931998. Registered 3-2-1984

W446636 Lease to Regal Displays Pty. Limited of premises being shop known as 664-668 Hunter Street, Newcastle, Expires 31-12-1987. Registered 12-8-1986

J824440 Lease X316109 Transfer of Lease to Hillside Homes Pty. Limited. Registered 28-1-1988

~~J824440 Lease X316110 Mortgage to Commonwealth Development Bank of Australia. Registered 28-1-1988~~

R746056 Lease Y730535 Transfer to Ratcliff & Sons Enterprises Pty. Limited. Registered 8-12-1989.

~~R746056 Lease Y730536 Mortgage to Westpac Banking Corporation. Registered 8-12-1989.~~

~~R746056 Lease Y777578 Mortgage to Savoy Theatre Restaurant Pty. Limited and Olympia Enterprises Pty. Limited as tenants in common. Registered 29-1-1990~~

R746056 Lease. Z740785 Mortgage to Commonwealth Bank of Australia. Registered 1-7-1991

J824440 Lease I660534 Mortgage to Neville John Ure. Registered 27-9-1993

045853

New Folios have been created for lots 1 to 8 inclusive in DP839050 by Deal 20-3-95

	I660533	
Discharged	Z740783	
Discharged	Z740784	

Req:R729721 /Doc:CT 11732-212 CT /Rev:03-Feb-2011 /Sts:OK.SC /Pgs:ALL /Prt:14-Dec-2018 10:32
Ref:advlegs /Src:P

[redacted]CATE OF TITLE

NEW SOUTH WALES

PROPERTY ACT, 1900

Vol. 11732 Fol. 212

Appln. No.48469

Edition issued 14-12-1971

CANCELLED

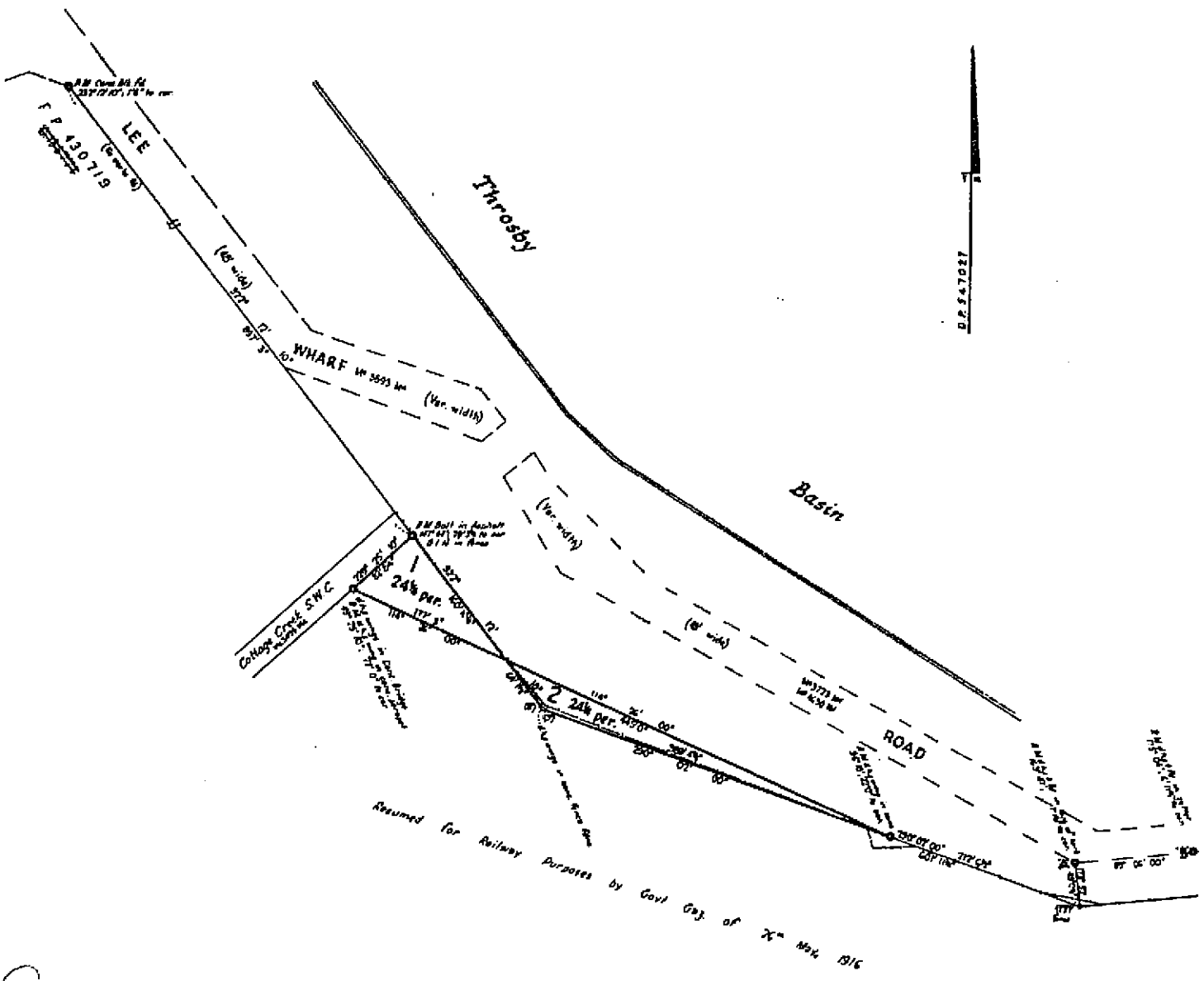
I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

SEE AUTO FOLIO

Registrar General.

(Page 1) Vol. 11732 Fol. 212

PLAN SHOWING LOCATION OF LAND



S

ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lot 2 in Deposited Plan 547027 at Wickham un the City of Newcastle Parish of Newcastle and County of Northumberland being land for which no Crown Grant has issued.

FIRST SCHEDULE

THE COMMISSIONER FOR RAILWAYS.

SECOND SCHEDULE

NIL

GRN

Registrar General

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON

WARNING: THIS DOCUMENT MUST NOT BE REMOVED FROM THE LAND TITLES OFFICE.

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED.

Vol. 11732 Fol. 212

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT			ENTERED	Signature of Registrar General
	NATURE	NUMBER	DATE		

SECOND SCHEDULE (continued)

INSTRUMENT			PARTICULARS	ENTERED	Signature of Registrar General	CANCELLATION
NATURE	NUMBER	DATE				
			CANCELLED			
			SEE AUTO FOLIO			

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

Form: 10CN
Release: 2.3
www.lands.nsw.gov.au

CHANGE OF NAM

New South Wales
Real Property Act 1900

AE234027V

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) **FOLIO OF THE REGISTER**

See Annexure "A"

(B) **REGISTERED DEALING**

Number	Folio of the Register

(C) **LODGED BY**

Document Collection Box 28A

Name, Address or DX, Telephone, and LLPN if any
LLPN: 124247U
PROPERTY SERVICES
DX 885 SYDNEY
02 9210 0993

Reference: HARRIS - 9690765

CODE CN

(D) **REGISTERED PROPRIETOR**

Whose name is to be changed: show the name as it currently appears on the folio of the Register
Honeysuckle Development Corporation ABN 94 688 782 063

(E) **NEW NAME**

Of the above registered proprietor in full
Hunter Development Corporation ABN 94 688 782 063

(F) The registered proprietor of the above folio of the Register applies to have its new name recorded in the Register in respect of that folio of the Register

(G) **STATUTORY DECLARATION BY THE APPLICANT** *

I, John Harry Loughnan, solicitor, of 3/175 Scott Street Newcastle New South Wales solemnly and sincerely declare that—

1. I am the solicitor for the registered proprietor
2. The name of the registered proprietor was changed to Hunter Development Corporation by the Growth Centres (Hunter Development Corporation) Order 2008 on 16 January 2008, a copy of which is annexed and marked "B".

I make this solemn declaration conscientiously believing the same to be true and by virtue of the provisions of the Oaths Act 1900, and

I certify this application to be correct for the purposes of the Real Property Act 1900.

Made and subscribed at Newcastle in the State of New South Wales

on 18 September 2008 in the presence of—

Signature of witness:

Signature of applicant:

Name of witness: KATHRYN HALYBURTON
Address of witness: SOLICITOR
Level 3, 175 Scott St
Newcastle 2300

Qualification of witness: ☐ Justice of the Peace ☒ Practising Solicitor ☐ Other qualified witness *[specify]*

* As the Department of Lands may not be able to provide the services of a justice of the peace or other qualified witness, the statutory declaration should be signed and witnessed prior to lodgment of the form at Land and Property Information Division.

Annexure **A** to CHANGE OF NAME

Parties:

From Honeysuckle Development Corporation to Hunter Development Corporation

Dated 18 September 2008

21/1096520

25/1096520

2/1113281

4/1111305

54/1106617

2/1111305

511/1030264

22/1072217

123/1008605

110/1015391

109/1015391

105/1015391

11/1113925

2/1037267

1/1113281

41/1001171

Req:R735661 /Doc:DL AE234027 /Rev:26-Sep-2008 /Sts:NO.OK /Pgs:ALL /Prt:17-Dec-2018 10:01 /Seq:3 of 5
Ref:advlegs /Src:P

Annexure B to Change of Name
Parties: From Honeysuckle Development Corporation ADI507C1
to Hunter Development Corporation

New South Wales

Growth Centres (Hunter Development Corporation) Order 2008

under the

Growth Centres (Development Corporations) Act 1974

MARIE BASHIR, Governor

I, Professor Marie Bashir AC, CVO, Governor of the State of New South Wales, with the advice of the Executive Council, and in pursuance of section 5 of the *Growth Centres (Development Corporations) Act 1974*, make the following Order.

Dated, this 16th day of January 2008.

By Her Excellency's Command,

FRANK SARTOR, M.P.,
Minister for Planning

Explanatory note

The object of this Order is:

(a) to expand the boundaries of the growth centre for which the Honeysuckle Development Corporation is constituted, and

(b) to rename that development corporation as the Hunter Development Corporation.

This Order is made under section 5 of the *Growth Centres (Development Corporations) Act 1974* and section 43 (2) of the *Interpretation Act 1987*.

Req:R735661 /Doc:DL AE234027 /Rev:26-Sep-2008 /Sts:NO.OK /Pgs:ALL /Prt:17-Dec-2018 10:01 /Seq:4 of 5
Ref:advlegs /Src:P

Growth Centres (Hunter Development Corporation) Order 2008

under the

Growth Centres (Development Corporations) Act 1974

1 Name of Order

This Order is the *Growth Centres (Hunter Development Corporation) Order 2008*.

2 Commencement

This Order commences on the day on which it is published in the Gazette.

3 Amendment of Growth Centres (Development Corporations) Act 1974 No 49

Schedule 1 to the *Growth Centres (Development Corporations) Act 1974* is amended by omitting the description of land relating to Part 2 from Column 2 and inserting instead:

All those pieces or parcels of land within the local government areas of Cessnock, Dungog, Gloucester, Great Lakes, Lake Macquarie, Maitland, Muswellbrook, Newcastle, Port Stephens, Singleton and Upper Hunter as at 1 January 2008.

4 Declaration of Hunter Development Corporation

The Honeysuckle Development Corporation is constituted in respect of the land referred to in Part 2 of Schedule 1 to the Act under the new corporate name of the Hunter Development Corporation.

5 Continuation of Development Corporation

For the avoidance of doubt, the Hunter Development Corporation is the continuation of, and is the same legal entity as, the Honeysuckle Development Corporation constituted under the *Growth Centres (Honeysuckle Development Corporation) Order 1992*.

Req:R735661 /Doc:DL AE234027 /Rev:26-Sep-2008 /Sts:NO.OK /Pgs:ALL /Prt:17-Dec-2018 10:01 /Seq:5 of 5
Ref:advlegs /Src:P

6 Repeal of Growth Centres (Honeysuckle Development Corporation) Order 1992

The *Growth Centres (Honeysuckle Development Corporation) Order 1992* is repealed.

Req:R729717 /Doc:DL 0045853 /Rev:09-Mar-2010 /Sts:OK.SC /Pgs:ALL /Prt:14-Dec-2018 10:31 /Seq:1 of 2
Ref:advlegs /Src:P

97-041 5

TRANSFER

Real Property Act, 1900

0
045853 N

OFFICE OF STATE REVENUE (N.S.W. TREASURY) $8
1994/95
NO STAMP DUTY IS PAYABLE ON THIS INSTRUMENT

(A) **LAND TRANSFERRED**

Show no more than 20 References to Title.
If appropriate, specify the share transferred.

Folio Identifiers: Vol 10259 folio 119 part being $2/547027$
1/839050
2/839050
3/839050ϕ
6/839050 and 4/828817 ~~4/839050~~

ϕ Marginal noted in LTO 2/547027 part being 3/839050

(B) **LODGED BY**

L.T.O. Box	Name, Address or DX and Telephone
4Q	Thomas Delgatto PoBox 813 Newcastle 2300.
	REFERENCE (max. 15 characters):

(C) **TRANSFEROR** STATE RAIL AUTHORITY OF NEW SOUTH WALES

(D) acknowledges receipt of the consideration of $1.00

and as regards the land specified above transfers to the Transferee an estate in fee simple

(E) subject to the following **ENCUMBRANCES** 1. ..... 2. ..... 3. .....

(F) **TRANSFEREE**

T HONEYSUCKLE DEVELOPMENT CORPORATION

OVER

(G) **TENANCY:**

(H) We certify this dealing correct for the purposes of the Real Property Act, 1900. **DATED** 24-2-95.

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

The Common Seal of **STATE RAIL AUTHORITY OF NEW SOUTH WALES** was hereto affixed in the presence of:

Signature of Witness

ALFRED RAINER

Name of Witness (BLOCK LETTERS)

Address of Witness

Signature of Transferor
Authorised Officer

Signed in my presence by the Transferee who is personally known to

Signed by Thomas Delgatto a delegate of the **HONEYSUCKLE DEVELOPMENT CORPORATION** and I certify I have no notice of revocation of such delegation:

Signature of Witness

Name of Witness (BLOCK LETTERS)

Address of Witness

Thomas Delgatto

Signature of Transferee

INSTRUCTIONS FOR FILLING OUT THIS FORM ARE AVAILABLE FROM THE LAND TITLES OFFICE

CHECKED BY (office use only) 2C D

10-1280

REGISTRATION DIRECTION ANNEXURE 0045853

Use this side only for **First and Second Schedule** directions

DO NOT USE BOTH SIDES OF THE FORM

FIRST SCHEDULE DIRECTIONS

FOLIO IDENTIFIER	DIRECTION	DETAILS
4/828817	S	Honeysuckle Development Corporation
10259-119	Prof	Honeysuckle Development Corporation as to part being lots 1, 2 Pt 3 & 6 in DP 839050 & State Rail Authority of NSW as part being lots 4, 5, 7 & 8 in DP 839050
2/547027	PROP	Honeysuckle Development Corporation as part being part of lot 3 in DP 839050

SECOND SCHEDULE AND OTHER DIRECTIONS

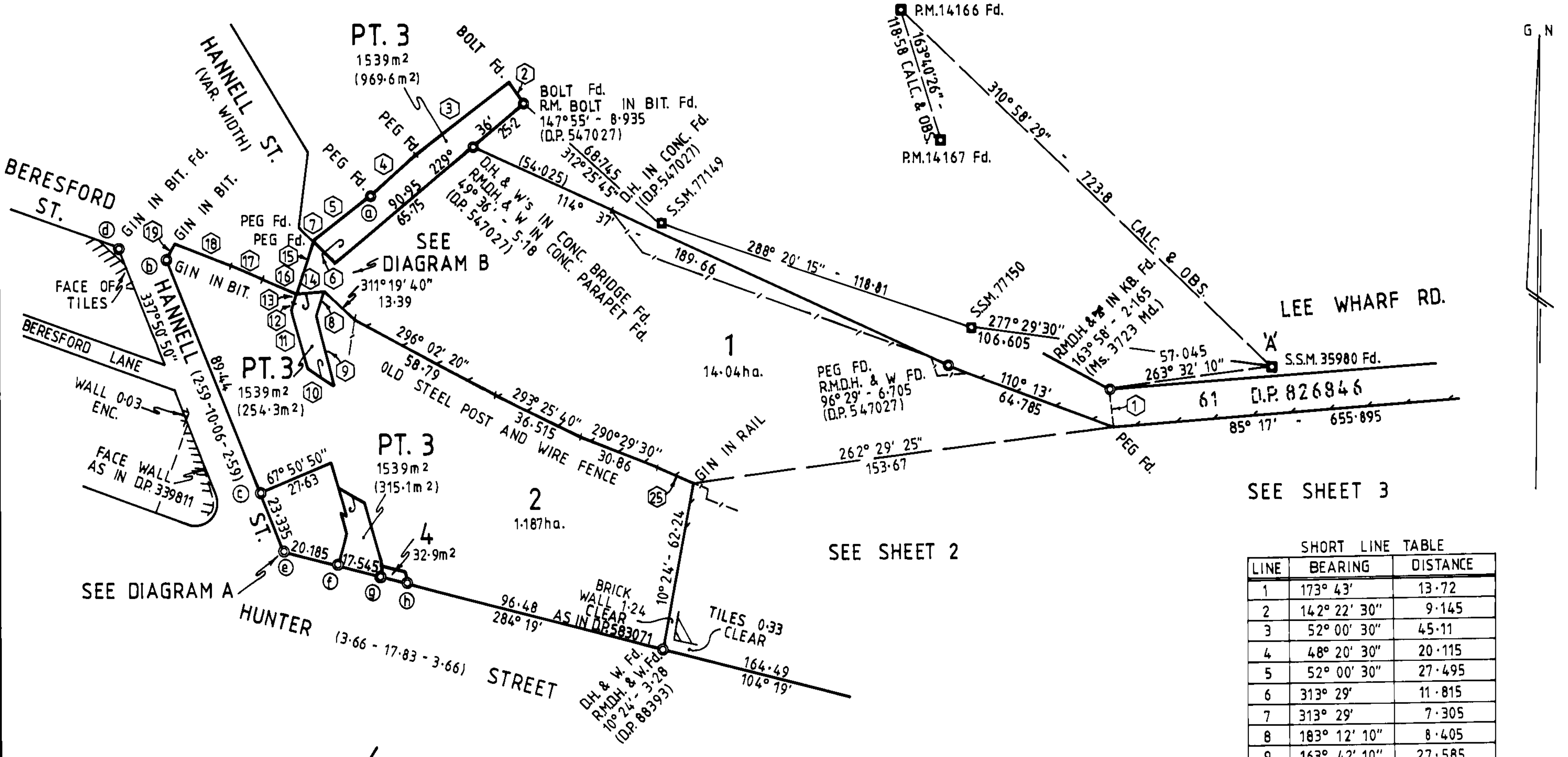
FOLIO IDENTIFIER	DIRECTION	NOTFN TYPE	DEALING NUMBER	DETAILS
~~10259-119~~	~~OFF~~	~~NB~~	~~DP 828817~~	
	~~OFF~~	~~NB~~	~~DP 839050~~	
2/547027	OFF	NB	DP. 828817	
	OFF	NB	DP 839050	
10259-119	ON	22		New Folios have been created for lots 1 to 8 inclusive in DP 839050
2/547027	ON	22		New Folio has been created for lot 3 in DP 839050
4/828817	CT	40		Thomas Delgatte PO Box 813 Newcastle 2300
10259-119	CT			NOCT
2/547027				

PLAN FORM 2

Plan Drawing only to appear in this space

*OFFICE USE ONLY

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



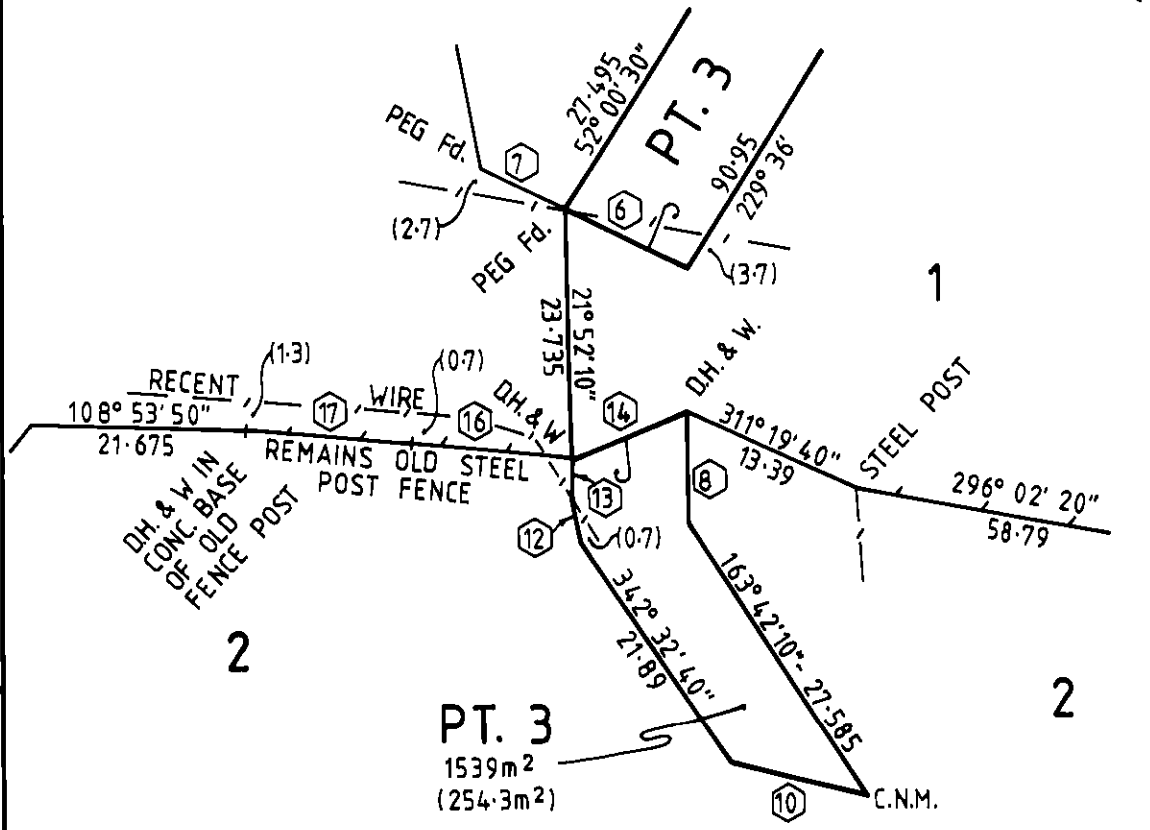


DIAGRAM B
(NOT TO SCALE)

REFERENCE MARKS

REF.	BEARING	DISTANCE	DESCRIPTION	ORIGIN
a	19° 40'	2·005	RM. SPIKE IN ∆ Fd.	D.P.826846
b	340° 35'	9·235	RM.D.H. & W	PLACED
c	67°50' 50"	2·35	R.M.D.H. & W	PLACED
d	206° 55' 30"	1·675	R.M.D.H. Fd.	D.P. 164463
e	348° 46'	2·33	R.M.D.H. & W	PLACED
f	14° 26' 40"	3·725	R.M.D.H. & W	PLACED
g	348° 43'40"	3·855	R.M.D.H. & W	PLACED
h	340° 32' 10"	3·925	R.M.D.H. & W	PLACED

SHORT LINE TABLE

LINE	BEARING	DISTANCE
1	173° 43'	13·72
2	142° 22' 30"	9·145
3	52° 00' 30"	45·11
4	48° 20' 30"	20·115
5	52° 00' 30"	27·495
6	313° 29'	11·815
7	313° 29'	7·305
8	183° 12' 10"	8·405
9	163° 42' 10"	27·585
10	307° 23' 40"	12·705
11	342° 32' 40"	21·89
12	355° 48' 40"	3·025
13	6° 06' 40"	2·515
14	265° 22' 10"	9·375
15	21° 52' 10"	23·735
16	114° 31'	10·09
17	115° 27'	14·895
18	108° 53' 50"	21·675
19	11° 09' 50"	4·065
20	330° 35' 40"	1·91
21	164° 52' 20"	6·58
22	348° 43' 40"	4·415
23	348° 43' 40"	8·390
24	348° 43' 40"	3·975
25	292° 44'	14·865
26	99° 04' 40"	7·625

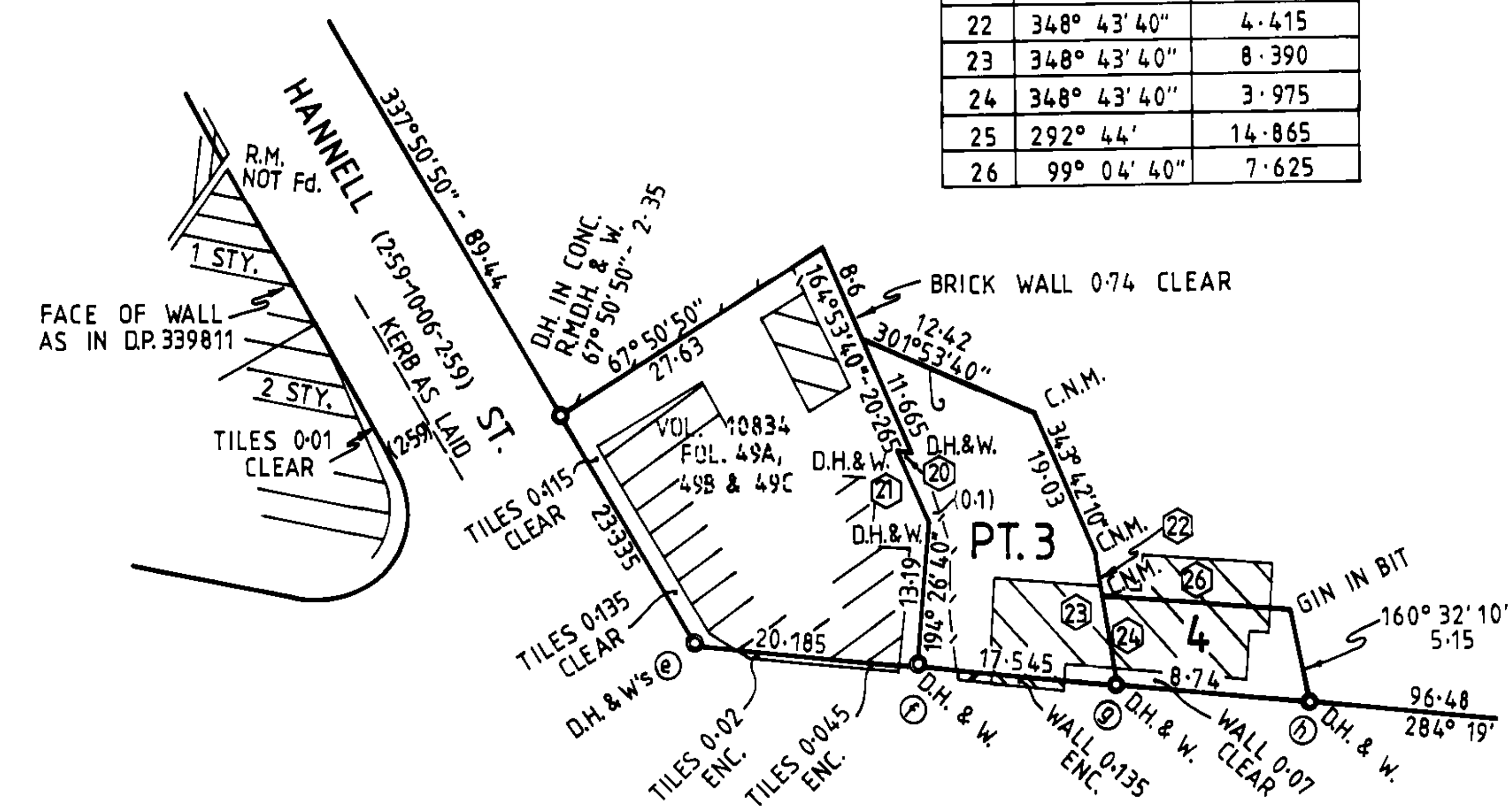


DIAGRAM A
(NOT TO SCALE)

SURVEY PRACTICE REGULATION, 1990, CLAUSE 32 (2)				
MARK	I. S. G. CO-ORDINATES		ZONE	ACC.
	EASTING	NORTHING		
P.M. 14166	370 975·230	1 355 747·132	56/1	2
P.M. 14167	371 008·564	1 355 633·332	56/1	2
S.S.M. 35980	371 521·698	1 355 272·520	56/1	2

SOURCE: I.S.G. CO-ORDINATES ADOPTED FROM N.S.W. LANDS DEPARTMENT, SURVEY CONTROL BRANCH, NEWCASTLE AT 9TH MARCH 1992

NOTE: C.N.M. DENOTES CORNER NOT MARKED

Crown Lands Office Approval

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

Council Clerk's Certificate

I hereby certify that —
(a) the requirements of the Local Government Act, 1919 (other than the requirements for the registration of plans), and
*(b) the requirements of Part 3 Division 2 of the † Water Board Act 1987 and † Water Supply Authorities Act 1987
have been complied with by the applicant in relation to the proposed .... (insert "new road", "subdivision" or "consolidated lot") set out herein
Subdivision No. ....
Date ....
(Signature) .... Council Clerk
Council File No. ....

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

DP 828817

Registered: [seal] 16. 3. 1993

C.A:

Title System: TORRENS / OLD SYSTEM / CROWN

Purpose: ACQUISITION - NOT A CURRENT PLAN AT REGN SEE S.327AA LGA, 1919

Ref. Map: U7250-13* U6350-34*

Last Plan: DP 3939 DP 80393 DP 724024 DP 514183 DP 920802

PLAN OF LAND TO BE ACQUIRED FOR FUTURE GROWTH CENTRE PURPOSES.

Lengths are in metres. Reduction Ratio 1: 1500

~~Mun./Shire~~ City: NEWCASTLE
Locality: NEWCASTLE
Parish: NEWCASTLE
County: NORTHUMBERLAND

This is sheet 1 of my plan in 4 sheets. (Delete if inapplicable).

I, ROBERT JOHN MONTEATH of MONTEATH & POWYS PTY. LTD. a surveyor registered under the Surveyors Act, 1929, as amended, hereby certify that the survey represented in this plan .... is accurate and has been made in accordance with the Survey Practice Regulations, 1990 and any special requirements of the Department of Lands, and was completed on # 24TH JUNE, 1992

Signature [signature]
Surveyor registered under Surveyors Act, 1929, as amended.
Datum Line of Azimuth.
#Insert date of survey.

Plans used in preparation of survey/compilation.

D.P. 526018	D.P. 164463	D.P. 74132
D.P. 448470	D.P. 88393	D.P. 795388
D.P. 237912	D.P. 705450	D.P. 501777
D.P. 547027	D.P. 739499	D.P. 583071
Ms. 3723 Md.		

CONTINUED SHEET 2

PANEL FOR USE ONLY for statements of intention to dedicate public roads or to create public reserves, drainage reserves, easements or restrictions as to user.
LOTS 2 TO 5 ARE TO BE ACQUIRED BY THE HONEYSUCKLE DEVELOPMENT CORPORATION.

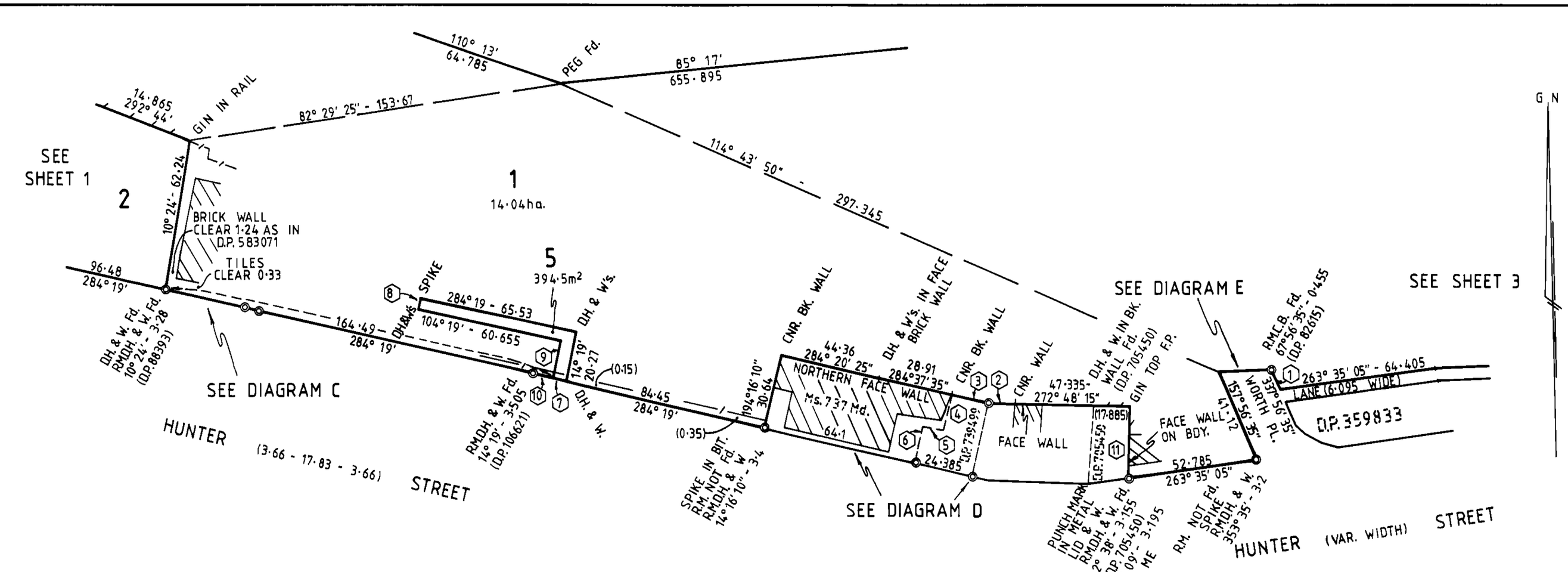
N 0 0 5 E 4 A

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

SURVEYOR'S REFERENCE: 91/105 CHECKLIST MPD

WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

PLAN FORM 3 | To be used in conjunction with Plan Form 2 | WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION | *OFFICE USE ONLY



SHORT LINE TABLE

LINE	BEARING	DISTANCE
1	337° 56' 35"	8·7
2	274° 11'	11·55
3	284° 29' 10"	15·23
4	14° 20' 40"	15·225
5	104° 19'	9·145
6	14° 17'	15·24
7	284° 19'	4·875
8	194° 19'	4·875
9	194° 19'	15·39
10	284° 19'	8·075
11	2° 38' 05"	28·81
12	89° 07'	7·93

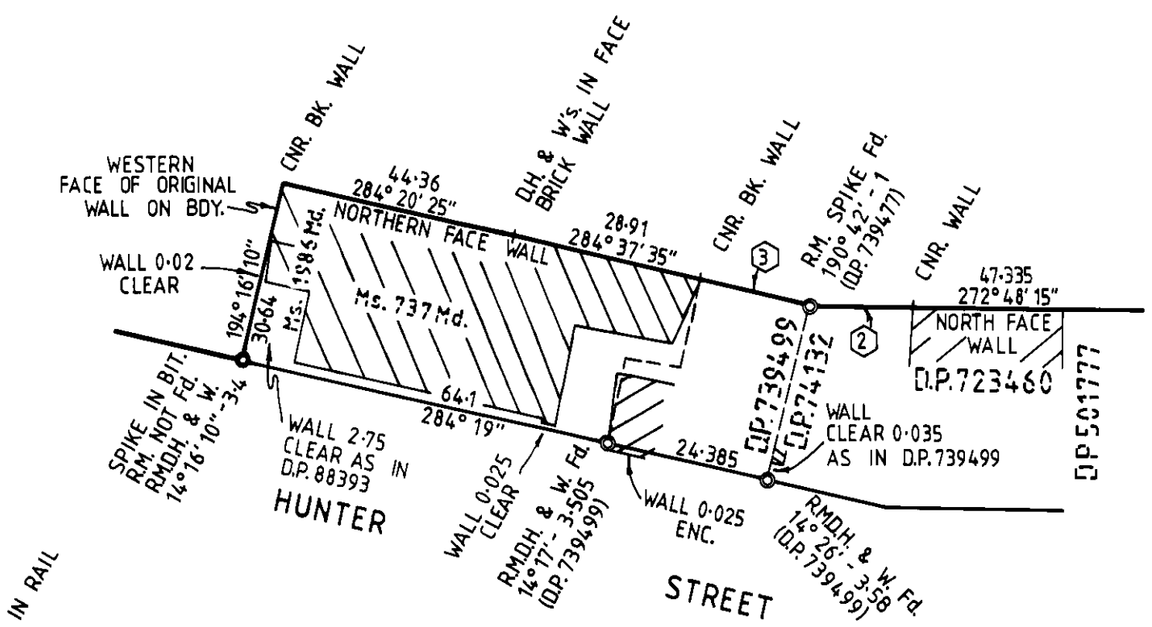


DIAGRAM D
(NOT TO SCALE)

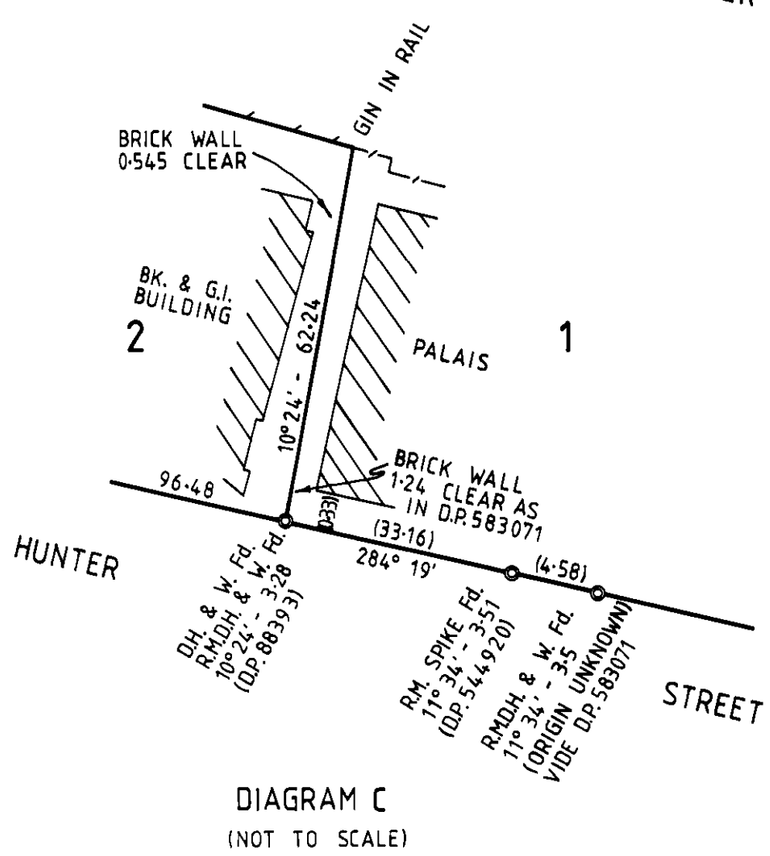


DIAGRAM C
(NOT TO SCALE)

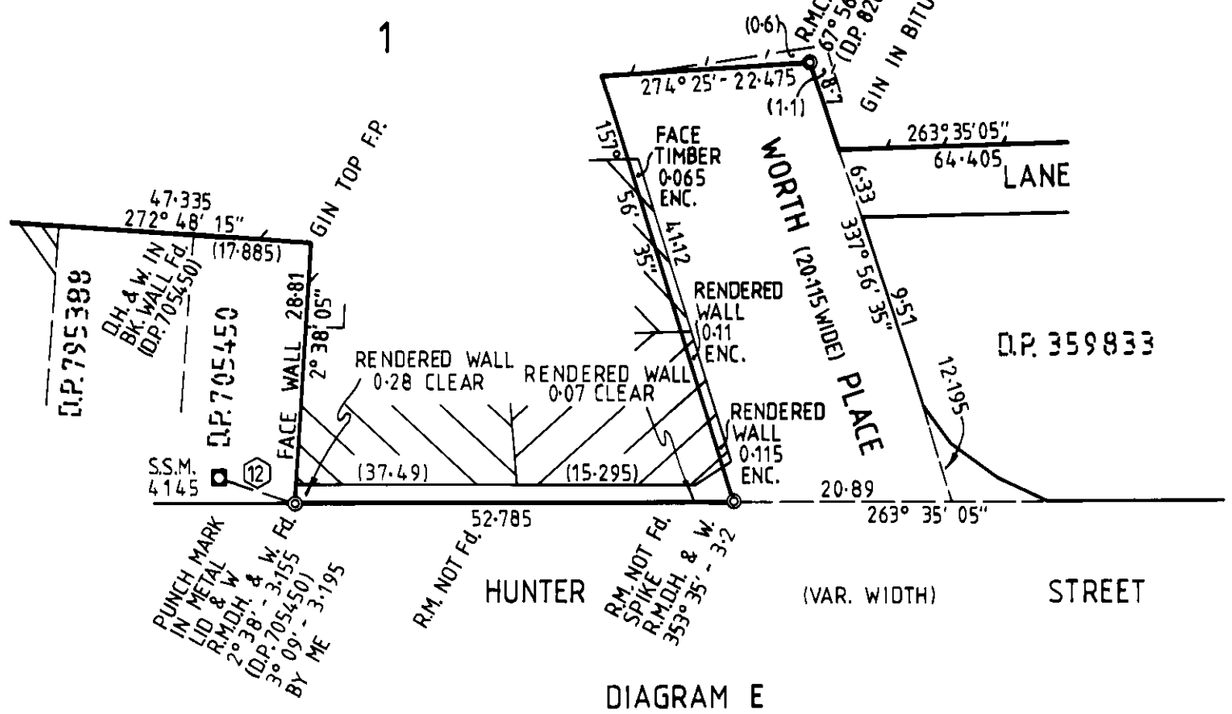


DIAGRAM E
(NOT TO SCALE)

DP 828817

Registered: 16.3.93

This is sheet 2 of my plan in 4 sheets dated

Surveyor registered under Surveyors Act 1929

This is sheet of the plan of sheets covered by my Certificate No. of

Council Clerk

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

PLANS USED IN PREPARATION OF SURVEY / COMPILATION CONTINUED FROM SHEET 1

D.P. 544920	D.P. 106621
Ms. 6359 Md.	D.P. 90308
D.P. 570385	D.P. 32620
D.P. 565400	D.P. 558335
D.P. 82615	D.P. 739499
D.P. 18256	D.P. 705450
D.P. 514183	D.P. 501777
D.P. 342744	D.P. 21503
D.P. 20606	D.P. 512039
D.P. 397414	D.P. 359833
D.P. 432848	D.P. 25008
D.P. 3939	D.P. 621859
D.P. 164463	D.P. 920802
D.P. 339811	D.P. 724024
Ms. 3429 Md.	Ms. 2751 Md.
Ms. 1971 Md.	Ms. 3096 Md.
Ms. 1972 Md.	D.P. 24717
D.P. 826846	

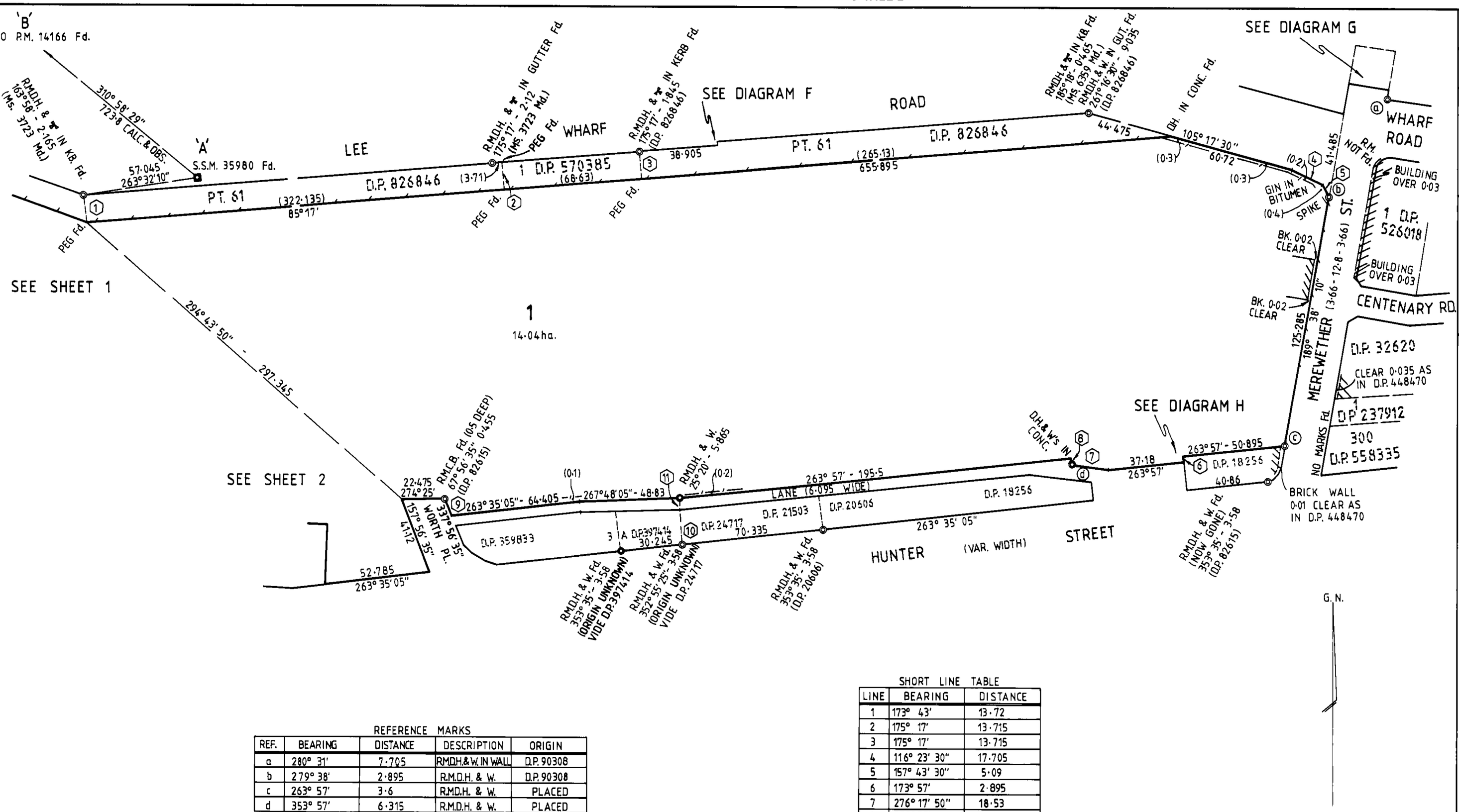
Reduction Ratio 1: 1500

Plan Drawing only to appear in this space

SURVEYOR'S REFERENCE: 91 / 105

Req:R733084 /Doc:DP 0828817 P /Rev:28-Mar-1993 /Sts:OK.OK /Pgs:ALL /Prt:14-Dec-2018 16:08 /Seq:2 of 4
Ref:advlegs /Src:P

PLAN FORM 3 | To be used in conjunction with Plan Form 2 | WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION | *OFFICE USE ONLY

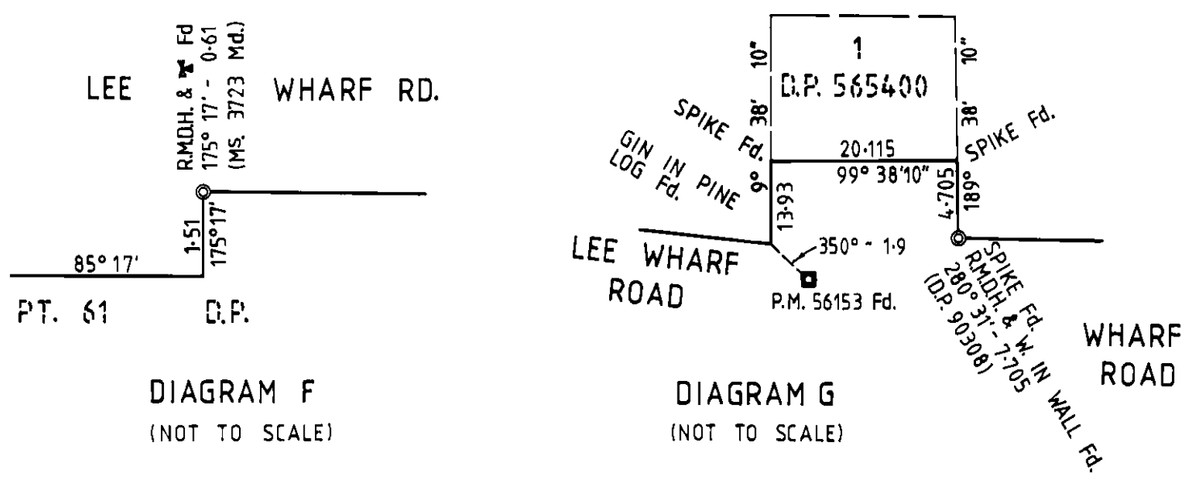


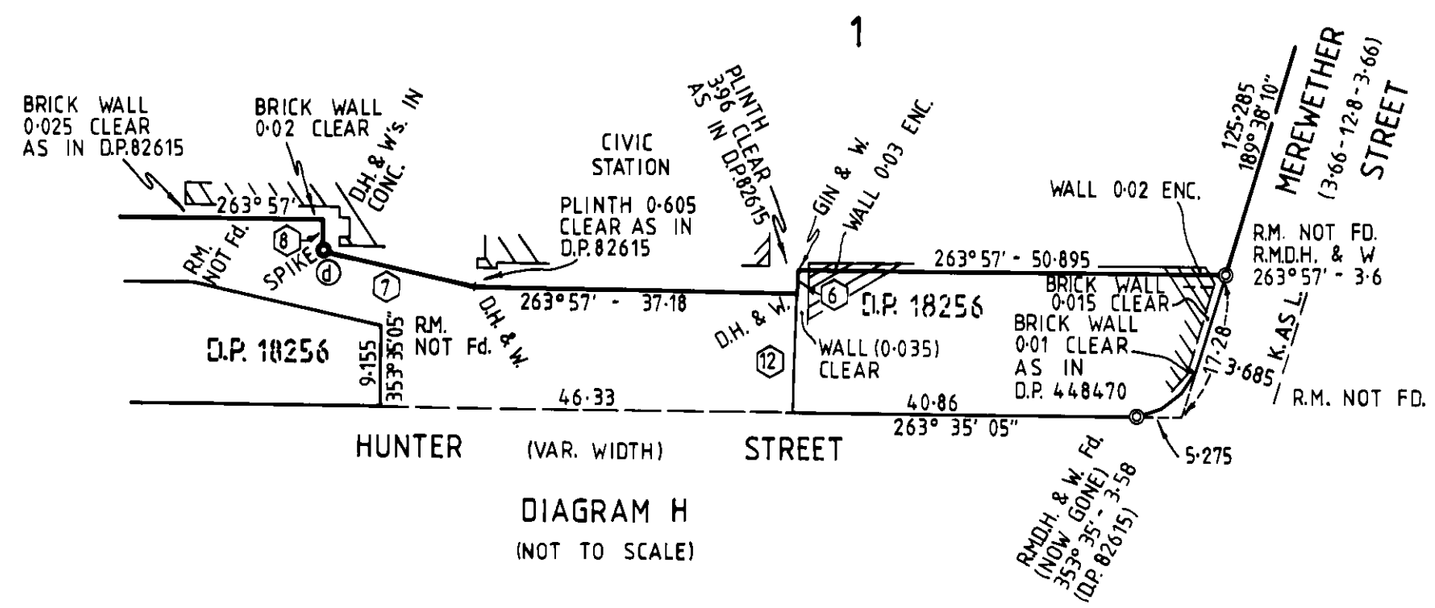
REFERENCE MARKS

REF.	BEARING	DISTANCE	DESCRIPTION	ORIGIN
a	280° 31'	7·705	R.M.D.H. & W. IN WALL	D.P. 90308
b	279° 38'	2·895	R.M.D.H. & W.	D.P. 90308
c	263° 57'	3·6	R.M.D.H. & W.	PLACED
d	353° 57'	6·315	R.M.D.H. & W.	PLACED

SHORT LINE TABLE

LINE	BEARING	DISTANCE
1	173° 43'	13·72
2	175° 17'	13·715
3	175° 17'	13·715
4	116° 23' 30"	17·705
5	157° 43' 30"	5·09
6	173° 57'	2·895
7	276° 17' 50"	18·53
8	353° 57'	3·81
9	337° 56' 35"	8·7
10	352° 55' 25"	17·315
11	355° 52' 30"	6·1
12	353° 35' 05"	14·04





DP 828817

Registered: 16·I·93

This is sheet 3 of my plan in 4 sheets dated

Surveyor registered under Surveyors Act 1929

This is sheet of the plan of sheets covered by my Certificate No. of

Council Clerk

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

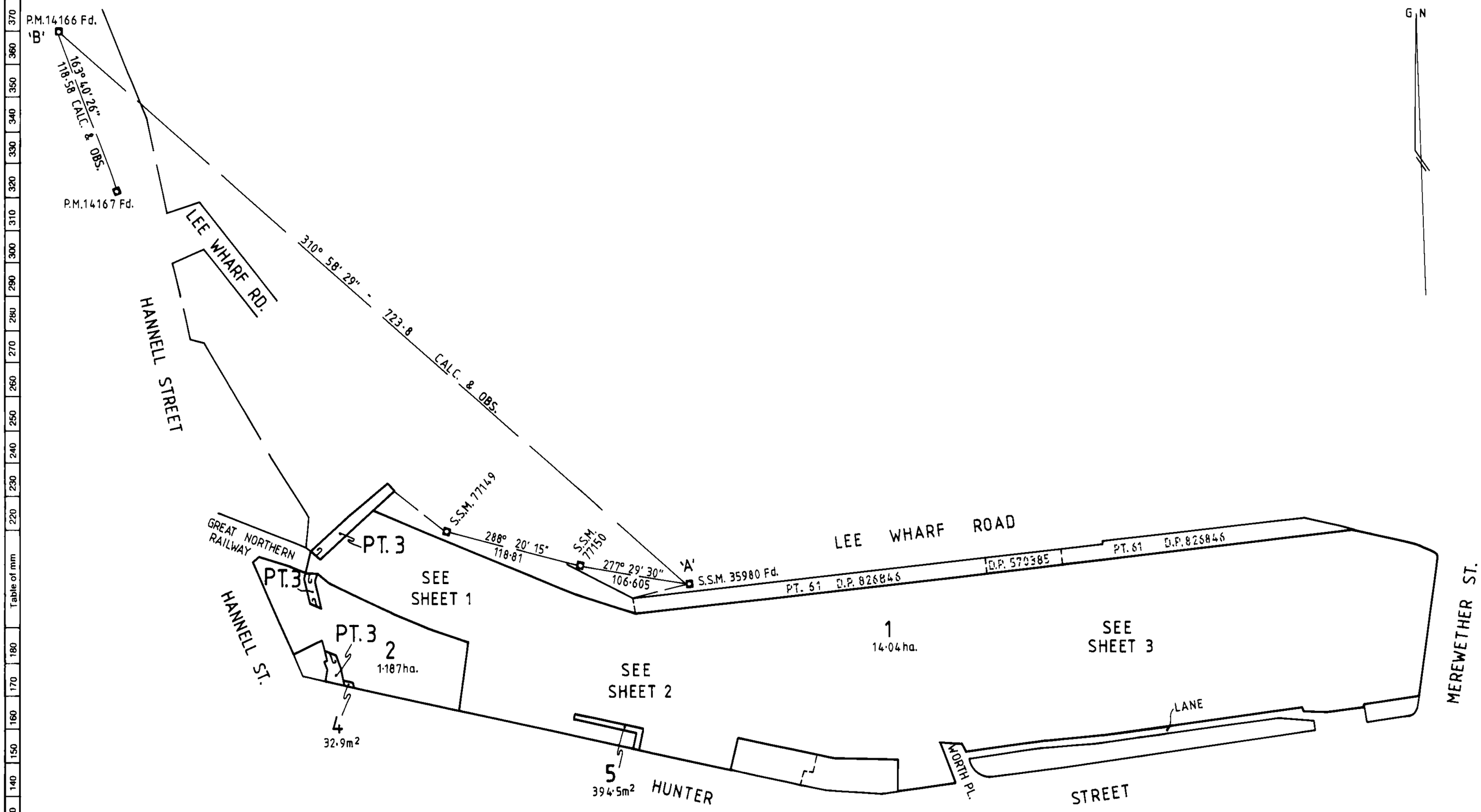
Reduction Ratio 1: 1500

Plan Drawing only to appear in this space

SURVEYOR'S REFERENCE: 91 / 105

Req:R733084 /Doc:DP 0828817 P /Rev:28-Mar-1993 /Sts:OK.OK /Pgs:ALL /Prt:14-Dec-2018 16:08 /Seq:3 of 4
Ref:advlegs /Src:P

PLAN FORM 3 | To be used in conjunction with Plan Form 2 | WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION | *OFFICE USE ONLY



DP 828817

Registered: 16·3·93

This is sheet 4 of my plan in 4 sheets dated

Surveyor registered under Surveyors Act 1929

This is sheet of the plan of sheets covered by my Certificate No. of

Council Clerk

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

Reduction Ratio 1: 3000

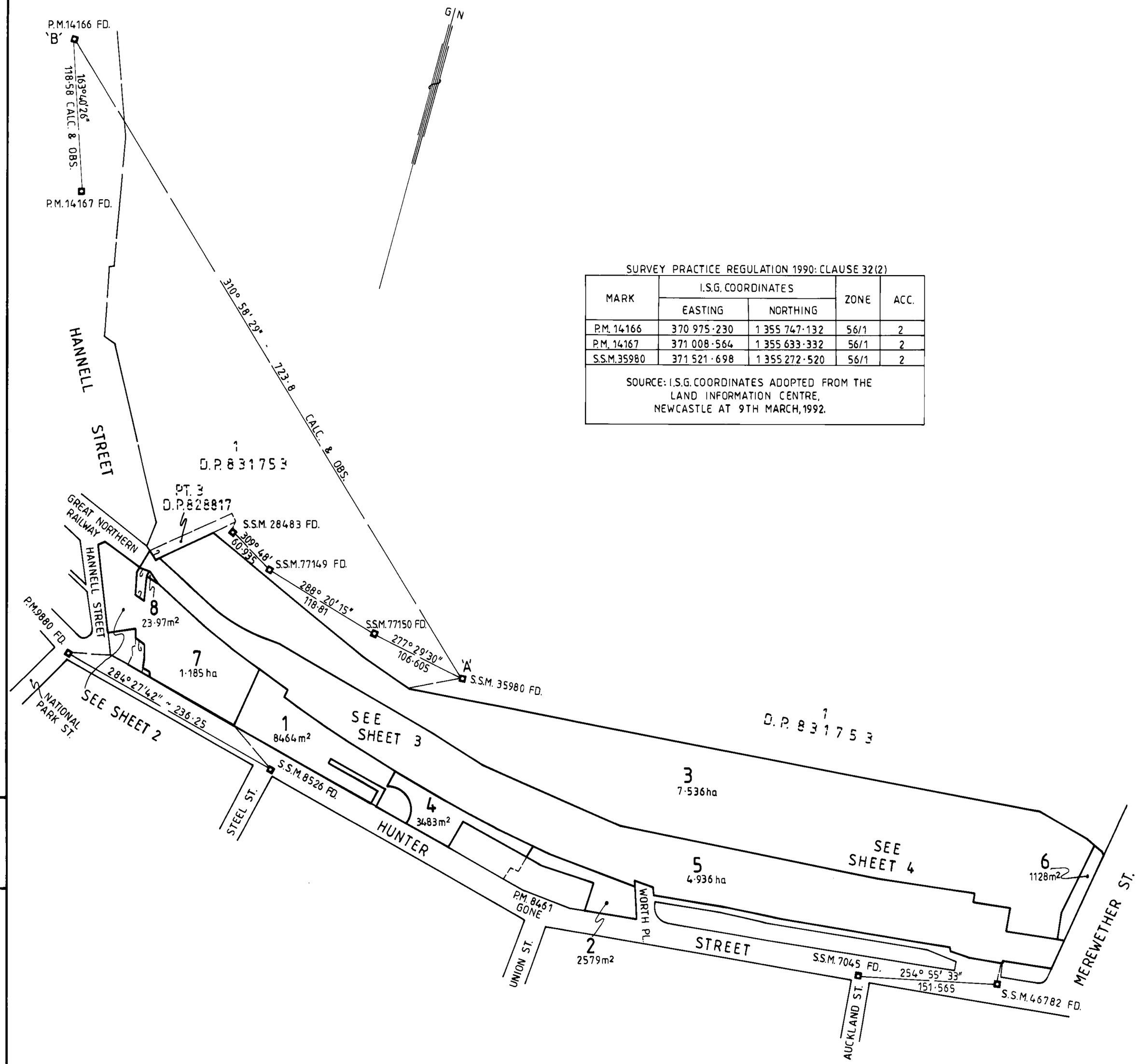
Plan Drawing only to appear in this space

SURVEYOR'S REFERENCE: 91/105

Req:R733084 /Doc:DP 0828817 P /Rev:28-Mar-1993 /Sts:OK.OK /Pgs:ALL /Prt:14-Dec-2018 16:08 /Seq:4 of 4
Ref:advlegs /Src:P

PLAN FORM 2 — Plan Drawing only to appear in this space — *OFFICE USE ONLY

SIGNATURE AND SEALS ONLY.



SURVEY PRACTICE REGULATION 1990: CLAUSE 32(2)

MARK	I.S.G. COORDINATES		ZONE	ACC.
	EASTING	NORTHING		
P.M. 14166	370 975·230	1 355 747·132	56/1	2
P.M. 14167	371 008·564	1 355 633·332	56/1	2
S.S.M.35980	371 521·698	1 355 272·520	56/1	2

SOURCE: I.S.G. COORDINATES ADOPTED FROM THE LAND INFORMATION CENTRE, NEWCASTLE AT 9TH MARCH, 1992.

DP 839050

Registered: 12.5.1994

C.A:

Title System: TORRENS OLD SYSTEM CROWN LAND

Purpose: ACQUISITION (NOT A CURRENT PLAN AT REGN. - S.327AA L.G. ACT, 1919)

Ref. Map: U7250-13 U6350-34

Last Plan: DP 828817

PLAN OF LAND TO BE ACQUIRED FOR FUTURE GROWTH CENTRE PURPOSES.

Lengths are in metres. Reduction Ratio 1: 3000

L.G.A. ~~Mun./Shire City~~ NEWCASTLE CITY

Locality: NEWCASTLE

Parish: NEWCASTLE

County: NORTHUMBERLAND

This is sheet 1 of my plan in 4 sheets. (Delete if inapplicable).

I, ROBERT JOHN MONTEATH

of MONTEATH & POWYS PTY. LTD

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

#. 23RD AUGUST 1993

Signature: Robert Monteath

Surveyor registered under Surveyors Act, 1929, as amended.
Datum Line of Azimuth. 'A'-'B'
#Insert date of survey.

Plans used in preparation of survey/compilation.

D.P. 828817	D.P. 88393	D.P. 795388	D.P. 448470
D.P. 831753	Ms. 3723 Md.	D.P. 501777	D.P. 565400
D.P. 547027	D.P. 106621	D.P. 570385	D.P. 82615
D.P. 583071	Ms. 737 Md	D.P. 826846	D.P. 74132
D.P. 739499	D.P. 705450	Ms. 6359 Md.	D.P. 88393
D.P. 82615	D.P. 723460	Ms. 1986 Md.	D.P. 90308

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

LOTS 1 TO 4 ARE TO BE ACQUIRED BY THE HONEYSUCKLE DEVELOPMENT CORPORATION.

STATUS OF PMs OBTAINED FROM S.C.I.M.S. ENQUIRY ON 4-5-1994

N 0 0 8 E 4 E

Crown Lands Office Approval

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

Council Clerk's Certificate

I hereby certify that —

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

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

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

Subdivision No. .....

Date .....

Signature .....
Council Clerk

Council File No. .....

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

†Delete if inapplicable.

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

SURVEYOR'S REFERENCE: 91/105/RL CHECKLIST / E.No. 93/331 - CLAUSE 33(3)(a)(i)

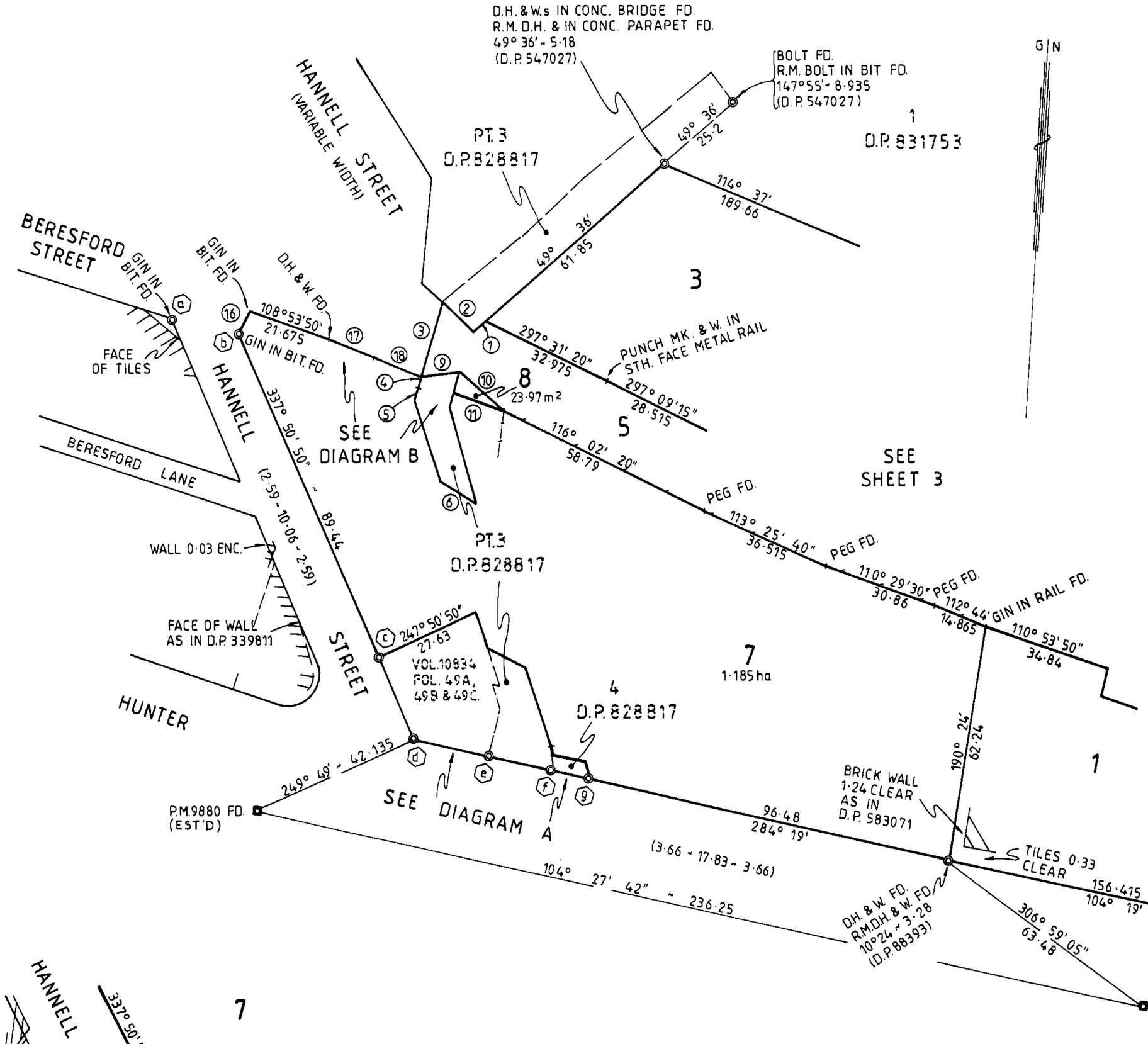
WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

R27081

Req:R732844 /Doc:DP 0839050 P /Rev:16-May-1994 /Sts:OK.OK /Pgs:ALL /Prt:14-Dec-2018 15:48 /Seq:1 of 4
Ref:advlegs /Src:P

PLAN FORM 3 | To be used in conjunction with Plan Form 2 | **WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION** | *OFFICE USE ONLY

Req:R732844 /Doc:DP 0839050 P /Rev:16-May-1994 /Sts:OK.OK /Pgs:ALL /Prt:14-Dec-2018 15:48 /Seq:2 of 4
Ref:advlegs /Src:P



SCHEDULE OF REFERENCE MARKS

REF.	BEARING	DISTANCE	DESCRIPTION	ORIGIN
a	206°55'30"	1·675	R.M.D.H. FD.	D.P. 164463
b	340°35'	9·235	R.M.D.H. & W. FD.	D.P. 828817
c	67°50'50"	2·35	R.M.D.H. & W. FD.	D.P. 828817
d	348°46'	2·33	R.M.D.H. & W. FD.	D.P. 828817
e	14°26'40"	3·725	R.M.D.H. & W. FD.	D.P. 828817
f	348°43'40"	3·855	R.M.D.H. & W. FD.	D.P. 828817
g	340°32'10"	3·925	R.M.D.H. & W. FD.	D.P. 828817

SHORT LINE TABLE

LINE	BEARING	DISTANCE
1	229°36'	3·9
2	313°29'	11·815
3	201°52'10"	23·735
4	186°06'40"	2·515
5	175°48'40"	3·025
6	127°23'40"	12·705
7	3°12'10"	3·855
8	3°12'10"	4·55
9	265°22'10"	9·375
10	311°19'40"	13·39
11	112°37'40"	11·17
12	340°32'10"	5·15
13	279°04'40"	7·625
14	348°43'40"	4·415
15	344°53'40"	8·6
16	11°09'50"	4·065
17	115°27'	14·895
18	114°31'	10·09

NOTE:
C.N.M. DENOTES CORNER NOT MARKED.

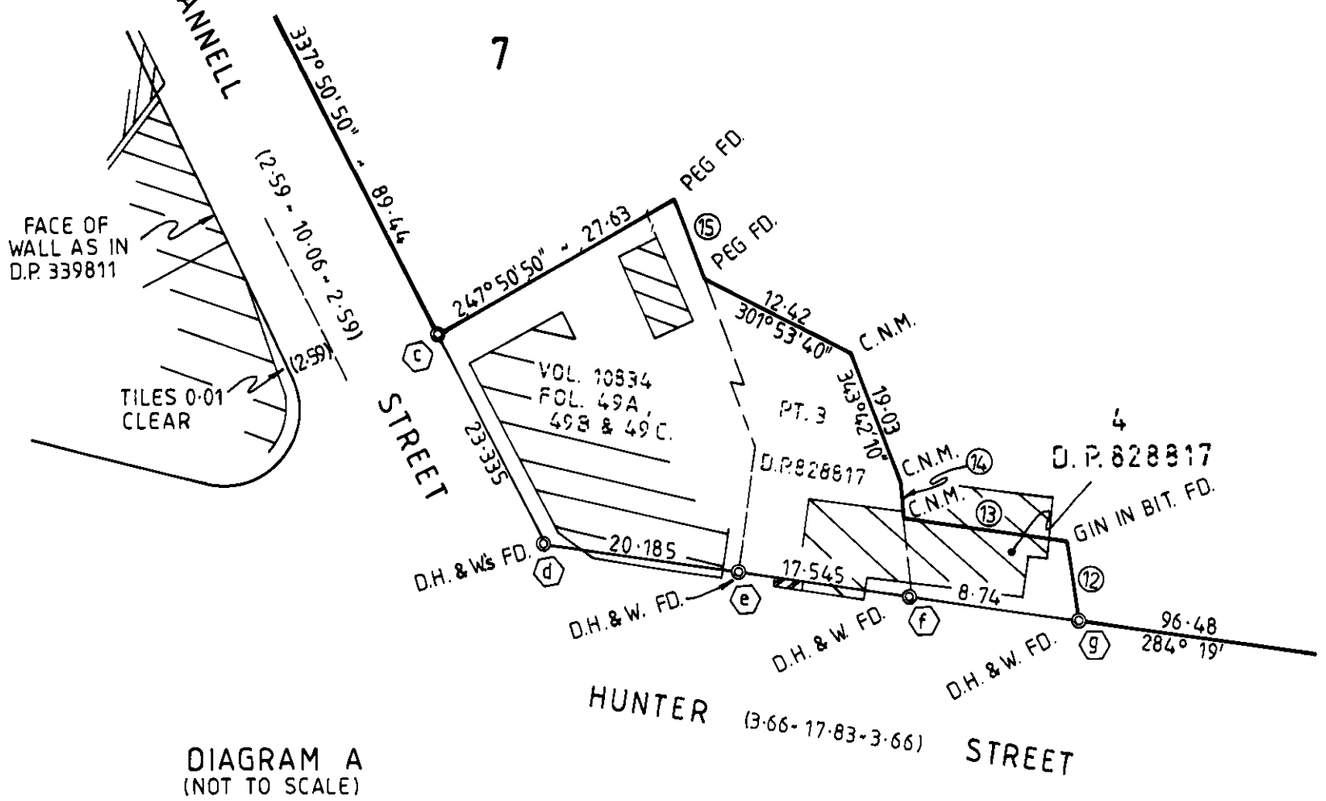


DIAGRAM A
(NOT TO SCALE)

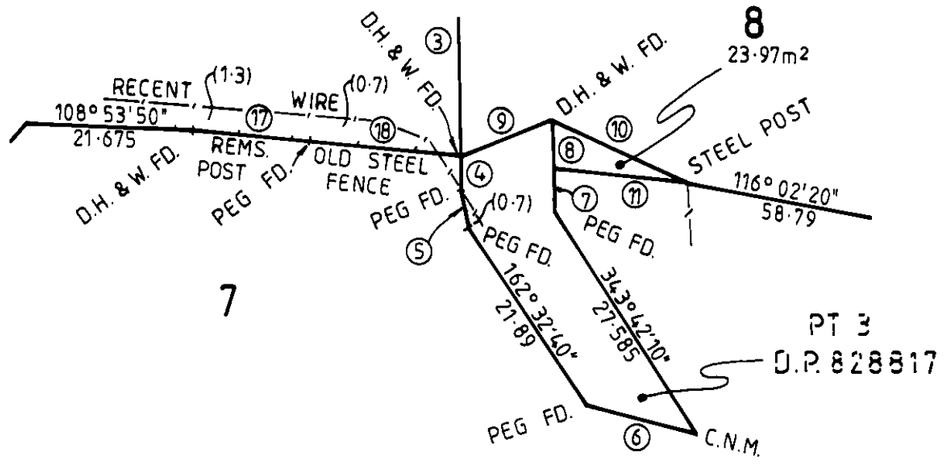


DIAGRAM B
(NOT TO SCALE)

DP 839050

Registered: 12.5.1994

This is sheet 2 of my plan in 4 sheets dated

Surveyor registered under Surveyors Act 1929

This is sheet of the plan of sheets covered by my Certificate No. of

Council Clerk

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

Reduction Ratio 1: 1000

Plan Drawing only to appear in this space

SURVEYOR'S REFERENCE: 91/105/RL R27081

PLAN FORM 3 — To be used in conjunction with Plan Form 2 — **WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION** — *OFFICE USE ONLY

DP 839050

Registered: 12.5.1994

This is sheet 3 of my plan in 4 sheets dated

Surveyor registered under Surveyors Act 1929

This is sheet of the plan of sheets covered by my Certificate No. of

Council Clerk

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

'B' P.M 14166 FD

310° 58' 29" ~ 723·8 CALC & OBS

'A' S.S.M. 35980 FD.

D.P. 831753

HANNELL STREET

D.H. & W's IN CONC. BRIDGE FD. R.M.D.H. & W. IN CONC. PARAPET FD. 49°36'~5·18 (D.P. 547027)

BOLT FD. RM. BOLT IN BIT. FD. 147°55'~8·935 (D.P. 547027) S.S.M. 28483 FD. (EST'D)

D.H. IN CONC. FD. (D.P. 547027)

S.S.M. 77149 FD. (EST'D)

S.S.M. 77150 FD. (EST'D)

PEG FD. R.M.D.H. & W. FD. 96°29'~6·705 (D.P. 547027)

PT. 3 D.P. 828817

SEE DIAGRAM C

PUNCH MK. & W. IN STH. FACE METAL RAIL

CH. 286°41'10"~73·125 A. 73·53 R. 201·6

PEG FD. OLD STEEL POST & WIRE FENCE

GIN RAIL FD.

SPIKE IN BIT.

D.H. & W's IN CONC.

NORTHERN FACE WALL

FACE WALL

SEE DIAGRAM H

SEE DIAGRAM D

SEE SHEET 2

SEE SHEET 4

1 8464 m²

2 2·033 ha

3 7·536 ha

4 3483 m²

5 4·936 ha

7 1·185 ha

BK. WALL 1·24 CLEAR AS IN D.P. 583071

TILES 0·33 CLEAR

D.H. & W's FD. R.M.D.H. & W. FD. 348°46'~2·33 (D.P. 828817)

P.M. 9880 FD. (EST'D)

D.H. & W. FD. R.M.D.H. & W. FD. 340°32'10"~3·925 (D.P. 828817)

D.H. & W. FD. R.M.D.H. & W. FD. 10°24'~3·28 (D.P. 88393)

S.S.M. 8526 FD. (NOT EST'D)

R.M.D.H. & W. FD. 14°19'~3·505 (D.P. 106621)

D.H. & W. FD. R.M.D.H. & W. FD. (353°31'~3·68)

SPIKE IN BIT. FD. R.M.D.H. & W. FD. 14°16'10"~3·4 (D.P. 828817)

R.M.D.H. & W. FD. 14°17'~3·505 (D.P. 739499)

R.M.D.H. & W. FD. 14°25'~3·58 (D.P. 739499)

HUNTER STREET

D.P. 828817

D.P. 739499

D.P. 723460

D.P. 501777

D.P. 74132

(3·66 ~ 17·83 ~ 3·66)

DIAGRAM H
NOT TO SCALE

PT. 3 D.P. 828817

PEG FD. 313° 29' 7·305 (2·7)

PUNCH MK. & W. IN STH. FACE METAL RAIL

DH. & W. FD.

STEEL POST FD.

DIAGRAM C
NOT TO SCALE

SHORT LINE TABLE

LINE.	BEARING	DISTANCE
1	274°11'	11·55
2	284°29'10"	15·23
3	284°19'	4·875
4	284°19'	8·075
5	194°19'	15·39
6	194°19'	4·875
7	14°19'	20·27
8	111°57'30"	17·645
9	191°34'	7·915
10	112°44'	14·865
11	110°29'30"	30·86
12	131°19'40"	13·39
13	3°12'10"	4·55
14	292°37'40"	11·17
15	85°22'10"	9·375
16	201°52'10"	23·735
17	313°29'	11·815
18	229°36'	3·9
19	297°09'15"	28·515
20	332°	8·35
21	274°49'40"	15·28
22	14°19'	18·03
23	14°19'	15·57

◑ PROPOSED RIGHT OF WAY 4 WIDE.

DIAGRAM D
NOT TO SCALE

Reduction Ratio 1: 1500

Plan Drawing only to appear in this space

SURVEYOR'S REFERENCE: 91/105/RL R27081

Req:R732844 /Doc:DP 0839050 P /Rev:16-May-1994 /Sts:OK.OK /Pgs:ALL /Prt:14-Dec-2018 15:48 /Seq:3 of 4
Ref:advlegs /Src:P

PLAN FORM 3

To be used in conjunction with Plan Form 2

WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

*OFFICE USE ONLY

DP 839050

Registered: 12.5.1994

This is sheet 4 of my plan in 4 sheets dated

Surveyor registered under Surveyors Act 1929

This is sheet of the plan of sheets covered by my Certificate No. of

Council Clerk

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

'B' P.M. 14166 FD.

310° 72³8 — S8° CALC. & OBS. 20"

'A' S.S.M. 35980 FD.

250° 01' 20" 58·77

(322·135) PEG FD. 85° 17' (68·63) PEG FD. 655·895 (265·13)

PEG FD

289° 54' 20" 106·555

D.H. & W/s IN CONC.

286° 45' 05" 61·995

278° 28' 15" 154·61

D.H. & W/s IN CONC.

266° 07' - 269·065

263° 22' 40" - 100·375

352° 29' 9·105

263° 44' 37·485

354° 11' 24·155

174° 02' 25" (9) 26·69

54·465

264° 11' - 59·99

190° 36' 35" - 78·335

95·685

9° 10" (3·66 - 12·8 - 3·66) 36"

29·6

MEREWETHER STREET

NO MARKS FD.

G|N

CENTENARY RD.

D.P. 32620

CLEAR 0·035 AS IN D.P. 448470

1 D.P. 237912

300

D.P. 558335

1 D.P. 565400

SPIKE FD.

SPIKE FD. (SPIKE FD. R.M.D.H. IN WALL FD. 280° 31' - 7·705 (D.P. 90308)

WHARF ROAD

BUILDING OVER 0·03

1 D.P. 526018

BUILDING OVER 0·03

SEE DIAGRAM G

1 D.P. 831753

3 7·536 ha

5 4·936 ha

6 1128 m²

R.M.D.H. & W. IN KB. FD. 185° 18' - 0·465 (Ms 6359 Md)

R.M.D.H. & W. IN GUT. FD. 261° 16' 30" - 9·035 (D.P. 826846)

D.H. IN CONC. FD. 105° 44·475 (10·3) 17' 60·72 30" (10·3) PEG FD.

SHEET 3

SEE DIAGRAM F

4 Ms737 Md

SPIKE IN BIT. ③ SPIKE IN BIT. ② SPIKE IN BIT. ① 97° 37' 20" 29·33

213° 03' 40" 60·32

SPIKE IN BIT. SPIKE IN BIT.

272° 48' 15" - 47·335

N FACE WALL

D.P. 739459

2 2579 m²

52·785

263° 35' 05"

PEG FD. R.M.C.B. FD. 67° 56' 35" - 0·455 (D.P. 826215)

83° 35' 05" - 64·405 (0·1) PEG FD. 87° 48' 05" 48·83 (PEG FD. R.M.D.H. & W. FD. 25° 20' - 5·865 (D.P. 828817)) (0·2)

83° 57' - 195·5

SPIKE FD. R.M.D.H. & W. FD. 353° 57' - 6·315 (D.P. 828817)

37·18 83° 57' ⑬ D.P. 18256

83° 57' - 50·895

WORTH PLACE 157° 58' 35" 35·835

D.P. 359833 | 3 A D.P. 397414 | D.P. 24717 | D.P. 21503 | D.P. 20606 | D.P. 18256

STREET (VAR. WIDTH)

HUNTER

S.S.M. 46782 FD. (EST'D) 254° 55' 33" 151·565

S.S.M. 7045 FD. (EST'D)

R.M.D.H. & W. FD. 14° 17' - 3·505 (D.P. 739499)

R.M.D.H. & W. FD. 14° 26' - 3·58 (D.P. 739499)

PUNCH MK. & W. IN METAL LID FD. R.M.D.H. & W. 3° 09' - 3·195 (D.P. 828817)

SEE DIAGRAM E

SHORT LINE TABLE

LINE.	BEARING	DISTANCE
1.	274° 11'	11·55
2.	284° 29' 10"	15·23
3.	14° 20' 40"	13·64
4.	99° 18'	19·34
5.	89° 07'	7·93
6.	173° 57'	3·81
7.	96° 17' 50"	18·53
8.	353° 57'	2·895
9.	84° 11'	5·525
10.	189° 38' 10"	4·705
11.	350°	1·9
12.	157° 43' 30"	5·09
13.	0° 37' 20"	17·07

SPIKE FD. 1 D.P. 565400 20·115 99° 38' 10" SPIKE FD. ⑩

SPIKE FD. R.M.D.H. & W. IN WALL FD. 280° 31' - 7·705 (D.P. 90308)

WHARF ROAD

10" 13·93 9° 38' 41·485 ⑪ P.M. 56153 FD. (EST'D)

PEG FD. 8·85 116° 25' 30" R.M.D.H. & W. 209° 26' - 3·3 (0·3) 8·855 ⑫

SPIKE FD. R.M.D.H. & W. FD. 279° 38' - 2·895 (D.P. 90308)

G.I.N. IN BIT FD.

190° 36' 35" 78·335

3 6

DIAGRAM G (NOT TO SCALE)

SPIKE IN BIT. 29·33 97° 37' 20" SPIKE IN BIT. 29·96 96° 03' 55" SPIKE IN BIT. 29·885 89° 27' 40"

R.M. SPIKE FD. 190° 42' - 1 (D.P. 739499)

CNR. WALL ① 272° 48' 15" - 47·335

NTH FACE WALL (17·885)

G.I.N. IN TOP F.P. FD.

D.H. & W. IN BK. WALL FD. (D.P. 705450)

D.P. 739459

D.P. 795388

D.P. 795450

2 2579 m²

28·81 2° 38' 05" FACE WALL

NAIL IN TIMBER POST R.M.D.H. & W. 337° 56' 35" - 2·885

RENDERED WALL 0·28 CLEAR RENDERED WALL 0·07 CLEAR

RENDERED WALL 0·115 ENC.

S.S.M. 4145 (NOT EST'D) (37·49) (15·295) 263° 35' 05" - 52·785

PEG FD. R.M.C.B. FD. 67° 56' 35" - 0·455 (D.P. 826215) (0·6) PEG FD. 94° 25 22·475 (1·1) 5·285 151° FACE TIMBER 0·065 ENC.

G.I.N. IN BIT. FD. 8·7 157° 56' 35" 9·51 12·195 83° 35' 05" 64·405

LANE (6·095 WIDE)

WORTH PLACE (20·115 WIDE) 35·835

D.P. 359833

20·89 263° 35' 05"

PUNCH MK. & W. IN METAL LID FD. R.M.D.H. & W. 3° 09' - 3·195 (D.P. 828817)

SPIKE FD. R.M.D.H. & W. 353° 35' - 3·2 (D.P. 828817)

HUNTER (VAR. WIDTH) STREET

DIAGRAM E (NOT TO SCALE)

BRICK WALL 0·025 CLEAR AS IN D.P. 82615

BRICK WALL 0·02 CLEAR D.H. & W/s FD.

SPIKE FD. R.M.D.H. & W. FD. 353° 57' - 6·315 (D.P. 828817)

CIVIC STATION PLINTH 0·605 CLEAR AS IN D.P. 82615

PLINTH 3·96 CLEAR AS IN D.P. 82615

GIN & W. FD. WALL 0·03 ENC.

WALL 0·02 ENC.

83° 57' ⑥ ⑦ 83° 57' - 37·18 D.H. & W. FD.

D.P. 18256

D.H. & W. FD. ⑧ 83° 57' - 50·895

BRICK WALL 0·015 CLEAR BRICK WALL 0·01 CLEAR AS IN D.P. 448470

WALL 0·035 CLEAR ⑬ 17·28

S.S.M. 46782 FD. (EST'D) 263° 35' 05" 5·275

R.M.D.H. & W. FD. 263° 57' - 3·6 (D.P. 828817)

9° 38' 10" - 29·6 MEREWETHER STREET (3·66 12·8 3·66)

R.M.D.H. & W. 279° 38' 10" 2·45

264° 11' - 54·465 ⑨

3 6 5

R.M.D.H. & W. FD. (NOW GONE) 353° 35' - 3·58 (D.P. 826215)

HUNTER (VAR. WIDTH) STREET

DIAGRAM F (NOT TO SCALE)

Reduction Ratio 1: 1500

Plan Drawing only to appear in this space

SURVEYOR'S REFERENCE: 91/105/RL R27081

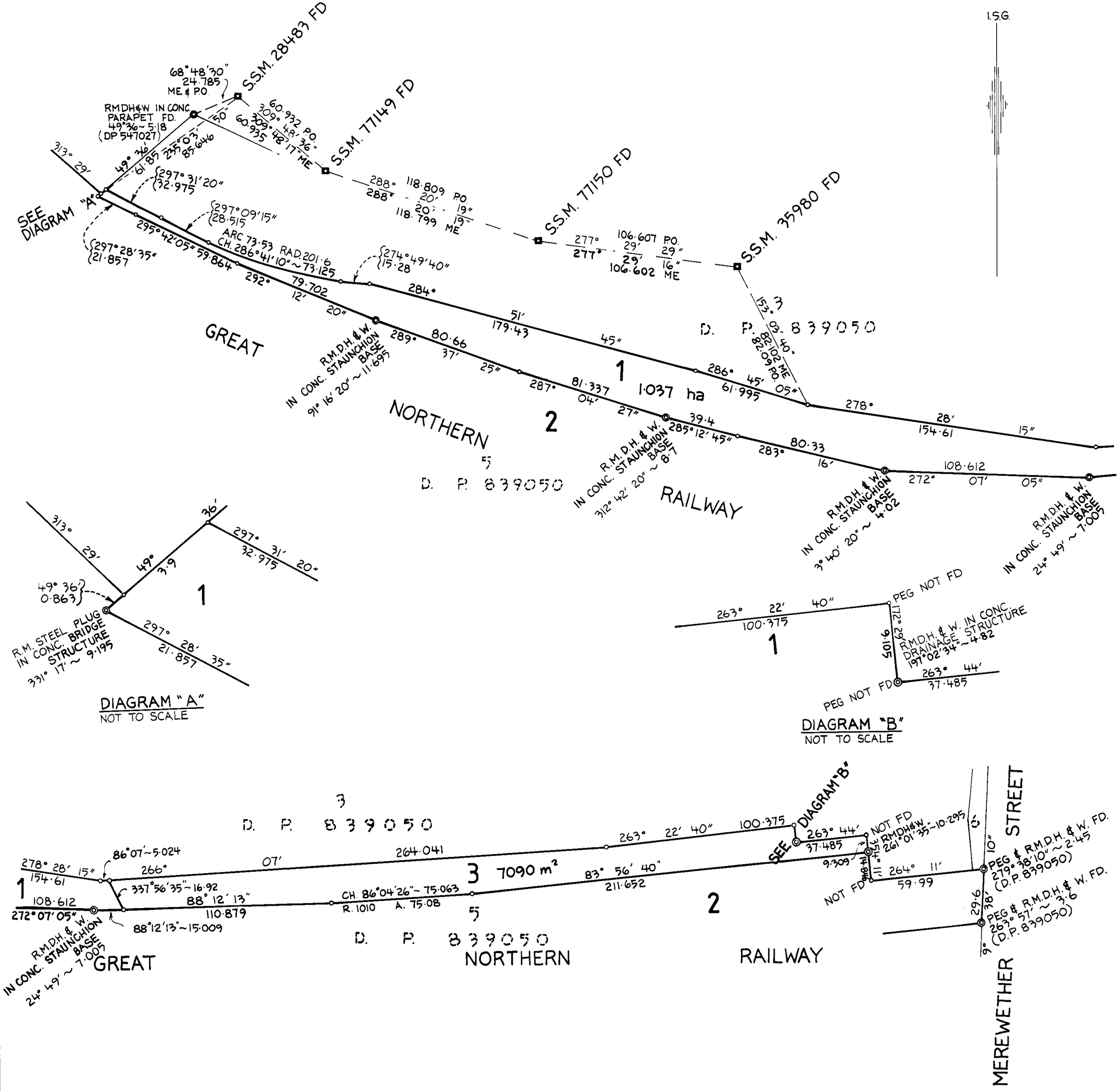
Req:R732844 /Doc:DP 0839050 P /Rev:16-May-1994 /Sts:OK.OK /Pgs:ALL /Prt:14-Dec-2018 15:48 /Seq:4 of 4
Ref:advlegs /Src:P

PLAN FORM 2

Plan Drawing only to appear in this space

*OFFICE USE ONLY

SIGNATURE AND SEALS ONLY.



DP 856783

Registered: 15 - 2 - 1996

C A

Title System: TORRENS

Purpose ACQUISITION

Ref Map: U6350-34*, J7250-13*

Last Plan: DP 839050

PLAN OF ACQUISITION OF PART OF ALLOTMENT 5 IN D.P. 839050.

Lengths are in metres. Reduction Ratio 1: 1500

LGA NEWCASTLE CITY

Locality: NEWCASTLE

Parish: NEWCASTLE

County: NORTHUMBERLAND

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

I FRANCIS JOHN SULLIVAN

of PATERSON

a surveyor registered under the Surveyors Act 1929, hereby certify that the survey represented in this plan is accurate, has been made in accordance with the Survey Practice Regulation 1990 and was completed on 11.12.1995

(Signature) Surveyor registered under the surveyors Act 1929

Datum Line of Azimuth

SSM 77149 - SSM 77150

Plans used in preparation of survey/compilation.

D. P. 839050

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

LOT 3 IS INTENDED TO BE ACQUIRED

Crown Lands Office Approval

PLAN APPROVED .....
Authorised Officer

Land District .....

Paper No. .....

Field Book ..... pages .....

Council's Certificate

I hereby certify that –

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

*(b) the requirements of † Part 3 Division 2 of the Water Board Act 1987, or † Part 5 Division 7 of the Hunter Water Board (Corporatisation) Act 1991.

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

Subdivision No. .....

Date .....

(Signature).....
General Manager/Authorised Person

Council File No. .....

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

† Delete if inapplicable

SURVEYOR'S REFERENCE: 95/059

WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

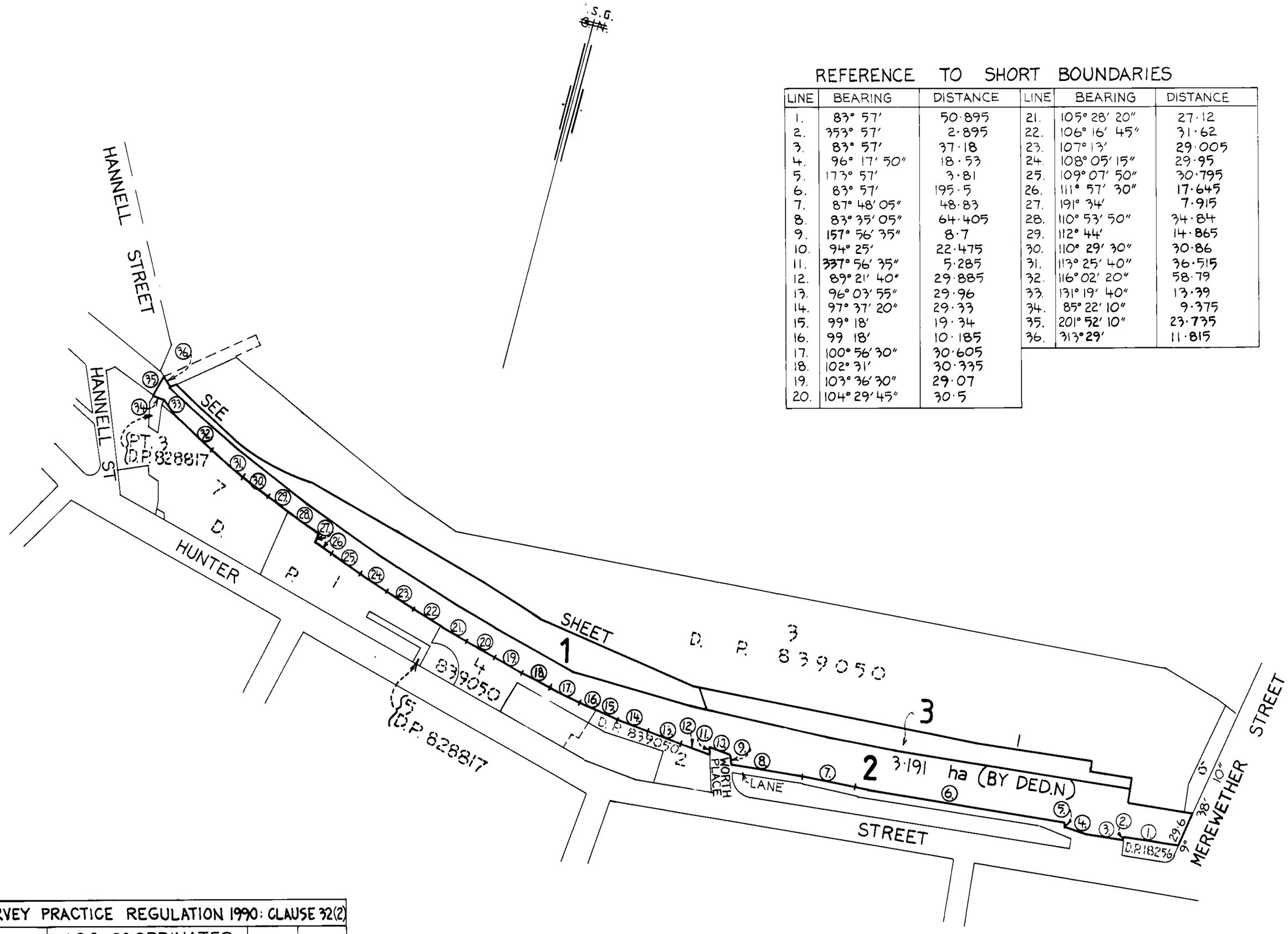
R27680/1

PLAN AMENDED IN LTO AT SURVEYORS REQUEST 15.2.1996

Ref:advlegs /Src:P /Req:R732843 /Doc:DP 0856783 P /Rev:16-Feb-1996 /Sts:OK.OK /Pgs:ALL /Prt:14-Dec-2018 15:48 /Seq:1 of 2

PLAN FORM 3 | To be used in conjunction with Plan Form 2 | WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION | *OFFICE USE ONLY

Req:R732843 /Doc:DP 0856783 P /Rev:16-Feb-1996 /Sts:OK.OK /Pgs:ALL /Prt:14-Dec-2018 15:48 /Seq:2 of 2
Ref:advlegs /Src:P
Table of mm 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 310 320 330 340 350 360 370 380 390



REFERENCE TO SHORT BOUNDARIES

LINE	BEARING	DISTANCE	LINE	BEARING	DISTANCE
1.	83° 57′	50·895	21.	105° 28′ 20″	27·12
2.	353° 57′	2·895	22.	106° 16′ 45″	31·62
3.	83° 57′	37·18	23.	107° 13′	29·005
4.	96° 17′ 50″	18·53	24.	108° 05′ 15″	29·95
5.	173° 57′	3·81	25.	109° 07′ 50″	30·795
6.	83° 57′	195·5	26.	111° 57′ 30″	17·645
7.	87° 48′ 05″	48·83	27.	191° 34′	7·915
8.	83° 35′ 05″	64·405	28.	110° 53′ 50″	34·84
9.	157° 56′ 35″	8·7	29.	112° 44′	14·865
10.	94° 25′	22·475	30.	110° 29′ 30″	30·86
11.	337° 56′ 35″	5·285	31.	113° 25′ 40″	36·515
12.	89° 21′ 40″	29·885	32.	116° 02′ 20″	58·79
13.	96° 03′ 55″	29·96	33.	131° 19′ 40″	13·39
14.	97° 37′ 20″	29·33	34.	85° 22′ 10″	9·375
15.	99° 18′	19·34	35.	201° 52′ 10″	23·735
16.	99 18′	10·185	36.	313° 29′	11·815
17.	100° 56′ 30″	30·605			
18.	102° 31′	30·335			
19.	103° 36′ 30″	29·07			
20.	104° 29′ 45″	30·5			

SURVEY PRACTICE REGULATION 1990: CLAUSE 32(2)				
MARK	I.S.G. COORDINATES		ZONE	ACC.
	EASTING	NORTHING		
SSM 28483	371256·420	1355362·811	56/1	2
SSM 35980	371521·698	1355272·520	56/1	2
SSM 77149	371303·226	1355323·800	56/1	2
SSM 77150	371416·001	1355286·419	56/1	2
COMBINED SEA LEVEL AND SCALE FACTOR 1·00000				
SOURCE: ISG COORDINATES ADOPTED FROM LIC ON 23 OCT 1995				

DP 856783

Registered: 15-2-1996

This is sheet 2 of my plan in 2 sheets dated

F J Sullivan
11·12·1995

Surveyor registered under Surveyors Act 1929

This is sheet of the plan of sheets covered by my Certificate No. of

Council Clerk

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

Reduction Ratio 1: 3000

Plan Drawing only to appear in this space

SURVEYOR'S REFERENCE: 95/059

R27680/2

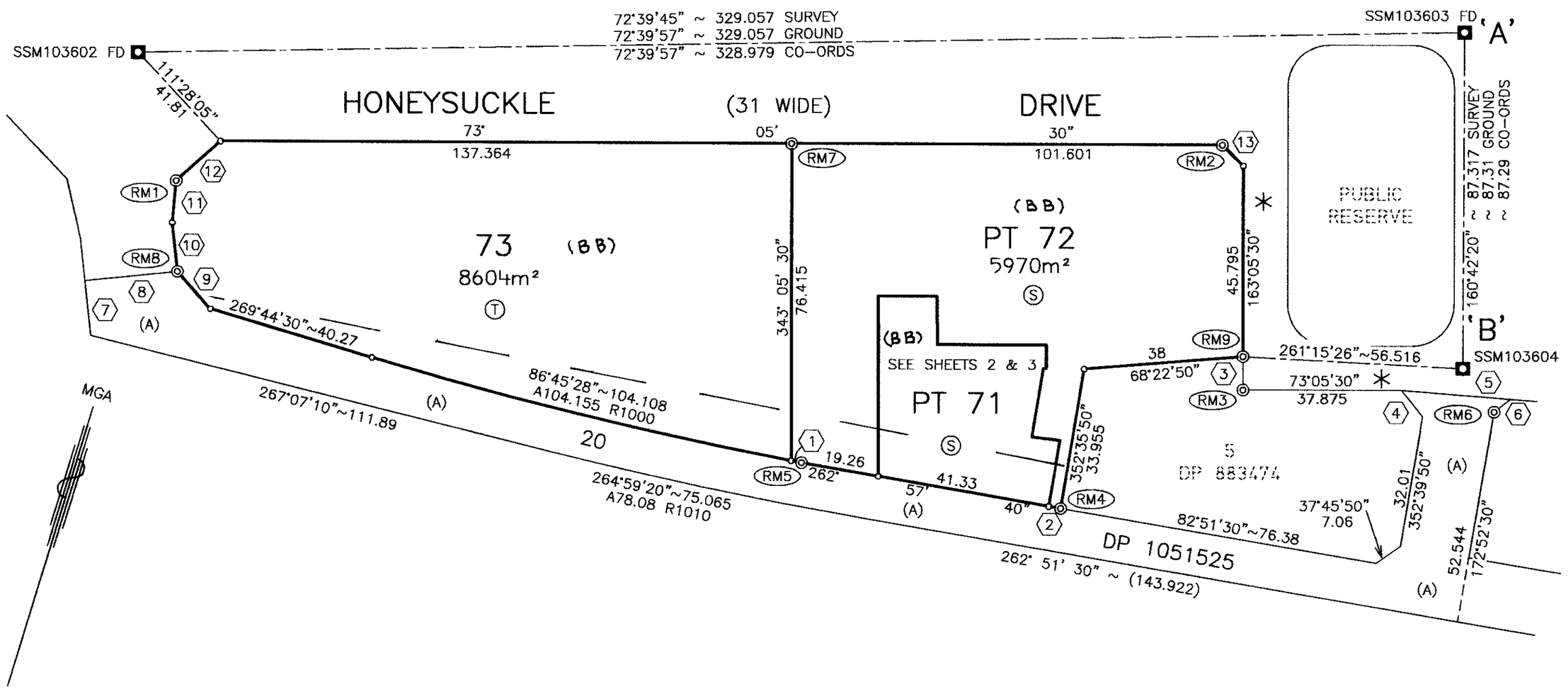
PLAN FORM 2

Plan Drawing only to appear in this space

SIGNATURE AND SEALS ONLY.

Signed by me.....
as delegate of the HONEYSUCKLE DEVELOPMENT CORPORATION and I hereby certify that I have no notice of revocation of such delegation.

ANGUS DAWSON (delegate for HONEYSUCKLE DEVELOPMENT CORPORATION)



SCHEDULE OF REFERENCE MARKS

REF.	BEARING	DISTANCE	DESCRIPTION	REMARKS
RM1	73°54'50"	4.425 & 21.055	RMDH&W's FD	DP 883474
RM2	172°15'10"	6.095 & 24.965	RMDH&W's FD	DP 883474
RM3	208°05'30"	10.405 & 19.135	RMDH&W's FD	DP 883474
RM4	77°30'	16.63	RMDH&W FD	DP 1051525
RM5	353°05'	1.735	RMDH&W FD	DP 1051525
RM6	125°23'50"	3.705	SSM 103604 FD	DP 883474
RM7	86°37'	18.853	RMDH&W	
RM8	289°51'30"	23.72	RMDH&W	
RM9	258°07'	7.385	RMDH&W	

SURVEYING REGULATION 2001 : CLAUSE 32(2)

MARK	M.G.A. COORDINATES		ZONE	CLASS	ORDER	R.L.
	EASTING	NORTHING				
SSM 103602	384791.132	6356244.856	56	C	U	2.082
SSM 103603	385105.169	6356342.875	56	C	U	2.024
SSM 103604	385134.012	6356260.488	56	C	U	2.126
COMBINED SEA LEVEL SCALE FACTOR = 0.999761						
SOURCE : M.G.A. COORDINATES ADOPTED FROM LIC SCIMS ONLINE 9th AUGUST, 2005						

LINE	BEARING	DISTANCE	ARC	RADIUS
1	263°45'23"	0.615	0.615	1000
2	262°57'40"	2.87		
3	163°05'30"	8		
4	302°52'50"	7.75		
5	77°41'50"	22.03		
6	216°50'50"	2.015		
7	336°51'50"	13.105		
8	67°34'20"	22		
9	121°58'50"	11.815		
10	336°51'50"	11.81		
11	348°10'50"	10.13		
12	30°53'50"	14.215		
13	118°05'30"	7.07		

∗ – HONEYSUCKLE DRIVE (10.65 WIDE & VARIABLE)

(S) PART LOTS 71 AND 72 ARE LIMITED IN HEIGHT TO RL 2.4 AND UNLIMITED IN DEPTH.

(T) LOT 73 IS UNLIMITED IN DEPTH AND HEIGHT.

(A) – RIGHT OF ACCESS VARIABLE WIDTH (A)

THE WHOLE OF LOTS 71,72 AND 73 ARE AFFECTED BY EASEMENT FOR NOISE VIBRATION AND ELECTROLYSIS (AB255044)

(BB) LAND EXCLUDES MINERALS – SEE SEC. 141 PUBLIC WORKS ACT, 1912

Department of Lands Approval

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

Signature: .....

Date: .....

File No.: .....

Office: .....

Subdivision Certificate

I hereby certify that the provisions of s.109J of the Environmental Planning and Assessment Act 1979 have been satisfied in relation to the proposed subdivision ..... set out herein

* (Insert 'subdivision' or 'new road')

Robert Black

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

Consent Authority: Minister for Planning

Date of endorsement: 27.9.2005

Accreditation no: ——

Subdivision Certificate no: 06-09-2005

File no. 9040329

Note: When the plan is to be lodged electronically in Land and Property Information, it should include a signature in an electronic or digital format approved by the Registrar-General.

* Delete whichever is inapplicable

DP1087271

*OFFICE USE ONLY

Registered 25.10.2005

Title System: TORRENS

Purpose: SUBDIVISION & EASEMENT

Ref. Map: U 6350-34# U 7250-13#

Last Plan: DP883474, DP1051525

PLAN OF SUBDIVISION OF LOT 21 DP 1051525 AND LOT 4 DP 883474 AND EASEMENT OVER LOT 20 DP 1051525

Lengths are in metres. Reduction Ratio 1: 1000

L G A NEWCASTLE

Locality: NEWCASTLE

Parish: NEWCASTLE

County: NORTHUMBERLAND

This is sheet 1 of my plan in 3 sheets. (Delete if inapplicable)

Surveying Regulation 2001

I, ROBERT JOHN MONTEATH

of MONTEATH & POWYS Pty Ltd

a surveyor registered under the Surveying Act, 2002, hereby certify that the survey represented in this plan is accurate, has been made in accordance with the Surveying Regulation, 2001 and was completed on 10 AUGUST 2005

The survey relates to LOTS 71, 72 & 73

(here specify the land actually surveyed, or specify any land shown in the plan that is not the subject of the survey)

(Signature) R J Monteath Dated: 9/9/05

Surveyor registered under the Surveying Act, 2002

Datum Line:

Type: Urban/~~Rural~~

Plans used in preparation of survey/~~compilation~~.

DP 883474

DP 1051525

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

PURSUANT TO SECTION 88B OF THE CONVEYANCING ACT 1919–1964 AS AMENDED IT IS INTENDED TO CREATE:

1. RIGHT OF ACCESS VARIABLE WIDTH (A).
2. RIGHT OF FOOTWAY VARIABLE WIDTH & LIMITED IN HEIGHT & DEPTH (B).
3. EASEMENT FOR PLANT & EQUIPMENT & LIMITED IN DEPTH (C).
4. RIGHT OF ACCESS 6.28 WIDE & LIMITED IN HEIGHT & DEPTH (D).
5. RIGHT OF ACCESS VARIABLE WIDTH & LIMITED IN HEIGHT (E).
6. RIGHT OF ACCESS 6.28 WIDE & LIMITED IN HEIGHT & DEPTH (F).
7. EASEMENT FOR SUPPORT 2.87 WIDE & LIMITED IN HEIGHT (G).

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

SURVEYOR'S REFERENCE: 02/195/B7 02195GY.DWG – (08/09/2005)

WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

Req:R732589 /Doc:DP 1087271 P /Rev:26-Oct-2005 /Sts:SC.OK /Pgs:ALL /Prt:14-Dec-2018 15:16 /Seq:1 of 3
Ref:advlegs /Src:P

PLAN FORM 3 To be used in conjunction with Plan Form 2

WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

LEVEL 1 — ABOVE RL 2.4

PT71/PT72

(H) THIS PART OF LOT 72 IS THE STRATUM LYING ABOVE RL 2.4 AND IS UNLIMITED HEIGHT

(J) THIS PART OF LOT 71 IS THE STRATUM LYING ABOVE RL 2.4 AND BELOW RL 7.0
THIS PART OF LOT 72 IS THE STRATUM LYING ABOVE RL 7.0 AND IS UNLIMITED IN HEIGHT.

(K) THIS PART OF LOT 71 IS THE STRATUM LYING ABOVE RL 2.4 AND BELOW RL 11.5
THIS PART OF LOT 72 IS THE STRATUM LYING ABOVE RL 11.5 AND IS UNLIMITED IN HEIGHT.

(L) THIS PART OF LOT 71 IS THE STRATUM LYING ABOVE RL 2.4 AND BELOW RL 13.0
THIS PART OF LOT 72 IS THE STRATUM LYING ABOVE RL 13.0 AND IS UNLIMITED IN HEIGHT.

(M) THIS PART OF LOT 71 IS THE STRATUM LYING ABOVE RL 2.4 AND BELOW RL 23.5
THIS PART OF LOT 72 IS THE STRATUM LYING ABOVE RL 23.5 AND IS UNLIMITED IN HEIGHT.

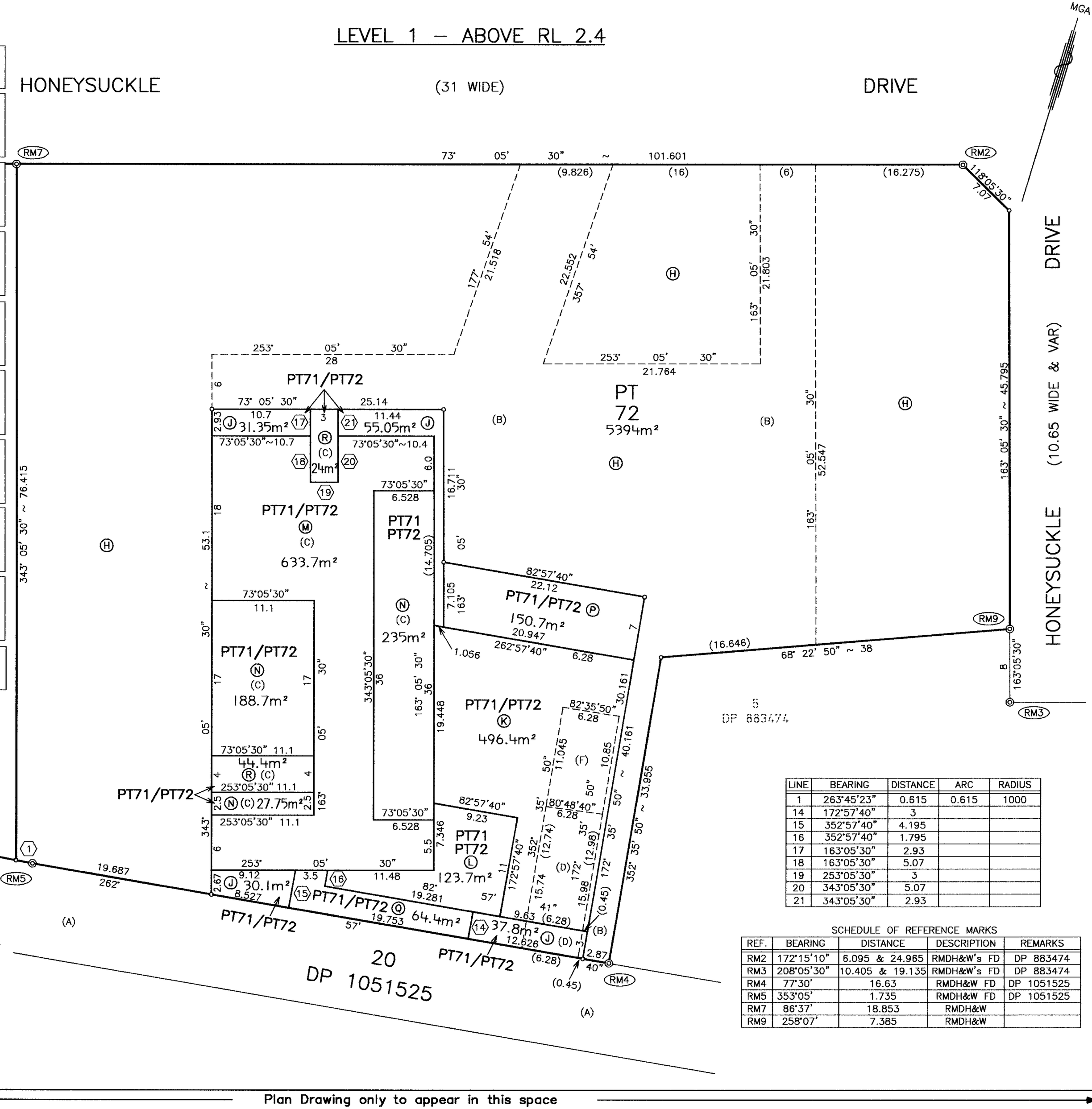
(N) THIS PART OF LOT 71 IS THE STRATUM LYING ABOVE RL 2.4 AND BELOW RL 24.55
THIS PART OF LOT 72 IS THE STRATUM LYING ABOVE RL 24.55 AND IS UNLIMITED IN HEIGHT.

(P) THIS PART OF LOT 71 IS THE STRATUM LYING ABOVE RL 2.4 AND BELOW RL 7.5
THIS PART OF LOT 72 IS THE STRATUM LYING ABOVE RL 7.5 AND IS UNLIMITED IN HEIGHT.

(Q) THIS PART OF LOT 71 IS THE STRATUM LYING ABOVE RL 2.4 AND BELOW RL 10
THIS PART OF LOT 72 IS THE STRATUM LYING ABOVE RL 10 AND IS UNLIMITED IN HEIGHT.

(R) THIS PART OF LOT 71 IS THE STRATUM LYING ABOVE RL 2.4 AND BELOW RL 27.2
THIS PART OF LOT 72 IS THE STRATUM LYING ABOVE RL 27.2 AND IS UNLIMITED IN HEIGHT.

EASEMENT (C) IS ABOVE THOSE PARTS OF LOT 71 NUMBERED (M), (N) & (R) AND IS UNLIMITED IN HEIGHT.



LINE	BEARING	DISTANCE	ARC	RADIUS
1	263°45'23"	0.615	0.615	1000
14	172°57'40"	3		
15	352°57'40"	4.195		
16	352°57'40"	1.795		
17	163°05'30"	2.93		
18	163°05'30"	5.07		
19	253°05'30"	3		
20	343°05'30"	5.07		
21	343°05'30"	2.93		

SCHEDULE OF REFERENCE MARKS

REF.	BEARING	DISTANCE	DESCRIPTION	REMARKS
RM2	172°15'10"	6.095 & 24.965	RMDH&W's FD	DP 883474
RM3	208°05'30"	10.405 & 19.135	RMDH&W's FD	DP 883474
RM4	77°30'	16.63	RMDH&W FD	DP 1051525
RM5	353°05'	1.735	RMDH&W FD	DP 1051525
RM7	86°37'	18.853	RMDH&W	
RM9	258°07'	7.385	RMDH&W	

(A) — RIGHT OF ACCESS VARIABLE WIDTH (A).

(B) — RIGHT OF FOOTWAY VARIABLE WIDTH & LIMITED IN HEIGHT & DEPTH (B). (LIMITED IN HEIGHT TO RL 5 & LIMITED IN DEPTH TO RL 2.4)

(C) — EASEMENT FOR PLANT & EQUIPMENT & LIMITED IN DEPTH (C).

(D) — RIGHT OF ACCESS 6.28 WIDE & LIMITED IN HEIGHT & DEPTH (D). (LIMITED IN HEIGHT TO RL 6.0 AND LIMITED IN DEPTH TO RL 1.9)

(F) — RIGHT OF ACCESS 6.28 WIDE & LIMITED IN HEIGHT & DEPTH (F). (LIMITED IN HEIGHT TO RL 6.0 AND LIMITED IN DEPTH TO RL 2.4)

DP1087271

Registered 25.10.2005

This is sheet 2 of my plan in 3 sheets dated 9/9/05

Surveyor registered under the Surveying Act, 2002

This is sheet 2 of the plan of 3 sheets covered by Subdivision Certificate No. 06-09-05 of 27.9.2005

Authorised Person/~~General Manager/Accredited Certifier~~

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

*OFFICE USE ONLY

Reduction Ratio 1: 300

Plan Drawing only to appear in this space

SURVEYOR'S REFERENCE: 02/195/B7

02195GY.DWG (08/09/2005)

Req:R732589 /Doc:DP 1087271 P /Rev:26-Oct-2005 /Sts:SC.OK /Pgs:ALL /Prt:14-Dec-2018 15:16 /Seq:2 of 3
Ref:advlegs /Src:P

PLAN FORM 3 To be used in conjunction with Plan Form 2

WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

BASEMENT – BELOW RL 2.4

Ⓢ PART LOTS 71 AND 72 ARE LIMITED IN HEIGHT TO RL 2.4 AND UNLIMITED IN DEPTH.

CNM – DENOTES CORNER NOT MARKED.

(A) – RIGHT OF ACCESS VARIABLE WIDTH (A).

(D) – RIGHT OF ACCESS 6.28 WIDE & LIMITED IN HEIGHT & DEPTH (D). (LIMITED IN HEIGHT TO RL 6.0 AND LIMITED IN DEPTH TO RL 1.9)

(E) – RIGHT OF ACCESS VARIABLE WIDTH & LIMITED IN HEIGHT (E). (LIMITED IN HEIGHT TO RL 2.4)

(G) – EASEMENT FOR SUPPORT 2.87 & LIMITED IN HEIGHT (G). (LIMITED IN HEIGHT TO RL 2.4)

MGA

73

343° 05' 30" ~ 76.415

PT 72 Ⓢ

PT 72 Ⓢ

PT 71
1567m²
Ⓢ

20
DP 1051525

CNM RM DH&W IN EAST FACE OF CONC WALL 253°02'30"~0.3

WEST FACE WALL ON BDY

73°02'30" 13.997

CONCRETE COLUMN

SOUTH FACE COLUMN 0.43

EAST FACE COLUMN 0.16 CNM RMDH&W IN SOUTH FACE CONCRETE COLUMN 343°02'30"~0.43

253° 02' 30" ~ 33.891

11.617 163°02'30"

(6)

(E) Ⓢ

NORTH FACE COLUMN 0.15

CONCRETE COLUMN

EAST FACE COLUMN 0.40

CNM RMDH&W IN NORTH FACE CONCRETE COLUMN 163°02'30"~0.15

73°02'30" 26.041

DH&W IN CONCRETE

~(0.705)

WEST FACE CONCRETE COLUMN ON BDY

CONCRETE COLUMN

343°02'30"~9.966

5.651 163°02'30"

SOUTH FACE CONCRETE COLUMN ON BDY

~(0.345)

DH&W IN CONCRETE

DH&W IN FACE OF COLUMN

(4.8) (5.57)

253°02'31" 0.617

FACE OF WALL 43°40'~8.523

82°35'50" 6.28

352°35'50"~0.303

EAST FACE OF CONC WALL ON BDY 172°35'50" ~ 16.615

(E)

172°35'50"~10.85

DH IN EAST FACE OF CONCRETE WALL

80°48'40" 6.732

(0.45)

EAST FACE OF CONCRETE WALL

(0.04)

172° 35' 50" ~ 33.955

(15.995)

15.995

15.98

172°35'50"

(D) (G)

(0.055)

(D) (6.28)

2.87 RM4

(0.45)

(A)

C 0.615 263°45'23" A 0.615 R 1000

RM5

262° 19.26 57' 40"

(0.03)

WEST FACE CONCRETE WALL

262° 41.33 57' 40"

(A)

DP1087271

Registered 25.10.2005 *

This is sheet 3 of my plan in 3 sheets dated 9/9/05

Surveyor registered under the Surveying Act, 2002

This is sheet 3 of the plan of 3 sheets covered by Subdivision Certificate No. 06-09-05 of 27.9.2005.

Authorised Person/~~General Manager/Accredited Certifier~~

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

*OFFICE USE ONLY

Reduction Ratio 1: 200

Plan Drawing only to appear in this space

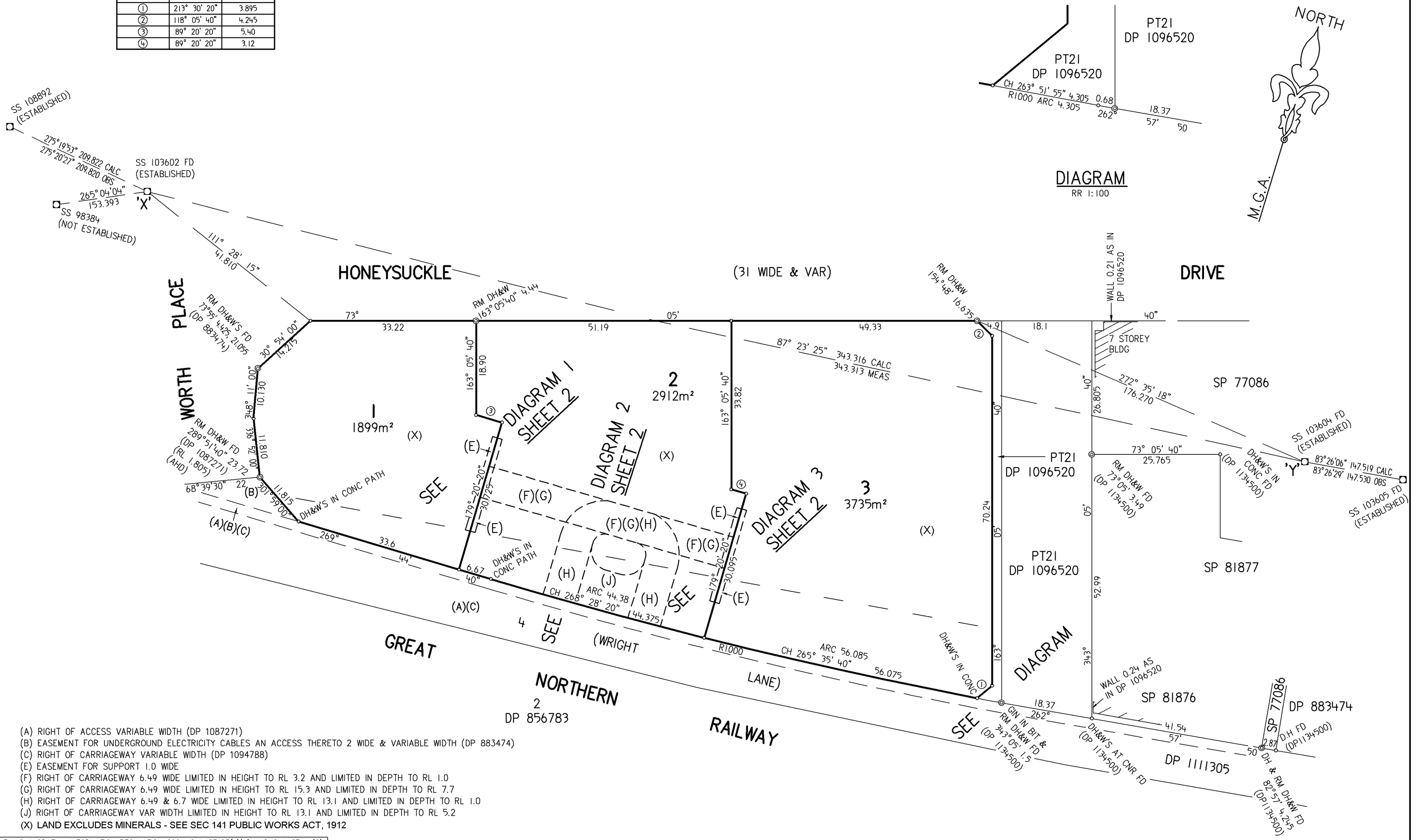
SURVEYOR'S REFERENCE: 02/195/B7

02195GY.DWG (08/09/2005)

Req:R732589 /Doc:DP 1087271 P /Rev:26-Oct-2005 /Sts:SC.OK /Pgs:ALL /Prt:14-Dec-2018 15:16 /Seq:3 of 3
Ref:advlegs /Src:P

Prt:14-Dec-2018 09:59 /Seq:1 of 4
Req:R729396 /Doc:DP 1163346 P /Rev:01-Apr-2011 /Sts:SC.OK /Pgs:ALL /Prt:
Ref:advlegs /Src:P

SHORT LINE SCHEDULE		
No.	BEARING	DISTANCE
①	213° 30' 20"	3.895
②	118° 05' 40"	4.245
③	89° 20' 20"	5.40
④	89° 20' 20"	3.12



(A) RIGHT OF ACCESS VARIABLE WIDTH (DP 1087271)
(B) EASEMENT FOR UNDERGROUND ELECTRICITY CABLES AN ACCESS THERETO 2 WIDE & VARIABLE WIDTH (DP 883474)
(C) RIGHT OF CARRIAGEWAY VARIABLE WIDTH (DP 1094788)
(E) EASEMENT FOR SUPPORT 1.0 WIDE
(F) RIGHT OF CARRIAGEWAY 6.49 WIDE LIMITED IN HEIGHT TO RL 3.2 AND LIMITED IN DEPTH TO RL 1.0
(G) RIGHT OF CARRIAGEWAY 6.49 WIDE LIMITED IN HEIGHT TO RL 15.3 AND LIMITED IN DEPTH TO RL 7.7
(H) RIGHT OF CARRIAGEWAY 6.49 & 6.7 WIDE LIMITED IN HEIGHT TO RL 13.1 AND LIMITED IN DEPTH TO RL 1.0
(J) RIGHT OF CARRIAGEWAY VAR WIDTH LIMITED IN HEIGHT TO RL 13.1 AND LIMITED IN DEPTH TO RL 5.2
(X) LAND EXCLUDES MINERALS - SEE SEC 141 PUBLIC WORKS ACT, 1912

SURVEYING & SPATIAL INFORMATION REGULATION 2006–CLAUSE 35(1)(b) AND CLAUSE 61(2)

MARK	M.G.A. COORDINATES EASTING	M.G.A. COORDINATES NORTHING	CLASS	ORDER	RL (AHD)	CLASS	ORDER
SS 103602	384 791.108	6 356 244.843	C	3	2.082	LC	L3
SS 103604	385 133.987	6 356 260.472	C	3			
SS 103605	385 280.504	6 356 277.334	C	3			
SS 108892	384 582.243	6 356 264.334	C	3	2.269	LC	L3
SS 98384					2.557	LC	L3

COMBINED SCALE FACTOR: 0.999763
M.G.A. ZONE = 56
SOURCE: MGA COORDINATES ADOPTED FROM SCIMS 08/02/2011

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 Table of mm

ALL REDUCED LEVELS ARE ON AUSTRALIAN HEIGHT DATUM (A.H.D.)

Surveyor: BRUCE PHILLIP GANDER Date of Survey: 21/02/2011 Surveyor's Ref: 16964/2A	PLAN OF SUBDIVISION OF LOT 25 DP 1096520	LGA: NEWCASTLE Locality: NEWCASTLE Subdivision No: 8395 Lengths are in metres. Reduction Ratio 1:500	Registered 1.4.2011	DP1163346

DP1163346

Req:R729396 /Doc:DP 1163346 P /Rev:01-Apr-2011 /Sts:SC.OK /Pgs:ALL /Prt:14-Dec-2018 09:59 /Seq:2 of 4
Ref:advlegs /Src:P

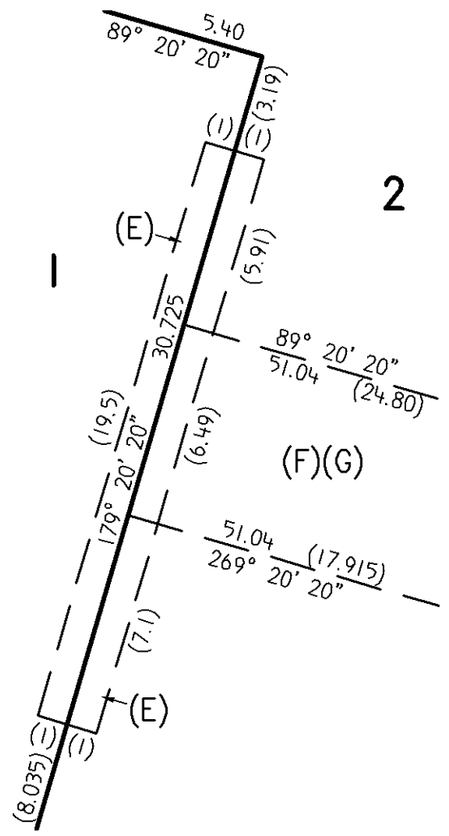


DIAGRAM 1
RR 1:200

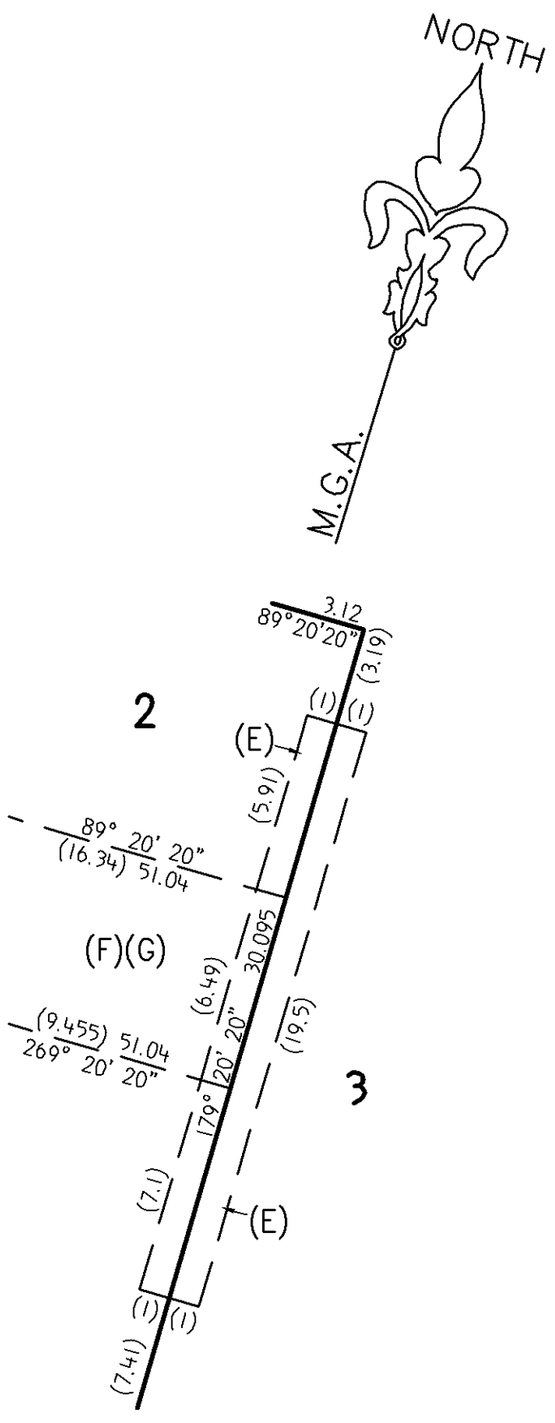


DIAGRAM 3
RR 1:200

SHORT LINE SCHEDULE				
No.	BEARING	DISTANCE	RADIUS	ARC
(1)	44° 20' 20"	3.535	2.5	3.925
(2)	134° 20' 20"	3.535	2.5	3.925
(3)	224° 20' 20"	5.655	4.0	6.28
(4)	314° 20' 20"	5.655	4.0	6.28

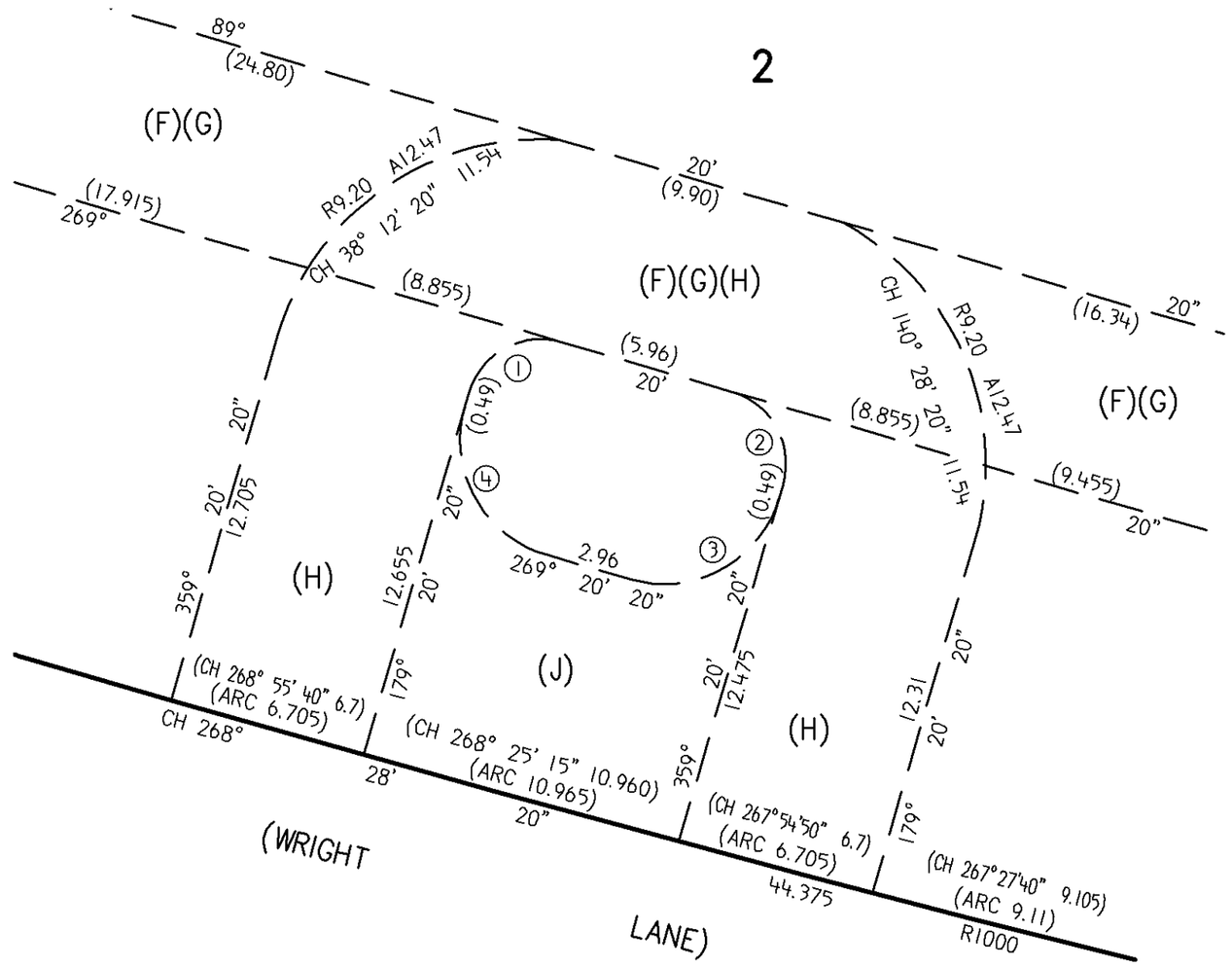


DIAGRAM 2
RR 1:200

(E) EASEMENT FOR SUPPORT 1.0 WIDE
(F) RIGHT OF CARRIAGEWAY 6.49 WIDE LIMITED IN HEIGHT TO RL 3.2 AND LIMITED IN DEPTH TO RL 1.0
(G) RIGHT OF CARRIAGEWAY 6.49 WIDE LIMITED IN HEIGHT TO RL 15.3 AND LIMITED IN DEPTH TO RL 7.7
(H) RIGHT OF CARRIAGEWAY 6.49 & 6.7 WIDE LIMITED IN HEIGHT TO RL 13.1 AND LIMITED IN DEPTH TO RL 1.0
(J) RIGHT OF CARRIAGEWAY VAR WIDTH LIMITED IN HEIGHT TO RL 13.1 AND LIMITED IN DEPTH TO RL 5.2

ALL REDUCED LEVELS ARE ON AUSTRALIAN HEIGHT DATUM (A.H.D.)

Surveyor: BRUCE PHILLIP GANDER Date of Survey: 21/02/2011 Surveyor's Ref: 16964/2A	PLAN OF SUBDIVISION OF LOT 25 DP 1096520	LGA: NEWCASTLE Locality: NEWCASTLE Subdivision No: 8395 Lengths are in metres. Reduction Ratio 1:500	Registered 1.4.2011	DP1163346

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 Table of mm

DP1163346

ePlan

PLAN FORM 6

Warning: Creasing or folding will lead to rejection

DEPOSITED PLAN ADMINISTRATION SHEET

Sheet ..1.. of ..2.. sheet(s)

OFFICE USE ONLY

DP1163346

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

PURSUANT TO SECTION 88B OF THE CONVEYANCING ACT 1919, AS AMENDED, IT IS INTENDED TO CREATE:

1. EASEMENT FOR SUPPORT 1.0 WIDE (E)
2. RIGHT OF CARRIAGEWAY 6.49 WIDE LIMITED IN HEIGHT TO RL 3.2 AND LIMITED IN DEPTH TO RL 1.0 (F)
3. RIGHT OF CARRIAGEWAY 6.49 WIDE LIMITED IN HEIGHT TO RL 15.3 AND LIMITED IN DEPTH TO RL 7.7 (G)
4. RIGHT OF CARRIAGEWAY 6.49 & 6.7 WIDE LIMITED IN HEIGHT TO RL 13.1 AND LIMITED IN DEPTH TO RL 1.0 (H)
5. RIGHT OF CARRIAGEWAY VAR WIDTH LIMITED IN HEIGHT TO RL 13.1 AND LIMITED IN DEPTH TO RL 5.2 (J)

If space is insufficient use PLAN FORM 6A annexure sheet

OFFICE USE ONLY

Registered: 1.4.2011

Title System: TORRENS

Purpose: SUBDIVISION

PLAN OF SUBDIVISION OF LOT 25
DP 1096520

LGA: NEWCASTLE
Locality: NEWCASTLE
Parish: NEWCASTLE
County: NORTHUMBERLAND

Crown Lands NSW/Western Lands Office Approval

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

Date: .....

File Number: .....

Office: .....

Subdivision Certificate

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

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

G. Manfield

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

Consent Authority The City of Newcastle

Date of Endorsement 14/03/2011

~~Accreditation No.~~ .....

Subdivision Certificate No. 8395

File No. DA! 08/x003

* Strike through inapplicable parts.

Survey Certificate

I, BRUCE PHILLIP GANDER

of C R HUTCHISON & CO PTY LTD

a surveyor registered under the ***Surveying and Spatial Information Act, 2002***, certify that the survey represented in this plan is accurate, has been made in accordance with the ***Surveying and Spatial Information Regulation, 2006*** and was completed on 21-02-2011

The survey relates to LOTS 1, 2 & 3

(specify the land actually surveyed or specify any land shown in the plan that is not the subject of the survey)

Signature ..... *Dated:* 28/2/2011

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

Datum Line : 'X'-'Y'.
Type: Urban / ~~*Rural*~~

Plans used in the preparation of survey/~~compilation~~

DP 1134500
DP 1096520
DP 1087271
DP 1094788
DP 883474
DP 1111305

If space is insufficient use PLAN FORM 6A annexure sheet

SURVEYOR'S REFERENCE: 16964/2A

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

DEPOSITED PLAN ADMINISTRATION SHEET

Sheet ..2.. of ..2.. sheets

PLAN OF SUBDIVISION OF LOT 25
DP 1096520

OFFICE USE ONLY

DP1163346

OFFICE USE ONLY

Registered: 1.4.2011

Subdivision Certificate No: 8395 Date of Endorsement: 14 · 3 · 2011

Signed by me .....
as delegate of the HUNTER
DEVELOPMENT CORPORATION
and I hereby certify that I have no
notice of revocation of such delegation.

Robert Hawes
General Manager

SURVEYOR'S REFERENCE: 16964/2A

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
14/12/2018 10:29AM

FOLIO: 2/547027

First Title(s): SEE PRIOR TITLE(S)
Prior Title(s): VOL 11732 FOL 212

Recorded	Number	Type of Instrument	C.T. Issue
28/3/1988		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
22/7/1988		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED
16/3/1993	DP828817	DEPOSITED PLAN	
12/5/1994	DP839050	DEPOSITED PLAN	
20/3/1995	O45853	TRANSFER	FOLIO CANCELLED
13/8/1996		AMENDMENT: LOCAL GOVT AREA	
25/8/1999	6131205	DEPARTMENTAL DEALING	

*** END OF SEARCH ***

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NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
14/12/2018 10:12AM

FOLIO: 21/1051525

First Title(s): OLD SYSTEM
Prior Title(s): 3/883474 9/883474

Recorded	Number	Type of Instrument	C.T. Issue
14/4/2003	DP1051525	DEPOSITED PLAN	FOLIO CREATED EDITION 1
9/3/2005	AB255044	TRANSFER GRANTING EASEMENT	EDITION 2
25/10/2005	DP1087271	DEPOSITED PLAN	FOLIO CANCELLED

*** END OF SEARCH ***

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NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
14/12/2018 10:02AM

FOLIO: 25/1096520

First Title(s): OLD SYSTEM
Prior Title(s): 71-73/1087271

Recorded	Number	Type of Instrument	C.T. Issue
14/8/2006	DP1096520	DEPOSITED PLAN	FOLIO CREATED EDITION 1
15/8/2006	SP77086	STRATA PLAN	
16/10/2007	AD492636	DEPARTMENTAL DEALING	
25/9/2008	AE234027	CHANGE OF NAME	EDITION 2
1/4/2011	DP1163346	DEPOSITED PLAN	FOLIO CANCELLED

*** END OF SEARCH ***

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NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
14/12/2018 10:12AM

FOLIO: 71/1087271

First Title(s): OLD SYSTEM
Prior Title(s): 4/883474 21/1051525

Recorded	Number	Type of Instrument	C.T. Issue
25/10/2005	DP1087271	DEPOSITED PLAN	FOLIO CREATED EDITION 1
28/10/2005	AB873409	REQUEST	
28/10/2005	AB873410	REQUEST	EDITION 2
28/3/2006	DP1094788	DEPOSITED PLAN	EDITION 3
16/5/2006	AC310711	DEPARTMENTAL DEALING	
25/7/2006	SP77516	UNNECESSARY - STRATA PLAN	
14/8/2006	AC442247	REQUEST	
14/8/2006	AC442248	REQUEST	
14/8/2006	DP1096520	DEPOSITED PLAN	FOLIO CANCELLED

*** END OF SEARCH ***

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NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 1/1163346

SEARCH DATE	TIME	EDITION NO	DATE
14/12/2018	9:59 AM	1	1/4/2011

LAND

LOT 1 IN DEPOSITED PLAN 1163346
AT NEWCASTLE
LOCAL GOVERNMENT AREA NEWCASTLE
PARISH OF NEWCASTLE COUNTY OF NORTHUMBERLAND
TITLE DIAGRAM DP1163346

FIRST SCHEDULE

HUNTER DEVELOPMENT CORPORATION

SECOND SCHEDULE (9 NOTIFICATIONS)

1 LAND EXCLUDES MINERALS (SEC. 141 PUBLIC WORKS ACT, 1912) WITHIN THE PART SHOWN SO INDICATED IN THE TITLE DIAGRAM
2 DP1087271 RIGHT OF ACCESS VARIABLE WIDTH APPURTENANT TO THE LAND ABOVE DESCRIBED
3 DP1096520 EASEMENT FOR ACCESS AND CONSTRUCTION APPURTENANT TO THE LAND ABOVE DESCRIBED
4 DP1163346 EASEMENT FOR SUPPORT 1.0 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
5 DP1163346 EASEMENT FOR SUPPORT 1.0 METRE(S) WIDE APPURTENANT TO THE LAND ABOVE DESCRIBED
6 DP1163346 RIGHT OF CARRIAGEWAY 6.49 METRE(S) WIDE LIMITED IN HEIGHT TO RL 3.2 AND LIMITED IN DEPTH TO RL 1.0 APPURTENANT TO THE LAND ABOVE DESCRIBED
7 DP1163346 RIGHT OF CARRIAGEWAY 6.49 METRE(S) WIDE LIMITED IN HEIGHT TO RL 15.3 AND LIMITED IN DEPTH TO RL 7.7 APPURTENANT TO THE LAND ABOVE DESCRIBED
8 DP1163346 RIGHT OF CARRIAGEWAY 6.49 & 6.7 METRE(S) WIDE LIMITED IN HEIGHT TO RL 13.1 AND LIMITED IN DEPTH TO RL 1.0 APPURTENANT TO THE LAND ABOVE DESCRIBED
9 DP1163346 RIGHT OF CARRIAGEWAY VARIABLE WIDTH LIMITED IN HEIGHT TO RL 13.1 AND LIMITED IN DEPTH TO RL 5.2 APPURTENANT TO THE LAND ABOVE DESCRIBED

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

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NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 2/1163346

SEARCH DATE	TIME	EDITION NO	DATE
14/12/2018	10:00 AM	1	1/4/2011

LAND

LOT 2 IN DEPOSITED PLAN 1163346
AT NEWCASTLE
LOCAL GOVERNMENT AREA NEWCASTLE
PARISH OF NEWCASTLE COUNTY OF NORTHUMBERLAND
TITLE DIAGRAM DP1163346

FIRST SCHEDULE

HUNTER DEVELOPMENT CORPORATION

SECOND SCHEDULE (9 NOTIFICATIONS)

1 LAND EXCLUDES MINERALS (SEC. 141 PUBLIC WORKS ACT, 1912) WITHIN THE PART SHOWN SO INDICATED IN THE TITLE DIAGRAM
2 DP1087271 RIGHT OF ACCESS VARIABLE WIDTH APPURTENANT TO THE LAND ABOVE DESCRIBED
3 DP1096520 EASEMENT FOR ACCESS AND CONSTRUCTION APPURTENANT TO THE LAND ABOVE DESCRIBED
4 DP1163346 EASEMENT FOR SUPPORT 1.0 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
5 DP1163346 EASEMENT FOR SUPPORT 1.0 METRE(S) WIDE APPURTENANT TO THE LAND ABOVE DESCRIBED
6 DP1163346 RIGHT OF CARRIAGEWAY 6.49 METRE(S) WIDE LIMITED IN HEIGHT TO RL 3.2 AND LIMITED IN DEPTH TO RL 1.0 AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
7 DP1163346 RIGHT OF CARRIAGEWAY 6.49 METRE(S) WIDE LIMITED IN HEIGHT TO RL 15.3 AND LIMITED IN DEPTH TO RL 7.7 AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
8 DP1163346 RIGHT OF CARRIAGEWAY 6.49 & 6.7 METRE(S) WIDE LIMITED IN HEIGHT TO RL 13.1 AND LIMITED IN DEPTH TO RL 1.0 AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
9 DP1163346 RIGHT OF CARRIAGEWAY VARIABLE WIDTH LIMITED IN HEIGHT TO RL 13.1 AND LIMITED IN DEPTH TO RL 5.2 AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM

NOTATIONS

END OF PAGE 1 - CONTINUED OVER

advlegs PRINTED ON 14/12/2018

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 2/1163346 PAGE 2

NOTATIONS (CONTINUED)

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

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NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 3/1163346

SEARCH DATE	TIME	EDITION NO	DATE
14/12/2018	10:00 AM	1	1/4/2011

LAND

LOT 3 IN DEPOSITED PLAN 1163346
AT NEWCASTLE
LOCAL GOVERNMENT AREA NEWCASTLE
PARISH OF NEWCASTLE COUNTY OF NORTHUMBERLAND
TITLE DIAGRAM DP1163346

FIRST SCHEDULE

HUNTER DEVELOPMENT CORPORATION

SECOND SCHEDULE (9 NOTIFICATIONS)

1 LAND EXCLUDES MINERALS (SEC. 141 PUBLIC WORKS ACT, 1912) WITHIN THE PART SHOWN SO INDICATED IN THE TITLE DIAGRAM
2 DP1087271 RIGHT OF ACCESS VARIABLE WIDTH APPURTENANT TO THE LAND ABOVE DESCRIBED
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9 DP1163346 RIGHT OF CARRIAGEWAY VARIABLE WIDTH LIMITED IN HEIGHT TO RL 13.1 AND LIMITED IN DEPTH TO RL 5.2 APPURTENANT TO THE LAND ABOVE DESCRIBED

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

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Title Search

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 1/1163346

SEARCH DATE	TIME	EDITION NO	DATE
11/2/2019	12:01 PM	2	14/12/2018

LAND

LOT 1 IN DEPOSITED PLAN 1163346
AT NEWCASTLE
LOCAL GOVERNMENT AREA NEWCASTLE
PARISH OF NEWCASTLE COUNTY OF NORTHUMBERLAND
TITLE DIAGRAM DP1163346

FIRST SCHEDULE

THE UNIVERSITY OF NEWCASTLE (T AN937435)

SECOND SCHEDULE (9 NOTIFICATIONS)

1 LAND EXCLUDES MINERALS (SEC. 141 PUBLIC WORKS ACT, 1912) WITHIN THE PART SHOWN SO INDICATED IN THE TITLE DIAGRAM
2 DP1087271 RIGHT OF ACCESS VARIABLE WIDTH APPURTENANT TO THE LAND ABOVE DESCRIBED
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7 DP1163346 RIGHT OF CARRIAGEWAY 6.49 METRE(S) WIDE LIMITED IN HEIGHT TO RL 15.3 AND LIMITED IN DEPTH TO RL 7.7 APPURTENANT TO THE LAND ABOVE DESCRIBED
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NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

LEG16/229 PRINTED ON 11/2/2019

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Received: 11/02/2019 12:01:19

Title Search

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 2/1163346

SEARCH DATE	TIME	EDITION NO	DATE
11/2/2019	12:09 PM	2	14/12/2018

LAND

LOT 2 IN DEPOSITED PLAN 1163346
AT NEWCASTLE
LOCAL GOVERNMENT AREA NEWCASTLE
PARISH OF NEWCASTLE COUNTY OF NORTHUMBERLAND
TITLE DIAGRAM DP1163346

FIRST SCHEDULE

THE UNIVERSITY OF NEWCASTLE (T AN937435)

SECOND SCHEDULE (9 NOTIFICATIONS)

1 LAND EXCLUDES MINERALS (SEC. 141 PUBLIC WORKS ACT, 1912) WITHIN THE PART SHOWN SO INDICATED IN THE TITLE DIAGRAM
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3 DP1096520 EASEMENT FOR ACCESS AND CONSTRUCTION APPURTENANT TO THE LAND ABOVE DESCRIBED
4 DP1163346 EASEMENT FOR SUPPORT 1.0 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
5 DP1163346 EASEMENT FOR SUPPORT 1.0 METRE(S) WIDE APPURTENANT TO THE LAND ABOVE DESCRIBED
6 DP1163346 RIGHT OF CARRIAGEWAY 6.49 METRE(S) WIDE LIMITED IN HEIGHT TO RL 3.2 AND LIMITED IN DEPTH TO RL 1.0 AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
7 DP1163346 RIGHT OF CARRIAGEWAY 6.49 METRE(S) WIDE LIMITED IN HEIGHT TO RL 15.3 AND LIMITED IN DEPTH TO RL 7.7 AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
8 DP1163346 RIGHT OF CARRIAGEWAY 6.49 & 6.7 METRE(S) WIDE LIMITED IN HEIGHT TO RL 13.1 AND LIMITED IN DEPTH TO RL 1.0 AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
9 DP1163346 RIGHT OF CARRIAGEWAY VARIABLE WIDTH LIMITED IN HEIGHT TO RL 13.1 AND LIMITED IN DEPTH TO RL 5.2 AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM

NOTATIONS

END OF PAGE 1 - CONTINUED OVER

NOTATIONS (CONTINUED)

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

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Title Search

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 3/1163346

SEARCH DATE	TIME	EDITION NO	DATE
11/2/2019	12:09 PM	2	14/12/2018

LAND

LOT 3 IN DEPOSITED PLAN 1163346
AT NEWCASTLE
LOCAL GOVERNMENT AREA NEWCASTLE
PARISH OF NEWCASTLE COUNTY OF NORTHUMBERLAND
TITLE DIAGRAM DP1163346

FIRST SCHEDULE

THE UNIVERSITY OF NEWCASTLE (T AN937435)

SECOND SCHEDULE (9 NOTIFICATIONS)

1 LAND EXCLUDES MINERALS (SEC. 141 PUBLIC WORKS ACT, 1912) WITHIN THE PART SHOWN SO INDICATED IN THE TITLE DIAGRAM
2 DP1087271 RIGHT OF ACCESS VARIABLE WIDTH APPURTENANT TO THE LAND ABOVE DESCRIBED
3 DP1096520 EASEMENT FOR ACCESS AND CONSTRUCTION APPURTENANT TO THE LAND ABOVE DESCRIBED
4 DP1163346 EASEMENT FOR SUPPORT 1.0 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
5 DP1163346 EASEMENT FOR SUPPORT 1.0 METRE(S) WIDE APPURTENANT TO THE LAND ABOVE DESCRIBED
6 DP1163346 RIGHT OF CARRIAGEWAY 6.49 METRE(S) WIDE LIMITED IN HEIGHT TO RL 3.2 AND LIMITED IN DEPTH TO RL 1.0 APPURTENANT TO THE LAND ABOVE DESCRIBED
7 DP1163346 RIGHT OF CARRIAGEWAY 6.49 METRE(S) WIDE LIMITED IN HEIGHT TO RL 15.3 AND LIMITED IN DEPTH TO RL 7.7 APPURTENANT TO THE LAND ABOVE DESCRIBED
8 DP1163346 RIGHT OF CARRIAGEWAY 6.49 & 6.7 METRE(S) WIDE LIMITED IN HEIGHT TO RL 13.1 AND LIMITED IN DEPTH TO RL 1.0 APPURTENANT TO THE LAND ABOVE DESCRIBED
9 DP1163346 RIGHT OF CARRIAGEWAY VARIABLE WIDTH LIMITED IN HEIGHT TO RL 13.1 AND LIMITED IN DEPTH TO RL 5.2 APPURTENANT TO THE LAND ABOVE DESCRIBED

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

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Title Search

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 2/1247375

SEARCH DATE	TIME	EDITION NO	DATE
11/2/2019	12:09 PM	2	14/12/2018

LAND

LOT 2 IN DEPOSITED PLAN 1247375
AT NEWCASTLE
LOCAL GOVERNMENT AREA NEWCASTLE
PARISH OF NEWCASTLE COUNTY OF NORTHUMBERLAND
TITLE DIAGRAM DP1247375

FIRST SCHEDULE

THE UNIVERSITY OF NEWCASTLE (T AN937458)

SECOND SCHEDULE (1 NOTIFICATION)

1 LAND EXCLUDES MINERALS (S.141 PUBLIC WORKS ACT, 1912)

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

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Title Search

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 5/1247375

SEARCH DATE	TIME	EDITION NO	DATE
11/2/2019	12:10 PM	2	14/12/2018

LAND

LOT 5 IN DEPOSITED PLAN 1247375
AT NEWCASTLE
LOCAL GOVERNMENT AREA NEWCASTLE
PARISH OF NEWCASTLE COUNTY OF NORTHUMBERLAND
TITLE DIAGRAM DP1247375

FIRST SCHEDULE

THE UNIVERSITY OF NEWCASTLE (T AN937458)

SECOND SCHEDULE (4 NOTIFICATIONS)

1 LAND EXCLUDES MINERALS (S.141 PUBLIC WORKS ACT, 1912) WITHIN THE PART(S) SHOWN SO INDICATED IN THE TITLE DIAGRAM
2 DP883474 EASEMENT FOR UNDERGROUND ELECTRICITY CABLES & ACCESS THERETO 2 METRE(S) WIDE & VARIABLE WIDTH AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
3 DP1087271 RIGHT OF ACCESS VARIABLE WIDTH AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
4 DP1094788 RIGHT OF CARRIAGEWAY VARIABLE WIDTH AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM

NOTATIONS

DP1247375 NOTE: PROPOSED EASEMENT

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

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Title Search

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 3/1247375

SEARCH DATE	TIME	EDITION NO	DATE
11/2/2019	12:09 PM	2	14/12/2018

LAND

LOT 3 IN DEPOSITED PLAN 1247375
AT NEWCASTLE
LOCAL GOVERNMENT AREA NEWCASTLE
PARISH OF NEWCASTLE COUNTY OF NORTHUMBERLAND
TITLE DIAGRAM DP1247375

FIRST SCHEDULE

THE UNIVERSITY OF NEWCASTLE (T AN937434)

SECOND SCHEDULE (1 NOTIFICATION)

1 LAND EXCLUDES MINERALS (S.141 PUBLIC WORKS ACT, 1912)

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

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Title Search

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 6/1247375

SEARCH DATE	TIME	EDITION NO	DATE
11/2/2019	12:09 PM	2	14/12/2018

LAND

LOT 6 IN DEPOSITED PLAN 1247375
AT NEWCASTLE
LOCAL GOVERNMENT AREA NEWCASTLE
PARISH OF NEWCASTLE COUNTY OF NORTHUMBERLAND
TITLE DIAGRAM DP1247375

FIRST SCHEDULE

THE UNIVERSITY OF NEWCASTLE (T AN937434)

SECOND SCHEDULE (6 NOTIFICATIONS)

1 LAND EXCLUDES MINERALS (S.141 PUBLIC WORKS ACT, 1912) WITHIN THE PART(S) SHOWN SO INDICATED IN THE TITLE DIAGRAM
2 DP883474 EASEMENT FOR UNDERGROUND ELECTRICITY CABLES & ACCESS THERETO 2 METRE(S) WIDE & VARIABLE WIDTH AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
3 DP883474 EASEMENT FOR WATER SUPPLY VARIABLE WIDTH AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
4 DP1087271 RIGHT OF ACCESS VARIABLE WIDTH AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
5 DP1094788 RIGHT OF CARRIAGEWAY VARIABLE WIDTH AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
6 DP1111305 RIGHT OF CARRIAGEWAY VARIABLE WIDTH AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM

NOTATIONS

DP1247375 NOTE: PROPOSED EASEMENT

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

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Appendix B – Aerials



Approximate Site Location

drawn	SR	coffey A TETRA TECH COMPANY	client:	University of Newcastle	
approved	PW		project:	Detailed Site Investigation - HCCD Site 1, Proposed Multi Building Development, 16 Honeysuckle Drive, Newcastle, NSW	
date	1/16/2019		title:	2018 AERIAL PHOTOGRAPH	
scale	NTS		project no:	754-NTLEN213472-R08	figure no: 2018
original	A4				



Approximate Site Location

drawn	SR	coffey A TETRA TECH COMPANY	client:	University of Newcastle	
approved	PW		project:	Detailed Site Investigation - HCCD Site 1, Proposed Multi Building Development, 16 Honeysuckle Drive, Newcastle, NSW	
date	1/16/2019				
scale	NTS		title:	2004 AERIAL PHOTOGRAPH	
original	A4		project no:	754-NTLEN213472-R08	figure no: 2004



Approximate Site Location

drawn	SR	coffey A TETRA TECH COMPANY	client:	University of Newcastle
approved	PW		project:	Detailed Site Investigation - HCCD Site 1, Proposed Multi Building Development, 16 Honeysuckle Drive, Newcastle, NSW
date	1/16/2019		title:	1993 AERIAL PHOTOGRAPH
scale	NTS		project no: 754-NTLEN213472-R08	figure no: 1993
original size	A4			



Approximate Site Location

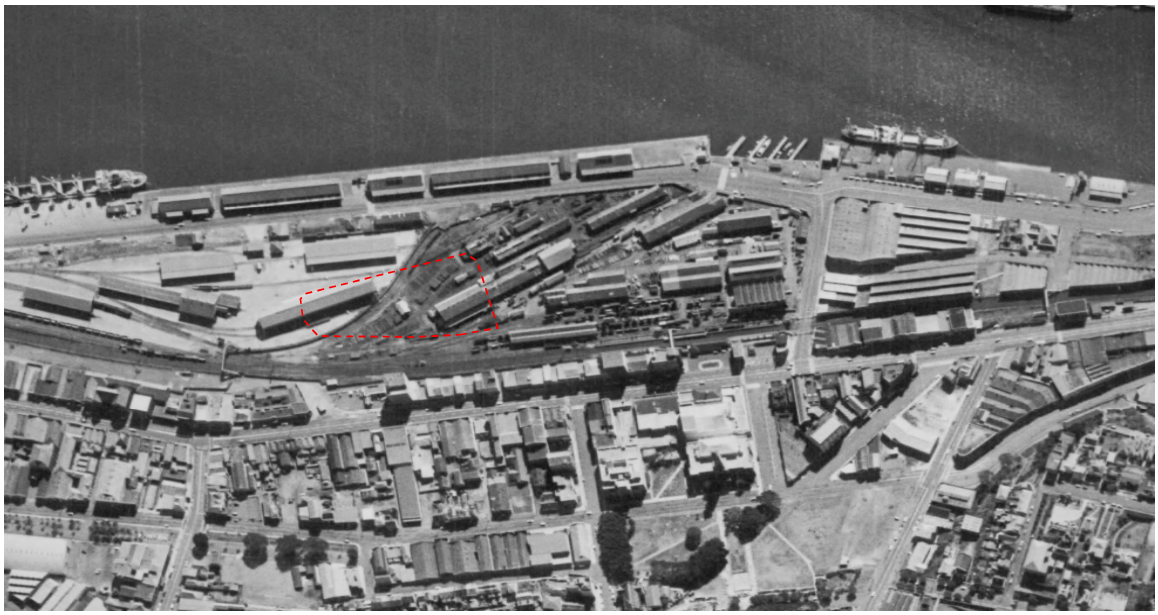
drawn	SR		client:	University of Newcastle
approved	PW		project:	Detailed Site Investigation - HCCD Site 1, Proposed Multi Building Development, 16 Honeysuckle Drive, Newcastle, NSW
date	1/16/2019		title:	1987 AERIAL PHOTOGRAPH
scale	NTS		project no: 754-NTLEN213472-R08	figure no: 1987
original size	A4			



Approximate Site Location

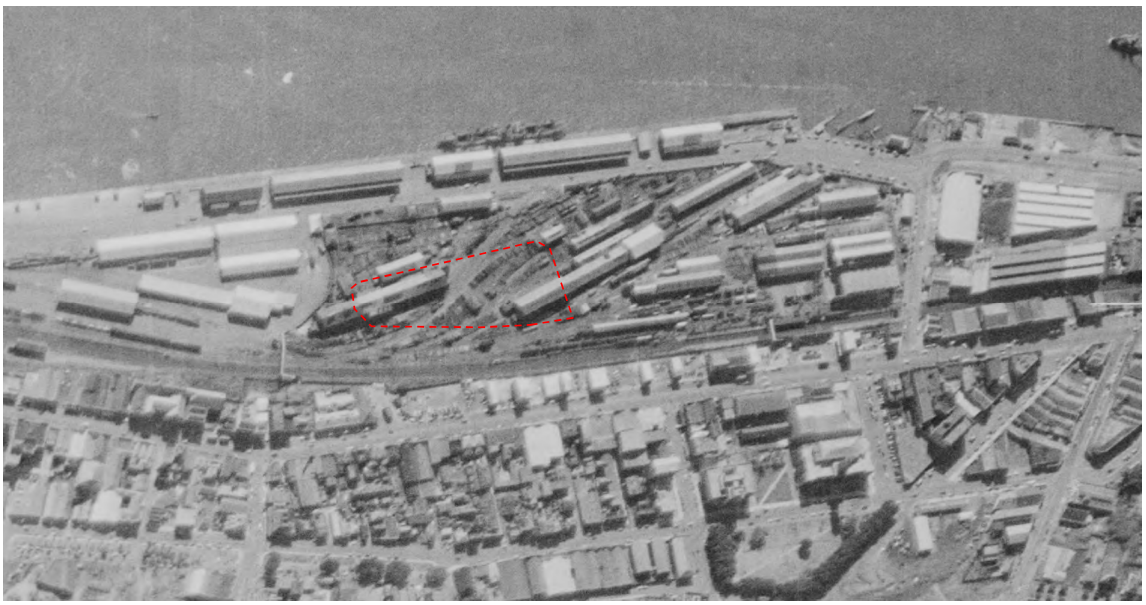
drawn	SR		client:	University of Newcastle
approved	PW		project:	Detailed Site Investigation - HCCD Site 1, Proposed Multi Building Development, 16 Honeysuckle Drive, Newcastle, NSW
date	1/16/2019		title:	1976 AERIAL PHOTOGRAPH
scale	NTS		project no: 754-NTLEN213472-R08	figure no: 1976
original size	A4			

coffey
A TETRA TECH COMPANY



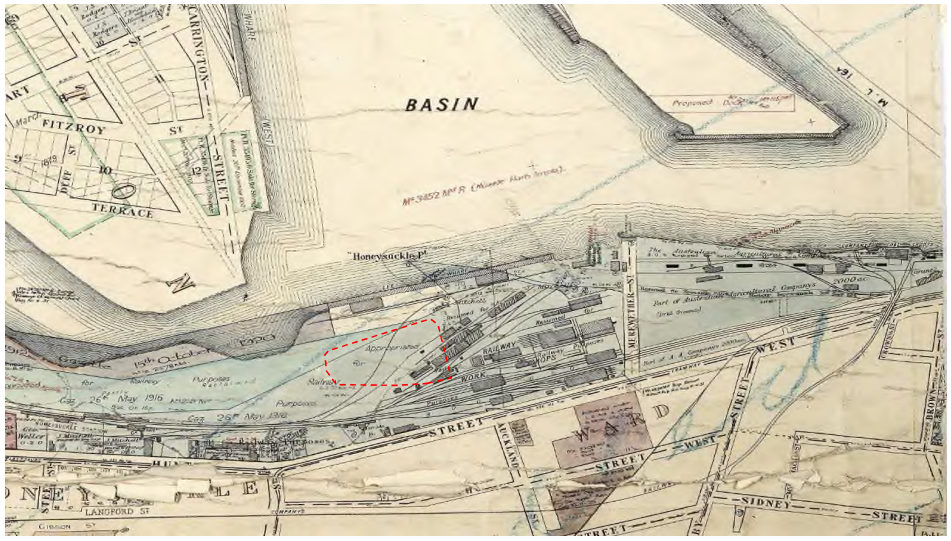
Approximate Site Location

drawn	SR		client:	University of Newcastle
approved	PW		project:	Detailed Site Investigation - HCCD Site 1, Proposed Multi Building Development, 16 Honeysuckle Drive, Newcastle, NSW
date	1/16/2019		title:	1966 AERIAL PHOTOGRAPH
scale	NTS		project no: 754-NTLEN213472-R08	figure no: 1966
original size	A4			



Approximate Site Location

drawn	SR		client:	University of Newcastle
approved	PW		project:	Detailed Site Investigation - HCCD Site 1, Proposed Multi Building Development, 16 Honeysuckle Drive, Newcastle, NSW
date	1/16/2019		title:	1954 AERIAL PHOTOGRAPH
scale	NTS		project no: 754-NTLEN213472-R08	figure no: 1954
original size	A4			



Approximate Site Location

drawn	SR	coffey A TETRA TECH COMPANY	client:	University of Newcastle	
approved	PW		project:	Detailed Site Investigation - HCCD Site 1, Proposed Multi Building Development, 16 Honeysuckle Drive, Newcastle, NSW	
date	1/16/2019		title:	1916 MAP	
scale	NTS		project no:	754-NTLEN213472-R08	figure no: 1916
original size	A4				

Appendix C – Site Photographs

Appendix C – Selected Site Photographs



Photograph 1:

View East – From western boundary of site



Photograph 2:

View West – From centre of site near the southern boudary



Photograph 3:

View North – From southern boundary of site, showing sparse medium length grasses



Photograph 4:

View West – Showing concrete footing with remaining construction/ waste materials



Photograph 5:

View South – With scattered waste materials in surface soils



Photograph 6:

View South– Western Site boundary, adjacent Worth Place



Photograph 7:

View West – Fill material in BHP8 being excavated near the south west border of the site



Photograph 8:

BHP8 profile showing fill materials in top 1.8m of borehole



Photograph 9:

Soil Profile encountered in MW03 from 2m bgs to 6 mbgs (left to right)



Photograph 10:

Fill encountered in top 1.0m in BHP10 showing large pieces of concrete



Photograph 11:

Fill encountered in BHP11 showing Brown Gravelly Sands and Orange-Brown Sandy Clay



Photograph 12:

Pale Brown Sand with Sea Shells encountered in BHP20



Photograph 13:

Disturbed Site Surface Soils near northern border of site



Photograph 14:

View North – Concrete footing on northern border of site



Photograph 15:

Aboriginal Heritage Item found in BHP16 at approximately 3.0m bgs



Photograph 16:

Dark Grey Clayey Sand encountered in BHP14 at approximately 3.1m bgs



Photograph 17:

Soils encountered during groundwater well installation MW01 at approximately 5.8-6.0mbgs, with marine sediment present



Photograph 18:

Ballast and scattered building materials encountered near the south east gate to site, off Wright Lane

Appendix D – Section 10.7

PLANNING CERTIFICATE

Section 10.7, Environmental Planning and Assessment Act 1979

To: Coffey Environments
19 Warabrook Boulevarde
Warabrook NSW 2304

Certificate No: PL2019/00221
Fees: $133.00
Receipt No(s): D001078294

Your Reference: NTLEN 213472

Date of Issue: 21/01/2019

The Land: Lot 1 DP 1163346
16B Honeysuckle Drive Newcastle NSW 2300

Advice provided on this Certificate:

Advice under section 10.7(2): see items 1 – 21
Additional advice under section 10.7(5): see Items 22 – 30

IMPORTANT: Please read this certificate carefully

This certificate contains important information about the land.

Please check for any item which could be inconsistent with the proposed use or development of the land. If there is anything you do not understand, phone our **Customer Contact Centre** on (02) 4974 2000, or come in and see us.

The information provided in this certificate relates only to the land described above. If you need information about adjoining or nearby land, or about the City of Newcastle (CN) development policies for the general area, contact our **Customer Contact Centre**.

All information provided is correct as at 21/01/2019. However, it's possible for changes to occur within a short time. We recommend that you only rely upon a very recent certificate.

City of Newcastle

PO Box 489
NEWCASTLE 2300

Phone: (02) 4974 2000
Facsimile: (02) 4974 2222

Customer Contact Centre
Ground floor,
282 King Street
Newcastle NSW 2300

Office hours:
Mondays to Fridays 8.30 am to 5.00 pm

PART 1:

ADVICE PROVIDED UNDER SECTION 10.7(2)

ATTENTION: The explanatory notes appearing in italic print within Part 1 are provided to assist understanding, but do not form part of the advice provided under section 10.7(2). These notes shall be taken as being advice provided under section 10.7(5).

1. Names of relevant planning instruments and DCPs

The following environmental planning instruments, proposed environmental planning instruments and development control plans apply to the land, either in full or in part.

State Environmental Planning Policy No. 44 - Koala Habitat Protection

State Environmental Planning Policy No. 50 - Canal Estate Development

State Environmental Planning Policy No. 55 - Remediation of Land

State Environmental Planning Policy No. 62 - Sustainable Aquaculture

State Environmental Planning Policy No. 64 - Advertising and Signage

State Environmental Planning Policy No. 65 - Design Quality of Residential Flat Development

State Environmental Planning Policy (Housing For Seniors or People with a Disability) 2004

State Environmental Planning Policy (Building Sustainability Index:BASIX) 2004

State Environmental Planning Policy (State Significant Precincts) 2005

State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007

State Environmental Planning Policy (Temporary Structures) 2007

State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Exempt and Complying Development Codes) 2008

State Environmental Planning Policy (Affordable Rental Housing) 2009

State Environmental Planning Policy (State and Regional Development) 2011

State Environmental Planning Policy (Coastal Management) 2018

Newcastle Local Environmental Plan 2012

Newcastle Development Control Plan 2012

2. Zoning and land use under relevant LEPs

Newcastle Local Environmental Plan 2012

Zoning: The Newcastle Local Environmental Plan 2012 identifies the land as being within the following zone(s):

Zone B4 Mixed Use

Note: Refer to www.newcastle.nsw.gov.au or www.legislation.nsw.gov.au web site for LEP instrument and zoning maps.

The following is an extract from the zoning provisions contained in Newcastle Local Environmental Plan 2012:

Zone B4 Mixed Use Zone

- **Objectives of zone**
  - To provide a mixture of compatible land uses.
  - To integrate suitable business, office, residential, retail and other development in accessible locations so as to maximise public transport patronage and encourage walking and cycling.
  - To support nearby or adjacent commercial centres without adversely impacting on the viability of those centres.
- **Permitted without consent**

  Environmental protection works; Home occupations
- **Permitted with consent**

  Boarding houses; Child care centres; Commercial premises; Community facilities; Educational establishments; Entertainment facilities; Function centres; Hotel or motel accommodation; Information and education facilities; Medical centres; Passenger transport facilities; Recreation facilities (indoor); Registered clubs; Respite day care centres; Restricted premises; Roads; Seniors housing; Shop top housing; Any other development not specified in, permitted without consent or prohibited
- **Prohibited**

  Agriculture; Air transport facilities; Airstrips; Animal boarding or training establishments; Biosolids treatment facilities; Camping grounds; Caravan parks; Cemeteries; Dual occupancies; Dwelling houses; Eco-tourist facilities; Electricity generating works; Farm buildings; Exhibition villages; Extractive industries; Forestry; Freight transport facilities; Heavy industrial storage establishments; Heavy industries; Helipads; High technology industries; Open cut mining; Resource recovery facilities; Rural industries; Secondary dwellings; Semi-detached dwellings; Sewage treatment plants; Truck depots; Vehicle body repair workshops; Waste disposal facilities; Water recycling facilities; Water supply systems

Minimum land dimensions for erection of a dwelling-house: There are no minimum land dimensions for the erection of a dwelling-house that apply to this site.

Critical habitat: The Newcastle Local Environmental Plan 2012 does not identify the land as including or comprising critical habitat.

Heritage conservation area: The land is not within a heritage conservation area under the Newcastle Local Environmental Plan 2012.

Heritage items: There are no heritage items listed in the Newcastle Local Environmental Plan 2012 situated on the land.

3. Complying development

Note Other requirements: *The advice below for all Complying Development Codes, is limited to identifying whether or not the* ***land****, the subject of the certificate, is land on which complying development may be carried out because of Clauses 1.17A(1)(c) to (e), (2), (3) & (4), 1.18 (1)(c3) and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 (the Codes SEPP).*

To ascertain the extent to which the complying development may or may not be carried out on the land, maps are available on City of Newcastle (CN) web pages.

General Housing Code

Complying development under the General Housing Code MAY be carried out on this land.

Rural Housing Code

Complying development under the Rural Housing Code MAY be carried out on this land.

Housing Alterations Code

Complying development under the Housing Alterations Code MAY be carried out on this land.

General Development Code

Complying development under the General Development Code MAY be carried out on this land.

Commercial and Industrial Alterations Code

Complying development under the Commercial and Industrial Alterations Code MAY be carried out on this land.

Commercial and Industrial (New Buildings and Additions) Code

Complying development under the Commercial and Industrial (New Buildings and Additions) Code MAY be carried out on this land.

Subdivision Code

Complying development under the Subdivision Code MAY be carried out on this land.

Demolition Code

Complying development under the Demolition Code MAY be carried out on this land.

Fire Safety Code

Complying development under the Fire Safety Code MAY be carried out on this land.

4B. Annual charges under Local Government Act 1993 for coastal protection services that relate to existing coastal protection works

The land IS NOT subject to an agreement for annual charges under section 496B of the Local Government Act 1993 for coastal protection services (within the meaning of section 553B of that Act).

5. Mine Subsidence Compensation Act 1961

The land IS within a proclaimed Mine Subsidence District under the Mine Subsidence Compensation Act 1961. The approval of the Mine Subsidence Board is required for all subdivision and building, except for certain minor structures. Surface development controls are in place to prevent damage from old, current or future mining. It is strongly recommended prospective purchasers consult with the Mine Subsidence Board regarding mine subsidence and any surface development guidelines. The Board can assist with information about mine subsidence and advise whether existing structures comply with the requirements of the Act.

NOTE: Plans of existing and abandoned mine workings are available for viewing at the Mine Subsidence Board's offices. For further clarification and details, contact the Mine Subsidence Board, 117 Bull Street, Newcastle West. Ph (02) 49084300.

6. Road widening or realignment

NOTE: The Roads and Maritime Services (RMS) may have proposals that are not referred to in this item. For advice about affectation by RMS proposals, contact the Roads and Maritime Services, Locked Mail Bag 30 Newcastle 2300. Ph: 131 782.

The land IS NOT AFFECTED by any road widening or road realignment under Division 2 of Part 3 of the Roads Act 1993.

The land IS NOT AFFECTED by any road widening or road realignment under an environmental planning instrument.

The land IS NOT AFFECTED by road widening or road realignment under a resolution of the Council.

7. Policies on hazard risk restrictions

Except as stated below, the land is not affected by a policy referred to in Item 7 of Schedule 4 of the Environmental Planning and Assessment Regulation 2000 that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

Potential acid sulfate soils: Works carried out on the land must be undertaken in accordance with Clause 6.1 Acid sulfate soils of the Newcastle Local Environmental Plan 2012.

Land Contamination: We have land contamination information/records in relation to this property. Council has adopted a policy of restricting development or imposing conditions on properties affected by land contamination. Refer to Section 5.02 Land Contamination of Newcastle Development Control Plan 2012, which may be inspected or purchased at our Customer Contact Centre.

NOTE: The absence of a policy to restrict development of the land because of the likelihood of a particular risk does not imply that the land is free from that risk. City of Newcastle (CN) considers the likelihood of natural and man-made risks when determining development applications under section 4.15 of the Environmental Planning and Assessment Act 1979. Detailed investigation carried out in conjunction with the preparation or assessment of a development application may result in CN either refusing development consent or imposing conditions of consent on the basis of risks that are not identified above.

7A. Flood related development controls information

Our information currently indicates that the property is, or contains, flood prone land as defined in the Floodplain Development Manual: the management of flood liable land, April 2005 published by the NSW Government.

Section 4.01 Flood Management of Newcastle Development Control Plan (DCP) 2012 provides guidelines with respect to all development of flood prone land. This includes development for the purpose of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings. The DCP may be viewed on our website, inspected or purchased at our Customer Contact Centre.

NOTE: More detailed flood information specific to the property is available on separate flooding certificate application through our Customer Contact Centre on (02) 4974 2000

8. Land reserved for acquisition

The land is not identified for acquisition by a public authority (as referred to in section 3.15 of the Act) by any environmental planning instrument or proposed environmental planning instrument applying to the land.

9. Contributions plans

The following contribution plan/s apply to the land.

Section 94A Development Contributions Plan 2009 - August 2017:

The Plan specifies section 94A contributions that may be imposed as a condition of development consent.

NOTE: Contributions plans are available on our website or may be inspected or purchased at our Customer Contact Centre.

9A. Biodiversity certified land

The land IS NOT biodiversity certified land under Part 8 of the Biodiversity Conservation Act 2016.

10. Biodiversity stewardship sites

The land IS NOT land (of which CN is aware) under a biodiversity stewardship agreement under Part 5 of the Biodiversity Conservation Act 2016.

10A. Native vegetation clearing set asides

The land IS NOT land (of which CN is aware) that contains a set aside area under section 60ZC of the Local Land Services Act 2013.

11. Bush fire prone land

The land IS NOT bush fire prone land for the purposes of the Environmental Planning and Assessment Act 1979.

12. Property vegetation plans

Not applicable. The Native Vegetation Act 2003 does not apply to the Newcastle local government area.

13. Orders under Trees (Disputes Between Neighbours) Act 2006

CN HAS NOT been notified that an order has been made under the Trees (Disputes between Neighbours) Act 2006 to carry out work in relation to a tree on the land.

14. Directions under Part 3A

The land IS NOT AFFECTED by a direction by the Minister in force under section 75P (2) (c1) of the Act.

15. Site compatibility certificates and conditions for seniors housing

(a) The land IS NOT AFFECTED by a current site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Housing for Seniors and People with a Disability) 2004.

(b) The land IS NOT AFFECTED by any terms of kind referred to in clause 18(2) of the State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004, that have been imposed as a condition of consent to a development application granted after 11 October, 2007 in respect of the land.

16. Site compatibility certificates for infrastructure, schools or TAFE establishments

The land IS NOT AFFECTED by a valid site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Infrastructure) 2007.

17. Site compatibility certificates and conditions for affordable rental housing

The land IS NOT AFFECTED by a valid site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Affordable Rental Housing) 2009.

18. Paper subdivision information

The land IS NOT AFFECTED by any development plan that applies to the land or that is proposed to be subject to a consent ballot.

19. Site verification certificates

The land IS NOT AFFECTED by a current site verification certificate (of which CN is aware) issued under the State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.

20. Loose-fill asbestos insulation

CN HAS NOT been notified that the land includes any residential premises (within the meaning of Division 1A of Part 8 of the Home Building Act 1989) that are listed on the register of loose-fill asbestos insulation, that is required to be maintained under that Division.

21. Affected building notices and building product rectification orders

The land IS NOT AFFECTED by any affected building notice of which CN is aware that is in force in respect of the land.

The land IS NOT AFFECTED by any building product rectification order that has not been fully complied with, of which CN is aware that is in force in respect of the land.

The land IS NOT AFFECTED by an outstanding notice of intention to make a building product rectification order of which CN is aware.

An affected building notice has the same meaning as in Part 4 of the Building Products (Safety) Act 2017.
Building product rectification order has the same meaning as in the Building Products (Safety) Act 2017.

Note: The following matters are prescribed by section 59(2) of the Contaminated Land Management Act 1997.

The land to which the certificate relates is the subject of the following site audit statement(s) within the meaning of the Contaminated Land Management Act 1997.

1. Site Audit Statement No. WRR15 (30/10/1998) produced by William R Ryall of Gutteridge Haskins & Davey Pty Ltd
2. Site Audit Statement No. WRR15A (27/09/02) produced by William R Ryall of Contamination Management Pty Ltd

You can contact Council's Compliance Services Unit on (02) 49742525 to obtain further information.
NOTE: Contamination information that relates to the land that is not required to be disclosed under section 59(2) Contaminated Land Management Act 1997, may be provided under a section 10.7(5) certificate.

PART 2:

ADVICE PROVIDED UNDER SECTION 10.7(5)

ATTENTION: Section 10.7(6) of the Act states that a Council shall not incur any liability in respect of advice provided in good faith pursuant to sub-section 10.7(5).

22. Outstanding Notices and Orders issued by City of Newcastle (CN).

Our records indicate that this premise IS NOT AFFECTED by a current notice or order (excluding the notices or orders mentioned in the note below).

NOTE: CN has not inspected the premises immediately prior to the issue of this certificate. It is possible that the premises are affected by matters of which we are unaware.

NOTE: This Certificate does not include any advice regarding outstanding notices or orders issued under the Environmental Planning and Assessment Act 1979 or the Local Government Act 1993. To obtain advice regarding these matters, you should lodge an application for a Certificate as to Outstanding Notices and Orders (accompanied by the appropriate fee). For further information, please contact the Customer Contact Centre on (02) 4974 2000.

23. Further consent requirements under the Newcastle Local Environmental Plan 2012.

The following provisions of the Newcastle Local Environmental Plan 2012 affect the carrying out of development on the land. These provisions are in addition to those required to be disclosed at Item 2 of this Certificate.

Refer to clause 3.1 Exempt Development of the Newcastle Local Environmental Plan 2012

Refer to clause 3.2 Complying Development of the Newcastle Local Environmental Plan 2012

Note: The Newcastle Local Environmental 2012 may have additional provisions that affect the carry out of development. Refer to the Newcastle Local Environmental 2012 for the full affect it may have on the land or obtain profession advice for more information.

24. Suspension of covenants.

Refer to 1.9A Suspension of covenants, agreements and instruments of the Newcastle Local Environmental Plan 2012.

25. Draft development control plans.

A draft development control plan DOES NOT APPLY to the land. The draft plans are exhibited pursuant to Part 3 of the Environmental Planning and Assessment Regulation 2000.

26. Heritage Act 1977.

The land IS NOT AFFECTED by a listing on the State Heritage Register or an Interim Heritage Order that is in force under the Heritage Act 1977.

NOTE: The above advice is provided to the extent that CN has been notified by the Heritage Council of NSW. For up-to-date details, contact the Office of Environment and Heritage, PO Box A290, South Sydney NSW 1232 Ph: (02) 9995 5000.

27. Listing by National Trust of Australia.

The land IS NOT AFFECTED by a listing of the National Trust of Australia (NSW).

NOTE: The above advice is provided to the extent that CN has been notified by the National Trust of Australia (NSW). For up-to-date details, contact the National Trust Ph 02 9258 0123.

28. Australian Heritage Database.

The land IS NOT AFFECTED by a listing on the Australian Heritage Database.

NOTE: The above advice is provided to the extent that CN has been notified by the Department of the Environment. For up-to-date details, contact the Department of the Environment, Heritage, King Edward Terrace, Parkes ACT 2600. Ph (02) 6274 1111.

29. Environment Protection & Biodiversity Conservation Act 1999 (Cth)

Under the (Commonwealth) Environment Protection and Biodiversity Conservation Act 1999, actions which have, may have or are likely to have, a significant impact on a matter of national environmental significance may be taken only with the approval of the Commonwealth Minister for the Environment.

Approval is also required for actions that have a significant effect on the environment of Commonwealth land. These actions may be on Commonwealth land or other land.

This approval is in addition to any approvals under the (NSW) Environmental Planning and Assessment Act 1979 or other NSW legislation.

Matters of national environmental significance are:

- declared World Heritage areas
- declared Ramsar wetlands
- listed threatened species and ecological communities
- listed migratory species
- nuclear actions
- the environment of Commonwealth marine areas.

Locations within the City of Newcastle that are a declared Ramsar wetland include Kooragang Nature Reserve and Shortland Wetlands. Listed threatened species and listed migratory species are known to occur within the City of Newcastle.

30. Other matters

The land is affected by the following:

Newcastle earthquake

Earthquakes occurred in the vicinity of Newcastle on 28th December 1989 and 6 August 1994. Buildings on the land may have suffered damage as a consequence of the earthquakes. Prospective purchasers are advised to make their own enquiries as to whether the property is affected by any damage.

Local Planning Strategy

The Local Planning Strategy is the principal land use strategy for Newcastle. It was adopted by the Council on 28 July 2015. The Strategy is taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Note: Refer to our website to view the document. www.newcastle.nsw.gov.au

Lower Hunter Regional Strategy (2006 - 2031)

The Lower Hunter Regional Strategy has been prepared by the Department of Planning and Infrastructure. The contents of the strategy will be taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

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Newcastle City-Wide Floodplain Risk Management Study and Plan (2012)

The Newcastle City-wide Floodplain Risk Management Study and Plan addresses flood management for the City of Newcastle. The Study and Plan will be taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Note: Refer to our website to view the document. www.newcastle.nsw.gov.au

Parking permit policy

This property is within the Permit Exclusion Area of the City Centre Parking Strategy adopted by Council on 25 June 2002 and updated on 16 May 2005. Residents within the Permit Exclusion Area are not eligible for resident parking permit stickers. For further information please contact Parking Services Coordinator Michael Heather on 4974 5008.

Contaminated land information

Council records indicate that this land has been identified as being affected by soil or groundwater contamination. Recommendations have been made regarding restrictions or special conditions over the use or development of the land. Council is in possession of the following management plan(s) which apply to the land:

1. Report: AGC Woodward-Clyde Pty Ltd (14 January 1999) Environmental Management Plan - Honeysuckle Development Newcastle, prepared for NSW Department of Public Works and Services, Project No. A8600476.

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3. Report: Woodward-Clyde, January 1997, Honeysuckle Redevelopment Remediation Strategy Civic/Honeysuckle Precincts. Project No. A8600476/001
4. Report: Robert Carr & Associates Pty Ltd (October 1998) Geochemical Investigation Lot HB5c Honeysuckle Redevelopment Newcastle, NSW Report No. 1013
5. Report: Robert Carr & Associates Pty Ltd (October 1998) Geochemical Investigation Lot HB5d Honeysuckle Redevelopment Newcastle, NSW Report No. 1013.
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7. Report: Summary Site Audit Report - Lot 3 in DP883474, Honeysuckle Drive, Newcastle (27 September 2002) Produced by William Ryall of Contamination Australia Pty Ltd.
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Persons relying on the certificate are advised to make their own investigations as to whether the land is affected by elevated concentrations of soil or groundwater contaminants in relation to proposed purchase or use of land.

Issued without alterations or additions, 21/01/19
Authorised by
JEREMY BATH
CHIEF EXECUTIVE OFFICER

PLANNING CERTIFICATE

Section 10.7, Environmental Planning and Assessment Act 1979

To: Coffey Environments
19 Warabrook Boulevarde
Warabrook NSW 2304

Certificate No: PL2019/00223
Fees: $133.00
Receipt No(s): D001078294

Your Reference: NTLEN 213472

Date of Issue: 21/01/2019

The Land: Lot 2 DP 1163346
16A Honeysuckle Drive Newcastle NSW 2300

Advice provided on this Certificate:

Advice under section 10.7(2): see items 1 – 21
Additional advice under section 10.7(5): see Items 22 – 30

IMPORTANT: Please read this certificate carefully

This certificate contains important information about the land.

Please check for any item which could be inconsistent with the proposed use or development of the land. If there is anything you do not understand, phone our **Customer Contact Centre** on (02) 4974 2000, or come in and see us.

The information provided in this certificate relates only to the land described above. If you need information about adjoining or nearby land, or about the City of Newcastle (CN) development policies for the general area, contact our **Customer Contact Centre**.

All information provided is correct as at 21/01/2019. However, it's possible for changes to occur within a short time. We recommend that you only rely upon a very recent certificate.

City of Newcastle

PO Box 489
NEWCASTLE 2300

Phone: (02) 4974 2000
Facsimile: (02) 4974 2222

Customer Contact Centre
Ground floor,
282 King Street
Newcastle NSW 2300

Office hours:
Mondays to Fridays 8.30 am to 5.00 pm

PART 1:

ADVICE PROVIDED UNDER SECTION 10.7(2)

ATTENTION: The explanatory notes appearing in italic print within Part 1 are provided to assist understanding, but do not form part of the advice provided under section 10.7(2). These notes shall be taken as being advice provided under section 10.7(5).

1. Names of relevant planning instruments and DCPs

The following environmental planning instruments, proposed environmental planning instruments and development control plans apply to the land, either in full or in part.

State Environmental Planning Policy No. 44 - Koala Habitat Protection

State Environmental Planning Policy No. 50 - Canal Estate Development

State Environmental Planning Policy No. 55 - Remediation of Land

State Environmental Planning Policy No. 62 - Sustainable Aquaculture

State Environmental Planning Policy No. 64 - Advertising and Signage

State Environmental Planning Policy No. 65 - Design Quality of Residential Flat Development

State Environmental Planning Policy (Housing For Seniors or People with a Disability) 2004

State Environmental Planning Policy (Building Sustainability Index:BASIX) 2004

State Environmental Planning Policy (State Significant Precincts) 2005

State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007

State Environmental Planning Policy (Temporary Structures) 2007

State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Exempt and Complying Development Codes) 2008

State Environmental Planning Policy (Affordable Rental Housing) 2009

State Environmental Planning Policy (State and Regional Development) 2011

State Environmental Planning Policy (Coastal Management) 2018

Newcastle Local Environmental Plan 2012

Newcastle Development Control Plan 2012

2. Zoning and land use under relevant LEPs

Newcastle Local Environmental Plan 2012

Zoning: The Newcastle Local Environmental Plan 2012 identifies the land as being within the following zone(s):

Zone B4 Mixed Use

Note: Refer to www.newcastle.nsw.gov.au or www.legislation.nsw.gov.au web site for LEP instrument and zoning maps.

The following is an extract from the zoning provisions contained in Newcastle Local Environmental Plan 2012:

Zone B4 Mixed Use Zone

- **Objectives of zone**
  - To provide a mixture of compatible land uses.
  - To integrate suitable business, office, residential, retail and other development in accessible locations so as to maximise public transport patronage and encourage walking and cycling.
  - To support nearby or adjacent commercial centres without adversely impacting on the viability of those centres.
- **Permitted without consent**

  Environmental protection works; Home occupations
- **Permitted with consent**

  Boarding houses; Child care centres; Commercial premises; Community facilities; Educational establishments; Entertainment facilities; Function centres; Hotel or motel accommodation; Information and education facilities; Medical centres; Passenger transport facilities; Recreation facilities (indoor); Registered clubs; Respite day care centres; Restricted premises; Roads; Seniors housing; Shop top housing; Any other development not specified in, permitted without consent or prohibited
- **Prohibited**

  Agriculture; Air transport facilities; Airstrips; Animal boarding or training establishments; Biosolids treatment facilities; Camping grounds; Caravan parks; Cemeteries; Dual occupancies; Dwelling houses; Eco-tourist facilities; Electricity generating works; Farm buildings; Exhibition villages; Extractive industries; Forestry; Freight transport facilities; Heavy industrial storage establishments; Heavy industries; Helipads; High technology industries; Open cut mining; Resource recovery facilities; Rural industries; Secondary dwellings; Semi-detached dwellings; Sewage treatment plants; Truck depots; Vehicle body repair workshops; Waste disposal facilities; Water recycling facilities; Water supply systems

Minimum land dimensions for erection of a dwelling-house: There are no minimum land dimensions for the erection of a dwelling-house that apply to this site.

Critical habitat: The Newcastle Local Environmental Plan 2012 does not identify the land as including or comprising critical habitat.

Heritage conservation area: The land is not within a heritage conservation area under the Newcastle Local Environmental Plan 2012.

Heritage items: There are no heritage items listed in the Newcastle Local Environmental Plan 2012 situated on the land.

3. Complying development

Note Other requirements: *The advice below for all Complying Development Codes, is limited to identifying whether or not the* ***land****, the subject of the certificate, is land on which complying development may be carried out because of Clauses 1.17A(1)(c) to (e), (2), (3) & (4), 1.18 (1)(c3) and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 (the Codes SEPP).*

To ascertain the extent to which the complying development may or may not be carried out on the land, maps are available on City of Newcastle (CN) web pages.

General Housing Code

Complying development under the General Housing Code MAY be carried out on this land.

Rural Housing Code

Complying development under the Rural Housing Code MAY be carried out on this land.

Housing Alterations Code

Complying development under the Housing Alterations Code MAY be carried out on this land.

General Development Code

Complying development under the General Development Code MAY be carried out on this land.

Commercial and Industrial Alterations Code

Complying development under the Commercial and Industrial Alterations Code MAY be carried out on this land.

Commercial and Industrial (New Buildings and Additions) Code

Complying development under the Commercial and Industrial (New Buildings and Additions) Code MAY be carried out on this land.

Subdivision Code

Complying development under the Subdivision Code MAY be carried out on this land.

Demolition Code

Complying development under the Demolition Code MAY be carried out on this land.

Fire Safety Code

Complying development under the Fire Safety Code MAY be carried out on this land.

4B. Annual charges under Local Government Act 1993 for coastal protection services that relate to existing coastal protection works

The land IS NOT subject to an agreement for annual charges under section 496B of the Local Government Act 1993 for coastal protection services (within the meaning of section 553B of that Act).

5. Mine Subsidence Compensation Act 1961

The land IS within a proclaimed Mine Subsidence District under the Mine Subsidence Compensation Act 1961. The approval of the Mine Subsidence Board is required for all subdivision and building, except for certain minor structures. Surface development controls are in place to prevent damage from old, current or future mining. It is strongly recommended prospective purchasers consult with the Mine Subsidence Board regarding mine subsidence and any surface development guidelines. The Board can assist with information about mine subsidence and advise whether existing structures comply with the requirements of the Act.

NOTE: Plans of existing and abandoned mine workings are available for viewing at the Mine Subsidence Board's offices. For further clarification and details, contact the Mine Subsidence Board, 117 Bull Street, Newcastle West. Ph (02) 49084300.

6. Road widening or realignment

NOTE: The Roads and Maritime Services (RMS) may have proposals that are not referred to in this item. For advice about affectation by RMS proposals, contact the Roads and Maritime Services, Locked Mail Bag 30 Newcastle 2300. Ph: 131 782.

The land IS NOT AFFECTED by any road widening or road realignment under Division 2 of Part 3 of the Roads Act 1993.

The land IS NOT AFFECTED by any road widening or road realignment under an environmental planning instrument.

The land IS NOT AFFECTED by road widening or road realignment under a resolution of the Council.

7. Policies on hazard risk restrictions

Except as stated below, the land is not affected by a policy referred to in Item 7 of Schedule 4 of the Environmental Planning and Assessment Regulation 2000 that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

Potential acid sulfate soils: Works carried out on the land must be undertaken in accordance with Clause 6.1 Acid sulfate soils of the Newcastle Local Environmental Plan 2012.

Land Contamination: We have land contamination information/records in relation to this property. Council has adopted a policy of restricting development or imposing conditions on properties affected by land contamination. Refer to Section 5.02 Land Contamination of Newcastle Development Control Plan 2012, which may be inspected or purchased at our Customer Contact Centre.

NOTE: The absence of a policy to restrict development of the land because of the likelihood of a particular risk does not imply that the land is free from that risk. City of Newcastle (CN) considers the likelihood of natural and man-made risks when determining development applications under section 4.15 of the Environmental Planning and Assessment Act 1979. Detailed investigation carried out in conjunction with the preparation or assessment of a development application may result in CN either refusing development consent or imposing conditions of consent on the basis of risks that are not identified above.

7A. Flood related development controls information

Our information currently indicates that the property is, or contains, flood prone land as defined in the Floodplain Development Manual: the management of flood liable land, April 2005 published by the NSW Government.

Section 4.01 Flood Management of Newcastle Development Control Plan (DCP) 2012 provides guidelines with respect to all development of flood prone land. This includes development for the purpose of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings. The DCP may be viewed on our website, inspected or purchased at our Customer Contact Centre.

NOTE: More detailed flood information specific to the property is available on separate flooding certificate application through our Customer Contact Centre on (02) 4974 2000

8. Land reserved for acquisition

The land is not identified for acquisition by a public authority (as referred to in section 3.15 of the Act) by any environmental planning instrument or proposed environmental planning instrument applying to the land.

9. Contributions plans

The following contribution plan/s apply to the land.

Section 94A Development Contributions Plan 2009 - August 2017:

The Plan specifies section 94A contributions that may be imposed as a condition of development consent.

NOTE: Contributions plans are available on our website or may be inspected or purchased at our Customer Contact Centre.

9A. Biodiversity certified land

The land IS NOT biodiversity certified land under Part 8 of the Biodiversity Conservation Act 2016.

10. Biodiversity stewardship sites

The land IS NOT land (of which CN is aware) under a biodiversity stewardship agreement under Part 5 of the Biodiversity Conservation Act 2016.

10A. Native vegetation clearing set asides

The land IS NOT land (of which CN is aware) that contains a set aside area under section 60ZC of the Local Land Services Act 2013.

11. Bush fire prone land

The land IS NOT bush fire prone land for the purposes of the Environmental Planning and Assessment Act 1979.

12. Property vegetation plans

Not applicable. The Native Vegetation Act 2003 does not apply to the Newcastle local government area.

13. Orders under Trees (Disputes Between Neighbours) Act 2006

CN HAS NOT been notified that an order has been made under the Trees (Disputes between Neighbours) Act 2006 to carry out work in relation to a tree on the land.

14. Directions under Part 3A

The land IS NOT AFFECTED by a direction by the Minister in force under section 75P (2) (c1) of the Act.

15. Site compatibility certificates and conditions for seniors housing

(a) The land IS NOT AFFECTED by a current site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Housing for Seniors and People with a Disability) 2004.

(b) The land IS NOT AFFECTED by any terms of kind referred to in clause 18(2) of the State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004, that have been imposed as a condition of consent to a development application granted after 11 October, 2007 in respect of the land.

16. Site compatibility certificates for infrastructure, schools or TAFE establishments

The land IS NOT AFFECTED by a valid site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Infrastructure) 2007.

17. Site compatibility certificates and conditions for affordable rental housing

The land IS NOT AFFECTED by a valid site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Affordable Rental Housing) 2009.

18. Paper subdivision information

The land IS NOT AFFECTED by any development plan that applies to the land or that is proposed to be subject to a consent ballot.

19. Site verification certificates

The land IS NOT AFFECTED by a current site verification certificate (of which CN is aware) issued under the State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.

20. Loose-fill asbestos insulation

CN HAS NOT been notified that the land includes any residential premises (within the meaning of Division 1A of Part 8 of the Home Building Act 1989) that are listed on the register of loose-fill asbestos insulation, that is required to be maintained under that Division.

21. Affected building notices and building product rectification orders

The land IS NOT AFFECTED by any affected building notice of which CN is aware that is in force in respect of the land.

The land IS NOT AFFECTED by any building product rectification order that has not been fully complied with, of which CN is aware that is in force in respect of the land.

The land IS NOT AFFECTED by an outstanding notice of intention to make a building product rectification order of which CN is aware.

An affected building notice has the same meaning as in Part 4 of the Building Products (Safety) Act 2017.
Building product rectification order has the same meaning as in the Building Products (Safety) Act 2017.

Note: The following matters are prescribed by section 59(2) of the Contaminated Land Management Act 1997.

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NOTE: Contamination information that relates to the land that is not required to be disclosed under section 59(2) Contaminated Land Management Act 1997, may be provided under a section 10.7(5) certificate.

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NOTE: CN has not inspected the premises immediately prior to the issue of this certificate. It is possible that the premises are affected by matters of which we are unaware.

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Refer to 1.9A Suspension of covenants, agreements and instruments of the Newcastle Local Environmental Plan 2012.

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27. Listing by National Trust of Australia.

The land IS NOT AFFECTED by a listing of the National Trust of Australia (NSW).

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The land IS NOT AFFECTED by a listing on the Australian Heritage Database.

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- declared Ramsar wetlands
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Issued without alterations or additions, 21/01/19
Authorised by
JEREMY BATH
CHIEF EXECUTIVE OFFICER

PLANNING CERTIFICATE

Section 10.7, Environmental Planning and Assessment Act 1979

To: Coffey Environments
19 Warabrook Boulevarde
Warabrook NSW 2304

Certificate No: PL2019/00224
Fees: $133.00
Receipt No(s): D001078294

Your Reference: NTLEN 213472

Date of Issue: 21/01/2019

The Land: Lot 3 DP 1163346
16 Honeysuckle Drive Newcastle NSW 2300

Advice provided on this Certificate:

Advice under section 10.7(2): see items 1 – 21
Additional advice under section 10.7(5): see Items 22 – 30

IMPORTANT: Please read this certificate carefully

This certificate contains important information about the land.

Please check for any item which could be inconsistent with the proposed use or development of the land. If there is anything you do not understand, phone our **Customer Contact Centre** on (02) 4974 2000, or come in and see us.

The information provided in this certificate relates only to the land described above. If you need information about adjoining or nearby land, or about the City of Newcastle (CN) development policies for the general area, contact our **Customer Contact Centre**.

All information provided is correct as at 21/01/2019. However, it's possible for changes to occur within a short time. We recommend that you only rely upon a very recent certificate.

City of Newcastle

PO Box 489
NEWCASTLE 2300

Phone: (02) 4974 2000
Facsimile: (02) 4974 2222

Customer Contact Centre
Ground floor,
282 King Street
Newcastle NSW 2300

Office hours:
Mondays to Fridays 8.30 am to 5.00 pm

PART 1:

ADVICE PROVIDED UNDER SECTION 10.7(2)

ATTENTION: The explanatory notes appearing in italic print within Part 1 are provided to assist understanding, but do not form part of the advice provided under section 10.7(2). These notes shall be taken as being advice provided under section 10.7(5).

1. Names of relevant planning instruments and DCPs

The following environmental planning instruments, proposed environmental planning instruments and development control plans apply to the land, either in full or in part.

State Environmental Planning Policy No. 44 - Koala Habitat Protection

State Environmental Planning Policy No. 50 - Canal Estate Development

State Environmental Planning Policy No. 55 - Remediation of Land

State Environmental Planning Policy No. 62 - Sustainable Aquaculture

State Environmental Planning Policy No. 64 - Advertising and Signage

State Environmental Planning Policy No. 65 - Design Quality of Residential Flat Development

State Environmental Planning Policy (Housing For Seniors or People with a Disability) 2004

State Environmental Planning Policy (Building Sustainability Index:BASIX) 2004

State Environmental Planning Policy (State Significant Precincts) 2005

State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007

State Environmental Planning Policy (Temporary Structures) 2007

State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Exempt and Complying Development Codes) 2008

State Environmental Planning Policy (Affordable Rental Housing) 2009

State Environmental Planning Policy (State and Regional Development) 2011

State Environmental Planning Policy (Coastal Management) 2018

Newcastle Local Environmental Plan 2012

Newcastle Development Control Plan 2012

2. Zoning and land use under relevant LEPs

Newcastle Local Environmental Plan 2012

Zoning: The Newcastle Local Environmental Plan 2012 identifies the land as being within the following zone(s):

Zone B4 Mixed Use

Note: Refer to www.newcastle.nsw.gov.au or www.legislation.nsw.gov.au web site for LEP instrument and zoning maps.

The following is an extract from the zoning provisions contained in Newcastle Local Environmental Plan 2012:

Zone B4 Mixed Use Zone

- **Objectives of zone**
  - To provide a mixture of compatible land uses.
  - To integrate suitable business, office, residential, retail and other development in accessible locations so as to maximise public transport patronage and encourage walking and cycling.
  - To support nearby or adjacent commercial centres without adversely impacting on the viability of those centres.
- **Permitted without consent**

  Environmental protection works; Home occupations
- **Permitted with consent**

  Boarding houses; Child care centres; Commercial premises; Community facilities; Educational establishments; Entertainment facilities; Function centres; Hotel or motel accommodation; Information and education facilities; Medical centres; Passenger transport facilities; Recreation facilities (indoor); Registered clubs; Respite day care centres; Restricted premises; Roads; Seniors housing; Shop top housing; Any other development not specified in, permitted without consent or prohibited
- **Prohibited**

  Agriculture; Air transport facilities; Airstrips; Animal boarding or training establishments; Biosolids treatment facilities; Camping grounds; Caravan parks; Cemeteries; Dual occupancies; Dwelling houses; Eco-tourist facilities; Electricity generating works; Farm buildings; Exhibition villages; Extractive industries; Forestry; Freight transport facilities; Heavy industrial storage establishments; Heavy industries; Helipads; High technology industries; Open cut mining; Resource recovery facilities; Rural industries; Secondary dwellings; Semi-detached dwellings; Sewage treatment plants; Truck depots; Vehicle body repair workshops; Waste disposal facilities; Water recycling facilities; Water supply systems

Minimum land dimensions for erection of a dwelling-house: There are no minimum land dimensions for the erection of a dwelling-house that apply to this site.

Critical habitat: The Newcastle Local Environmental Plan 2012 does not identify the land as including or comprising critical habitat.

Heritage conservation area: The land is not within a heritage conservation area under the Newcastle Local Environmental Plan 2012.

Heritage items: There are no heritage items listed in the Newcastle Local Environmental Plan 2012 situated on the land.

3. Complying development

Note Other requirements: *The advice below for all Complying Development Codes, is limited to identifying whether or not the* ***land****, the subject of the certificate, is land on which complying development may be carried out because of Clauses 1.17A(1)(c) to (e), (2), (3) & (4), 1.18 (1)(c3) and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 (the Codes SEPP).*

To ascertain the extent to which the complying development may or may not be carried out on the land, maps are available on City of Newcastle (CN) web pages.

General Housing Code

Complying development under the General Housing Code MAY be carried out on this land.

Rural Housing Code

Complying development under the Rural Housing Code MAY be carried out on this land.

Housing Alterations Code

Complying development under the Housing Alterations Code MAY be carried out on this land.

General Development Code

Complying development under the General Development Code MAY be carried out on this land.

Commercial and Industrial Alterations Code

Complying development under the Commercial and Industrial Alterations Code MAY be carried out on this land.

Commercial and Industrial (New Buildings and Additions) Code

Complying development under the Commercial and Industrial (New Buildings and Additions) Code MAY be carried out on this land.

Subdivision Code

Complying development under the Subdivision Code MAY be carried out on this land.

Demolition Code

Complying development under the Demolition Code MAY be carried out on this land.

Fire Safety Code

Complying development under the Fire Safety Code MAY be carried out on this land.

4B. Annual charges under Local Government Act 1993 for coastal protection services that relate to existing coastal protection works

The land IS NOT subject to an agreement for annual charges under section 496B of the Local Government Act 1993 for coastal protection services (within the meaning of section 553B of that Act).

5. Mine Subsidence Compensation Act 1961

The land IS within a proclaimed Mine Subsidence District under the Mine Subsidence Compensation Act 1961. The approval of the Mine Subsidence Board is required for all subdivision and building, except for certain minor structures. Surface development controls are in place to prevent damage from old, current or future mining. It is strongly recommended prospective purchasers consult with the Mine Subsidence Board regarding mine subsidence and any surface development guidelines. The Board can assist with information about mine subsidence and advise whether existing structures comply with the requirements of the Act.

NOTE: Plans of existing and abandoned mine workings are available for viewing at the Mine Subsidence Board's offices. For further clarification and details, contact the Mine Subsidence Board, 117 Bull Street, Newcastle West. Ph (02) 49084300.

6. Road widening or realignment

NOTE: The Roads and Maritime Services (RMS) may have proposals that are not referred to in this item. For advice about affectation by RMS proposals, contact the Roads and Maritime Services, Locked Mail Bag 30 Newcastle 2300. Ph: 131 782.

The land IS NOT AFFECTED by any road widening or road realignment under Division 2 of Part 3 of the Roads Act 1993.

The land IS NOT AFFECTED by any road widening or road realignment under an environmental planning instrument.

The land IS NOT AFFECTED by road widening or road realignment under a resolution of the Council.

7. Policies on hazard risk restrictions

Except as stated below, the land is not affected by a policy referred to in Item 7 of Schedule 4 of the Environmental Planning and Assessment Regulation 2000 that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

Potential acid sulfate soils: Works carried out on the land must be undertaken in accordance with Clause 6.1 Acid sulfate soils of the Newcastle Local Environmental Plan 2012.

Land Contamination: We have land contamination information/records in relation to this property. Council has adopted a policy of restricting development or imposing conditions on properties affected by land contamination. Refer to Section 5.02 Land Contamination of Newcastle Development Control Plan 2012, which may be inspected or purchased at our Customer Contact Centre.

NOTE: The absence of a policy to restrict development of the land because of the likelihood of a particular risk does not imply that the land is free from that risk. City of Newcastle (CN) considers the likelihood of natural and man-made risks when determining development applications under section 4.15 of the Environmental Planning and Assessment Act 1979. Detailed investigation carried out in conjunction with the preparation or assessment of a development application may result in CN either refusing development consent or imposing conditions of consent on the basis of risks that are not identified above.

7A. Flood related development controls information

Our information currently indicates that the property is, or contains, flood prone land as defined in the Floodplain Development Manual: the management of flood liable land, April 2005 published by the NSW Government.

Section 4.01 Flood Management of Newcastle Development Control Plan (DCP) 2012 provides guidelines with respect to all development of flood prone land. This includes development for the purpose of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings. The DCP may be viewed on our website, inspected or purchased at our Customer Contact Centre.

NOTE: More detailed flood information specific to the property is available on separate flooding certificate application through our Customer Contact Centre on (02) 4974 2000

8. Land reserved for acquisition

The land is not identified for acquisition by a public authority (as referred to in section 3.15 of the Act) by any environmental planning instrument or proposed environmental planning instrument applying to the land.

9. Contributions plans

The following contribution plan/s apply to the land.

Section 94A Development Contributions Plan 2009 - August 2017:

The Plan specifies section 94A contributions that may be imposed as a condition of development consent.

NOTE: Contributions plans are available on our website or may be inspected or purchased at our Customer Contact Centre.

9A. Biodiversity certified land

The land IS NOT biodiversity certified land under Part 8 of the Biodiversity Conservation Act 2016.

10. Biodiversity stewardship sites

The land IS NOT land (of which CN is aware) under a biodiversity stewardship agreement under Part 5 of the Biodiversity Conservation Act 2016.

10A. Native vegetation clearing set asides

The land IS NOT land (of which CN is aware) that contains a set aside area under section 60ZC of the Local Land Services Act 2013.

11. Bush fire prone land

The land IS NOT bush fire prone land for the purposes of the Environmental Planning and Assessment Act 1979.

12. Property vegetation plans

Not applicable. The Native Vegetation Act 2003 does not apply to the Newcastle local government area.

13. Orders under Trees (Disputes Between Neighbours) Act 2006

CN HAS NOT been notified that an order has been made under the Trees (Disputes between Neighbours) Act 2006 to carry out work in relation to a tree on the land.

14. Directions under Part 3A

The land IS NOT AFFECTED by a direction by the Minister in force under section 75P (2) (c1) of the Act.

15. Site compatibility certificates and conditions for seniors housing

(a) The land IS NOT AFFECTED by a current site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Housing for Seniors and People with a Disability) 2004.

(b) The land IS NOT AFFECTED by any terms of kind referred to in clause 18(2) of the State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004, that have been imposed as a condition of consent to a development application granted after 11 October, 2007 in respect of the land.

16. Site compatibility certificates for infrastructure, schools or TAFE establishments

The land IS NOT AFFECTED by a valid site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Infrastructure) 2007.

17. Site compatibility certificates and conditions for affordable rental housing

The land IS NOT AFFECTED by a valid site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Affordable Rental Housing) 2009.

18. Paper subdivision information

The land IS NOT AFFECTED by any development plan that applies to the land or that is proposed to be subject to a consent ballot.

19. Site verification certificates

The land IS NOT AFFECTED by a current site verification certificate (of which CN is aware) issued under the State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.

20. Loose-fill asbestos insulation

CN HAS NOT been notified that the land includes any residential premises (within the meaning of Division 1A of Part 8 of the Home Building Act 1989) that are listed on the register of loose-fill asbestos insulation, that is required to be maintained under that Division.

21. Affected building notices and building product rectification orders

The land IS NOT AFFECTED by any affected building notice of which CN is aware that is in force in respect of the land.

The land IS NOT AFFECTED by any building product rectification order that has not been fully complied with, of which CN is aware that is in force in respect of the land.

The land IS NOT AFFECTED by an outstanding notice of intention to make a building product rectification order of which CN is aware.

An affected building notice has the same meaning as in Part 4 of the Building Products (Safety) Act 2017.
Building product rectification order has the same meaning as in the Building Products (Safety) Act 2017.

Note: The following matters are prescribed by section 59(2) of the Contaminated Land Management Act 1997.

The land to which the certificate relates is the subject of the following site audit statement(s) within the meaning of the Contaminated Land Management Act 1997.

1. Site Audit Statement No. WRR15 (30/10/1998) produced by William R Ryall of Gutteridge Haskins & Davey Pty Ltd
2. Site Audit Statement No. WRR15A (27/09/02) produced by William R Ryall of Contamination Management Pty Ltd

You can contact Council's Compliance Services Unit on (02) 49742525 to obtain further information.
NOTE: Contamination information that relates to the land that is not required to be disclosed under section 59(2) Contaminated Land Management Act 1997, may be provided under a section 10.7(5) certificate.

PART 2:

ADVICE PROVIDED UNDER SECTION 10.7(5)

ATTENTION: Section 10.7(6) of the Act states that a Council shall not incur any liability in respect of advice provided in good faith pursuant to sub-section 10.7(5).

22. Outstanding Notices and Orders issued by City of Newcastle (CN).

Our records indicate that this premise IS NOT AFFECTED by a current notice or order (excluding the notices or orders mentioned in the note below).

NOTE: CN has not inspected the premises immediately prior to the issue of this certificate. It is possible that the premises are affected by matters of which we are unaware.

NOTE: This Certificate does not include any advice regarding outstanding notices or orders issued under the Environmental Planning and Assessment Act 1979 or the Local Government Act 1993. To obtain advice regarding these matters, you should lodge an application for a Certificate as to Outstanding Notices and Orders (accompanied by the appropriate fee). For further information, please contact the Customer Contact Centre on (02) 4974 2000.

23. Further consent requirements under the Newcastle Local Environmental Plan 2012.

The following provisions of the Newcastle Local Environmental Plan 2012 affect the carrying out of development on the land. These provisions are in addition to those required to be disclosed at Item 2 of this Certificate.

Refer to clause 3.1 Exempt Development of the Newcastle Local Environmental Plan 2012

Refer to clause 3.2 Complying Development of the Newcastle Local Environmental Plan 2012

Note: The Newcastle Local Environmental 2012 may have additional provisions that affect the carry out of development. Refer to the Newcastle Local Environmental 2012 for the full affect it may have on the land or obtain profession advice for more information.

24. Suspension of covenants.

Refer to 1.9A Suspension of covenants, agreements and instruments of the Newcastle Local Environmental Plan 2012.

25. Draft development control plans.

A draft development control plan DOES NOT APPLY to the land. The draft plans are exhibited pursuant to Part 3 of the Environmental Planning and Assessment Regulation 2000.

26. Heritage Act 1977.

The land IS NOT AFFECTED by a listing on the State Heritage Register or an Interim Heritage Order that is in force under the Heritage Act 1977.

NOTE: The above advice is provided to the extent that CN has been notified by the Heritage Council of NSW. For up-to-date details, contact the Office of Environment and Heritage, PO Box A290, South Sydney NSW 1232 Ph: (02) 9995 5000.

27. Listing by National Trust of Australia.

The land IS NOT AFFECTED by a listing of the National Trust of Australia (NSW).

NOTE: The above advice is provided to the extent that CN has been notified by the National Trust of Australia (NSW). For up-to-date details, contact the National Trust Ph 02 9258 0123.

28. Australian Heritage Database.

The land IS NOT AFFECTED by a listing on the Australian Heritage Database.

NOTE: The above advice is provided to the extent that CN has been notified by the Department of the Environment. For up-to-date details, contact the Department of the Environment, Heritage, King Edward Terrace, Parkes ACT 2600. Ph (02) 6274 1111.

29. Environment Protection & Biodiversity Conservation Act 1999 (Cth)

Under the (Commonwealth) Environment Protection and Biodiversity Conservation Act 1999, actions which have, may have or are likely to have, a significant impact on a matter of national environmental significance may be taken only with the approval of the Commonwealth Minister for the Environment.

Approval is also required for actions that have a significant effect on the environment of Commonwealth land. These actions may be on Commonwealth land or other land.

This approval is in addition to any approvals under the (NSW) Environmental Planning and Assessment Act 1979 or other NSW legislation.

Matters of national environmental significance are:

- declared World Heritage areas
- declared Ramsar wetlands
- listed threatened species and ecological communities
- listed migratory species
- nuclear actions
- the environment of Commonwealth marine areas.

Locations within the City of Newcastle that are a declared Ramsar wetland include Kooragang Nature Reserve and Shortland Wetlands. Listed threatened species and listed migratory species are known to occur within the City of Newcastle.

30. Other matters

The land is affected by the following:

Newcastle earthquake

Earthquakes occurred in the vicinity of Newcastle on 28th December 1989 and 6 August 1994. Buildings on the land may have suffered damage as a consequence of the earthquakes. Prospective purchasers are advised to make their own enquiries as to whether the property is affected by any damage.

Local Planning Strategy

The Local Planning Strategy is the principal land use strategy for Newcastle. It was adopted by the Council on 28 July 2015. The Strategy is taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Note: Refer to our website to view the document. www.newcastle.nsw.gov.au

Lower Hunter Regional Strategy (2006 - 2031)

The Lower Hunter Regional Strategy has been prepared by the Department of Planning and Infrastructure. The contents of the strategy will be taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Note: Refer to our website to view the document. www.newcastle.nsw.gov.au

Newcastle City-Wide Floodplain Risk Management Study and Plan (2012)

The Newcastle City-wide Floodplain Risk Management Study and Plan addresses flood management for the City of Newcastle. The Study and Plan will be taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Note: Refer to our website to view the document. www.newcastle.nsw.gov.au

Parking permit policy

This property is within the Permit Exclusion Area of the City Centre Parking Strategy adopted by Council on 25 June 2002 and updated on 16 May 2005. Residents within the Permit Exclusion Area are not eligible for resident parking permit stickers. For further information please contact Parking Services Coordinator Michael Heather on 4974 5008.

Contaminated land information

Council records indicate that this land has been identified as being affected by soil or groundwater contamination. Recommendations have been made regarding restrictions or special conditions over the use or development of the land. Council is in possession of the following management plan(s) which apply to the land:

1. Report: AGC Woodward-Clyde Pty Ltd (14 January 1999) Environmental Management Plan - Honeysuckle Development Newcastle, prepared for NSW Department of Public Works and Services, Project No. A8600476.

Council is in possession of the following contaminated land document(s) which relate to the land. Persons relying on the certificate are advised to examine and consider the contents of each document:

1. Report: ICF Pty. Ltd. March 1994, Human Health Risk Assessment for the Honeysuckle Redevelopment, prepared for Honeysuckle Development Corporation.
2. Report: Woodward-Clyde, May 1996, Honeysuckle Redevelopment Remediation Strategy Civic/Honeysuckle Precincts. Project No. A8600476/001
3. Report: Woodward-Clyde, January 1997, Honeysuckle Redevelopment Remediation Strategy Civic/Honeysuckle Precincts. Project No. A8600476/001
4. Report: Robert Carr & Associates Pty Ltd (October 1998) Geochemical Investigation Lot HB5c Honeysuckle Redevelopment Newcastle, NSW Report No. 1013
5. Report: Robert Carr & Associates Pty Ltd (October 1998) Geochemical Investigation Lot HB5d Honeysuckle Redevelopment Newcastle, NSW Report No. 1013.
6. Report: Environmental Site Audit Report (30/10/1998) Honeysuckle Redevelopment Site HB5A, produced by William R Ryall of Gutteridge Haskins & Davey Pty Ltd.
7. Report: Summary Site Audit Report - Lot 3 in DP883474, Honeysuckle Drive, Newcastle (27 September 2002) Produced by William Ryall of Contamination Australia Pty Ltd.
8. Report: Summary Site Audit Statement No. WRR15A (27/09/2002) produced by William R Ryall of Contamination Management Pty Ltd.

Persons relying on the certificate are advised to make their own investigations as to whether the land is affected by elevated concentrations of soil or groundwater contaminants in relation to proposed purchase or use of land.

Issued without alterations or additions, 21/01/19
Authorised by
JEREMY BATH
CHIEF EXECUTIVE OFFICER

Appendix E – Groundwater Search

All Groundwater Map

bookmark this page

All data times are Eastern Standard Time

Map | Info



Scale = 1 : 3385

WaterNSW
Work Summary

GW201489

Licence:
Licence Status:

Authorised Purpose(s):
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method: Auger - Hollow Flight
Owner Type: Local Govt

Commenced Date:
Completion Date: 12/01/2011
Final Depth: 5.00 m
Drilled Depth: 5.00 m

Contractor Name: (None)
Driller: Peter James Stewart
Assistant Driller: Mark Davis

Property:
GWMA:
GW Zone:
Standing Water Level (m): 2.000
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCASTLE	4//1010675
Licensed:			

Region: 20 - Hunter
River Basin: 210 - HUNTER RIVER
Area/District:
CMA Map: 9232-2S
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6356135.000
Easting: 385315.000
Latitude: 32°55'37.3"S
Longitude: 151°46'24.1"E

GS Map: -
MGA Zone: 56
Coordinate Source: GIS - Geogra

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	5.00	200			Auger - Hollow Flight
1		Annulus	Drill Cuttings	0.00	1.50	200	61		
1		Annulus	Bentonite	1.50	1.90	200	61		
1		Annulus	Waterworn/Rounded	1.90	5.00	200	61		Graded, PL:Tremie Pipe
1	1	Casing	Pvc Class 9	0.00	5.00	61	49		Seated on Bottom, Screwed
1	1	Opening	Slots	2.00	5.00	61		0	Mechanically Slotted, PVC Class 9, Screwed, A: 3.00mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
2.00	5.00	3.00	Unknown	2.00					

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	1.60	1.60	Fill, sandy silty, dark brown	Fill	
1.60	2.50	0.90	Sand, natural, white, fine to medium	Sand	
2.50	4.50	2.00	Sand, ginger brown, fine/coarse, with rounded gravels with some organic material & shell present	Sand	
4.50	5.00	0.50	Clay, marine, grey	Clay	

Remarks

12/01/2011: Form A Remarks:
Nat Carling, 17-Apr-2012; Coordinates based on location map provided with the Form-A.

***** End of GW201489 *****

Warning To Clients: This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW201490

Licence:
Licence Status:

Authorised Purpose(s):
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method: Auger - Hollow Flight
Owner Type: Local Govt

Commenced Date:
Completion Date: 12/01/2011
Final Depth: 4.50 m
Drilled Depth: 4.50 m

Contractor Name: (None)
Driller: Peter James Stewart
Assistant Driller: Mark Davis

Property:
GWMA:
GW Zone:
Standing Water Level (m): 2.000
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCASTLE	4//1010675
Licensed:			

Region: 20 - Hunter
River Basin: 210 - HUNTER RIVER
Area/District:
CMA Map: 9232-2S
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6356140.000
Easting: 385380.000
Latitude: 32°55'37.2"S
Longitude: 151°46'26.6"E

GS Map: -
MGA Zone: 56
Coordinate Source: GIS - Geogra

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	4.50	200			Auger - Hollow Flight
1		Annulus	Drill Cuttings	0.00	1.50	200	61		PL:Tremie Pipe
1		Annulus	Bentonite	1.50	1.90	200	61		PL:Tremie Pipe
1		Annulus	Waterworn/Rounded	1.90	4.50	200	61		Graded, PL:Tremie Pipe
1	1	Casing	Pvc Class 9	2.00	4.50	61	49		Seated on Bottom, Screwed
1	1	Opening	Slots	2.00	4.50	61		0	Mechanically Slotted, PVC Class 9, Screwed, A: 3.00mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
2.00	4.50	2.50	Unknown	2.00					

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	1.50	1.50	Fill, sandy silty, dark brown	Fill	
1.50	2.50	1.00	Sand, natural, white, fine to medium grained	Sand	
2.50	4.50	2.00	Sand, ginger brown, fine/coarse, with rounded gravels with some orangic material & shell present	Sand	

Remarks

12/01/2011: Form A Remarks:
Nat Carling, 17-Apr-2012; Coordinates based on location map provided with the Form-A.

***** End of GW201490 *****

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WaterNSW
Work Summary

GW201491

Licence:
Licence Status:

Authorised Purpose(s):
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method: Auger - Hollow Flight
Owner Type: Local Govt

Commenced Date:
Completion Date: 12/01/2011
Final Depth: 4.50 m
Drilled Depth: 4.50 m

Contractor Name: (None)
Driller: Peter James Stewart
Assistant Driller: Mark Davis

Property:
GWMA:
GW Zone:
Standing Water Level (m): 2.000
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCASTLE	4//1010675
Licensed:			

Region: 20 - Hunter
River Basin: 210 - HUNTER RIVER
Area/District:
CMA Map: 9232-2S
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6356085.000
Easting: 385320.000
Latitude: 32°55'38.9"S
Longitude: 151°46'24.3"E

GS Map: -
MGA Zone: 56
Coordinate Source: GIS - Geogra

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	4.50	200			Auger - Hollow Flight
1		Annulus	Drill Cuttings	0.00	1.50	200	61		PL:Tremie Pipe
1		Annulus	Bentonite	1.50	1.90	200	61		PL:Tremie Pipe
1		Annulus	Waterworn/Rounded	1.90	4.50	200	61		Graded, PL:Tremie Pipe
1	1	Casing	Pvc Class 9	0.00	4.50	61	49		Seated on Bottom, Screwed
1	1	Opening	Slots	2.00	4.50	61		0	Mechanically Slotted, PVC Class 9, Screwed, A: 3.00mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
2.00	4.50	2.50	Unknown	2.00					

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	1.50	1.50	Fill, sandy/silty, dark brown	Fill	
1.50	2.50	1.00	Sand, natural white, fine to medium	Sand	
2.50	4.50	2.00	Sand, ginger brown, fine to coarse, with rounded gravels with some organic material & shell present	Sand	

Remarks

12/01/2011: Form A Remarks:
Nat Carling, 17-Apr-2012; Coordinates based on location map provided with the Form-A.

***** End of GW201491 *****

Warning To Clients: This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

Appendix F – Contaminated Land Search

Search results

Your search for: Suburb: NEWCASTLE

Matched 23 notices relating to 2 sites.

Search Again Refine Search

Suburb	Address	Site Name	Notices related to this site
NEWCASTLE	Bound by Hunter River, Selwyn Street & Industrial DRIVE	BHP Steelworks (Closure site)	9 current and 13 former
NEWCASTLE	26-28 Honeysuckle DRIVE	Reclaimed Land	1 former

17 January 2019

Appendix G – Borehole Logs

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Environmental Log - Borehole

Hole ID.	***BHP08***
sheet:	1 of 1
project no.	***NTLEN213472***
client:	***University of Newcastle***
date started:	***18 Dec 2018***
principal:	***APP***
date completed:	***18 Dec 2018***
project:	***HCCD***
logged by:	***SR***
location:	***16 HONEYSUCKLE DRIVE, NEWCASTLE***
checked by:	

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

equipment type: 4-6t Excavator, Excavator mounted | drilling fluid: | hole diameter : 350 mm

drilling information | **material substance**

method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	structure and additional observations
AD / N		E	0		0.5		SP	**FILL: Gravelly SAND**: fine to coarse grained, dark brown, bricks, glass, metals, pvc pipe, slag skulls.	D		**FILL**
		E	0		1.0		SW	**FILL: SAND**: fine to coarse grained, pale brown, sea shells.	D		**FILL/ RECLAIMED**
		E	0		1.5		SW	**SAND**: fine to coarse grained, pale brown, sea shells.	D		**RECLAIMED/ MARINE DEPOSITS**
					2.0			Borehole BHP08 terminated at 2.20 m Collapse			
					2.5						
					3.0						
					3.5						
					4.0						
					4.5						

CDF_0_9_06_LIBRARY.GLB rev:AR Log COF BOREHOLE: ENVIRONMENTAL NTLEN213472.GPJ <<DrawingFile>> 11-01-2019 09:43

method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- PT push tube

* bit shown by suffix e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nill

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- ALT air lift test
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- WS water sample
- HB hammer bouncing
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- PID photoionization detector
- R refusal

classification symbol & soil description based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

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Environmental Log - Borehole

Hole ID.	**BHP09**
sheet:	1 of 1
project no.	**NTLEN213472**
client:	***University of Newcastle***
principal:	***APP***
project:	***HCCD***
location:	***16 HONEYSUCKLE DRIVE, NEWCASTLE***
date started:	***18 Dec 2018***
date completed:	***18 Dec 2018***
logged by:	***SR***
checked by:	

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

equipment type: 4-6t Excavator, Excavator mounted | drilling fluid: | hole diameter : 350 mm

drilling information | **material substance**

method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	structure and additional observations
AD / N		E	0		0.0			**FILL: Gravelly SAND**: fine to medium grained, rounded to sub-angular, dark brown.	D		**FILL**
		E	0		0.5		SC	**FILL: CLAYEY SAND**: fine to coarse grained, orange brown.	D		
		E	0		1.0		SW	**FILL: SAND**: fine to coarse grained, pale brown.	D		**FILL/ RECLAIMED**
		E	0		1.5						
		E	0		2.0						
	18-12-18	E	0		2.5		SW	**SAND**: fine to coarse grained, brown.	M to W		**RECLAIMED/ MARINE DEPOSITS**
		E	0		3.0		SC	**CLAYEY SAND**: fine to coarse grained, dark grey.	W		**MARINE DEPOSITS**
		E	0		3.5						
		E	0		4.0			Borehole BHP09 terminated at 4.00 m Target depth			
					4.5						

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- PT push tube

* bit shown by suffix, e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nill

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- ALT air lift test
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- WS water sample
- HB hammer bouncing
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- PID photoionization detector
- R refusal

classification symbol & soil description based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

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Environmental Log - Borehole

Hole ID.	**BHP10**
sheet:	1 of 1
project no.	**NTLEN213472**
client:	***University of Newcastle***
principal:	***APP***
project:	***HCCD***
location:	***16 HONEYSUCKLE DRIVE, NEWCASTLE***
date started:	***18 Dec 2018***
date completed:	***18 Dec 2018***
logged by:	***SR***
checked by:	

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

equipment type: 4-6t Excavator, Excavator mounted | drilling fluid: | hole diameter : 350 mm

drilling information | **material substance**

method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	structure and additional observations
AD / N		E	0		0.5		SW	**FILL: Gravelly SAND**: fine to coarse grained, brown, dark brown, some rail ballast, brick fragments and slag skulls.	D		**FILL**
		E	0		1.0						
		E	0		1.5		SW	**FILL: SAND**: fine to coarse grained, pale brown, sea shells.			**FILL/ RECLAIMED**
		E	0		2.0						
					2.5			Borehole BHP10 terminated at 2.30 m Collapse			
					3.0						
					3.5						
					4.0						
					4.5						

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- PT push tube

* bit shown by suffix e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nill

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- ALT air lift test
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- WS water sample
- HB hammer bouncing
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- PID photoionization detector
- R refusal

classification symbol & soil description based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

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Environmental Log - Borehole

Hole ID.	**BHP11**
sheet:	1 of 1
project no.	**NTLEN213472**
client:	***University of Newcastle***
principal:	***APP***
project:	***HCCD***
location:	***16 HONEYSUCKLE DRIVE, NEWCASTLE***
date started:	***19 Dec 2018***
date completed:	***19 Dec 2018***
logged by:	***SR***
checked by:	

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

equipment type: 4-6t Excavator, Excavator mounted | drilling fluid: | hole diameter : 350 mm

drilling information | **material substance**

method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	structure and additional observations
AD, N		E	0		0.5		SW	**FILL: SAND**: fine to coarse grained, dark brown, trace large pieces of sandstone.	D		**FILL**
							Cl	**FILL: Sandy CLAY**: medium plasticity, orange brown, trace gravel.	M to <Wp		
		E	0		1.0		SW	**FILL: SAND**: fine to coarse grained, pale brown, sea shells.	M		**FILL/ RECLAIMED**
		E	0		1.5						
		E	0		2.0		SW	**SAND**: fine to coarse grained, pale brown to dark brown, sea shells.			**MARINE DEPOSITS**
	19-12-18				2.5				W		
		E	0		3.0		SC	**CLAYEY SAND**: fine to coarse grained, dark grey, sea shells.			
		E	0		3.5						
					4.0			Borehole BHP11 terminated at 3.80 m Target stratum			
					4.5						

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- PT push tube

* bit shown by suffix, e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nill

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- ALT air lift test
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- WS water sample
- HB hammer bouncing
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- PID photoionization detector
- R refusal

classification symbol & soil description based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

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Environmental Log - Borehole

Hole ID.	**BHP12**
sheet:	1 of 1
project no.	**NTLEN213472**
client:	***University of Newcastle***
principal:	***APP***
project:	***HCCD***
location:	***16 HONEYSUCKLE DRIVE, NEWCASTLE***
date started:	***18 Dec 2018***
date completed:	***18 Dec 2018***
logged by:	***SR***
checked by:	

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

equipment type: 4-6t Excavator, Excavator mounted | drilling fluid: | hole diameter : 350 mm

drilling information | **material substance**

method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	structure and additional observations
AD / N		E	0		0.5		SW	**FILL: Gravelly SAND**: fine to coarse grained, rounded to sub-angular, dark brown, trace clay.	D to M		**FILL**
		E	0		1.0		SW	**FILL: SAND**: fine to coarse grained, pale brown, sea shells.	D		**FILL/ RECLAIMED**
		E	0		1.5		SW	**SAND**: fine to coarse grained, pale brown to orange brown, sea shells.	M		**MARINE DEPOSITS**
	18-12-18	E	0		2.0						
		E	0		2.5				W		
					3.0		SC	**CLAYEY SAND**: fine to coarse grained, grey.			
					3.5			Borehole BHP12 terminated at 3.30 m Collapse			
					4.0						
					4.5						

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- PT push tube

* bit shown by suffix e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nill

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- ALT air lift test
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- WS water sample
- HB hammer bouncing
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- PID photoionization detector
- R refusal

classification symbol & soil description based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

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Environmental Log - Borehole

Hole ID.	**BHP13**
sheet:	1 of 1
project no.	**NTLEN213472**
client:	***University of Newcastle***
date started:	***18 Dec 2018***
principal:	***APP***
date completed:	***18 Dec 2018***
project:	***HCCD***
logged by:	***SR***
location:	***16 HONEYSUCKLE DRIVE, NEWCASTLE***
checked by:	

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

equipment type: 4-6t Excavator, Excavator mounted | drilling fluid: | hole diameter : 350 mm

drilling information | **material substance**

method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	structure and additional observations
AD / N		E	0		0.5		SW	**FILL: Gravelly SAND**: fine to coarse grained, rounded to sub-angular, brown, metal pipe in borehole wall @ 0.5m bgs.	D		**FILL**
		E	0		1.0		SW	**FILL: SAND**: fine to coarse grained, pale brown, sea shells.	D to M		**FILL/ RECLAIMED**
		E	0		1.5		SW	**SAND**: fine to coarse grained, pale brown to dark brown, sea shells.	M to W		**MARINE DEPOSITS**
	18-12-18	E	0		2.0						
					2.5				W		
					3.0		SC	**CLAYEY SAND**: fine to coarse grained, dark brown to grey, sea shells.			
								Borehole BHP13 terminated at 3.10 m Collapse			
					3.5						
					4.0						
					4.5						

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- PT push tube

* bit shown by suffix, e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nill

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- ALT air lift test
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- WS water sample
- HB hammer bouncing
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- PID photoionization detector
- R refusal

classification symbol & soil description based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

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Environmental Log - Borehole

Hole ID.	**BHP14**
sheet:	1 of 1
project no.	**NTLEN213472**
client:	***University of Newcastle***
principal:	***APP***
project:	***HCCD***
location:	***16 HONEYSUCKLE DRIVE, NEWCASTLE***
date started:	***19 Dec 2018***
date completed:	***19 Dec 2018***
logged by:	***SR***
checked by:	

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

equipment type: 4-6t Excavator, Excavator mounted | drilling fluid: | hole diameter : 350 mm

drilling information | **material substance**

method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	structure and additional observations
AD, N		E	0		0.0		SW	**FILL: Gravelly SAND**: fine to coarse grained, sub-rounded to angular, dark brown.	D		**FILL**
					0.5		SW	**FILL: SAND**: fine to coarse grained, pale brown, sea shells.			**FILL/ RECLAIMED**
		E	0		1.0				D to M		
					1.5						
		E	0		2.0		SW	**SAND**: fine to coarse grained, pale brown, sea shells.	M		**MARINE DEPOSITS**
	19-12-18	E	14.5		2.5				W		
					3.0		SC	**CLAYEY SAND**: fine to coarse grained, dark grey.			
		E	0		3.5						
					4.0			Borehole BHP14 terminated at 4.00 m Target depth			
					4.5						

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- PT push tube

* bit shown by suffix e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nill

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- ALT air lift test
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- WS water sample
- HB hammer bouncing
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- PID photoionization detector
- R refusal

classification symbol & soil description based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

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Environmental Log - Borehole

Hole ID.	**BHP15**
sheet:	1 of 1
project no.	**NTLEN213472**
client:	***University of Newcastle***
date started:	***19 Dec 2018***
principal:	***APP***
date completed:	***19 Dec 2018***
project:	***HCCD***
logged by:	***SR***
location:	***16 HONEYSUCKLE DRIVE, NEWCASTLE***
checked by:	

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

equipment type: 4-6t Excavator, Excavator mounted | drilling fluid: | hole diameter : 350 mm

drilling information | **material substance**

method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	classification symbol	material description (**SOIL TYPE**: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	structure and additional observations
AD, N		E	0		0.5		SW	**FILL: Gravelly SAND**: fine to coarse grained, sub-rounded to angular, brown to black, trace black slag skulls, trace brick pieces, sheet metal and reo bars, traces of sandy clay.	D		**FILL**
		E	15.1		1.0				M		
		E	0		1.5		SW	**FILL: SAND**: fine to coarse grained, pale brown, sea shells.	M to W		**FILL/ RECLAIMED**
	19-12-18				2.0		SW	**SAND**: fine to coarse grained, pale brown, trace orange brown, sea shells.			**MARINE DEPOSITS**
		E	0		2.5				W		
								Borehole BHP15 terminated at 2.80 m Collapse			
					3.0						
					3.5						
					4.0						
					4.5						

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- PT push tube

* bit shown by suffix
e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nill

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- ALT air lift test
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- WS water sample
- HB hammer bouncing
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- PID photoionization detector
- R refusal

classification symbol & soil description
based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

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Environmental Log - Borehole

Hole ID.	**BHP16**
sheet:	1 of 1
project no.	**NTLEN213472**
client:	***University of Newcastle***
principal:	***APP***
project:	***HCCD***
location:	***16 HONEYSUCKLE DRIVE, NEWCASTLE***
date started:	***19 Dec 2018***
date completed:	***19 Dec 2018***
logged by:	***SR***
checked by:	

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

equipment type: 4-6t Excavator, Excavator mounted | drilling fluid: | hole diameter : 350 mm

drilling information | **material substance**

method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	structure and additional observations
AD / N		E	0				GP	**FILL: Sandy GRAVEL**: fine to coarse grained, rounded to sub-angular, orange brown to brown.	D		**FILL**
							SW	**FILL: SAND**: fine to medium grained, dark brown, trace gravel.	D		
					0.5		SW	**FILL: SAND**: fine to coarse grained, pale brown, sea shells.	D		**FILL/ RECLAIMED**
		E	0								
					1.0						
					1.5						
		E	0				SW	**SAND**: fine to coarse grained, pale brown to pale grey, increase in sea shells.	D to M		**MARINE DEPOSITS**
	19-12-18				2.0				M to W		
					2.5		SW	**SAND**: fine to coarse grained, pale brown to pale grey, traces of pale grey sand, aboriginal artifact found @ 3.0-3.2m bgs.			
		E	0		3.0						
								Borehole BHP16 terminated at 3.20 m			
					3.5						
					4.0						
					4.5						

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- PT push tube

* bit shown by suffix
e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nill

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- ALT air lift test
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- WS water sample
- HB hammer bouncing
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- PID photoionization detector
- R refusal

classification symbol & soil description
based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

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Environmental Log - Borehole

Hole ID.	**BHP18**
sheet:	1 of 1
project no.	**NTLEN213472**
client:	***University of Newcastle***
principal:	***APP***
project:	***HCCD***
location:	***16 HONEYSUCKLE DRIVE, NEWCASTLE***
date started:	***19 Dec 2018***
date completed:	***19 Dec 2018***
logged by:	***SR***
checked by:	

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

equipment type: 4-6t Excavator, Excavator mounted | drilling fluid: | hole diameter : 350 mm

drilling information | **material substance**

method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	structure and additional observations
AD / N		E	0		0.5		SW	**FILL: Gravelly SAND**: fine to coarse grained, sub-rounded to sub-angular, dark brown to black.	M		**FILL**
		E	0		1.0		SW	**FILL: SAND**: fine to coarse grained, pale brown, sea shells.	M		**FILL/ RECLAIMED**
		E	0		2.0		SW	**SAND**: fine grained, orange brown to pale brown, sea shells.			**MARINE DEPOSITS**
	19-12-18	E	0		2.5		SW	**SAND**: fine to coarse grained, dark brown, sea shells, becoming clayey sand.	W		
		E	0		3.0		SC	**CLAYEY SAND**: fine to coarse grained, dark grey.			
					3.5						
					4.0			Borehole BHP18 terminated at 4.00 m Target depth			
					4.5						

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- PT push tube

* bit shown by suffix, e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nill

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- ALT air lift test
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- WS water sample
- HB hammer bouncing
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- PID photoionization detector
- R refusal

classification symbol & soil description based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

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Environmental Log - Borehole

Hole ID.	**BHP19**
sheet:	1 of 1
project no.	**NTLEN213472**
client:	***University of Newcastle***
date started:	***19 Dec 2018***
principal:	***APP***
date completed:	***19 Dec 2018***
project:	***HCCD***
logged by:	***SR***
location:	***16 HONEYSUCKLE DRIVE, NEWCASTLE***
checked by:	

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

equipment type: 4-6t Excavator, Excavator mounted | drilling fluid: | hole diameter : 350 mm

drilling information | **material substance**

method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	structure and additional observations
AD / N	19-12-18 ▽	E	0		0.5		SW	**FILL: Gravelly SAND**: fine to coarse grained, dark brown, trace rootlets, glass, metal, some slag skulls.	D to M		**FILL**
		E	0		1.0		GP	**FILL: GRAVEL**: coarse grained, red brown to orange brown, black slag skulls.	M to W		
		E	0		1.5						
					2.0		SP	**FILL: SAND**: fine grained, grey, trace sea shells.	W		
		E	0		2.5		SW	**SAND**: fine to coarse grained, pale brown.			**MARINE DEPOSITS**
					3.0		SC	**CLAYEY SAND**: fine to coarse grained, grey, trace sea shells.			
		E	0		3.5			Borehole BHP19 terminated at 3.50 m Collapse			
					4.0						
					4.5						

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- PT push tube

* bit shown by suffix, e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nill

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- ALT air lift test
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- WS water sample
- HB hammer bouncing
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- PID photoionization detector
- R refusal

classification symbol & soil description based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

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Environmental Log - Borehole

Hole ID.	**BHP20**
sheet:	1 of 1
project no.	**NTLEN213472**
client:	***University of Newcastle***
principal:	***APP***
project:	***HCCD***
location:	***16 HONEYSUCKLE DRIVE, NEWCASTLE***
date started:	***18 Dec 2018***
date completed:	***18 Dec 2018***
logged by:	***SR***
checked by:	

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

equipment type: 4-6t Excavator, Excavator mounted | drilling fluid: | hole diameter : 350 mm

drilling information | **material substance**

method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	structure and additional observations
		E	0				GP	**FILL: Sandy GRAVEL**: fine to coarse grained, sub-rounded to angular, brown to dark brown, trace rail ballast.	D		**FILL**
		E	0		0.5						
		E	0		1.0		SP	**FILL: SAND**: fine to medium grained, dark brown to brown, trace sub-rounded to sub-angular gravel.	D		**FILL/ RECLAIMED**
		E	0		1.5						
		E	0		2.0		SP	**SAND**: fine to medium grained, pale brown.	D		**MARINE DEPOSITS**
		E	0		2.5		SP	**SAND**: fine to medium grained, pale brown, sea shells, trace rounded to sub-angular pebbles.	M to W		
	18-12-18	E	0				SW	**CLAYEY SAND**: fine to coarse grained, grey to dark grey, sea shells, trace mud stone pebbles, aboriginal artifact found @ 3.0m bgs.	W		
					3.0			Borehole BHP20 terminated at 3.00 m			
					3.5						
					4.0						
					4.5						

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method

AD	auger drilling*
AS	auger screwing*
HA	hand auger
W	washbore
PT	push tube
*	bit shown by suffix
e.g.	AD/T
B	blank bit
T	TC bit
V	V bit

support

M	mud
C	casing
N	nill

water

10-Oct-12 water level on date shown
water inflow
water outflow

samples & field tests

ALT	air lift test
B	bulk disturbed sample
D	disturbed sample
E	environmental sample
SS	split spoon sample
U##	undisturbed sample ##mm diameter
WS	water sample
HB	hammer bouncing
N	standard penetration test (SPT)
N*	SPT - sample recovered
Nc	SPT with solid cone
PID	photoionization detector
R	refusal

classification symbol & soil description
based on Unified Classification System

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
Wl	liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

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Environmental Log - Monitoring Well

Hole ID.	***MW01***
sheet:	1 of 1
project no.	***NTLEN213472***
client:	***University of Newcastle***
date started:	***09 Jan 2019***
principal:	***APP***
date completed:	***09 Jan 2019***
project:	***HCCD***
logged by:	***SR***
location:	***16 HONEYSUCKLE DRIVE, NEWCASTLE***
checked by:	

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

equipment type: Geoprobe, Track mounted | drilling fluid: | hole diameter : 100 mm

drilling information | **material substance**

method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	structure and additional observations
PT	09-01-19 ▽	E			0.0		SW	**FILL: Gravelly SAND**: fine to coarse grained, rounded to sub-angular, brown, metal pipe in borehole wall approximate @0.5 mbgs.	D		**FILL**
					1.0		SW	**FILL: SAND**: fine to coarse grained, pale brown, sea shells.			**FILL/ RECLAIMED**
		E			2.0		SW	**SAND**: fine to coarse grained, pale brown, sea shells.	M		**MARINE DEPOSITS**
		E			3.0		SC	**CLAYEY SAND**: fine to coarse grained, dark grey, trace sea shells.	W		
		E			4.0		SW	**SAND**: fine to coarse grained, grey.			
		E			5.0		SW	**SAND**: fine to coarse grained, dark grey, marine sediment.			
					6.0			Monitoring Well MW01 terminated at 6.00 m Target depth			
					7.0						

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- PT push tube

* bit shown by suffix
e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nill

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- ALT air lift test
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- WS water sample
- HB hammer bouncing
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- PID photoionization detector
- R refusal

classification symbol & soil description
based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

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Environmental Log - Monitoring Well

Hole ID.	***MW02***
sheet:	1 of 1
project no.	***NTLEN213472***
client:	***University of Newcastle***
date started:	***09 Jan 2019***
principal:	***APP***
date completed:	***09 Jan 2019***
project:	***HCCD***
logged by:	***SR***
location:	***16 HONEYSUCKLE DRIVE, NEWCASTLE***
checked by:	

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

equipment type: Geoprobe, Track mounted | drilling fluid: | hole diameter : 100 mm

drilling information | **material substance**

method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	structure and additional observations
PT							SW	**FILL: SAND**: fine to coarse grained, dark brown, trace gravel, trace pieces of sandstone.	D		**FILL**
							Cl	**FILL: Sandy CLAY**: medium plasticity, orange brown, trace gravel.			
					1.0		SW	**FILL**: fine to coarse grained, pale brown, sea shells.			**FILL/ RECLAIMED**
					2.0		SW	**SAND**: fine to coarse grained, pale brown, sea shells.			**MARINE DEPOSITS**
		E									
					3.0		SC	**CLAYEY SAND**: fine to coarse grained, dark grey, trace sea shells.	M		
	09-01-19 ▽	E							W		
					4.0						
		E			5.0						
							SW	**SAND**: fine to coarse grained, grey, marine sediment.			
		E			6.0						
								Monitoring Well MW02 terminated at 6.00 m Target depth			
					7.0						

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- PT push tube

* bit shown by suffix
e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nill

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- ALT air lift test
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- WS water sample
- HB hammer bouncing
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- PID photoionization detector
- R refusal

classification symbol & soil description
based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

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Environmental Log - Monitoring Well

Hole ID.	***MW03***
sheet:	1 of 1
project no.	***NTLEN213472***
client:	***University of Newcastle***
date started:	***09 Jan 2019***
principal:	***APP***
date completed:	***09 Jan 2019***
project:	***HCCD***
logged by:	***SR***
location:	***16 HONEYSUCKLE DRIVE, NEWCASTLE***
checked by:	

position: Not Specified | surface elevation: Not Specified | angle from horizontal: 90°

equipment type: Geoprobe, Track mounted | drilling fluid: | hole diameter : 100 mm

drilling information | **material substance**

method & support	water	samples & field tests	photoionization detector (ppmv)	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	structure and additional observations
PT	09-01-19 ▽	E			1.0		SW	**FILL: Gravelly SAND**: fine to coarse grained, sub-rounded to angular, dark brown.	D		**FILL**
							SW	**FILL: SAND**: fine to coarse grained, pale brown, sea shells.			**FILL/ RECLAIMED**
					2.0		SW	**SAND**: fine to coarse grained, pale brown, sea shells, increase in shells with orange brown sand @2.5mbgs.	D to M M		**MARINE DEPOSITS**
		E			3.0		SC	**CLAYEY SAND**: fine to coarse grained, dark grey, pocket of shells @4.4 to 4.6.	W		
		E			4.0		SW	**SAND**: fine to coarse grained, pale brown, becoming pale grey @ 5.0mbgs.			
		E			5.0						
		E			6.0			Monitoring Well MW03 terminated at 6.00 m Target depth			
					7.0						

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method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- PT push tube

* bit shown by suffix
e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nill

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- ALT air lift test
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- WS water sample
- HB hammer bouncing
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- PID photoionization detector
- R refusal

classification symbol & soil description
based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

Appendix H – Analytical Results Tables

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Table LR1
Health Investigation Levels
HCCD - Site 1
754-NTLEN213472

						Field_ID	BHE1	BHE1	BHE1	BHE1	BHE2	BHE2	BHE2	BHE3	BHE3	BHE3	BHE3	BHE4	BHE4	BHE4	BHE5	BHE5	BHE5	BHE6	BHE6	BHE6	BHE7	BHE7	BHE7
						Sample_Depth_Range	0.4-0.5	0.8-0.9	1.4-1.5	2.9-3.0	0.4-0.5	0.9-1.0	2.9-3.0	0.4-0.5	1.0-1.1	1.1-1.2	2.9-3.0	0.4-0.5	1.6-1.7	2.9-3.0	0.6-0.7	1.1-1.2	2.9-3.0	0.4-0.5	0.8-0.9	2.9-3.0	0.5-0.6	2.0-2.1	2.9-3.0
						Sampled_Date-Time	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
						Matrix_Description	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
				NEPM 2013 HILs Residential A Soil[1]	NEPM 2013 HILs Residential B Soil[2]	NEPM 2013 HILs Recreational C Soil[3]	NEPM 2013 HILs Commercial/ industrial D Soil[4]																						
Method_Type	ChemName	Units	EQL																									
Heavy Metal	Arsenic	mg/kg	2	100	500	300	3000	<5	<5	<5	<5	9	<5	6	<5	<5	<5	<5	31	42	7	22	7	<5	10	10	<5	10	<5	<5
	Cadmium	mg/kg	0.4	20	150	90	900	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	1.2	0.6	0.6	<0.5	<0.5	0.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Chromium	mg/kg	5					12	11	<5	<5	11	<5	<5	16	16	<5	<5	6	21	<5	<5	<5	<5	<5	<5	<5	7	<5	<5
	Copper	mg/kg	5	6000	30000	17000	240000	63	7	<5	<5	100	<5	16	83	19	10	34	56	170	39	100	<5	9	330	6	<5	310	17	6
	Lead	mg/kg	5	300	1200	600	1500	54	12	<5	<5	390	15	20	120	49	30	<5	59	480	350	110	<5	11	230	7	15	1800	22	8
	Mercury	mg/kg	0.1	40	120	80	730	0.05	<0.05	<0.05	<0.05	0.12	<0.05	<0.05	0.17	<0.05	<0.05	<0.05	<0.05	0.15	0.1	0.08	<0.05	0.12	0.08	<0.05	0.13	<0.05	<0.05	<0.05
	Nickel	mg/kg	5	400	1200	1200	6000	4	<2	<2	<2	9	<2	<2	6	2	<2	<2	6	18	<2	5	<2	<2	6	<2	<2	23	3	<2
	Zinc	mg/kg	5	7400	60000	30000	400000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Magnanese	mg/kg						<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Inorganic	Moisture Content (dried @ 103°C)	%	1					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OCP	4,4-DDE	mg/kg	0.05					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	a-BHC	mg/kg	0.05					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Aldrin	mg/kg	0.05					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Aldrin + Dieldrin	mg/kg	0.05	6	10	10	45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	b-BHC	mg/kg	0.05					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chlordane	mg/kg	0.1	50	90	70	530	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	d-BHC	mg/kg	0.05					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	DDD	mg/kg	0.05					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	DDT	mg/kg	0.05					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	DDT+DDE+DDD	mg/kg	0.05	240	600	400	3600	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dieldrin	mg/kg	0.05					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Endosulfan I	mg/kg	0.05					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Endosulfan II	mg/kg	0.05					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Endosulfan sulphate	mg/kg	0.05					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Endrin	mg/kg	0.05	10	20	20	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Endrin aldehyde	mg/kg	0.05					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Endrin ketone	mg/kg	0.05					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	g-BHC (Lindane)	mg/kg	0.05					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Heptachlor	mg/kg	0.05	6	10	10	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Heptachlor epoxide	mg/kg	0.05					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hexachlorobenzene	mg/kg	0.05	10	15	10	80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Methoxychlor	mg/kg	0.2	300	500	400	2500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Toxaphene	mg/kg	1	20	30	30	160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Vic EPA IWRG 621 OCP (Total)*	MG/KG	0.1					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Vic EPA IWRG 621 Other OCP (Total)*	MG/KG	0.1					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Organic	Naphthalene	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	F2-NAPHTHALENE	mg/kg	50					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	C6 - C9	mg/kg	20					<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	C10 - C40 (Sum of total)	mg/kg	100					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	C6-C10 less BTEX (F1)	mg/kg	20					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	C10-C16	mg/kg	50					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	C16-C34	mg/kg	100					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	C34-C40	mg/kg	100					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	C6 - C10	mg/kg	20					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAH	Acenaphthene	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Acenaphthylene	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Anthracene	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(a)anthracene	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(a)pyrene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	0.8	<0.5	0.8	<0.5	<0.5	<0.5
	Benzo(a)pyrene TEQ (lower bound) *	MG/KG	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(a)pyrene TEQ (medium bound) *	MG/KG	0.5	3	4	3	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(a)pyrene TEQ (upper bound) *	MG/KG	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(g,h,i)perylene	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(k)fluoranthene	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chrysene	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo[b+j]fluoranthene	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dibenz(a,h)anthracene	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fluoranthene	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fluorene	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Naphthalene	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Phenanthrene	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pyrene	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total PAHs	mg/kg	0.5	300	400	300	4000	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.6	1.4	<0.5	7.2	11	<0.5	6.6	1.8	<0.5	<0.5
PCB	Arochlor 1221	mg/kg	0.1					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Aroclor 1016	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Aroclor 1232	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Aroclor 1242	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Aroclor 1248	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Aroclor 1254	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Aroclor 1260	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PCBs (Sum of total)	mg/kg	0.5	1	1	1	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SVOC	2,4,5-trichlorophenol	mg/kg	1					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2,4,6-trichlorophenol	mg/kg	1					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2,4-dichlorophenol	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2,4-dimethylphenol	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2,4-dinitrophenol	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2,6-dichlorophenol	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2-chlorophenol	mg/kg	0.5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2-methylphenol	mg/kg	0.2					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2-nitrophenol	mg/kg	1					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3-&4-methylphenol	mg/kg	0.4					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4,6-Dinitro-2-methylphenol	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4,6-Dinitro-o-cyclohexyl phenol	mg/kg	20					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4-chloro-3-methylphenol	mg/kg	1					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4-nitrophenol	mg/kg	5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dinoseb	mg/kg	20					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pentachlorophenol	mg/kg	1	100	130	120	660	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Phenol	mg/kg	0.5	3000	45000	40000	240000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	tetrachlorophenols	mg/kg	1					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Phenols (Total Halogenated)	mg/kg	1					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Phenols (Total Non Halogenated)	mg/kg	20					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH	C10 - C14	mg/kg	20					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	C15 - C28	mg/kg	50					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	C29 - C36	mg/kg	50					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	C10 - C36 (Sum of total)	mg/kg	50					<110	<110	<110	<110	<150	<110	<110	<110	<110	<110	<110	<110	<130	<110	<110	<110	<200	500	<110	<110	240	<110	<110
Volatile	Benzene	mg/kg	0.1					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Ethylbenzene	mg/kg	0.1					<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Toluene	mg/kg	0.1					<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Xylene (m & p)	mg/kg	0.2					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Xylene (o)	mg/kg	0.1					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Xylene Total	mg/kg	0.3					<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
Asbestos	Asbestos							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Result Concentration exceeds adopted human health criteria (Residential A)
Result Concentration exceeds adopted human health criteria (Residential B)
Result Concentration exceeds adopted human health criteria (Recreational/ Open Space C)
Result Concentration exceeds adopted human health criteria (Commercial/ Industrial D)

* Not Analysed
ND No Asbestos Detected

1 NEPM (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Table 1A(1): Health Investiagtion Levels Residential A
2 NEPM (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Table 1A(1): Health Investiagtion Levels Residential B
3 NEPM (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Table 1A(1): Health Investiagtion Levels Recreational/ Open Space C
4 NEPM (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Table 1A(1): Health Investiagtion Levels Commercial/ Industrial D

coffey
A TETRA TECH COMPANY

Table LR1
Health Investigation Levels
HCCD - Site 1
754-NTLEN213472

Method_Type	ChemName	Units	EQL	NEPM 2013 HILs Residential A Soil[1]	NEPM 2013 HILs Residential B Soil[2]	NEPM 2013 HILs Recreational C Soil[3]	NEPM 2013 HILs Commercial/ industrial D Soil[4]	BHP8 0.2-0.3	BHP8 0.9-1.0	BHP9 0.2-0.5	BHP9 1.0-1.1	BHP10 0.2-0.3	BHP10 1.7-1.8	BHP11 0.2-0.3	BHP11 0.9-1.0
	Field_ID							BHP8 0.2-0.3	BHP8 0.9-1.0	BHP9 0.2-0.5	BHP9 1.0-1.1	BHP10 0.2-0.3	BHP10 1.7-1.8	BHP11 0.2-0.3	BHP11 0.9-1.0
	Sample_Depth_Range							0.2-0.3	0.9-1.0	0.2-0.5	1.0-1.1	0.2-0.3	1.7-1.8	0.2-0.3	0.9-1.0
	Sampled_Date-Time							18-Dec-18	18-Dec-18	18-Dec-18	18-Dec-18	18-Dec-18	18-Dec-18	19-Dec-18	19-Dec-18
	Matrix_Description							Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Heavy Metal	Arsenic	mg/kg	2	100	500	300	3000	10	22	11	2.7	15	3.1	6.8	4.6
	Cadmium	mg/kg	0.4	20	150	90	900	0.4	3.6	2.3	<0.4	<0.4	<0.4	<0.4	<0.4
	Chromium	mg/kg	5					20	20	75	<5	5.3	<5	26	19
	Copper	mg/kg	5	6000	30000	17000	240000	200	380	120	<5	150	<5	71	57
	Lead	mg/kg	5	300	1200	600	1500	740	640	230	6.1	210	15	32	42
	Mercury	mg/kg	0.1	40	120	80	730	0.2	0.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Nickel	mg/kg	5	400	1200	1200	6000	13	19	9.6	<5	7.8	<5	<5	<5
	Zinc	mg/kg	5	7400	60000	30000	400000	320	870	430	<5	240	15	27	31
	Magnanese	mg/kg						-	-	-	-	-	-	-	-
Inorganic	Moisture Content (dried @ 103°C)	%	1					8.9	8.8	18	2.1	3.4	2.8	11	12
OCP	4,4-DDE	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	a-BHC	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Aldrin	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Aldrin + Dieldrin	mg/kg	0.05	6	10	10	45	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	b-BHC	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Chlordane	mg/kg	0.1	50	90	70	530	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	d-BHC	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	DDD	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	DDT	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	DDT+DDE+DDD	mg/kg	0.05	240	600	400	3600	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Dieldrin	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endosulfan I	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endosulfan II	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endosulfan sulphate	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endrin	mg/kg	0.05	10	20	20	100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endrin aldehyde	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endrin ketone	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	g-BHC (Lindane)	mg/kg	0.05					<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Heptachlor	mg/kg	0.05	6	10	10	50	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Heptachlor epoxide	mg/kg	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Hexachlorobenzene	mg/kg	0.05	10	15	10	80	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Methoxychlor	mg/kg	0.2	300	500	400	2500	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Toxaphene	mg/kg	1	20	30	30	160	<1	<1	<1	<1	<1	<1	<1	<1
	Vic EPA IWRG 621 OCP (Total)*	MG/KG	0.1					<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Vic EPA IWRG 621 Other OCP (Total)*	MG/KG	0.1					<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Organic	Naphthalene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	F2-NAPHTHALENE	mg/kg	50					<50	<50	<50	<50	<50	<50	<50	<50
	C6 - C9	mg/kg	20					<20	<20	<20	<20	<20	<20	<20	<20
	C10 - C40 (Sum of total)	mg/kg	100					940	720	<100	<100	120	<100	<100	<100
	C6-C10 less BTEX (F1)	mg/kg	20					<20	<20	<20	<20	<20	<20	<20	<20
	C10-C16	mg/kg	50					<50	<50	<50	<50	<50	<50	<50	<50
	C16-C34	mg/kg	100					800	590	<100	<100	120	<100	<100	<100
	C34-C40	mg/kg	100					140	130	<100	<100	<100	<100	<100	<100
	C6 - C10	mg/kg	20					<20	<20	<20	<20	<20	<20	<20	<20
PAH	Acenaphthene	mg/kg	0.5					6.8	2	<0.5	<0.5	<50	<0.5	<0.5	<0.5
	Acenaphthylene	mg/kg	0.5					0.9	1	<0.5	<0.5	<50	<0.5	<0.5	<0.5
	Anthracene	mg/kg	0.5					16	7	<0.5	<0.5	<50	<0.5	<0.5	<0.5
	Benzo(a)anthracene	mg/kg	0.5					30	20	<0.5	<0.5	<50	<0.5	<0.5	<0.5
	Benzo(a)pyrene	mg/kg	0.5					31	23	<0.5	<0.5	<50	<0.5	<0.5	<0.5
	Benzo(a)pyrene TEQ (lower bound) *	MG/KG	0.5					45	30	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo(a)pyrene TEQ (medium bound) *	MG/KG	0.5	3	4	3	40	45	31	0.6	0.6	61	0.6	0.6	0.6
	Benzo(a)pyrene TEQ (upper bound) *	MG/KG	0.5					45	31	1.2	1.2	120	1.2	1.2	1.2
	Benzo(g,h,i)perylene	mg/kg	0.5					20	17	<0.5	<0.5	<50	<0.5	<0.5	<0.5
	Benzo(k)fluoranthene	mg/kg	0.5					13	8.3	<0.5	<0.5	<50	<0.5	<0.5	<0.5
	Chrysene	mg/kg	0.5					27	19	<0.5	<0.5	<50	<0.5	<0.5	<0.5
	Benzo[b+j]fluoranthene	mg/kg	0.5					34	27	<0.5	<0.5	<50	<0.5	<0.5	<0.5
	Dibenz(a,h)anthracene	mg/kg	0.5					4.2	<0.5	<0.5	<0.5	<50	<0.5	<0.5	<0.5
	Fluoranthene	mg/kg	0.5					80	56	<0.5	<0.5	<50	<0.5	<0.5	<0.5
	Fluorene	mg/kg	0.5					6	2	<0.5	<0.5	<50	<0.5	<0.5	<0.5
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5					19	16	<0.5	<0.5	<50	<0.5	<0.5	<0.5
	Naphthalene	mg/kg	0.5					0.7	<0.5	<0.5	<0.5	<50	<0.5	<0.5	<0.5
	Phenanthrene	mg/kg	0.5					73	33	<0.5	<0.5	<50	<0.5	<0.5	<0.5
	Pyrene	mg/kg	0.5					75	51	<0.5	<0.5	<50	<0.5	<0.5	<0.5
	Total PAHs	mg/kg	0.5	300	400	300	4000	436.6	282.3	<0.5	<0.5	<50	<0.5	<0.5	<0.5
PCB	Arochlor 1221	mg/kg	0.1					<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Aroclor 1016	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Aroclor 1232	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Aroclor 1242	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Aroclor 1248	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Aroclor 1254	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Aroclor 1260	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	PCBs (Sum of total)	mg/kg	0.5	1	1	1	7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SVOC	2,4,5-trichlorophenol	mg/kg	1					<1	<1	<1	<1	<1	<1	<1	<1
	2,4,6-trichlorophenol	mg/kg	1					<1	<1	<1	<1	<1	<1	<1	<1
	2,4-dichlorophenol	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2,4-dimethylphenol	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2,4-dinitrophenol	mg/kg	5					<5	<5	<5	<5	<5	<5	<5	<5
	2,6-dichlorophenol	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2-chlorophenol	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2-methylphenol	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	2-nitrophenol	mg/kg	1					<1	<1	<1	<1	<1	<1	<1	<1
	3-&4-methylphenol	mg/kg	0.4					<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
	4,6-Dinitro-2-methylphenol	mg/kg	5					<5	<5	<5	<5	<5	<5	<5	<5
	4,6-Dinitro-o-cyclohexyl phenol	mg/kg	20					<20	<20	<20	<20	<20	<20	<20	<20
	4-chloro-3-methylphenol	mg/kg	1					<1	<1	<1	<1	<1	<1	<1	<1
	4-nitrophenol	mg/kg	5					<5	<5	<5	<5	<5	<5	<5	<5
	Dinoseb	mg/kg	20					<20	<20	<20	<20	<20	<20	<20	<20
	Pentachlorophenol	mg/kg	1	100	130	120	660	<1	<1	<1	<1	<1	<1	<1	<1
	Phenol	mg/kg	0.5	3000	45000	40000	240000	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	tetrachlorophenols	mg/kg	1					<1	<1	<1	<1	<1	<1	<1	<1
	Phenols (Total Halogenated)	mg/kg	1					<1	<1	<1	<1	<1	<1	<1	<1
	Phenols (Total Non Halogenated)	mg/kg	20					<20	<20	<20	<20	<20	<20	<20	<20
TPH	C10 - C14	mg/kg	20					<20	<20	<20	<20	<20	<20	<20	<20
	C15 - C28	mg/kg	50					600	420	<50	<50	87	<50	<50	<50
	C29 - C36	mg/kg	50					260	230	<50	<50	50	<50	<50	<50
	C10 - C36 (Sum of total)	mg/kg	50					860	650	<50	<50	137	<50	<50	<50
Volatile	Benzene	mg/kg	0.1					<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Ethylbenzene	mg/kg	0.1					<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Toluene	mg/kg	0.1					<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Xylene (m & p)	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Xylene (o)	mg/kg	0.1					<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Xylene Total	mg/kg	0.3					<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Asbestos	Asbestos							ND	-	ND	-	ND	-	-	-

Method_Type	ChemName	BHP12 0.2-0.3	BHP12 0.9-1.0	BHP13 0.2-0.3	BHP13 1.9-2.0	BHP14 0.2-0.3	BHP14 0.9-1.0	BHP15 0.2-0.3	BHP15 0.9-1.0	BHP16 0.0-0.2	BHP16 0.6-0.7	BHP18 0.2-0.3	BHP18 0.9-1.0	BHP19 0.1-0.3	BHP19 1.5-1.6	BHP20 0.2-0.3	BHP20 1.2-1.3	SS1	SS2
	Field_ID	BHP12 0.2-0.3	BHP12 0.9-1.0	BHP13 0.2-0.3	BHP13 1.9-2.0	BHP14 0.2-0.3	BHP14 0.9-1.0	BHP15 0.2-0.3	BHP15 0.9-1.0	BHP16 0.0-0.2	BHP16 0.6-0.7	BHP18 0.2-0.3	BHP18 0.9-1.0	BHP19 0.1-0.3	BHP19 1.5-1.6	BHP20 0.2-0.3	BHP20 1.2-1.3	SS1	SS2
	Sample_Depth_Range	0.2-0.3	0.9-1.0	0.2-0.3	1.9-2.0	0.2-0.3	0.9-1.0	0.2-0.3	0.9-1.0	0.0-0.2	0.6-0.7	0.2-0.3	0.9-1.0	0.1-0.3	1.5-1.6	0.2-0.3	1.2-1.3	0.0-0.1	0.0-0.1
	Sampled_Date-Time	18-Dec-18	18-Dec-18	18-Dec-18	18-Dec-18	19-Dec-18	19-Dec-18	19-Dec-18	19-Dec-18	19-Dec-18	19-Dec-18	19-Dec-18	19-Dec-18	19-Dec-18	19-Dec-18	18-Dec-18	18-Dec-18	19-Dec-18	19-Dec-18
	Matrix_Description	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Heavy Metal	Arsenic	14	3.4	19	8.6	96	10	83	40	91	<2	240	15	49	19	3	2.4	3.6	6.2
	Cadmium	1.1	<0.4	0.8	<0.4	<0.4	<0.4	0.7	0.8	<0.4	<0.4	1.3	<0.4	0.9	<0.4	<0.4	<0.4	<0.4	0.5
	Chromium	26	<5	5.5	<5	13	<5	17	25	17	<5	11	<5	11	<5	8.2	<5	<5	9.5
	Copper	240	<5	61	37	360	<5	1900	2600	160	<5	150	<5	1200	550	12	<5	29	59
	Lead	190	7.4	140	66	290	7.4	2200	1800	1100	7.5	1100	6.4	1000	250	44	8.8	50	120
	Mercury	<0.1	<0.1	<0.1	0.3	<0.1	<0.1	1.9	1.2	0.7	<0.1	0.5	<0.1	1.2	0.5	<0.1	<0.1	<0.1	0.8
	Nickel	13	<5	7.8	<5	18	<5	36	29	24	<5	23	<5	38	16	<5	<5	<5	6.2
	Zinc	1200	<5	190	120	160	<5	460	550	250	<5	580	21	510	270	53	<5	70	190
	Magnanese	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Inorganic	Moisture Content (dried @ 103°C)	10	19	5.6	19	9.1	5.3	17	13	6	3.1	11	4.5	15	19	7.7	23	2.8	4.4
OCP	4,4-DDE	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	a-BHC	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Aldrin	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Aldrin + Dieldrin	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	b-BHC	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Chlordane	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	d-BHC	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	DDD	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	DDT	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	DDT+DDE+DDD	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Dieldrin	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endosulfan I	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endosulfan II	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endosulfan sulphate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endrin	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endrin aldehyde	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endrin ketone	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	g-BHC (Lindane)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Heptachlor	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Heptachlor epoxide	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Hexachlorobenzene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Methoxychlor	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Toxaphene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Vic EPA IWRG 621 OCP (Total)*	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Vic EPA IWRG 621 Other OCP (Total)*	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Organic	Naphthalene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	F2-NAPHTHALENE	<50	<50	<50	<50	<50	<50	<50	86	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
	C6 - C9	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	C10 - C40 (Sum of total)	<100	<100	120	<100	<100	<100	500	789	<100	<100	690	<100	170	<100	<100	<100	4800	160
	C6-C10 less BTEX (F1)	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	C10-C16	<50	<50	<50	<50	<50	<50	<50	89	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
	C16-C34	<100	<100	120	<100	<100	<100	400	580	<100	<100	540	<100	170	<100	<100	<100	3200	160
	C34-C40	<100	<100	<100	<100	<100	<100	100	120	<100	<100	150	<100	<100	<100	<100	<100	1600	<100
	C6 - C10	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
PAH	Acenaphthene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Acenaphthylene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Anthracene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	4.4	<0.5	<0.5	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo(a)anthracene	0.9	<0.5	1.2	<0.5	0.5	<0.5	2.3	6	<0.5	<0.5	5.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
	Benzo(a)pyrene	1	<0.5	1.5	<0.5	0.7	<0.5	1.8	5	<0.5	<0.5	5.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6
	Benzo(a)pyrene TEQ (lower bound) *	1.3	<0.5	2	<0.5	0.8	<0.5	2.4	6.7	<0.5	<0.5	7.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7
	Benzo(a)pyrene TEQ (medium bound) *	1.6	0.6	2.2	0.6	1.1	0.6	2.7	6.9	0.6	0.6	7.4	0.6	0.6	0.6	0.6	0.6	0.6	1
	Benzo(a)pyrene TEQ (upper bound) *	1.8	1.2	2.5	1.2	1.4	1.2	2.9	7.2	1.2	1.2	7.6	1.2	1.2	1.2	1.2	1.2	1.2	1.3
	Benzo(g,h,i)perylene	0.8	<0.5	1.3	<0.5	0.5	<0.5	0.9	2.8	<0.5	<0.5	3.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo(k)fluoranthene	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	0.8	1.9	<0.5	<0.5	2.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Chrysene	0.9	<0.5	1.1	<0.5	<0.5	<0.5	1.8	5.4	<0.5	<0.5	5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo[b+j]fluoranthene	1.2	<0.5	1.7	<0.5	0.8	<0.5	2.2	5.4	<0.5	<0.5	6.3	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	0.8
	Dibenz(a,h)anthracene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Fluoranthene	2.3	<0.5	3	<0.5	1.2	<0.5	4.3	14	0.7	<0.5	11	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	1.3
	Fluorene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Indeno(1,2,3-c,d)pyrene	0.7	<0.5	1.1	<0.5	<0.5	<0.5	0.9	2.4	<0.5	<0.5	3.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Naphthalene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	3.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Phenanthrene	1.7	<0.5	1.4	<0.5	0.6	<0.5	4.2	19	<0.5	<0.5	6.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7
	Pyrene	2.2	<0.5	3	<0.5	1.1	<0.5	3.9	13	0.6	<0.5	10	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	1.2
	Total PAHs	11.7	<0.5	15.9	<0.5	5.4	<0.5	24.3	86.8	1.3	<0.5	60.9	<0.5	2	<0.5	<0.5	<0.5	<0.5	5.1
PCB	Arochlor 1221	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Aroclor 1016	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Aroclor 1232	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Aroclor 1242	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Aroclor 1248	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Aroclor 1254	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Aroclor 1260	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	PCBs (Sum of total)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SVOC	2,4,5-trichlorophenol	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	2,4,6-trichlorophenol	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	2,4-dichlorophenol	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2,4-dimethylphenol	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2,4-dinitrophenol	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	2,6-dichlorophenol	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2-chlorophenol	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2-methylphenol	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	2-nitrophenol	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	3-&4-methylphenol	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
	4,6-Dinitro-2-methylphenol	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	4,6-Dinitro-o-cyclohexyl phenol	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	4-chloro-3-methylphenol	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	4-nitrophenol	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	Dinoseb	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	Pentachlorophenol	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Phenol	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	tetrachlorophenols	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Phenols (Total Halogenated)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Phenols (Total Non Halogenated)	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
TPH	C10 - C14	<20	<20	<20	<20	<20	<20	<20	58	<20	<20	31	<20	<20	<20	<20	<20	<20	<20
	C15 - C28	57	<50	72	<50	51	<50	260	420	<50	<50	360	<50	110	<50	<50	<50	1500	67
	C29 - C36	<50	<50	63	<50	<50	<50	190	240	<50	<50	260	<50	83	<50	<50	<50	2600	150
	C10 - C36 (Sum of total)	57	<50	135	<50	51	<50	450	718	<50	<50	651	<50	193	<50	<50	<50	4100	217
Volatile	Benzene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Ethylbenzene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Toluene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Xylene (m & p)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Xylene (o)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Xylene Total	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Asbestos	Asbestos	ND	-	ND	-	-	-	ND	-	-	-	-	-	-	-	ND	-	ND	ND

Result	Concentration exceeds adopted human health criteria (Residential A)
Result	Concentration exceeds adopted human health criteria (Residential B)
Result	Concentration exceeds adopted human health criteria (Recreational/ Open Space C)
Result	Concentration exceeds adopted human health criteria (Commercial/ Industrial D)

- Not Analysed
ND No Asbestos Detected
1 NEPM (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Table 1A(1): Health Investiagtion Levels Re
2 NEPM (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Table 1A(1): Health Investiagtion Levels Re
3 NEPM (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Table 1A(1): Health Investiagtion Levels Re
4 NEPM (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Table 1A(1): Health Investiagtion Levels Co

Table LR1
Health Investigation Levels
HCCD - Site 1
754-NTLEN213472

							Field_ID	ACM1	ACM2	ACM3
							Sample_Depth_Range	-	-	-
							Sampled_Date-Time	19-Dec-18	19-Dec-18	19-Dec-18
							Matrix_Description	Fragment	Fragment	Fragment
				NEPM 2013 HILs Residential A Soil[1]	NEPM 2013 HILs Residential B Soil[2]	NEPM 2013 HILs Recreational C Soil[3]	NEPM 2013 HILs Commercial/ industrial D Soil[4]			
Method_Type	**ChemName**	**Units**	**EQL**							
Heavy Metal	Arsenic	mg/kg	2	100	500	300	3000	-	-	-
	Cadmium	mg/kg	0.4	20	150	90	900	-	-	-
	Chromium	mg/kg	5					-	-	-
	Copper	mg/kg	5	6000	30000	17000	240000	-	-	-
	Lead	mg/kg	5	300	1200	600	1500	-	-	-
	Mercury	mg/kg	0.1	40	120	80	730	-	-	-
	Nickel	mg/kg	5	400	1200	1200	6000	-	-	-
	Zinc	mg/kg	5	7400	60000	30000	400000	-	-	-
	Magnanese	mg/kg						-	-	-
Inorganic	Moisture Content (dried @ 103°C)	%	1					-	-	-
OCP	4,4-DDE	mg/kg	0.05					-	-	-
	a-BHC	mg/kg	0.05					-	-	-
	Aldrin	mg/kg	0.05					-	-	-
	Aldrin + Dieldrin	mg/kg	0.05	6	10	10	45	-	-	-
	b-BHC	mg/kg	0.05					-	-	-
	Chlordane	mg/kg	0.1	50	90	70	530	-	-	-
	d-BHC	mg/kg	0.05					-	-	-
	DDD	mg/kg	0.05					-	-	-
	DDT	mg/kg	0.05					-	-	-
	DDT+DDE+DDD	mg/kg	0.05	240	600	400	3600	-	-	-
	Dieldrin	mg/kg	0.05					-	-	-
	Endosulfan I	mg/kg	0.05					-	-	-
	Endosulfan II	mg/kg	0.05					-	-	-
	Endosulfan sulphate	mg/kg	0.05					-	-	-
	Endrin	mg/kg	0.05	10	20	20	100	-	-	-
	Endrin aldehyde	mg/kg	0.05					-	-	-
	Endrin ketone	mg/kg	0.05					-	-	-
	g-BHC (Lindane)	mg/kg	0.05					-	-	-
	Heptachlor	mg/kg	0.05	6	10	10	50	-	-	-
	Heptachlor epoxide	mg/kg	0.05					-	-	-
	Hexachlorobenzene	mg/kg	0.05	10	15	10	80	-	-	-
	Methoxychlor	mg/kg	0.2	300	500	400	2500	-	-	-
	Toxaphene	mg/kg	1	20	30	30	160	-	-	-
	Vic EPA IWRG 621 OCP (Total)*	MG/KG	0.1					-	-	-
	Vic EPA IWRG 621 Other OCP (Total)*	MG/KG	0.1					-	-	-
Organic	Naphthalene	mg/kg	0.5					-	-	-
	F2-NAPHTHALENE	mg/kg	50					-	-	-
	C6 - C9	mg/kg	20					-	-	-
	C10 - C40 (Sum of total)	mg/kg	100					-	-	-
	C6-C10 less BTEX (F1)	mg/kg	20					-	-	-
	C10-C16	mg/kg	50					-	-	-
	C16-C34	mg/kg	100					-	-	-
	C34-C40	mg/kg	100					-	-	-
	C6 - C10	mg/kg	20					-	-	-
PAH	Acenaphthene	mg/kg	0.5					-	-	-
	Acenaphthylene	mg/kg	0.5					-	-	-
	Anthracene	mg/kg	0.5					-	-	-
	Benzo(a)anthracene	mg/kg	0.5					-	-	-
	Benzo(a)pyrene	mg/kg	0.5					-	-	-
	Benzo(a)pyrene TEQ (lower bound) *	MG/KG	0.5					-	-	-
	Benzo(a)pyrene TEQ (medium bound) *	MG/KG	0.5	3	4	3	40	-	-	-
	Benzo(a)pyrene TEQ (upper bound) *	MG/KG	0.5					-	-	-
	Benzo(g,h,i)perylene	mg/kg	0.5					-	-	-
	Benzo(k)fluoranthene	mg/kg	0.5					-	-	-
	Chrysene	mg/kg	0.5					-	-	-
	Benzo[b+j]fluoranthene	mg/kg	0.5					-	-	-
	Dibenz(a,h)anthracene	mg/kg	0.5					-	-	-
	Fluoranthene	mg/kg	0.5					-	-	-
	Fluorene	mg/kg	0.5					-	-	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5					-	-	-
	Naphthalene	mg/kg	0.5					-	-	-
	Phenanthrene	mg/kg	0.5					-	-	-
	Pyrene	mg/kg	0.5					-	-	-
	Total PAHs	mg/kg	0.5	300	400	300	4000	-	-	-
PCB	Arochlor 1221	mg/kg	0.1					-	-	-
	Aroclor 1016	mg/kg	0.5					-	-	-
	Aroclor 1232	mg/kg	0.5					-	-	-
	Aroclor 1242	mg/kg	0.5					-	-	-
	Aroclor 1248	mg/kg	0.5					-	-	-
	Aroclor 1254	mg/kg	0.5					-	-	-
	Aroclor 1260	mg/kg	0.5					-	-	-
	PCBs (Sum of total)	mg/kg	0.5	1	1	1	7	-	-	-
SVOC	2,4,5-trichlorophenol	mg/kg	1					-	-	-
	2,4,6-trichlorophenol	mg/kg	1					-	-	-
	2,4-dichlorophenol	mg/kg	0.5					-	-	-
	2,4-dimethylphenol	mg/kg	0.5					-	-	-
	2,4-dinitrophenol	mg/kg	5					-	-	-
	2,6-dichlorophenol	mg/kg	0.5					-	-	-
	2-chlorophenol	mg/kg	0.5					-	-	-
	2-methylphenol	mg/kg	0.2					-	-	-
	2-nitrophenol	mg/kg	1					-	-	-
	3-&4-methylphenol	mg/kg	0.4					-	-	-
	4,6-Dinitro-2-methylphenol	mg/kg	5					-	-	-
	4,6-Dinitro-o-cyclohexyl phenol	mg/kg	20					-	-	-
	4-chloro-3-methylphenol	mg/kg	1					-	-	-
	4-nitrophenol	mg/kg	5					-	-	-
	Dinoseb	mg/kg	20					-	-	-
	Pentachlorophenol	mg/kg	1	100	130	120	660	-	-	-
	Phenol	mg/kg	0.5	3000	45000	40000	240000	-	-	-
	tetrachlorophenols	mg/kg	1					-	-	-
	Phenols (Total Halogenated)	mg/kg	1					-	-	-
	Phenols (Total Non Halogenated)	mg/kg	20					-	-	-
TPH	C10 - C14	mg/kg	20					-	-	-
	C15 - C28	mg/kg	50					-	-	-
	C29 - C36	mg/kg	50					-	-	-
	C10 - C36 (Sum of total)	mg/kg	50					-	-	-
Volatile	Benzene	mg/kg	0.1					-	-	-
	Ethylbenzene	mg/kg	0.1					-	-	-
	Toluene	mg/kg	0.1					-	-	-
	Xylene (m & p)	mg/kg	0.2					-	-	-
	Xylene (o)	mg/kg	0.1					-	-	-
	Xylene Total	mg/kg	0.3					-	-	-
Asbestos	Asbestos							ND	ND	ND

Result Concentration exceeds adopted human health criteria (Residential A)
Result Concentration exceeds adopted human health criteria (Residential B)
Result Concentration exceeds adopted human health criteria (Recreational/ Open Space C)
Result Concentration exceeds adopted human health criteria (Commercial/ Industrial D)
- Not Analysed
ND No Asbestos Detected
1 NEPM (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Table 1A(1): Health Investiagtion Levels Re
2 NEPM (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Table 1A(1): Health Investiagtion Levels Re
3 NEPM (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Table 1A(1): Health Investiagtion Levels Re
4 NEPM (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Table 1A(1): Health Investiagtion Levels Co

coffey
A TETRA TECH COMPANY

Table LR2
Health Screening Levels
HCCD - Site 1
754-NTLEN213472

				NEPM 2013 Residential Soil HSL A/B for Vapour Intrusion, 0 to <1m, Sand[1]	NEPM 2013 Residential Soil HSL A/B for Vapour Intrusion, 1m to <2m, Sand[2]	NEPM 2013 Residential Soil HSL A/B for Vapour Intrusion, 2m to <4m, Sand[3]	NEPM 2013 Residential Soil HSL A/B for Vapour Intrusion, 4m+, Sand[4]	NEPM 2013 Commercial/Industrial D Soil HSL for Vapour Intrusion, 0 to <1m, Sand[5]	NEPM 2013 Commercial/Industrial D Soil HSL for Vapour Intrusion, 1m to <2m, Sand[6]	NEPM 2013 Commercial/Industrial D Soil HSL for Vapour Intrusion, 2m to <4m, Sand[7]	NEPM 2013 Commercial/Industrial D Soil HSL for Vapour Intrusion, 4m+, Sand[8]	Coffey Waste Classification (2004)															
												Field_ID	BHE1	BHE1	BHE1	BHE1	BHE2	BHE2	BHE2	BHE3	BHE3	BHE3	BHE3	BHE4	BHE4	BHE4	BHE5	BHE5	BHE5	BHE6	BHE6	BHE6	BHE7	BHE7	BHE7
												Sample_Depth_Range	0.4-0.5	0.8-0.9	1.4-1.5	2.9-3.0	0.4-0.5	0.9-1.0	2.9-3.0	0.4-0.5	1.0-1.1	1.1-1.2	2.9-3.0	0.4-0.5	1.6-1.7	2.9-3.0	0.6-0.7	1.1-1.2	2.9-3.0	0.4-0.5	0.8-0.9	2.9-3.0	0.5-0.6	2.0-2.1	2.9-3.0
												Sampled_Date-Time	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
												Matrix_Description	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Method_Type	ChemName	Units	EQL																								
Heavy Metal	Arsenic	mg/kg	2										<5	<5	<5	<5	9	<5	6	<5	<5	<5	<5	31	42	7	22	7	<5	10	10	<5	10	<5	<5
	Cadmium	mg/kg	0.4										<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	1.2	0.6	0.6	<0.5	<0.5	0.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Chromium	mg/kg	5										12	11	<5	<5	11	<5	<5	16	16	<5	<5	6	21	<5	<5	<5	<5	<5	<5	<5	7	<5	<5
	Copper	mg/kg	5										63	7	<5	<5	100	<5	16	83	19	10	34	56	170	39	100	<5	9	330	6	<5	310	17	6
	Lead	mg/kg	5										54	12	<5	<5	390	15	20	120	49	30	<5	59	480	350	110	<5	11	230	7	15	1800	22	8
	Mercury	mg/kg	0.1										0.05	<0.05	<0.05	<0.05	0.12	<0.05	<0.05	0.17	<0.05	<0.05	<0.05	<0.05	0.15	0.1	0.08	<0.05	0.12	0.08	<0.05	0.13	<0.05	<0.05	<0.05
	Nickel	mg/kg	5										4	<2	<2	<2	9	<2	<2	6	2	<2	<2	6	18	<2	5	<2	<2	6	<2	<2	23	3	<2
	Zinc	mg/kg	5										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Magnanese	mg/kg	5										<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Inorganic	Moisture Content (dried @ 103°C)	%	1										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OCP	4,4-DDE	mg/kg	0.05										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	a-BHC	mg/kg	0.05										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Aldrin	mg/kg	0.05										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Aldrin + Dieldrin	mg/kg	0.05										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	b-BHC	mg/kg	0.05										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chlordane	mg/kg	0.1										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	d-BHC	mg/kg	0.05										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	DDD	mg/kg	0.05										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	DDT	mg/kg	0.05										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	DDT+DDE+DDD	mg/kg	0.05										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dieldrin	mg/kg	0.05										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Endosulfan I	mg/kg	0.05										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Endosulfan II	mg/kg	0.05										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Endosulfan sulphate	mg/kg	0.05										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Endrin	mg/kg	0.05										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Endrin aldehyde	mg/kg	0.05										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Endrin ketone	mg/kg	0.05										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	g-BHC (Lindane)	mg/kg	0.05										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Heptachlor	mg/kg	0.05										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Heptachlor epoxide	mg/kg	0.05										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hexachlorobenzene	mg/kg	0.05										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Methoxychlor	mg/kg	0.2										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Toxaphene	mg/kg	1										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Vic EPA IWRG 621 OCP (Total)*	MG/KG	0.1										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Vic EPA IWRG 621 Other OCP (Total)*	MG/KG	0.1										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Organic	Naphthalene	mg/kg	0.5	3									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	F2-NAPHTHALENE	mg/kg	50	110	240	440							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	C6 - C9	mg/kg	20										<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	C10 - C40 (Sum of total)	mg/kg	100										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	C6-C10 less BTEX (F1)	mg/kg	20	45	70	110	200	260	370	630			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	C10-C16	mg/kg	50										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	C16-C34	mg/kg	100										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	C34-C40	mg/kg	100										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	C6 - C10	mg/kg	20										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAH	Acenaphthene	mg/kg	0.5										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Acenaphthylene	mg/kg	0.5										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Anthracene	mg/kg	0.5										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(a)anthracene	mg/kg	0.5										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(a)pyrene	mg/kg	0.5										<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	0.8	<0.5	0.8	<0.5	<0.5	<0.5
	Benzo(a)pyrene TEQ (lower bound) *	MG/KG	0.5										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(a)pyrene TEQ (medium bound) *	MG/KG	0.5										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(a)pyrene TEQ (upper bound) *	MG/KG	0.5										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(g,h,i)perylene	mg/kg	0.5										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(k)fluoranthene	mg/kg	0.5										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chrysene	mg/kg	0.5										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Benzo(b+j)fluoranthene	mg/kg	0.5										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dibenz(a,h)anthracene	mg/kg	0.5										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fluoranthene	mg/kg	0.5										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fluorene	mg/kg	0.5										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Naphthalene	mg/kg	0.5	3									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Phenanthrene	mg/kg	0.5										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pyrene	mg/kg	0.5										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total PAHs	mg/kg	0.5										<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.6	1.4	<0.5	7.2	11	<0.5	6.6	1.8	<0.5	<0.5
PCB	Arochlor 1221	mg/kg	0.1										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Aroclor 1016	mg/kg	0.5										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Aroclor 1232	mg/kg	0.5										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Aroclor 1242	mg/kg	0.5										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Aroclor 1248	mg/kg	0.5										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Aroclor 1254	mg/kg	0.5										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Aroclor 1260	mg/kg	0.5										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PCBs (Sum of total)	mg/kg	0.5										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SVOC	2,4,5-trichlorophenol	mg/kg	1										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2,4,6-trichlorophenol	mg/kg	1										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2,4-dichlorophenol	mg/kg	0.5										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2,4-dimethylphenol	mg/kg	0.5										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2,4-dinitrophenol	mg/kg	5										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2,6-dichlorophenol	mg/kg	0.5										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2-chlorophenol	mg/kg	0.5										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2-methylphenol	mg/kg	0.2										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2-nitrophenol	mg/kg	1										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3-&4-methylphenol	mg/kg	0.4										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4,6-Dinitro-2-methylphenol	mg/kg	5										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4,6-Dinitro-o-cyclohexyl phenol	mg/kg	20										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4-chloro-3-methylphenol	mg/kg	1										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4-nitrophenol	mg/kg	5										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dinoseb	mg/kg	20										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pentachlorophenol	mg/kg	1										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Phenol	mg/kg	0.5										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	tetrachlorophenols	mg/kg	1										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Phenols (Total Halogenated)	mg/kg	1										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Phenols (Total Non Halogenated)	mg/kg	20										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPH	C10 - C14	mg/kg	20										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	C15 - C28	mg/kg	50										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	C29 - C36	mg/kg	50										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	C10 - C36 (Sum of total)	mg/kg	50										<110	<110	<110	<110	<150	<110	<110	<110	<110	<110	<110	<110	<130	<110	<110	<110	<200	500	<110	<110	240	<110	<110
Volatile	Benzene	mg/kg	0.1	0.5	0.5	0.5	0.5	3	3	3	3		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Ethylbenzene	mg/kg	0.1	55									<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Toluene	mg/kg	0.1	160	220	310	540						<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Xylene (m & p)	mg/kg	0.2										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Xylene (o)	mg/kg	0.1										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Xylene Total	mg/kg	0.3	40	60	95	170	230					<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3

Result	Concentration exceeds adopted Health Screening Levels (Residential A/B)
Result	Concentration exceeds adopted Health Screening Levels (Residential A/B)
Result	Concentration exceeds adopted Health Screening Levels (Residential A/B)
Result	Concentration exceeds adopted Health Screening Levels (Residential A/B)
Result	Concentration exceeds adopted Health Screening Levels (Commercial/ Industrial)
Result	Concentration exceeds adopted Health Screening Levels (Commercial/ Industrial)
Result	Concentration exceeds adopted Health Screening Levels (Commercial/ Industrial)
Result	Concentration exceeds adopted Health Screening Levels (Commercial/ Industrial)

- Not Analysed

[1] NEPM (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Table1A(3): Health Screening Levels Low - High Density Residential 0 < 1m Sand
[2] NEPM (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Table1A(3): Health Screening Levels Low - High Density Residential 1 to < 2m Sand
[3] NEPM (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Table1A(3): Health Screening Levels Low - High Density Residential 2 to < 4m Sand
[4] NEPM (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Table1A(3): Health Screening Levels Low - High Density Residential 4m + Sand
[5] NEPM (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Table1A(3): Health Screening Levels Commercial/ Industrial 0 < 1m Sand
[6] NEPM (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Table1A(3): Health Screening Levels Commercial/ Industrial 1 to <2m Sand
[7] NEPM (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Table1A(3): Health Screening Levels Commercial/ Industrial 2 to < 4m Sand
[8] NEPM (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Table1A(3): Health Screening Levels Commercial/ Industrial 4m + Sand

coffey
A TETRA TECH COMPANY

Table LR2
Health Screening Levels
HCCD - Site 1
754-NTLEN213472

Coffey DSI

Method_Type	ChemName	Units	EQL	NEPM 2013 Residential Soil HSL A/B for Vapour Intrusion, 0 to <1m, Sand[1]	NEPM 2013 Residential Soil HSL A/B for Vapour Intrusion, 1m to <2m, Sand[2]	NEPM 2013 Residential Soil HSL A/B for Vapour Intrusion, 2m to <4m, Sand[3]	NEPM 2013 Residential Soil HSL A/B for Vapour Intrusion, 4m+, Sand[4]	NEPM 2013 Commercial/Industrial D Soil HSL for Vapour Intrusion, 0 to <1m, Sand[5]	NEPM 2013 Commercial/Industrial D Soil HSL for Vapour Intrusion, 1m to <2m, Sand[6]	NEPM 2013 Commercial/Industrial D Soil HSL for Vapour Intrusion, 2m to <4m, Sand[7]	NEPM 2013 Commercial/Industrial D Soil HSL for Vapour Intrusion, 4m+, Sand[8]	Field_ID	BHP8 0.2-0.3	BHP8 0.9-1.0	BHP9 0.2-0.5	BHP9 1.0-1.1	BHP10 0.2-0.3	BHP10 1.7-1.8	BHP11 0.2-0.3	BHP11 0.9-1.0	BHP12 0.2-0.3	BHP12 0.9-1.0	BHP13 0.2-0.3	BHP13 1.9-2.0	BHP14 0.2-0.3
												Sample_Depth_Range	0.2-0.3	0.9-1.0	0.2-0.5	1.0-1.1	0.2-0.3	1.7-1.8	0.2-0.3	0.9-1.0	0.2-0.3	0.9-1.0	0.2-0.3	1.9-2.0	0.2-0.3
												Sampled_Date-Time	18-Dec-18	18-Dec-18	18-Dec-18	18-Dec-18	18-Dec-18	18-Dec-18	19-Dec-18	19-Dec-18	18-Dec-18	18-Dec-18	18-Dec-18	18-Dec-18	19-Dec-18
												Matrix_Description	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Heavy Metal	Arsenic	mg/kg	2										10	22	11	2.7	15	3.1	6.8	4.6	14	3.4	19	8.6	96
	Cadmium	mg/kg	0.4										0.4	3.6	2.3	<0.4	<0.4	<0.4	<0.4	<0.4	1.1	<0.4	0.8	<0.4	<0.4
	Chromium	mg/kg	5										20	20	75	<5	5.3	<5	26	19	26	<5	5.5	<5	13
	Copper	mg/kg	5										200	380	120	<5	150	<5	71	57	240	<5	61	37	360
	Lead	mg/kg	5										740	640	230	6.1	210	15	32	42	190	7.4	140	66	290
	Mercury	mg/kg	0.1										0.2	0.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.3	<0.1
	Nickel	mg/kg	5										13	19	9.6	<5	7.8	<5	<5	<5	13	<5	7.8	<5	18
	Zinc	mg/kg	5										320	870	430	<5	240	15	27	31	1200	<5	190	120	160
	Magnanese	mg/kg	5										-	-	-	-	-	-	-	-	-	-	-	-	-
Inorganic	Moisture Content (dried @ 103°C)	%	1										8.9	8.8	18	2.1	3.4	2.8	11	12	10	19	5.6	19	9.1
OCP	4,4-DDE	mg/kg	0.05										<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	a-BHC	mg/kg	0.05										<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Aldrin	mg/kg	0.05										<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Aldrin + Dieldrin	mg/kg	0.05										<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	b-BHC	mg/kg	0.05										<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Chlordane	mg/kg	0.1										<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	d-BHC	mg/kg	0.05										<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	DDD	mg/kg	0.05										<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	DDT	mg/kg	0.05										<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	DDT+DDE+DDD	mg/kg	0.05										<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Dieldrin	mg/kg	0.05										<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endosulfan I	mg/kg	0.05										<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endosulfan II	mg/kg	0.05										<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endosulfan sulphate	mg/kg	0.05										<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endrin	mg/kg	0.05										<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endrin aldehyde	mg/kg	0.05										<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endrin ketone	mg/kg	0.05										<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	g-BHC (Lindane)	mg/kg	0.05										<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Heptachlor	mg/kg	0.05										<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Heptachlor epoxide	mg/kg	0.05										<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Hexachlorobenzene	mg/kg	0.05										<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Methoxychlor	mg/kg	0.2										<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Toxaphene	mg/kg	1										<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Vic EPA IWRG 621 OCP (Total)*	MG/KG	0.1										<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Vic EPA IWRG 621 Other OCP (Total)*	MG/KG	0.1										<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Organic	Naphthalene	mg/kg	0.5	3									<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	F2-NAPHTHALENE	mg/kg	50	110	240	440							<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
	C6 - C9	mg/kg	20										<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	C10 - C40 (Sum of total)	mg/kg	100										940	720	<100	<100	120	<100	<100	<100	<100	<100	120	<100	<100
	C6-C10 less BTEX (F1)	mg/kg	20	45	70	110	200	260	370	630			<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	C10-C16	mg/kg	50										<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
	C16-C34	mg/kg	100										800	590	<100	<100	120	<100	<100	<100	<100	<100	120	<100	<100
	C34-C40	mg/kg	100										140	130	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
	C6 - C10	mg/kg	20										<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
PAH	Acenaphthene	mg/kg	0.5										6.8	2	<0.5	<0.5	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Acenaphthylene	mg/kg	0.5										0.9	1	<0.5	<0.5	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Anthracene	mg/kg	0.5										16	7	<0.5	<0.5	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo(a)anthracene	mg/kg	0.5										30	20	<0.5	<0.5	<50	<0.5	<0.5	<0.5	0.9	<0.5	1.2	<0.5	0.5
	Benzo(a)pyrene	mg/kg	0.5										31	23	<0.5	<0.5	<50	<0.5	<0.5	<0.5	1	<0.5	1.5	<0.5	0.7
	Benzo(a)pyrene TEQ (lower bound) *	MG/KG	0.5										45	30	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.3	<0.5	2	<0.5	0.8
	Benzo(a)pyrene TEQ (medium bound) *	MG/KG	0.5										45	31	0.6	0.6	61	0.6	0.6	0.6	1.6	0.6	2.2	0.6	1.1
	Benzo(a)pyrene TEQ (upper bound) *	MG/KG	0.5										45	31	1.2	1.2	120	1.2	1.2	1.2	1.8	1.2	2.5	1.2	1.4
	Benzo(g,h,i)perylene	mg/kg	0.5										20	17	<0.5	<0.5	<50	<0.5	<0.5	<0.5	0.8	<0.5	1.3	<0.5	0.5
	Benzo(k)fluoranthene	mg/kg	0.5										13	8.3	<0.5	<0.5	<50	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5
	Chrysene	mg/kg	0.5										27	19	<0.5	<0.5	<50	<0.5	<0.5	<0.5	0.9	<0.5	1.1	<0.5	<0.5
	Benzo[b+j]fluoranthene	mg/kg	0.5										34	27	<0.5	<0.5	<50	<0.5	<0.5	<0.5	1.2	<0.5	1.7	<0.5	0.8
	Dibenz(a,h)anthracene	mg/kg	0.5										4.2	<0.5	<0.5	<0.5	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Fluoranthene	mg/kg	0.5										80	56	<0.5	<0.5	<50	<0.5	<0.5	<0.5	2.3	<0.5	3	<0.5	1.2
	Fluorene	mg/kg	0.5										6	2	<0.5	<0.5	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5										19	16	<0.5	<0.5	<50	<0.5	<0.5	<0.5	0.7	<0.5	1.1	<0.5	<0.5
	Naphthalene	mg/kg	0.5	3									0.7	<0.5	<0.5	<0.5	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Phenanthrene	mg/kg	0.5										73	33	<0.5	<0.5	<50	<0.5	<0.5	<0.5	1.7	<0.5	1.4	<0.5	0.6
	Pyrene	mg/kg	0.5										75	51	<0.5	<0.5	<50	<0.5	<0.5	<0.5	2.2	<0.5	3	<0.5	1.1
	Total PAHs	mg/kg	0.5										436.6	282.3	<0.5	<0.5	<50	<0.5	<0.5	<0.5	11.7	<0.5	15.9	<0.5	5.4
PCB	Arochlor 1221	mg/kg	0.1										<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Aroclor 1016	mg/kg	0.5										<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Aroclor 1232	mg/kg	0.5										<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Aroclor 1242	mg/kg	0.5										<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Aroclor 1248	mg/kg	0.5										<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Aroclor 1254	mg/kg	0.5										<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Aroclor 1260	mg/kg	0.5										<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	PCBs (Sum of total)	mg/kg	0.5										<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SVOC	2,4,5-trichlorophenol	mg/kg	1										<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	2,4,6-trichlorophenol	mg/kg	1										<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	2,4-dichlorophenol	mg/kg	0.5										<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2,4-dimethylphenol	mg/kg	0.5										<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2,4-dinitrophenol	mg/kg	5										<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	2,6-dichlorophenol	mg/kg	0.5										<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2-chlorophenol	mg/kg	0.5										<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2-methylphenol	mg/kg	0.2										<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	2-nitrophenol	mg/kg	1										<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	3-&4-methylphenol	mg/kg	0.4										<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
	4,6-Dinitro-2-methylphenol	mg/kg	5										<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	4,6-Dinitro-o-cyclohexyl phenol	mg/kg	20										<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	4-chloro-3-methylphenol	mg/kg	1										<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	4-nitrophenol	mg/kg	5										<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	Dinoseb	mg/kg	20										<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	Pentachlorophenol	mg/kg	1										<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Phenol	mg/kg	0.5										<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	tetrachlorophenols	mg/kg	1										<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Phenols (Total Halogenated)	mg/kg	1										<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Phenols (Total Non Halogenated)	mg/kg	20										<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
TPH	C10 - C14	mg/kg	20										<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	C15 - C28	mg/kg	50										600	420	<50	<50	87	<50	<50	<50	57	<50	72	<50	51
	C29 - C36	mg/kg	50										260	230	<50	<50	50	<50	<50	<50	<50	<50	63	<50	<50
	C10 - C36 (Sum of total)	mg/kg	50										860	650	<50	<50	137	<50	<50	<50	57	<50	135	<50	51
Volatile	Benzene	mg/kg	0.1	0.5	0.5	0.5	0.5	3	3	3	3		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Ethylbenzene	mg/kg	0.1	55									<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Toluene	mg/kg	0.1	160	220	310	540						<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Xylene (m & p)	mg/kg	0.2										<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Xylene (o)	mg/kg	0.1										<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Xylene Total	mg/kg	0.3	40	60	95	170	230					<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3

Result	Concentration exceeds adopted Health Screening Levels (Residential A/B)
Result	Concentration exceeds adopted Health Screening Levels (Residential A/B)
Result	Concentration exceeds adopted Health Screening Levels (Residential A/B)
Result	Concentration exceeds adopted Health Screening Levels (Residential A/B)
Result	Concentration exceeds adopted Health Screening Levels (Commercial/ Industrial)
Result	Concentration exceeds adopted Health Screening Levels (Commercial/ Industrial)
Result	Concentration exceeds adopted Health Screening Levels (Commercial/ Industrial)
Result	Concentration exceeds adopted Health Screening Levels (Commercial/ Industrial)

- Not Analysed

[1] NEPM (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Table1A(3): Health Screening Levels Low - High Density Residential 0 < 1m Sand
[2] NEPM (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Table1A(3): Health Screening Levels Low - High Density Residential 1 to < 2m Sand
[3] NEPM (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Table1A(3): Health Screening Levels Low - High Density Residential 2 to < 4m Sand
[4] NEPM (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Table1A(3): Health Screening Levels Low - High Density Residential 4m + Sand
[5] NEPM (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Table1A(3): Health Screening Levels Commercial/ Industrial 0 < 1m Sand
[6] NEPM (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Table1A(3): Health Screening Levels Commercial/ Industrial 1 to <2m Sand
[7] NEPM (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Table1A(3): Health Screening Levels Commercial/ Industrial 2 to < 4m Sand
[8] NEPM (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Table1A(3): Health Screening Levels Commercial/ Industrial 4m + Sand

Table LR2
Health Screening Levels
HCCD - Site 1
754-NTLEN213472

(2019)

Method_Type	ChemName	Units	EQL	NEPM 2013 Residential Soil HSL A/B for Vapour Intrusion, 0 to <1m, Sand[1]	NEPM 2013 Residential Soil HSL A/B for Vapour Intrusion, 1m to <2m, Sand[2]	NEPM 2013 Residential Soil HSL A/B for Vapour Intrusion, 2m to <4m, Sand[3]	NEPM 2013 Residential Soil HSL A/B for Vapour Intrusion, 4m+, Sand[4]	NEPM 2013 Commercial/Industrial D Soil HSL for Vapour Intrusion, 0 to <1m, Sand[5]	NEPM 2013 Commercial/Industrial D Soil HSL for Vapour Intrusion, 1m to <2m, Sand[6]	NEPM 2013 Commercial/Industrial D Soil HSL for Vapour Intrusion, 2m to <4m, Sand[7]	NEPM 2013 Commercial/Industrial D Soil HSL for Vapour Intrusion, 4m+, Sand[8]	BHP14 0.9-1.0	BHP15 0.2-0.3	BHP15 0.9-1.0	BHP16 0.0-0.2	BHP16 0.6-0.7	BHP18 0.2-0.3	BHP18 0.9-1.0	BHP19 0.1-0.3	BHP19 1.5-1.6	BHP20 0.2-0.3	BHP20 1.2-1.3	SS1	SS2
	Sample_Depth_Range											0.9-1.0	0.2-0.3	0.9-1.0	0.0-0.2	0.6-0.7	0.2-0.3	0.9-1.0	0.1-0.3	1.5-1.6	0.2-0.3	1.2-1.3	0.0-0.1	0.0-0.1
	Sampled_Date-Time											19-Dec-18	19-Dec-18	19-Dec-18	19-Dec-18	19-Dec-18	19-Dec-18	19-Dec-18	19-Dec-18	19-Dec-18	18-Dec-18	18-Dec-18	19-Dec-18	19-Dec-18
	Matrix_Description											Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Heavy Metal	Arsenic	mg/kg	2									10	83	40	91	<2	240	15	49	19	3	2.4	3.6	6.2
	Cadmium	mg/kg	0.4									<0.4	0.7	0.8	<0.4	<0.4	1.3	<0.4	0.9	<0.4	<0.4	<0.4	<0.4	0.5
	Chromium	mg/kg	5									<5	17	25	17	<5	11	<5	11	<5	8.2	<5	<5	9.5
	Copper	mg/kg	5									<5	1900	2600	160	<5	150	<5	1200	550	12	<5	29	59
	Lead	mg/kg	5									7.4	2200	1800	1100	7.5	1100	6.4	1000	250	44	8.8	50	120
	Mercury	mg/kg	0.1									<0.1	1.9	1.2	0.7	<0.1	0.5	<0.1	1.2	0.5	<0.1	<0.1	<0.1	0.8
	Nickel	mg/kg	5									<5	36	29	24	<5	23	<5	38	16	<5	<5	<5	6.2
	Zinc	mg/kg	5									<5	460	550	250	<5	580	21	510	270	53	<5	70	190
	Magnanese	mg/kg	5									-	-	-	-	-	-	-	-	-	-	-	-	-
Inorganic	Moisture Content (dried @ 103°C)	%	1									5.3	17	13	6	3.1	11	4.5	15	19	7.7	23	2.8	4.4
OCP	4,4-DDE	mg/kg	0.05									<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	a-BHC	mg/kg	0.05									<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Aldrin	mg/kg	0.05									<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Aldrin + Dieldrin	mg/kg	0.05									<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	b-BHC	mg/kg	0.05									<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Chlordane	mg/kg	0.1									<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	d-BHC	mg/kg	0.05									<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	DDD	mg/kg	0.05									<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	DDT	mg/kg	0.05									<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	DDT+DDE+DDD	mg/kg	0.05									<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Dieldrin	mg/kg	0.05									<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endosulfan I	mg/kg	0.05									<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endosulfan II	mg/kg	0.05									<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endosulfan sulphate	mg/kg	0.05									<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endrin	mg/kg	0.05									<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endrin aldehyde	mg/kg	0.05									<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endrin ketone	mg/kg	0.05									<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	g-BHC (Lindane)	mg/kg	0.05									<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Heptachlor	mg/kg	0.05									<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Heptachlor epoxide	mg/kg	0.05									<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Hexachlorobenzene	mg/kg	0.05									<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Methoxychlor	mg/kg	0.2									<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Toxaphene	mg/kg	1									<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Vic EPA IWRG 621 OCP (Total)*	MG/KG	0.1									<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Vic EPA IWRG 621 Other OCP (Total)*	MG/KG	0.1									<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Organic	Naphthalene	mg/kg	0.5	3								<0.5	<0.5	2.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	F2-NAPHTHALENE	mg/kg	50	110	240	440						<50	<50	86	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
	C6 - C9	mg/kg	20									<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	C10 - C40 (Sum of total)	mg/kg	100									<100	500	789	<100	<100	690	<100	170	<100	<100	<100	4800	160
	C6-C10 less BTEX (F1)	mg/kg	20	45	70	110	200	260	370	630		<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	C10-C16	mg/kg	50									<50	<50	89	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
	C16-C34	mg/kg	100									<100	400	580	<100	<100	540	<100	170	<100	<100	<100	3200	160
	C34-C40	mg/kg	100									<100	100	120	<100	<100	150	<100	<100	<100	<100	<100	1600	<100
	C6 - C10	mg/kg	20									<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
PAH	Acenaphthene	mg/kg	0.5									<0.5	<0.5	2.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Acenaphthylene	mg/kg	0.5									<0.5	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Anthracene	mg/kg	0.5									<0.5	1.2	4.4	<0.5	<0.5	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo(a)anthracene	mg/kg	0.5									<0.5	2.3	6	<0.5	<0.5	5.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
	Benzo(a)pyrene	mg/kg	0.5									<0.5	1.8	5	<0.5	<0.5	5.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6
	Benzo(a)pyrene TEQ (lower bound) *	MG/KG	0.5									<0.5	2.4	6.7	<0.5	<0.5	7.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7
	Benzo(a)pyrene TEQ (medium bound) *	MG/KG	0.5									0.6	2.7	6.9	0.6	0.6	7.4	0.6	0.6	0.6	0.6	0.6	0.6	1
	Benzo(a)pyrene TEQ (upper bound) *	MG/KG	0.5									1.2	2.9	7.2	1.2	1.2	7.6	1.2	1.2	1.2	1.2	1.2	1.2	1.3
	Benzo(g,h,i)perylene	mg/kg	0.5									<0.5	0.9	2.8	<0.5	<0.5	3.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo(k)fluoranthene	mg/kg	0.5									<0.5	0.8	1.9	<0.5	<0.5	2.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Chrysene	mg/kg	0.5									<0.5	1.8	5.4	<0.5	<0.5	5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo[b+j]fluoranthene	mg/kg	0.5									<0.5	2.2	5.4	<0.5	<0.5	6.3	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	0.8
	Dibenz(a,h)anthracene	mg/kg	0.5									<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Fluoranthene	mg/kg	0.5									<0.5	4.3	14	0.7	<0.5	11	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	1.3
	Fluorene	mg/kg	0.5									<0.5	<0.5	1.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5									<0.5	0.9	2.4	<0.5	<0.5	3.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Naphthalene	mg/kg	0.5	3								<0.5	<0.5	3.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Phenanthrene	mg/kg	0.5									<0.5	4.2	19	<0.5	<0.5	6.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7
	Pyrene	mg/kg	0.5									<0.5	3.9	13	0.6	<0.5	10	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	1.2
	Total PAHs	mg/kg	0.5									<0.5	24.3	86.8	1.3	<0.5	60.9	<0.5	2	<0.5	<0.5	<0.5	<0.5	5.1
PCB	Arochlor 1221	mg/kg	0.1									<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Aroclor 1016	mg/kg	0.5									<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Aroclor 1232	mg/kg	0.5									<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Aroclor 1242	mg/kg	0.5									<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Aroclor 1248	mg/kg	0.5									<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Aroclor 1254	mg/kg	0.5									<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Aroclor 1260	mg/kg	0.5									<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	PCBs (Sum of total)	mg/kg	0.5									<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SVOC	2,4,5-trichlorophenol	mg/kg	1									<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	2,4,6-trichlorophenol	mg/kg	1									<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	2,4-dichlorophenol	mg/kg	0.5									<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2,4-dimethylphenol	mg/kg	0.5									<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2,4-dinitrophenol	mg/kg	5									<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	2,6-dichlorophenol	mg/kg	0.5									<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2-chlorophenol	mg/kg	0.5									<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	2-methylphenol	mg/kg	0.2									<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	2-nitrophenol	mg/kg	1									<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	3-&4-methylphenol	mg/kg	0.4									<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
	4,6-Dinitro-2-methylphenol	mg/kg	5									<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	4,6-Dinitro-o-cyclohexyl phenol	mg/kg	20									<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	4-chloro-3-methylphenol	mg/kg	1									<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	4-nitrophenol	mg/kg	5									<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	Dinoseb	mg/kg	20									<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	Pentachlorophenol	mg/kg	1									<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Phenol	mg/kg	0.5									<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	tetrachlorophenols	mg/kg	1									<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Phenols (Total Halogenated)	mg/kg	1									<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Phenols (Total Non Halogenated)	mg/kg	20									<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
TPH	C10 - C14	mg/kg	20									<20	<20	58	<20	<20	31	<20	<20	<20	<20	<20	<20	<20
	C15 - C28	mg/kg	50									<50	260	420	<50	<50	360	<50	110	<50	<50	<50	1500	67
	C29 - C36	mg/kg	50									<50	190	240	<50	<50	260	<50	83	<50	<50	<50	2600	150
	C10 - C36 (Sum of total)	mg/kg	50									<50	450	718	<50	<50	651	<50	193	<50	<50	<50	4100	217
Volatile	Benzene	mg/kg	0.1	0.5	0.5	0.5	0.5	3	3	3	3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Ethylbenzene	mg/kg	0.1	55								<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Toluene	mg/kg	0.1	160	220	310	540					<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Xylene (m & p)	mg/kg	0.2									<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Xylene (o)	mg/kg	0.1									<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Xylene Total	mg/kg	0.3	40	60	95	170	230				<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3

Result	Concentration exceeds adopted Health Scrrening Levels (Residential A/B)
Result	Concentration exceeds adopted Health Scrrening Levels (Residential A/B)
Result	Concentration exceeds adopted Health Scrrening Levels (Residential A/B)
Result	Concentration exceeds adopted Health Scrrening Levels (Residential A/B)
Result	Concentration exceeds adopted Health Scrrening Levels (Commercial/ Industrial)
Result	Concentration exceeds adopted Health Scrrening Levels (Commercial/ Industrial)
Result	Concentration exceeds adopted Health Scrrening Levels (Commercial/ Industrial)
Result	Concentration exceeds adopted Health Scrrening Levels (Commercial/ Industrial)
-	Not Analysed

1 NEPM (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Table1A(3): Health Screening Levels Low - High Density Residential 0 < 1m Sand
2 NEPM (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Table1A(3): Health Screening Levels Low - High Density Residential 1 to < 2m Sand
3 NEPM (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Table1A(3): Health Screening Levels Low - High Density Residential 2 to < 4m Sand
4 NEPM (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Table1A(3): Health Screening Levels Low - High Density Residential 4m + Sand
5 NEPM (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Table1A(3): Health Screening Levels Commercial/ Industrial 0 < 1m Sand
6 NEPM (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Table1A(3): Health Screening Levels Commercial/ Industrial 1 to <2m Sand
7 NEPM (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Table1A(3): Health Screening Levels Commercial/ Industrial 2 to < 4m Sand
8 NEPM (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Table1A(3): Health Screening Levels Commercial/ Industrial 4m + Sand

Table LR3
QA/QC Results
HCCD - Site 1
754-NTLEN213472

Field Duplicates (SOIL)
Filter: SDG in('20 Dec 2018')

SDG		20-Dec-18	20-Dec-18		20-Dec-18	Interlab_D		20-Dec-18	20-Dec-18		20-Dec-18	Interlab_D		20-Dec-18	20-Dec-18	
Field ID		BHP8 0.2-0.3	QC1	**RPD**	BHP8 0.2-0.3	QC2	**RPD**	BHP13 0.2-0.3	QC3	**RPD**	BHP13 0.2-0.3	QC4	**RPD**	BHP19 0.1-0.3	QC5	**RPD**
Sampled Date/Time		12/18/2018	########		12/18/2018	########		12/18/2018	########		12/18/2018	########		12/19/2018	########	
Method_Type	**ChemName**	**Units**	**EQL**													
Organic	C6-C10 less BTEX (F1)	mg/kg	20 (Primary): 10 (Interlab)	<20.0	<20.0	0	<20.0	<10.0	0	<20.0	<20.0	0	<20.0	<10.0	0	<20.0	<20.0	0
Volatile	Benzene	mg/kg	0.1 (Primary): 0.2 (Interlab)	<0.1	<0.1	0	<0.1	<0.2	0	<0.1	<0.1	0	<0.1	<0.2	0	<0.1	<0.1	0
	Ethylbenzene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0
	Toluene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0
	Xylene (m & p)	mg/kg	0.2 (Primary): 0.5 (Interlab)	<0.2	<0.2	0	<0.2	<0.5	0	<0.2	<0.2	0	<0.2	<0.5	0	<0.2	<0.2	0
	Xylene (o)	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0
	Xylene Total	mg/kg	0.3 (Primary): 0.5 (Interlab)	<0.3	<0.3	0	<0.3	<0.5	0	<0.3	<0.3	0	<0.3	<0.5	0	<0.3	<0.3	0
SVOC	tetrachlorophenols	mg/kg	1	<1.0	<1.0	0	<1.0			<1.0	<1.0	0	<1.0			<1.0	<1.0	0
Inorganic	Moisture Content (dried @ 103°C)	%	1	8.9	8.9	0	8.9			5.6	8.1	36	5.6			15.0	12.0	22
Heavy Metal	Arsenic	mg/kg	2 (Primary): 5 (Interlab)	10.0	11.0	10	10.0	9.0	11	**19.0**	**47.0**	**85**	**19.0**	**32.0**	**51**	**49.0**	**73.0**	**39**
	Cadmium	mg/kg	0.4 (Primary): 1 (Interlab)	0.4	0.6	40	**0.4**	**1.0**	**86**	0.8	0.8	0	0.8	1.0	22	**0.9**	**2.1**	**80**
	Chromium	mg/kg	5 (Primary): 2 (Interlab)	20.0	13.0	42	**20.0**	**9.0**	**76**	5.5	5.8	5	5.5	6.0	9	11.0	18.0	48
	Copper	mg/kg	5	200.0	220.0	10	200.0	218.0	9	**61.0**	**99.0**	**48**	**61.0**	**163.0**	**91**	**1200.0**	**460.0**	**89**
	Lead	mg/kg	5	**740.0**	**400.0**	**60**	**740.0**	**406.0**	**58**	**140.0**	**220.0**	**44**	140.0	152.0	8	1000.0	900.0	11
	Mercury	mg/kg	0.1	0.2	0.3	40	0.2	0.2	0	<0.1	<0.1	0	<0.1	0.1	0	**1.2**	**0.5**	**82**
	Nickel	mg/kg	5 (Primary): 2 (Interlab)	13.0	14.0	7	13.0	9.0	36	7.8	11.0	34	7.8	9.0	14	38.0	25.0	41
	Zinc	mg/kg	5	320.0	360.0	12	320.0	394.0	21	190.0	220.0	15	**190.0**	**276.0**	**37**	510.0	670.0	27
OCP	4,4-DDE	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	a-BHC	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	Aldrin	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	Aldrin + Dieldrin	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	b-BHC	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	Chlordane	mg/kg	0.1 (Primary): 0.05 (Interlab)	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0
	d-BHC	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	DDD	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	DDT	mg/kg	0.05 (Primary): 0.2 (Interlab)	<0.05	<0.05	0	<0.05	<0.2	0	<0.05	<0.05	0	<0.05	<0.2	0	<0.05	<0.05	0
	DDT+DDE+DDD	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	Dieldrin	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	Endosulfan I	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	Endosulfan II	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	Endosulfan sulphate	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	Endrin	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	Endrin aldehyde	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	Endrin ketone	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	g-BHC (Lindane)	mg/kg	0.05	<0.1	<0.05	0	<0.1	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	Heptachlor	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	Heptachlor epoxide	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	Hexachlorobenzene	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	Methoxychlor	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.2	0
	Toxaphene	mg/kg	1	<1.0	<1.0	0	<1.0			<1.0	<1.0	0	<1.0			<1.0	<1.0	0
	Vic EPA IWRG 621 OCP (Total)*	mg/kg	0.1	<0.1	<0.1	0	<0.1			<0.1	<0.1	0	<0.1			<0.1	<0.1	0
	Vic EPA IWRG 621 Other OCP (Total)*	mg/kg	0.1	<0.1	<0.1	0	<0.1			<0.1	<0.1	0	<0.1			<0.1	<0.1	0
PAH	Acenaphthene	mg/kg	0.5	**6.8**	**2.9**	**80**	**6.8**	**<0.5**	**173**	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Acenaphthylene	mg/kg	0.5	0.9	0.8	12	**0.9**	**<0.5**	**57**	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Anthracene	mg/kg	0.5	**16.0**	**10.0**	**46**	**16.0**	**2.3**	**150**	<0.5	<0.5	0	**<0.5**	**1.4**	**95**	<0.5	<0.5	0
	Benzo(a)anthracene	mg/kg	0.5	30.0	24.0	22	**30.0**	**4.3**	**150**	1.2	0.9	29	**1.2**	**2.7**	**77**	<0.5	0.8	46
	Benzo(a)pyrene	mg/kg	0.5	31.0	26.0	18	**31.0**	**4.9**	**145**	1.5	1.0	40	1.5	2.4	46	**<0.5**	**0.9**	**57**
	Benzo(a)pyrene TEQ (lower bound) *	mg/kg	0.5	45.0	34.0	28	**45.0**	**6.3**	**151**	2.0	1.3	42	2.0	3.2	46	**<0.5**	**1.2**	**82**
	Benzo(a)pyrene TEQ (medium bound) *	mg/kg	0.5	45.0	35.0	25	**45.0**	**6.5**	**150**	2.2	1.6	32	2.2	3.5	46	**0.6**	**1.4**	**80**
	Benzo(a)pyrene TEQ (upper bound) *	mg/kg	0.5	45.0	35.0	25	**45.0**	**6.8**	**147**	2.5	1.8	33	2.5	3.7	39	1.2	1.7	34
	Benzo(g,h,i)perylene	mg/kg	0.5	20.0	18.0	11	**20.0**	**2.7**	**152**	**1.3**	**0.7**	**60**	1.3	1.5	14	<0.5	0.6	18
	Benzo(k)fluoranthene	mg/kg	0.5	**13.0**	**9.5**	**31**	**13.0**	**1.8**	**151**	0.6	<0.5	18	**0.6**	**1.2**	**67**	<0.5	<0.5	0
	Chrysene	mg/kg	0.5	27.0	22.0	20	**27.0**	**3.7**	**152**	1.1	0.9	20	**1.1**	**2.4**	**74**	<0.5	0.8	46
	Benzo[b+j]fluoranthene	mg/kg	0.5	34.0	30.0	13	**34.0**	**4.7**	**151**	1.7	1.3	27	**1.7**	**3.0**	**55**	**0.6**	**1.2**	**67**
	Dibenz(a,h)anthracene	mg/kg	0.5	**4.2**	**<0.5**	**157**	**4.2**	**<0.5**	**157**	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Fluoranthene	mg/kg	0.5	80.0	71.0	12	**80.0**	**15.3**	**136**	3.0	2.1	35	**3.0**	**7.8**	**89**	**0.7**	**1.3**	**60**
	Fluorene	mg/kg	0.5	**6.0**	**3.4**	**55**	**6.0**	**0.6**	**164**	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	19.0	17.0	11	**19.0**	**2.3**	**157**	**1.1**	**0.6**	**59**	1.1	1.2	9	<0.5	0.5	0
	Phenanthrene	mg/kg	0.5	**73.0**	**50.0**	**37**	**73.0**	**8.2**	**160**	1.4	0.9	43	**1.4**	**5.7**	**121**	<0.5	0.7	33
	Pyrene	mg/kg	0.5	75.0	62.0	19	**75.0**	**14.6**	**135**	3.0	2.0	40	**3.0**	**6.7**	**76**	**0.7**	**1.4**	**67**
	Total PAHs	mg/kg	0.5	436.6	346.6	23	**436.6**	**65.4**	**148**	**15.9**	**10.4**	**42**	**15.9**	**36.0**	**77**	**2.0**	**8.2**	**122**
SVOC	2,4,5-trichlorophenol	mg/kg	1 (Primary): 0.5 (Interlab)	<1.0	<1.0	0	<1.0	<0.5	0	<1.0	<1.0	0	<1.0	<0.5	0	<1.0	<1.0	0
	2,4,6-trichlorophenol	mg/kg	1 (Primary): 0.5 (Interlab)	<1.0	<1.0	0	<1.0	<0.5	0	<1.0	<1.0	0	<1.0	<0.5	0	<1.0	<1.0	0
	2,4-dichlorophenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	2,4-dimethylphenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	2,4-dinitrophenol	mg/kg	5	<5.0	<5.0	0	<5.0			<5.0	<5.0	0	<5.0			<5.0	<5.0	0
	2,6-dichlorophenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	2-chlorophenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	2-methylphenol	mg/kg	0.2 (Primary): 0.5 (Interlab)	<0.2	<0.2	0	<0.2	<0.5	0	<0.2	<0.2	0	<0.2	<0.5	0	<0.2	<0.2	0
	2-nitrophenol	mg/kg	1 (Primary): 0.5 (Interlab)	<1.0	<1.0	0	<1.0	<0.5	0	<1.0	<1.0	0	<1.0	<0.5	0	<1.0	<1.0	0
	3-&4-methylphenol	mg/kg	0.4 (Primary): 1 (Interlab)	<0.4	<0.4	0	<0.4	<1.0	0	<0.4	<0.4	0	<0.4	<1.0	0	<0.4	<0.4	0
	4,6-Dinitro-2-methylphenol	mg/kg	5	<5.0	<5.0	0	<5.0			<5.0	<5.0	0	<5.0			<5.0	<5.0	0
	4,6-Dinitro-o-cyclohexyl phenol	mg/kg	20	<20.0	<20.0	0	<20.0			<20.0	<20.0	0	<20.0			<20.0	<20.0	0
	4-chloro-3-methylphenol	mg/kg	1 (Primary): 0.5 (Interlab)	<1.0	<1.0	0	<1.0	<0.5	0	<1.0	<1.0	0	<1.0	<0.5	0	<1.0	<1.0	0
	4-nitrophenol	mg/kg	5	<5.0	<5.0	0	<5.0			<5.0	<5.0	0	<5.0			<5.0	<5.0	0
	Dinoseb	mg/kg	20	<20.0	<20.0	0	<20.0			<20.0	<20.0	0	<20.0			<20.0	<20.0	0
	Pentachlorophenol	mg/kg	1 (Primary): 2 (Interlab)	<1.0	<1.0	0	<1.0	<2.0	0	<1.0	<1.0	0	<1.0	<2.0	0	<1.0	<1.0	0
	Phenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Phenols (Total Halogenated)	mg/kg	1	<1.0	<1.0	0	<1.0			<1.0	<1.0	0	<1.0			<1.0	<1.0	0
	Phenols (Total Non Halogenated)	mg/kg	20	<20.0	<20.0	0	<20.0			<20.0	<20.0	0	<20.0			<20.0	<20.0	0
PCB	Arochlor 1221	mg/kg	0.1	<0.1	<0.1	0	<0.1			<0.1	<0.1	0	<0.1			<0.1	<0.1	0
	Aroclor 1016	mg/kg	0.5	<0.5	<0.5	0	<0.5			<0.5	<0.5	0	<0.5			<0.5	<0.5	0
	Aroclor 1232	mg/kg	0.5	<0.5	<0.5	0	<0.5			<0.5	<0.5	0	<0.5			<0.5	<0.5	0
	Aroclor 1242	mg/kg	0.5	<0.5	<0.5	0	<0.5			<0.5	<0.5	0	<0.5			<0.5	<0.5	0
	Aroclor 1248	mg/kg	0.5	<0.5	<0.5	0	<0.5			<0.5	<0.5	0	<0.5			<0.5	<0.5	0
	Aroclor 1254	mg/kg	0.5	<0.5	<0.5	0	<0.5			<0.5	<0.5	0	<0.5			<0.5	<0.5	0
	Aroclor 1260	mg/kg	0.5	<0.5	<0.5	0	<0.5			<0.5	<0.5	0	<0.5			<0.5	<0.5	0
	PCBs (Sum of total)	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.1	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5	<0.5	0
Organic	F2-NAPHTHALENE	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0
	C6 - C9	mg/kg	20 (Primary): 10 (Interlab)	<20.0	<20.0	0	<20.0	<10.0	0	<20.0	<20.0	0	<20.0	<10.0	0	<20.0	<20.0	0
	C10 - C40 (Sum of total)	mg/kg	100 (Primary): 50 (Interlab)	940.0	740.0	24	**940.0**	**170.0**	**139**	120.0	130.0	8	**120.0**	**<50.0**	**82**	170.0	220.0	26
	C10-C16	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0
	C16-C34	mg/kg	100	800.0	620.0	25	**800.0**	**170.0**	**130**	120.0	130.0	8	120.0	<100.0	18	170.0	220.0	26
	C34-C40	mg/kg	100	140.0	120.0	15	140.0	<100.0	33	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0
	C6 - C10	mg/kg	20 (Primary): 10 (Interlab)	<20.0	<20.0	0	<20.0	<10.0	0	<20.0	<20.0	0	<20.0	<10.0	0	<20.0	<20.0	0
TPH	C10 - C14	mg/kg	20 (Primary): 50 (Interlab)	<20.0	<20.0	0	<20.0	<50.0	0	<20.0	<20.0	0	<20.0	<50.0	0	<20.0	<20.0	0
	C15 - C28	mg/kg	50 (Primary): 100 (Interlab)	600.0	450.0	29	**600.0**	**100.0**	**143**	72.0	97.0	30	72.0	<100.0	0	110.0	140.0	24
	C29 - C36	mg/kg	50 (Primary): 100 (Interlab)	260.0	220.0	17	**260.0**	**<100.0**	**89**	63.0	66.0	5	63.0	<100.0	0	**83.0**	**140.0**	**51**
	C10 - C36 (Sum of total)	mg/kg	50	860.0	670.0	25	**860.0**	**100.0**	**158**	135.0	163.0	19	**135.0**	**<50.0**	**92**	193.0	280.0	37

*RPDs have only been considered where a concentration is greater than 0 times the EQL.
**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 50 (0-10 x EQL); 30 (10-20 x EQL); 30 (> 20 x EQL))
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

Table LR4
Trip Blanks and Trip Spikes
HCCD - Site 1
754-NTLEN213472

Field Blanks (WATER)
Filter: SDG in('20 Dec 2018

SDG	20-Dec-18	20-Dec-18	16-Jan-19	20-Dec-18	20-Dec-18	16-Jan-19
Field ID	TRIP BLANK	TRIP BLANK 2	TRIP BLANK	Trip Spike	Trip Spike 2	Trip Spike
Sampled_Date	12/18/2018	12/19/2018	1/15/2019	12/18/2019	12/19/2018	1/15/2019
Sample Type	Trip_B	Trip_B	Trip_B	Trip Spike	Trip Spike	Trip Spike

Method_Typ	ChemName	Units	EQL						
F1-BTEX	C6-C10 less B	mg/l	0.02	<0.02	<0.02	<0.02	-	-	-
Organic	Naphthalene	µg/l	10	<10	<10	<10	110,000	85,000	120,000
	C6 - C9	µg/l	20	<20	<20	<20	78,000	80,000	76,000
	C6 - C10	mg/l	0.02	<0.02	<0.02	<0.02	74	75	79
Volatile	Benzene	µg/l	1	<1	<1	<1	100,000	130,000	81,000
	Ethylbenzene	µg/l	1	<1	<1	<1	98,000	95,000	120,000
	Toluene	µg/l	1	<1	<1	<1	98,000	110,000	100,000
	Xylene (m & p	µg/l	2	<2	<2	<2	94,000	91,000	110,000
	Xylene (o)	µg/l	1	<1	<1	<1	100,000	97,000	120,000
	Xylene Total	µg/l	3	<3	<3	<3	97,000	93,000	110,000

coffey
A TETRA TECH COMPANY

Table LR5
Waste Classification Results
HCCD - Site 1
754-NTLEN213472

									Coffey Waste Classification (2004)																									
								Field_ID	BHE1	BHE1	BHE1	BHE1	BHE2	BHE2	BHE2	BHE3	BHE3	BHE3	BHE3	BHE4	BHE4	BHE4	BHE5	BHE5	BHE5	BHE6	BHE6	BHE6	BHE7	BHE7	BHE7	BHP8 0.2-0.3	BHP8 0.9-1.0	BHP9 0.2-0.5	BHP9 1.0-1.1
								Sample_Depth_Range	0.4-0.5	0.8-0.9	1.4-1.5	2.9-3.0	0.4-0.5	0.9-1.0	2.9-3.0	0.4-0.5	1.0-1.1	1.1-1.2	2.9-3.0	0.4-0.5	1.6-1.7	2.9-3.0	0.6-0.7	1.1-1.2	2.9-3.0	0.4-0.5	0.8-0.9	2.9-3.0	0.5-0.6	2.0-2.1	2.9-3.0	0.2-0.3	0.9-1.0	0.2-0.5	1.0-1.1
								Sampled_Date-Time	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18-Dec-18	18-Dec-18	18-Dec-18	18-Dec-18
								Matrix_Description	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
				CT1 NSW 2014 General Solid Waste	SCC1 NSW 2014 General Solid Waste	CT2 NSW 2014 General Solid Waste	CT2 NSW 2014 Restricted Solid Waste	SCC2 NSW 2014 Restricted Solid Waste																												
Method_Type	ChemName	Units	EQL	(No Leaching)[1]	(leached)[2]	(No Leaching)	(No Leaching)[3]	(leached)[4]																										
Heavy Metal	Arsenic	mg/kg	2	100	500		400	2000	<5	<5	<5	<5	9	<5	6	<5	<5	<5	<5	31	42	7	22	7	<5	10	10	<5	10	<5	<5	10	22	11	2.7
	Cadmium	mg/kg	0.4	20	100		80	400	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	1.2	0.6	0.6	<0.5	<0.5	0.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.4	3.6	2.3	<0.4
	Chromium	mg/kg	5	100	1900	400		7600	12	11	<5	<5	11	<5	<5	16	16	<5	<5	6	21	<5	<5	<5	<5	<5	<5	<5	7	<5	<5	20	20	75	<5
	Copper	mg/kg	5						63	7	<5	<5	100	<5	16	83	19	10	34	56	170	39	100	<5	9	330	6	<5	310	17	6	200	380	120	<5
	Lead	mg/kg	5	100	1500		400	6000	54	12	<5	<5	390	15	20	120	49	30	<5	59	480	350	110	<5	11	230	7	15	1800	22	8	740	640	230	6.1
	Mercury	mg/kg	0.1	4	50		16	200	0.05	<0.05	<0.05	<0.05	0.12	<0.05	<0.05	0.17	<0.05	<0.05	<0.05	<0.05	0.15	0.1	0.08	<0.05	0.12	0.08	<0.05	0.13	<0.05	<0.05	<0.05	0.2	0.4	<0.1	<0.1
	Nickel	mg/kg	5	40	1050		160	4200	4	<2	<2	<2	9	<2	13	<2	6	2	<2	<2	6	18	<2	5	<2	<2	6	<2	<2	23	3	<2	13	19	9.6	<5
	Zinc	mg/kg	5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	320	870	430	<5
	Magnanese	mg/kg	5						<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5		-	-	-
Inorganic	Moisture Content (dried @ 103°C)	%	1						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.9	8.8	18	2.1
Asbestos	Detected								-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	ND	-
OCP	4,4-DDE	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05
	a-BHC	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05
	Aldrin	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05
	Aldrin + Dieldrin	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05
	b-BHC	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05
	Chlordane	mg/kg	0.1						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1
	d-BHC	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05
	DDD	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05
	DDT	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05
	DDT+DDE+DDD	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05
	Dieldrin	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05
	Endosulfan I	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05
	Endosulfan II	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05
	Endosulfan sulphate	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05
	Endrin	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05
	Endrin aldehyde	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05
	Endrin ketone	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05
	g-BHC (Lindane)	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.05	<0.05	<0.05
	Heptachlor	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05
	Heptachlor epoxide	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05
	Hexachlorobenzene	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05
	Methoxychlor	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	<0.2	<0.2	<0.2
	Toxaphene	mg/kg	1						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1
	Vic EPA IWRG 621 OCP (Total)*	MG/KG	0.1						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1
	Vic EPA IWRG 621 Other OCP (Total)*	MG/KG	0.1						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1
Organic	Naphthalene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5
	F2-NAPHTHALENE	mg/kg	50						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<50	<50	<50
	C6 - C9	mg/kg	20	650	650		2600	2600	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<20	<20	<20	<20
	C10 - C40 (Sum of total)	mg/kg	100						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	940	720	<100	<100
	C6-C10 less BTEX (F1)	mg/kg	20						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<20	<20	<20	<20
	C10-C16	mg/kg	50						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<50	<50	<50
	C16-C34	mg/kg	100						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	800	590	<100	<100
	C34-C40	mg/kg	100						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	140	130	<100	<100
	C6 - C10	mg/kg	20						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<20	<20	<20	<20
PAH	Acenaphthene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.8	2	<0.5	<0.5
	Acenaphthylene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.9	1	<0.5	<0.5
	Anthracene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	7	<0.5	<0.5
	Benzo(a)anthracene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	20	<0.5	<0.5
	Benzo(a)pyrene	mg/kg	0.5	0.8	10		3.2	23	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	0.8	<0.5	0.8	<0.5	<0.5	<0.5	31	23	<0.5	<0.5
	Benzo(a)pyrene TEQ (lower bound) *	MG/KG	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	45	30	<0.5	<0.5
	Benzo(a)pyrene TEQ (medium bound) *	MG/KG	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	45	31	0.6	0.6
	Benzo(a)pyrene TEQ (upper bound) *	MG/KG	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	45	31	1.2	1.2
	Benzo(g,h,i)perylene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20	17	<0.5	<0.5
	Benzo(k)fluoranthene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	8.3	<0.5	<0.5
	Chrysene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27	19	<0.5	<0.5
	Benzo[b+j]fluoranthene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34	27	<0.5	<0.5
	Dibenz(a,h)anthracene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.2	<0.5	<0.5	<0.5
	Fluoranthene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	80	56	<0.5	<0.5
	Fluorene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	2	<0.5	<0.5
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	16	<0.5	<0.5
	Naphthalene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.7	<0.5	<0.5	<0.5
	Phenanthrene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	73	33	<0.5	<0.5
	Pyrene	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	75	51	<0.5	<0.5
	Total PAHs	mg/kg	0.5	200	200		800	800	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.6	1.4	<0.5	7.2	11	<0.5	6.6	1.8	<0.5	<0.5	436.6	282.3	<0.5	<0.5
PCB	Arochlor 1221	mg/kg	0.1						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1
	Aroclor 1016	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5
	Aroclor 1232	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5
	Aroclor 1242	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5
	Aroclor 1248	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5
	Aroclor 1254	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5
	Aroclor 1260	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5
	PCBs (Sum of total)	mg/kg	0.5	50	50		50	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5
SVOC	2,4,5-trichlorophenol	mg/kg	1	8000	14400		32000	57600	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1
	2,4,6-trichlorophenol	mg/kg	1	40	72		160	288	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1
	2,4-dichlorophenol	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5
	2,4-dimethylphenol	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5
	2,4-dinitrophenol	mg/kg	5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5	<5	<5	<5
	2,6-dichlorophenol	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5
	2-chlorophenol	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5
	2-methylphenol	mg/kg	0.2	4000	7200		16000	28800	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	<0.2	<0.2	<0.2
	2-nitrophenol	mg/kg	1						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1
	3-&4-methylphenol	mg/kg	0.4						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.4	<0.4	<0.4	<0.4
	4,6-Dinitro-2-methylphenol	mg/kg	5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5	<5	<5	<5
	4,6-Dinitro-o-cyclohexyl phenol	mg/kg	20						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<20	<20	<20	<20
	4-chloro-3-methylphenol	mg/kg	1						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1
	4-nitrophenol	mg/kg	5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5	<5	<5	<5
	Dinoseb	mg/kg	20						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<20	<20	<20	<20
	Pentachlorophenol	mg/kg	1						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1
	Phenol	mg/kg	0.5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5
	tetrachlorophenols	mg/kg	1						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1
	Phenols (Total Halogenated)	mg/kg	1						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1
	Phenols (Total Non Halogenated)	mg/kg	20	288	518		1152	2073	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<20	<20	<20	<20
TPH	C10 - C14	mg/kg	20						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<20	<20	<20	<20
	C15 - C28	mg/kg	50						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	600	420	<50	<50
	C29 - C36	mg/kg	50						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	260	230	<50	<50
	C10 - C36 (Sum of total)	mg/kg	50	10000	10000		40000	40000	<110	<110	<110	<110	<150	<110	<110	<110	<110	<110	<110	<110	<130	<110	<110	<110	<200	500	<110	<110	240	<110	<110	860	650	<50	<50
Volatile	Benzene	mg/kg	0.1	10	18		40	72	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1
	Ethylbenzene	mg/kg	0.1	600	1080		2400	4320	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.1	<0.1	<0.1	<0.1
	Toluene	mg/kg	0.1	288	518		1152	2073	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.1	<0.1	<0.1	<0.1
	Xylene (m & p)	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	<0.2	<0.2	<0.2
	Xylene (o)	mg/kg	0.1						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1
	Xylene Total	mg/kg	0.3	1000	1800		4000	7200	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<0.3	<0.3	<0.3	<0.3

Result	Exceed NSW 2014 General Solid Waste (No TCLP)
Result	Exceed NSW 2014 General Solid Waste (with TCLP)
Result	Exceed NSW 2014 General Solid Waste (No TCLP)
Result	Exceed NSW 2014 Restricted Solid Waste (No TCLP)
Result	Exceed NSW 2014 Restricted Solid Waste (With TCLP)

Notes:

1 Contamination Threshold Value (CT1) for General Solid Waste
2 Specific Contaminant Concentration (SCC1) for General Solid Waste
3 Contamination Threshold Value (CT2) for Restricted Solid Waste
4 Specific Contaminant Concentration (SCC2) for Restricted Solid Waste
- Not Analysed
ND No Asbestos Detected

Table LR5
Waste Classification Results
HCCD - Site 1
754-NTLEN213472

									Coffey DSI (2019)																								
								Field_ID	BHP10 0.2-0.3	BHP10 1.7-1.8	BHP11 0.2-0.3	BHP11 0.9-1.0	BHP12 0.2-0.3	BHP12 0.9-1.0	BHP13 0.2-0.3	BHP13 1.9-2.0	BHP14 0.2-0.3	BHP14 0.9-1.0	BHP15 0.2-0.3	BHP15 0.9-1.0	BHP16 0.0-0.2	BHP16 0.6-0.7	BHP18 0.2-0.3	BHP18 0.9-1.0	BHP19 0.1-0.3	BHP19 1.5-1.6	BHP20 0.2-0.3	BHP20 1.2-1.3	SS1	SS2	ACM1	ACM2	ACM3
								Sample_Depth_Range	0.2-0.3	1.7-1.8	0.2-0.3	0.9-1.0	0.2-0.3	0.9-1.0	0.2-0.3	1.9-2.0	0.2-0.3	0.9-1.0	0.2-0.3	0.9-1.0	0.0-0.2	0.6-0.7	0.2-0.3	0.9-1.0	0.1-0.3	1.5-1.6	0.2-0.3	1.2-1.3	0.0-0.1	0.0-0.1	Surface	Surface	Surface
								Sampled_Date-Time	18-Dec-18	18-Dec-18	19-Dec-18	19-Dec-18	18-Dec-18	18-Dec-18	18-Dec-18	18-Dec-18	19-Dec-18	19-Dec-18	19-Dec-18	19-Dec-18	19-Dec-18	19-Dec-18	19-Dec-18	19-Dec-18	19-Dec-18	19-Dec-18	18-Dec-18	18-Dec-18	19-Dec-18	19-Dec-18	19-Dec-18	19-Dec-18	19-Dec-18
								Matrix_Description	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Fragment	Fragment	Fragment
Method_Type	ChemName	Units	EQL	CT1 NSW 2014 General Solid Waste (No Leaching)[1]	SCC1 NSW 2014 General Solid Waste (leached)[2]	CT2 NSW 2014 General Solid Waste (No Leaching)	CT2 NSW 2014 Restricted Solid Waste (No Leaching)[3]	SCC2 NSW 2014 Restricted Solid Waste (leached)[4]																									
Heavy Metal	Arsenic	mg/kg	2	100	500		400	2000	15	3.1	6.8	4.6	14	3.4	19	8.6	96	10	83	40	91	<2	240	15	49	19	3	2.4	3.6	6.2	-	-	-
	Cadmium	mg/kg	0.4	20	100		80	400	<0.4	<0.4	<0.4	<0.4	1.1	<0.4	0.8	<0.4	<0.4	<0.4	0.7	0.8	<0.4	<0.4	1.3	<0.4	0.9	<0.4	<0.4	<0.4	<0.4	0.5	-	-	-
	Chromium	mg/kg	5	100	1900	400		7600	5.3	<5	26	19	26	<5	5.5	<5	13	<5	17	25	17	<5	11	<5	11	<5	8.2	<5	<5	9.5	-	-	-
	Copper	mg/kg	5						150	<5	71	57	240	<5	61	37	360	<5	1900	2600	160	<5	150	<5	1200	550	12	<5	29	59	-	-	-
	Lead	mg/kg	5	100	1500		400	6000	210	15	32	42	190	7.4	140	66	290	7.4	2200	1800	1100	7.5	1100	6.4	1000	250	44	8.8	50	120	-	-	-
	Mercury	mg/kg	0.1	4	50		16	200	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.3	<0.1	<0.1	1.9	1.2	0.7	<0.1	0.5	<0.1	1.2	0.5	<0.1	<0.1	<0.1	0.8	-	-	-
	Nickel	mg/kg	5	40	1050		160	4200	7.8	<5	<5	<5	13	<5	7.8	<5	18	<5	36	29	24	<5	23	<5	38	16	<5	<5	<5	6.2	-	-	-
	Zinc	mg/kg	5						240	15	27	31	1200	<5	190	120	160	<5	460	550	250	<5	580	21	510	270	53	<5	70	190	-	-	-
	Magnanese	mg/kg	5						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Inorganic	Moisture Content (dried @ 103°C)	%	1						3.4	2.8	11	12	10	19	5.6	19	9.1	5.3	17	13	6	3.1	11	4.5	15	19	7.7	23	2.8	4.4	-	-	-
Asbestos	Detected								ND	-	-	-	ND	-	ND	-	-	-	ND	-	-	-	-	-	-	-	ND	-	ND	ND	ND	ND	ND
OCP	4,4-DDE	mg/kg	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-
	a-BHC	mg/kg	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-
	Aldrin	mg/kg	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-
	Aldrin + Dieldrin	mg/kg	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-
	b-BHC	mg/kg	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-
	Chlordane	mg/kg	0.1						<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-
	d-BHC	mg/kg	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-
	DDD	mg/kg	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-
	DDT	mg/kg	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-
	DDT+DDE+DDD	mg/kg	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-
	Dieldrin	mg/kg	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-
	Endosulfan I	mg/kg	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-
	Endosulfan II	mg/kg	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-
	Endosulfan sulphate	mg/kg	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-
	Endrin	mg/kg	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-
	Endrin aldehyde	mg/kg	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-
	Endrin ketone	mg/kg	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-
	g-BHC (Lindane)	mg/kg	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-
	Heptachlor	mg/kg	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-
	Heptachlor epoxide	mg/kg	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-
	Hexachlorobenzene	mg/kg	0.05						<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-
	Methoxychlor	mg/kg	0.2						<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	-	-
	Toxaphene	mg/kg	1						<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	Vic EPA IWRG 621 OCP (Total)*	MG/KG	0.1						<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-
	Vic EPA IWRG 621 Other OCP (Total)*	MG/KG	0.1						<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-
Organic	Naphthalene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
	F2-NAPHTHALENE	mg/kg	50						<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	86	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	-	-	-
	C6 - C9	mg/kg	20	650	650		2600	2600	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	-	-	-
	C10 - C40 (Sum of total)	mg/kg	100						120	<100	<100	<100	<100	<100	120	<100	<100	<100	500	789	<100	<100	690	<100	170	<100	<100	<100	4800	160	-	-	-
	C6-C10 less BTEX (F1)	mg/kg	20						<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	-	-	-
	C10-C16	mg/kg	50						<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	89	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	-	-	-
	C16-C34	mg/kg	100						120	<100	<100	<100	<100	<100	120	<100	<100	<100	400	580	<100	<100	540	<100	170	<100	<100	<100	3200	160	-	-	-
	C34-C40	mg/kg	100						<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	100	120	<100	<100	150	<100	<100	<100	<100	<100	1600	<100	-	-	-
	C6 - C10	mg/kg	20						<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	-	-	-
PAH	Acenaphthene	mg/kg	0.5						<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
	Acenaphthylene	mg/kg	0.5						<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
	Anthracene	mg/kg	0.5						<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	4.4	<0.5	<0.5	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
	Benzo(a)anthracene	mg/kg	0.5						<50	<0.5	<0.5	<0.5	0.9	<0.5	1.2	<0.5	0.5	<0.5	2.3	6	<0.5	<0.5	5.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	-	-	-
	Benzo(a)pyrene	mg/kg	0.5	0.8	10		3.2	23	<50	<0.5	<0.5	<0.5	1	<0.5	1.5	<0.5	0.7	<0.5	1.8	5	<0.5	<0.5	5.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	-	-	-
	Benzo(a)pyrene TEQ (lower bound) *	MG/KG	0.5						<0.5	<0.5	<0.5	<0.5	1.3	<0.5	2	<0.5	0.8	<0.5	2.4	6.7	<0.5	<0.5	7.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	-	-	-
	Benzo(a)pyrene TEQ (medium bound) *	MG/KG	0.5						61	0.6	0.6	0.6	1.6	0.6	2.2	0.6	1.1	0.6	2.7	6.9	0.6	0.6	7.4	0.6	0.6	0.6	0.6	0.6	0.6	1	-	-	-
	Benzo(a)pyrene TEQ (upper bound) *	MG/KG	0.5						120	1.2	1.2	1.2	1.8	1.2	2.5	1.2	1.4	1.2	2.9	7.2	1.2	1.2	7.6	1.2	1.2	1.2	1.2	1.2	1.2	1.3	-	-	-
	Benzo(g,h,i)perylene	mg/kg	0.5						<50	<0.5	<0.5	<0.5	0.8	<0.5	1.3	<0.5	0.5	<0.5	0.9	2.8	<0.5	<0.5	3.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
	Benzo(k)fluoranthene	mg/kg	0.5						<50	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	0.8	1.9	<0.5	<0.5	2.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
	Chrysene	mg/kg	0.5						<50	<0.5	<0.5	<0.5	0.9	<0.5	1.1	<0.5	<0.5	<0.5	1.8	5.4	<0.5	<0.5	5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
	Benzo[b+j]fluoranthene	mg/kg	0.5						<50	<0.5	<0.5	<0.5	1.2	<0.5	1.7	<0.5	0.8	<0.5	2.2	5.4	<0.5	<0.5	6.3	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	0.8	-	-	-
	Dibenz(a,h)anthracene	mg/kg	0.5						<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
	Fluoranthene	mg/kg	0.5						<50	<0.5	<0.5	<0.5	2.3	<0.5	3	<0.5	1.2	<0.5	4.3	14	0.7	<0.5	11	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	1.3	-	-	-
	Fluorene	mg/kg	0.5						<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5						<50	<0.5	<0.5	<0.5	0.7	<0.5	1.1	<0.5	<0.5	<0.5	0.9	2.4	<0.5	<0.5	3.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
	Naphthalene	mg/kg	0.5						<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	3.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
	Phenanthrene	mg/kg	0.5						<50	<0.5	<0.5	<0.5	1.7	<0.5	1.4	<0.5	0.6	<0.5	4.2	19	<0.5	<0.5	6.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	-	-	-
	Pyrene	mg/kg	0.5						<50	<0.5	<0.5	<0.5	2.2	<0.5	3	<0.5	1.1	<0.5	3.9	13	0.6	<0.5	10	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	1.2	-	-	-
	Total PAHs	mg/kg	0.5	200	200		800	800	<50	<0.5	<0.5	<0.5	11.7	<0.5	15.9	<0.5	5.4	<0.5	24.3	86.8	1.3	<0.5	60.9	<0.5	2	<0.5	<0.5	<0.5	<0.5	5.1	-	-	-
PCB	Arochlor 1221	mg/kg	0.1						<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-
	Aroclor 1016	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
	Aroclor 1232	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
	Aroclor 1242	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
	Aroclor 1248	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
	Aroclor 1254	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
	Aroclor 1260	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
	PCBs (Sum of total)	mg/kg	0.5	50	50		50	50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
SVOC	2,4,5-trichlorophenol	mg/kg	1	8000	14400		32000	57600	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	2,4,6-trichlorophenol	mg/kg	1	40	72		160	288	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	2,4-dichlorophenol	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
	2,4-dimethylphenol	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
	2,4-dinitrophenol	mg/kg	5						<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	-	-	-
	2,6-dichlorophenol	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
	2-chlorophenol	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
	2-methylphenol	mg/kg	0.2	4000	7200		16000	28800	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	-	-
	2-nitrophenol	mg/kg	1						<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	3-&4-methylphenol	mg/kg	0.4						<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	-	-	-
	4,6-Dinitro-2-methylphenol	mg/kg	5						<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	-	-	-
	4,6-Dinitro-o-cyclohexyl phenol	mg/kg	20						<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	-	-	-
	4-chloro-3-methylphenol	mg/kg	1						<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	4-nitrophenol	mg/kg	5						<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	-	-	-
	Dinoseb	mg/kg	20						<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	-	-	-
	Pentachlorophenol	mg/kg	1						<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	Phenol	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
	tetrachlorophenols	mg/kg	1						<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	Phenols (Total Halogenated)	mg/kg	1						<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-
	Phenols (Total Non Halogenated)	mg/kg	20	288	518		1152	2073	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	-	-	-
TPH	C10 - C14	mg/kg	20						<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	58	<20	<20	31	<20	<20	<20	<20	<20	<20	<20	-	-	-
	C15 - C28	mg/kg	50						87	<50	<50	<50	57	<50	72	<50	51	<50	260	420	<50	<50	360	<50	110	<50	<50	<50	1500	67	-	-	-
	C29 - C36	mg/kg	50						50	<50	<50	<50	<50	<50	63	<50	<50	<50	190	240	<50	<50	260	<50	83	<50	<50	<50	2600	150	-	-	-
	C10 - C36 (Sum of total)	mg/kg	50	10000	10000		40000	40000	137	<50	<50	<50	57	<50	135	<50	51	<50	450	718	<50	<50	651	<50	193	<50	<50	<50	4100	217	-	-	-
Volatile	Benzene	mg/kg	0.1	10	18		40	72	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-
	Ethylbenzene	mg/kg	0.1	600	1080		2400	4320	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-
	Toluene	mg/kg	0.1	288	518		1152	2073	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-
	Xylene (m & p)	mg/kg	0.2						<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	-	-
	Xylene (o)	mg/kg	0.1						<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-
	Xylene Total	mg/kg	0.3	1000	1800		4000	7200	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	-	-	-

Result	Exceed NSW 2014 General Solid Waste (No TCLP)
Result	Exceed NSW 2014 General Solid Waste (with TCLP)
Result	Exceed NSW 2014 General Solid Waste (No TCLP)
Result	Exceed NSW 2014 Restricted Solid Waste (No TCLP)
Result	Exceed NSW 2014 Restricted Solid Waste (With TCLP)

Notes:

1 Contamination Threshold Value (CT1) for General Solid Waste
2 Specific Contaminant Concentration (SCC1) for General Solid Waste
3 Contamination Threshold Value (CT2) for Restricted Solid Waste
4 Specific Contaminant Concentration (SCC2) for Restricted Solid Waste
- Not Analysed
ND No Asbestos Detected

Table LR6
Acid Sulfate Soil Results Table
HCCD - Site 1
754-NTLEN213472

					Field ID	BHP9 3.4-3.5	BHP9 3.8-3.9	BHP11 2.8-2.9	BHP11 3.3-3.5	BHP13 2.5-2.6	BHP14 2.5-2.8	BHP14 3.3-3.5	BHP15 2.5-2.8	BHP16 2.8-3.0	BHP18 2.7-3.0	BHP18 3.5-3.8	BHP19 3.1-3.3	BHP20 2.9-3.0
					Sampled Date	18-Dec-18	18-Dec-18	19-Dec-18	19-Dec-18	18-Dec-18	19-Dec-18	19-Dec-18	19-Dec-18	19-Dec-18	19-Dec-18	19-Dec-18	19-Dec-18	18-Dec-18
	Units	**EQL**	**Action Criteria if More than 1,000 tonnes disturbed - Sulfur Trail %S (Coarse Texture)**	**Action Criteria if More than 1,000 tonnes disturbed - Acid Trail mol H+ (Coarse Texture)**														
pH-F (Field pH test)	pH Units	0.1				8.9	9.1	8.9	9	9.2	9.2	8.9	9.3	9.1	8.8	9.3	8.6	8.7
pH-FOX (Field pH Peroxide test)	pH Units	0.1				7.1	7.2	7.4	3.6	3	7.7	2.8	7.5	7.6	7.4	3.9	7.8	7.4
Reaction Ratings*	Comment					2	2	4	2	4	2	4	2	4	2	4	4	2
pH KCl (23A)	pH Unit	0.1				9.2	9.3	-	9.1	8.9	-	8.7	9.5	9.6	-	8.8	9.4	9.3
Titratable Actual Acidity	mole H+ / t	2			18	< 2	< 2	-	< 2	< 2	-	< 2	< 2	< 2	-	< 2	< 2	< 2
sulfidic - Titratable Actual Acidity	% pyrite S	0.02				< 0.02	< 0.02	-	< 0.02	< 0.02	-	< 0.02	< 0.02	< 0.02	-	< 0.02	< 0.02	< 0.02
Chromium Reducible Sulfur	% S	0.005	0.03			0.035	0.032	-	0.087	0.24	-	0.19	0.015	0.023	-	0.44	0.18	0.052
Calculated Liming Rate (Coffey)	kg CaCO3/t					1.64	1.5	-	4.07	11.24	-	8.9	0.7	1.08	-	20.59	8.42	2.43
acidity - Chromium Reducible Sulfur	mole H+ / t	3				22	20	-	54	150	-	120	< 3	14	-	270	110	33
Acid Neutralising Capacity	% CaCO3	0.01				1.9	1.9	-	2	2	-	0.9	6.2	6.5	-	3.4	18	9.5
acidity - Acid Neutralising Capacity	mole H+ / t	10				380	380	-	410	390	-	180	1200	1300	-	690	3500	1900
sulfidic - Acid Neutralising Capacity	% pyrite S	0.01				0.61	0.61	-	0.65	0.63	-	0.29	2	2.1	-	1.1	5.7	3.1
ANC Fineness Factor		0.5				1.5	1.5	-	1.5	1.5	-	1.5	1.5	1.5	-	1.5	1.5	1.5
Net Acidity (sulfur units)	% S	0.02				n/a	n/a	-	n/a	n/a	-	n/a	n/a	n/a	-	n/a	n/a	n/a
Net Acidity (acidity units)	mole H+ / t	10				n/a	n/a	-	n/a	n/a	-	n/a	n/a	n/a	-	n/a	n/a	n/a
Liming Rate	kg CaCO3/t	1				< 1	< 1	-	< 1	< 1	-	< 1	< 1	< 1	-	< 1	< 1	< 1
Net Acidity excluding ANC (sulfur units)	% S	0.02				n/a	n/a	-	n/a	n/a	-	n/a	n/a	n/a	-	n/a	n/a	n/a
Net Acidity excluding ANC (acidity units)	mole H+ / t	10				<10	<10	-	<10	<10	-	<10	<10	<10	-	<10	<10	<10
Liming Rate excluding ANC	kg CaCO3/t	1				n/a	n/a	-	n/a	n/a	-	n/a	n/a	n/a	-	n/a	n/a	n/a
Acid Volatile Sulfur	%	0.001				n/a	n/a	-	n/a	n/a	-	n/a	n/a	n/a	-	n/a	n/a	n/a
Exceeds Action Criteria																		

N/R - ANC not required as pH KCL less than 6.5

* Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth; 4.0; Extreme reaction.

coffey
A TETRA TECH COMPANY

Table LR7
Groundwater Analytical Results
HCCD - Site 1
754-NTLEN213472

								Field_ID	MW01	MW02	MW03
								WellCode	MW01	MW02	MW03
								Sampled_Date-Time	15-Jan-19	15-Jan-19	15-Jan-19
Method_Type	ChemName	Units	EQL	ANZECC 2000 Marine water	ANZECC 2000 Marine water 99%	NEPM 2013 Commercial/ industrial GW HSL D Vapour	NEPM 2013 Commercial/ industrial GW HSL D	NEPM 2013 Commercial/ industrial GW HSL D			
Heavy Metal	Arsenic (Filtered)	mg/L	0.001						0.003	0.001	0.002
	Cadmium (Filtered)	mg/L	0.0002	0.0055	0.0007				<0.0002	<0.0002	0.0006
	Chromium (Filtered)	mg/L	0.001						<0.001	<0.001	0.001
	Copper (Filtered)	mg/L	0.001	0.0013	0.0003				0.004	<0.001	<0.001
	Lead (Filtered)	mg/L	0.001	0.0044	0.0022				0.002	<0.001	<0.001
	Mercury (Filtered)	mg/L	0.0001	0.0004	0.0001				<0.0001	<0.0001	<0.0001
	Nickel (Filtered)	mg/L	0.001	0.07	0.007				0.008	<0.001	0.012
	Zinc (Filtered)	mg/L	0.005	0.015	0.007				0.087	<0.005	0.17
OCP	4,4-DDE	µg/L	0.1						<0.1	<0.1	<0.1
	a-BHC	µg/L	0.1						<0.1	<0.1	<0.1
	Aldrin	µg/L	0.1						<0.1	<0.1	<0.1
	Aldrin + Dieldrin	µg/L	0.1						<0.1	<0.1	<0.1
	b-BHC	µg/L	0.1						<0.1	<0.1	<0.1
	Chlordane	µg/L	1						<1	<1	<1
	d-BHC	µg/L	0.1						<0.1	<0.1	<0.1
	DDD	µg/L	0.1						<0.1	<0.1	<0.1
	DDT	µg/L	0.1						<0.1	<0.1	<0.1
	DDT+DDE+DDD	µg/L	0.1						<0.1	<0.1	<0.1
	Dieldrin	µg/L	0.1						<0.1	<0.1	<0.1
	Endosulfan I	µg/L	0.1						<0.1	<0.1	<0.1
	Endosulfan II	µg/L	0.1						<0.1	<0.1	<0.1
	Endosulfan sulphate	µg/L	0.1						<0.1	<0.1	<0.1
	Endrin	µg/L	0.1	0.008	0.004				<0.1	<0.1	<0.1
	Endrin aldehyde	µg/L	0.1						<0.1	<0.1	<0.1
	Endrin ketone	µg/L	0.1						<0.1	<0.1	<0.1
	g-BHC (Lindane)	µg/L	0.1						<0.1	<0.1	<0.1
	Heptachlor	µg/L	0.1						<0.1	<0.1	<0.1
	Heptachlor epoxide	µg/L	0.1						<0.1	<0.1	<0.1
	Hexachlorobenzene	µg/L	0.1						<0.1	<0.1	<0.1
	Methoxychlor	µg/L	0.1						<0.1	<0.1	<0.1
	Toxaphene	mg/L	0.01						<0.01	<0.01	<0.01
Organic	Naphthalene	µg/L	10	70	50				<10	<10	<10
	F2-NAPHTHALENE	mg/L	0.05						<0.05	<0.05	<0.05
	C6 - C9	µg/L	20						<20	<20	<20
	C10 - C40 (Sum of total)	µg/L	100						<100	<100	<100
	C6-C10 less BTEX (F1)	mg/L	0.02			6	6	7	<0.02	<0.02	<0.02
	C10-C16	mg/L	0.05						<0.05	<0.05	<0.05
	C16-C34	mg/L	0.1						<0.1	<0.1	<0.1
	C34-C40	mg/L	0.1						<0.1	<0.1	<0.1
	C6 - C10	mg/L	0.02						<0.02	<0.02	<0.02
PAH	Acenaphthene	µg/L	1						<1	<1	<1
	Acenaphthylene	µg/L	1						<1	<1	<1
	Anthracene	µg/L	1						<1	<1	<1
	Benzo(a)anthracene	µg/L	1						<1	<1	<1
	Benzo(a)pyrene	µg/L	1						<1	<1	<1
	Benzo(g,h,i)perylene	µg/L	1						<1	<1	<1
	Benzo(k)fluoranthene	µg/L	1						<1	<1	<1
	Chrysene	µg/L	1						<1	<1	<1
	Benzo[b+j]fluoranthene	mg/L	0.001						<0.001	<0.001	<0.001
	Dibenz(a,h)anthracene	µg/L	1						<1	<1	<1
	Fluoranthene	µg/L	1						<1	<1	<1
	Fluorene	µg/L	1						<1	<1	<1
	Indeno(1,2,3-c,d)pyrene	µg/L	1						<1	<1	<1
	Naphthalene	µg/L	1	70	50				<1	<1	<1
	Phenanthrene	µg/L	1						<1	<1	<1
	Pyrene	µg/L	1						<1	<1	<1
	Total PAHs	µg/L	1						<1	<1	<1
PCB	Arochlor 1221	µg/L	1						<1	<1	<1
	Aroclor 1016	µg/L	1						<1	<1	<1
	Aroclor 1232	µg/L	1						<1	<1	<1
	Aroclor 1242	µg/L	1						<1	<1	<1
	Aroclor 1248	µg/L	1						<1	<1	<1
	Aroclor 1254	µg/L	1						<1	<1	<1
	Aroclor 1260	µg/L	1						<1	<1	<1
	PCBs (Sum of total)	µg/L	1						<1	<1	<1
TPH	C10 - C14	µg/L	50						<50	<50	<50
	C15 - C28	µg/L	100						<100	<100	<100
	C29 - C36	µg/L	100						<100	<100	<100
	C10 - C36 (Sum of total)	µg/L	100						<100	<100	<100
Volatile	Benzene	µg/L	1	700	500	5000	5000	5000	<1	<1	<1
	Ethylbenzene	µg/L	1						<1	<1	<1
	Toluene	µg/L	1						<1	<1	<1
	Xylene (m & p)	µg/L	2						<2	<2	<2
	Xylene (o)	µg/L	1						<1	<1	<1
	Xylene Total	µg/L	3						<3	<3	<3

Result	Exceeds ANZECC 2000 Marine Water 95% guidelines
Result	Exceeds ANZECC 2000 Marine Water 99% guidelines
Result	Exceeds NEPM 2013 Commercial/ Industrial GW HSL D Vapour Intrusions, 2m to <8m, Sand guidelines

Notes:

- Not Analysed

Table LR8
QA/QC Results Groundwater
HCCD - Site 1
754-NTLEN213472

Field Duplicates (WATER)
Filter: SDG in('16 Jan 2019')

SDG	16-Jan-19	16-Jan-19	
Field ID	MW02	QWC1	**RPD**
Sampled Date/Time	1/15/2019	1/15/2019	

Method_T	ChemName	Units	EQL			
Organic	C6-C10 less BTEX (F1)	mg/l	0.02	<0.02	<0.02	0
Volatile	Benzene	µg/l	1	<1.0	<1.0	0
	Ethylbenzene	µg/l	1	<1.0	<1.0	0
	Toluene	µg/l	1	<1.0	<1.0	0
	Xylene (m & p)	µg/l	2	<2.0	<2.0	0
	Xylene (o)	µg/l	1	<1.0	<1.0	0
	Xylene Total	µg/l	3	<3.0	<3.0	0
Heavy Me	Arsenic (Filtered)	mg/l	0.001	0.001	0.001	0
	Cadmium (Filtered)	mg/l	0.0002	<0.0002	<0.0002	0
	Chromium (Filtered)	mg/l	0.001	<0.001	<0.001	0
	Copper (Filtered)	mg/l	0.001	<0.001	<0.001	0
	Lead (Filtered)	mg/l	0.001	<0.001	<0.001	0
	Mercury (Filtered)	mg/l	0.0001	<0.0001	<0.0001	0
	Nickel (Filtered)	mg/l	0.001	<0.001	<0.001	0
	Zinc (Filtered)	mg/l	0.005	<0.005	<0.005	0
OCP	4,4-DDE	µg/l	0.1	<0.1	<0.1	0
	a-BHC	µg/l	0.1	<0.1	<0.1	0
	Aldrin	µg/l	0.1	<0.1	<0.1	0
	Aldrin + Dieldrin	µg/l	0.1	<0.1	<0.1	0
	b-BHC	µg/l	0.1	<0.1	<0.1	0
	Chlordane	µg/l	1	<1.0	<1.0	0
	d-BHC	µg/l	0.1	<0.1	<0.1	0
	DDD	µg/l	0.1	<0.1	<0.1	0
	DDT	µg/l	0.1	<0.1	<0.1	0
	DDT+DDE+DDD	µg/l	0.1	<0.1	<0.1	0
	Dieldrin	µg/l	0.1	<0.1	<0.1	0
	Endosulfan I	µg/l	0.1	<0.1	<0.1	0
	Endosulfan II	µg/l	0.1	<0.1	<0.1	0
	Endosulfan sulphate	µg/l	0.1	<0.1	<0.1	0
	Endrin	µg/l	0.1	<0.1	<0.1	0
	Endrin aldehyde	µg/l	0.1	<0.1	<0.1	0
	Endrin ketone	µg/l	0.1	<0.1	<0.1	0
	g-BHC (Lindane)	µg/l	0.1	<0.1	<0.1	0
	Heptachlor	µg/l	0.1	<0.1	<0.1	0
	Heptachlor epoxide	µg/l	0.1	<0.1	<0.1	0
	Hexachlorobenzene	µg/l	0.1	<0.1	<0.1	0
	Methoxychlor	µg/l	0.1	<0.1	<0.1	0
	Toxaphene	mg/l	0.01	<0.01	<0.01	0
Organic	Naphthalene	µg/l	10	<10.0	<10.0	0
PAH	Acenaphthene	µg/l	1	<1.0	<1.0	0
	Acenaphthylene	µg/l	1	<1.0	<1.0	0
	Anthracene	µg/l	1	<1.0	<1.0	0
	Benzo(a)anthracene	µg/l	1	<1.0	<1.0	0
	Benzo(a)pyrene	µg/l	1	<1.0	<1.0	0
	Benzo(g,h,i)perylene	µg/l	1	<1.0	<1.0	0
	Benzo(k)fluoranthene	µg/l	1	<1.0	<1.0	0
	Chrysene	µg/l	1	<1.0	<1.0	0
	Benzo[b+j]fluoranthene	mg/l	0.001	<0.001	<0.001	0
	Dibenz(a,h)anthracene	µg/l	1	<1.0	<1.0	0
	Fluoranthene	µg/l	1	<1.0	<1.0	0
	Fluorene	µg/l	1	<1.0	<1.0	0
	Indeno(1,2,3-c,d)pyrene	µg/l	1	<1.0	<1.0	0
	Naphthalene	µg/l	1	<1.0	<1.0	0
	Phenanthrene	µg/l	1	<1.0	<1.0	0
	Pyrene	µg/l	1	<1.0	<1.0	0
	Total PAHs	µg/l	1	<1.0	<1.0	0
PCB	Arochlor 1221	µg/l	1	<1.0	<1.0	0
	Aroclor 1016	µg/l	1	<1.0	<1.0	0
	Aroclor 1232	µg/l	1	<1.0	<1.0	0
	Aroclor 1242	µg/l	1	<1.0	<1.0	0
	Aroclor 1248	µg/l	1	<1.0	<1.0	0
	Aroclor 1254	µg/l	1	<1.0	<1.0	0
	Aroclor 1260	µg/l	1	<1.0	<1.0	0
	PCBs (Sum of total)	µg/l	1	<1.0	<1.0	0
Organic	F2-NAPHTHALENE	mg/l	0.05	<0.05	<0.05	0
	C6 - C9	µg/l	20	<20.0	<20.0	0
	C10 - C40 (Sum of total)	µg/l	100	<100.0	<100.0	0
	C10-C16	mg/l	0.05	<0.05	<0.05	0
	C16-C34	mg/l	0.1	<0.1	<0.1	0
	C34-C40	mg/l	0.1	<0.1	<0.1	0
	C6 - C10	mg/l	0.02	<0.02	<0.02	0
TPH	C10 - C14	µg/l	50	<50.0	<50.0	0
	C15 - C28	µg/l	100	<100.0	<100.0	0
	C29 - C36	µg/l	100	<100.0	<100.0	0
	C10 - C36 (Sum of total)	µg/l	100	<100.0	<100.0	0

*RPDs have only been considered where a concentration is greater than 0 times the EQL.
**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 50 (0-10 x EQL); 30 (10-20 x EQL); 30 (> 20 x EQL))
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

coffey

Well Gauging Form

Project Name:	**HCCD - Site 1**	**Project Number:**	**NTLEN213472**
Field Staff:	**Sam Ramsey**	**Date:**	**15-01-19**
Project Manager:	**Paul Wright**		

REFER TO SOPs WHEN GAUGING WELLS:	**Equipment Used:**	**Interface Probe**
SOP - Monitoring Well Gauging and SOP - Decontamination of Sampling Equipment	**IP Serial Number:**	**269618**

Date	Time	Well ID	Casing Diameter	Total Well Depth	Depth to NAPL	Depth to Groundwater	NAPL Thickness	Height of Well Stick up	Comments (NAPL, Apparent Odour, Well Condition)
			mm	m	mBTOC	mBTOC	mm	m	
15-01-19	9:30am	MW01	50	6.090	NA	3.410	NA	0.445	Clear, No Odour, No Sheen, No Sediment, Good Condition
15-01-19	9:00am	MW02	50	6.810	NA	4.090	NA	0.940	Clear, No Odour, No Sheen, No Sediment, Good Condition
15-01-19	11:30am	MW03	50	6.240	NA	3.900	NA	1.095	Clear, No Odour, No Sheen, No Sediment, Good Condition

Groundwater Sampling Form (A) - General

Project Name: HCCD - Site 1 **Project Number:** NTLEN213472

Field Staff: Sam Ramsey **Date:** 15-01-19

Project Manager: Paul Wright

WELL ID: MW01 **DIAMETER:** 50 mm **TOTAL WELL DEPTH:** 6.09 m **SCREEN INTERVAL:** 2.60 to 6.00 mbTOC **Stick Up:** 445 mm

FIELD EQUIPMENT

WQ Metre ID: 11K100284

WQ Meter Type: YSI-PRO

ORP Ref Electrode:

WELL GAUGE AND PURGE VOLUME CALCULATION

(TOTAL WELL DEPTH) - (DEPTH TO WATER) = (WATER COLUMN)

6.09 m - 3.41 m = 2.68 m

Use water column calculation together with the procedures in 'SOP- Groundwater Sampling - Bailers' to determine the correct volume to be purged from the well (enter this value in the field to the right)

LITRES PER 1 WELL VOLUME: 9.91 L

WELL HEADSPACE PID READING: 0.0 ppmv

Time	Cycle/ Pump Rate (mL/min)	Volume (L)	Depth to Water (m)	Dissolved Oxygen (mg/L)		Electrical Conductivity (µS/cm)		pH (pH units)		Redox Potenital (mV)		Temperature (°C)		Clarity - tick one					Comments
														Clear	Slightly Cloudy	Cloudy	Very Cloudy	Turbid	Odour, colour, sediment, NAPL Collected etc
STABILISATION CRITERIA				± 10%		± 3%		± 0.1 unit		± 10 mV		± 0.2 °C							
(3 Readings within following ranges)				Reading	Change	Reading	Change	Reading	Change	Reading	Change	Reading	Change						
9:30am		4.00	3.43	19.6		5,529		7.07		72.7		25.4							Clear, No Odour, No Sediment
9:42am		11.00	3.44	19.2		5,499		7.09		55.4		25.0							Clear, No Odour, No Sediment
9:53am		21.00	3.44	18.3		5,471		7.10		59.1		25.1							Clear, No Odour, No Sediment
10:08am		31.00	3.43	21.2		5,472		7.12		66.4		25.1							Clear, No Odour, No Sediment
10:11am		33.00	3.44	18.3		5,464		7.08		54		25.1							Clear, No Odour, No Sediment
10:15am		35.00	3.44	17.6		5,453		7.09		51.1		25.0							Clear, No Odour, No Sediment
10:20am		37.00	3.44	17.9		5,453		7.09		56.1		25.0							Clear, No Odour, No Sediment

DUPLICATE COLLECTED: NA **DUPLICATE ID:** NA **METALS FILTERED?** Yes

TRIPLICATE COLLECTED: NA **TRIPLICATE ID:** NA

Unfiltered samples must not be put into a preserved container (ie a 'metals' bottle)

Groundwater Sampling Form (A) - General

Project Name: HCCD - Site 1 **Project Number:** NTLEN213472

Field Staff: Sam Ramsey **Date:** 15-01-19

Project Manager: Paul Wright

WELL ID: MWO2 **DIAMETER:** 50 mm **TOTAL WELL DEPTH:** 6.81 m **SCREEN INTERVAL:** 2.80 to 6.00 mbTOC **Stick Up:** 920 mm

FIELD EQUIPMENT

WQ Metre ID: 11K100284

WQ Meter Type: YSI-PRO

ORP Ref Electrode:

WELL GAUGE AND PURGE VOLUME CALCULATION

(TOTAL WELL DEPTH) - (DEPTH TO WATER) = (WATER COLUMN)

6.81 m - 4.09 m = 2.72 m

Use water column calculation together with the procedures in 'SOP- Groundwater Sampling - Bailers' to determine the correct volume to be purged from the well (enter this value in the field to the right)

LITRES PER 1 WELL VOLUME: 10.06 L

WELL HEADSPACE PID READING: 0.0 ppmv

Time	Cycle/ Pump Rate (mL/min)	Volume (L)	Depth to Water (m)	Dissolved Oxygen (mg/L)		Electrical Conductivity (µS/cm)		pH (pH units)		Redox Potenital (mV)		Temperature (°C)		Clarity - tick one					Comments
														Clear	Slightly Cloudy	Cloudy	Very Cloudy	Turbid	Odour, colour, sediment, NAPL Collected etc
STABILISATION CRITERIA				**± 10%**		**± 3%**		**± 0.1 unit**		**± 10 mV**		**± 0.2 °C**							
(3 Readings within following ranges)				Reading	Change	Reading	Change	Reading	Change	Reading	Change	Reading	Change						
8:03am		1.00	4.09	10.5		3,647		7.33		67.7		22.6							Clear, No Odour, No Sediment
8:07am		4.00	4.15	7.3		3,615		7.34		57.6		22.9							Clear, No Odour, No Sediment
8:11am		8.00	4.12	7.2		3,533		7.35		53.3		22.9							Clear, No Odour, No Sediment
8:17am		11.00	4.12	7.2		3,262		7.42		88.8		22.6							Clear, No Odour, No Sediment
8:22am		15.00	4.14	7.1		2,708		7.46		-2.8		22.1							Clear, No Odour, No Sediment
8:27am		21.00	4.14	5.3		2,654		7.47		21.6		22.3							Clear, No Odour, No Sediment
8:33am		25.00	4.13	9.6		2,602		7.50		14.6		22.3							Clear, No Odour, No Sediment
8:42am		31.00	4.13	17.8		2,648		7.55		8.8		22.3							Clear, No Odour, No Sediment
8:45am		34.00	4.13	17.2		2,624		7.57		4.2		22.2							Clear, No Odour, No Sediment
8:50am		37.00	4.13	17.4		2,608		7.55		-3.2		22.2							Clear, No Odour, No Sediment

DUPLICATE COLLECTED: Yes **DUPLICATE ID:** WQC1 **METALS FILTERED?** Yes

TRIPLICATE COLLECTED: NA **TRIPLICATE ID:** NA

Unfiltered samples must not be put into a preserved container (ie a 'metals' bottle)

Groundwater Sampling Form (A) - General

Project Name: HCCD - Site 1 **Project Number:** NTLEN213472

Field Staff: Sam Ramsey **Date:** 15-01-19

Project Manager: Paul Wright

WELL ID: MW03 **DIAMETER:** 50 mm **TOTAL WELL DEPTH:** 6.24 m **SCREEN INTERVAL:** 2.60 to 6.00 mbTOC **Stick Up:** 1095 mm

FIELD EQUIPMENT

WQ Metre ID: 11K100284

WQ Meter Type: YSI-PRO

ORP Ref Electrode:

WELL GAUGE AND PURGE VOLUME CALCULATION

(TOTAL WELL DEPTH) - (DEPTH TO WATER) = (WATER COLUMN)

6.24 m - 3.9 m = 2.34 m

Use water column calculation together with the procedures in 'SOP- Groundwater Sampling - Bailers' to determine the correct volume to be purged from the well (enter this value in the field to the right)

LITRES PER 1 WELL VOLUME: 8.69 L

WELL HEADSPACE PID READING

0.0 ppmv

Time	Cycle/ Pump Rate (mL/min)	Volume (L)	Depth to Water (m)	Dissolved Oxygen (mg/L)		Electrical Conductivity (µS/cm)		pH (pH units)		Redox Potenital (mV)		Temperature (°C)		Clarity - tick one					Comments
														Clear	Slightly Cloudy	Cloudy	Very Cloudy	Turbid	Odour, colour, sediment, NAPL Collected etc
STABILISATION CRITERIA				± 10%		± 3%		± 0.1 unit		± 10 mV		± 0.2 °C							
(3 Readings within following ranges)				Reading	Change	Reading	Change	Reading	Change	Reading	Change	Reading	Change						
10:53am		2.00	3.9	21.3		7,273		6.99		147.9		26.3		☒					Clear, No Odour, No Sediment
11:05am		10.00	3.92	17.2		7,134		7.00		154.1		25.2		☒					Clear, No Odour, No Sediment
11:15am		20.00	3.93	21.0		7,244		7.04		180.0		25.6		☒					Clear, No Odour, No Sediment
11:19am		25.00	3.93	17.7		7,150		7.02		162.0		25.1		☒					Clear, No Odour, No Sediment
11:22am		27.00	3.93	18.2		7,133		7.00		151.3		25.1		☒					Clear, No Odour, No Sediment
11:25am		29.00	3.93	19.4		7,143		7.02		150.2		25.1		☒					Clear, No Odour, No Sediment
11:29am		33.00	3.93	20.0		7,137		7.01		143.0		25.1		☒					Clear, No Odour, No Sediment

DUPLICATE COLLECTED: NA **DUPLICATE ID:** NA **METALS FILTERED?** Yes

TRIPLICATE COLLECTED: NA **TRIPLICATE ID:** NA

Unfiltered samples must not be put into a preserved container (ie a 'metals' bottle)

Appendix I – Laboratory Reports

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Site # 1254 & 14271

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NATA # 1261 Site # 18217

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Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name: Coffey Environments P/L N'castle
Address: Lot 101, 19 Warabrook Boulevard
Warabrook
NSW 2304

Project Name: UON HCCD
Project ID: NTLEN213472

Order No.:
Report #: 634424
Phone: 02 4016 2300
Fax: 02 4016 2380

Received: Dec 20, 2018 9:00 AM
Due: Jan 8, 2019
Priority: 10 Day
Contact Name: Paul Wright

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	Asbestos Absence /Presence	HOLD	Acid Sulfate Soils Field pH Test	Eurofins | mgt Suite B13	Chromium Reducible Sulfur Suite	Moisture Set	Moisture Set	Eurofins | mgt Suite B7A	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X		X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794									X		X	X	X		
Perth Laboratory - NATA Site # 23736															
External Laboratory															
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**										
1	BHP12 0.2-0.3	Dec 18, 2018		Soil	S18-De31067	X				X			X	X	
2	BHP12 0.9-1.0	Dec 18, 2018		Soil	S18-De31068					X			X	X	
3	BHP13 0.2-0.3	Dec 18, 2018		Soil	S18-De31069	X				X			X	X	
4	BHP13 1.9-2.0	Dec 18, 2018		Soil	S18-De31070					X			X	X	
5	BHP13 2.5-2.6	Dec 18, 2018		Soil	S18-De31071				X		X	X			
6	BHP20 0.2-0.3	Dec 18, 2018		Soil	S18-De31072	X				X			X	X	
7	BHP20 1.2-1.3	Dec 18, 2018		Soil	S18-De31073					X			X	X	
8	BHP20 2.9-3.0	Dec 18, 2018		Soil	S18-De31074				X		X	X			
9	BHP10 0.2-0.3	Dec 18, 2018		Soil	S18-De31075	X				X			X	X	

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NATA # 1261
Site # 23736

Company Name: Coffey Environments P/L N'castle
Address: Lot 101, 19 Warabrook Boulevard
Warabrook
NSW 2304

Project Name: UON HCCD
Project ID: NTLEN213472

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Received: Dec 20, 2018 9:00 AM
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Priority: 10 Day
Contact Name: Paul Wright

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	Asbestos Absence /Presence	HOLD	Acid Sulfate Soils Field pH Test	Eurofins | mgt Suite B13	Chromium Reducible Sulfur Suite	Moisture Set	Moisture Set	Eurofins | mgt Suite B7A	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X		X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794									X		X	X	X		
Perth Laboratory - NATA Site # 23736															
10	BHP10 1.7-1.8	Dec 18, 2018		Soil	S18-De31076					X			X	X	
11	BHP8 0.2-0.3	Dec 18, 2018		Soil	S18-De31077	X				X			X	X	
12	BHP8 0.9-1.0	Dec 18, 2018		Soil	S18-De31078					X			X	X	
13	QC1	Dec 18, 2018		Soil	S18-De31079					X			X	X	
14	BHP9 0.2-0.5	Dec 18, 2018		Soil	S18-De31080	X				X			X	X	
15	BHP9 1.0-1.1	Dec 18, 2018		Soil	S18-De31081					X			X	X	
16	BHP9 3.4-3.5	Dec 18, 2018		Soil	S18-De31082				X		X	X			
17	BHP9 3.8-3.9	Dec 18, 2018		Soil	S18-De31083				X		X	X			
18	QC3	Dec 18, 2018		Soil	S18-De31084					X			X	X	
19	TRIP SPIKE	Dec 18, 2018		Water	S18-De31085										X
20	TRIP BLANK	Dec 18, 2018		Water	S18-De31086										X
21	BHP18 0.2-0.3	Dec 19, 2018		Soil	S18-De31087					X			X	X	

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Address: Lot 101, 19 Warabrook Boulevard
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Project Name: UON HCCD
Project ID: NTLEN213472

Order No.:
Report #: 634424
Phone: 02 4016 2300
Fax: 02 4016 2380

Received: Dec 20, 2018 9:00 AM
Due: Jan 8, 2019
Priority: 10 Day
Contact Name: Paul Wright

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	Asbestos Absence /Presence	HOLD	Acid Sulfate Soils Field pH Test	Eurofins | mgt Suite B13	Chromium Reducible Sulfur Suite	Moisture Set	Moisture Set	Eurofins | mgt Suite B7A	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X		X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794									X		X	X	X		
Perth Laboratory - NATA Site # 23736															
22	BHP18 0.9-1.0	Dec 19, 2018		Soil	S18-De31088					X			X	X	
23	BHP18 2.7-3.0	Dec 19, 2018		Soil	S18-De31089				X						
24	BHP18 3.5-3.8	Dec 19, 2018		Soil	S18-De31090				X		X	X			
25	BHP15 0.2-0.3	Dec 19, 2018		Soil	S18-De31091	X				X			X	X	
26	BHP15 0.9-1.0	Dec 19, 2018		Soil	S18-De31092					X			X	X	
27	BHP15 2.5-2.8	Dec 19, 2018		Soil	S18-De31093				X		X	X			
28	BHP14 0.2-0.3	Dec 19, 2018		Soil	S18-De31094					X			X	X	
29	BHP14 0.9-1.0	Dec 19, 2018		Soil	S18-De31095					X			X	X	
30	BHP14 2.5-2.8	Dec 19, 2018		Soil	S18-De31096				X						
31	BHP14 3.3-3.5	Dec 19, 2018		Soil	S18-De31097				X		X	X			
32	BHP11 0.2-0.3	Dec 19, 2018		Soil	S18-De31098					X			X	X	
33	BHP11 0.9-1.0	Dec 19, 2018		Soil	S18-De31099					X			X	X	

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Report #: 634424
Phone: 02 4016 2300
Fax: 02 4016 2380

Received: Dec 20, 2018 9:00 AM
Due: Jan 8, 2019
Priority: 10 Day
Contact Name: Paul Wright

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	Asbestos Absence /Presence	HOLD	Acid Sulfate Soils Field pH Test	Eurofins | mgt Suite B13	Chromium Reducible Sulfur Suite	Moisture Set	Moisture Set	Eurofins | mgt Suite B7A	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X		X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794									X		X	X	X		
Perth Laboratory - NATA Site # 23736															
34	BHP11 2.8-2.9	Dec 19, 2018		Soil	S18-De31100				X						
35	BHP11 3.3-3.5	Dec 19, 2018		Soil	S18-De31101				X		X	X			
36	BHP19 0.1-0.3	Dec 19, 2018		Soil	S18-De31102					X			X	X	
37	BHP19 1.5-1.6	Dec 19, 2018		Soil	S18-De31103					X			X	X	
38	BHP19 3.1-3.3	Dec 19, 2018		Soil	S18-De31104				X		X	X			
39	BHP16 0.0-0.2	Dec 19, 2018		Soil	S18-De31105					X			X	X	
40	BHP16 0.6-0.7	Dec 19, 2018		Soil	S18-De31106					X			X	X	
41	BHP16 2.8-3.0	Dec 19, 2018		Soil	S18-De31107				X		X	X			
42	QC5	Dec 19, 2018		Soil	S18-De31108					X			X	X	
43	TRIP SPIKE 2	Dec 19, 2018		Water	S18-De31109										X
44	TRIP BLANK 2	Dec 19, 2018		Water	S18-De31110										X
45	ACM1	Dec 19, 2018		Building	S18-De31111		X								

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Company Name: Coffey Environments P/L N'castle
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Project ID: NTLEN213472

Order No.:
Report #: 634424
Phone: 02 4016 2300
Fax: 02 4016 2380

Received: Dec 20, 2018 9:00 AM
Due: Jan 8, 2019
Priority: 10 Day
Contact Name: Paul Wright

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	Asbestos Absence /Presence	HOLD	Acid Sulfate Soils Field pH Test	Eurofins | mgt Suite B13	Chromium Reducible Sulfur Suite	Moisture Set	Moisture Set	Eurofins | mgt Suite B7A	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X		X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794									X		X	X	X		
Perth Laboratory - NATA Site # 23736															
				Materials											
46	ACM2	Dec 19, 2018		Building Materials	S18-De31112		X								
47	ACM3	Dec 19, 2018		Building Materials	S18-De31113		X								
48	SS1	Dec 19, 2018		Soil	S18-De31114	X				X			X	X	
49	SS2	Dec 19, 2018		Soil	S18-De31115	X				X			X	X	
50	BHP12 1.9-2.0	Dec 18, 2018		Soil	S18-De31116			X							
51	BHP12 2.5-2.6	Dec 18, 2018		Soil	S18-De31117			X							
52	BHP12 3.0-3.1	Dec 18, 2018		Soil	S18-De31118			X							
53	BHP13 0.9-1.0	Dec 18, 2018		Soil	S18-De31119			X							
54	BHP20 0.5-0.6	Dec 19, 2018		Soil	S18-De31120			X							
55	BHP20 1.9-2.0	Dec 18, 2018		Soil	S18-De31121			X							

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Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X		X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794									X		X	X	X		
Perth Laboratory - NATA Site # 23736															
56	BHP20 2.4-2.5	Dec 18, 2018		Soil	S18-De31122			X							
57	BHP10 0.9-1.0	Dec 18, 2018		Soil	S18-De31123			X							
58	BHP8 1.9-2.0	Dec 19, 2018		Soil	S18-De31124			X							
59	BHP9 0.6-0.7	Dec 19, 2018		Soil	S18-De31125			X							
60	BHP9 1.8-1.9	Dec 19, 2018		Soil	S18-De31126			X							
61	BHP9 2.4-2.5	Dec 19, 2018		Soil	S18-De31127			X							
62	BHP9 3.0-3.1	Dec 19, 2018		Soil	S18-De31128			X							
63	BHP10 2.2-2.3	Dec 19, 2018		Soil	S18-De31129			X							
64	BHP18 1.9-2.0	Dec 19, 2018		Soil	S18-De31130			X							
65	BHP15 1.8-2.0	Dec 19, 2018		Soil	S18-De31131			X							
66	BHP14 1.8-2.0	Dec 19, 2018		Soil	S18-De31132			X							
67	BHP11 1.2-1.3	Dec 19, 2018		Soil	S18-De31133			X							

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Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X		X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794									X		X	X	X		
Perth Laboratory - NATA Site # 23736															
68	BHP11 1.9-2.0	Dec 19, 2018		Soil	S18-De31134			X							
69	BHP19 1.0-1.1	Dec 19, 2018		Soil	S18-De31135			X							
70	BHP19 2.2-2.3	Dec 19, 2018		Soil	S18-De31136			X							
71	BHP16 1.6-1.7	Dec 19, 2018		Soil	S18-De31137			X							
72	QC6	Dec 19, 2018		Soil	S18-De31138			X							
Test Counts						9	3	23	13	29	10	39	39	29	4

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Sample Receipt Advice

Company name:	**Coffey Environments P/L N'castle**
Contact name:	Paul Wright
Project name:	UON HCCD
Project ID:	NTLEN213472
COC number:	Not provided
Turn around time:	10 Day
Date/Time received:	Dec 20, 2018 9:00 AM
Eurofins | mgt reference:	**634424**

Sample information

- ☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 6.1 degrees Celsius.
- ☑ All samples have been received as described on the above COC.
- ☑ COC has been completed correctly.
- ☑ Attempt to chill was evident.
- ☑ Appropriately preserved sample containers have been used.
- ☑ All samples were received in good condition.
- ☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☑ Appropriate sample containers have been used.
- ☑ Sample containers for volatile analysis received with zero headspace.
- ☒ Split sample sent to requested external lab.
- ☒ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

QC2 & QC4 sent to ALS.

Contact notes

If you have any questions with respect to these samples please contact:

Andrew Black on Phone : (+61) 2 9900 8490 or by e.mail: AndrewBlack@eurofins.com

Results will be delivered electronically via e.mail to Paul Wright - paul.wright@coffey.com.

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025–Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Coffey Environments Pty Ltd Newcastle
Lot 101, 19 Warabrook Boulevard
Warabrook
NSW 2304

Attention:	Paul Wright
Report	634424-AID
Project Name	UON HCCD
Project ID	NTLEN213472
Received Date	Dec 20, 2018
Date Reported	Jan 09, 2019

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos".This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

Project Name UON HCCD
Project ID NTLEN213472
Date Sampled Dec 18, 2018 to Dec 19, 2018
Report 634424-AID

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
BHP12 0.2-0.3	18-De31067	Dec 18, 2018	Approximate Sample 255g Sample consisted of: Dark brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
BHP13 0.2-0.3	18-De31069	Dec 18, 2018	Approximate Sample 239g Sample consisted of: Dark brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
BHP20 0.2-0.3	18-De31072	Dec 18, 2018	Approximate Sample 259g Sample consisted of: Brown fine-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
BHP10 0.2-0.3	18-De31075	Dec 18, 2018	Approximate Sample 188g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
BHP8 0.2-0.3	18-De31077	Dec 18, 2018	Approximate Sample 172g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
BHP9 0.2-0.5	18-De31080	Dec 18, 2018	Approximate Sample 194g Sample consisted of: Brown fine-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
BHP15 0.2-0.3	18-De31091	Dec 19, 2018	Approximate Sample 128g Sample consisted of: Dark brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
ACM1	18-De31111	Dec 19, 2018	Approximate Sample 14g / 70x40x10mm Sample consisted of: White plaster-board like material	No asbestos detected. Synthetic mineral fibre detected. No respirable fibres detected.
ACM2	18-De31112	Dec 19, 2018	Approximate Sample 28g / 75x45x4mm Sample consisted of: Grey compressed fibre cement material	No asbestos detected. Organic fibre detected. No respirable fibres detected.
ACM3	18-De31113	Dec 19, 2018	Approximate Sample 47g / 90x70x4mm Sample consisted of: Grey compressed fibre cement material	No asbestos detected. Organic fibre detected. No respirable fibres detected.
SS1	18-De31114	Dec 19, 2018	Approximate Sample 238g Sample consisted of: Brown fine- grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.
SS2	18-De31115	Dec 19, 2018	Approximate Sample 202g Sample consisted of: Brown fine- grained sandy soil and organic debris	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No respirable fibres detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

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
Asbestos - LTM-ASB-8020	Sydney	Dec 27, 2018	Indefinite
Asbestos - LTM-ASB-8020	Sydney	Dec 27, 2018	Indefinite

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Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X		X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794									X		X	X	X		
Perth Laboratory - NATA Site # 23736															
External Laboratory															
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**										
1	BHP12 0.2-0.3	Dec 18, 2018		Soil	S18-De31067	X				X			X	X	
2	BHP12 0.9-1.0	Dec 18, 2018		Soil	S18-De31068					X			X	X	
3	BHP13 0.2-0.3	Dec 18, 2018		Soil	S18-De31069	X				X			X	X	
4	BHP13 1.9-2.0	Dec 18, 2018		Soil	S18-De31070					X			X	X	
5	BHP13 2.5-2.6	Dec 18, 2018		Soil	S18-De31071				X		X	X			
6	BHP20 0.2-0.3	Dec 18, 2018		Soil	S18-De31072	X				X			X	X	
7	BHP20 1.2-1.3	Dec 18, 2018		Soil	S18-De31073					X			X	X	
8	BHP20 2.9-3.0	Dec 18, 2018		Soil	S18-De31074				X		X	X			
9	BHP10 0.2-0.3	Dec 18, 2018		Soil	S18-De31075	X				X			X	X	

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Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X		X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794									X		X	X	X		
Perth Laboratory - NATA Site # 23736															
10	BHP10 1.7-1.8	Dec 18, 2018		Soil	S18-De31076					X			X	X	
11	BHP8 0.2-0.3	Dec 18, 2018		Soil	S18-De31077	X				X			X	X	
12	BHP8 0.9-1.0	Dec 18, 2018		Soil	S18-De31078					X			X	X	
13	QC1	Dec 18, 2018		Soil	S18-De31079					X			X	X	
14	BHP9 0.2-0.5	Dec 18, 2018		Soil	S18-De31080	X				X			X	X	
15	BHP9 1.0-1.1	Dec 18, 2018		Soil	S18-De31081					X			X	X	
16	BHP9 3.4-3.5	Dec 18, 2018		Soil	S18-De31082				X		X	X			
17	BHP9 3.8-3.9	Dec 18, 2018		Soil	S18-De31083				X		X	X			
18	QC3	Dec 18, 2018		Soil	S18-De31084					X			X	X	
19	TRIP SPIKE	Dec 18, 2018		Water	S18-De31085										X
20	TRIP BLANK	Dec 18, 2018		Water	S18-De31086										X
21	BHP18 0.2-0.3	Dec 19, 2018		Soil	S18-De31087					X			X	X	

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Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X		X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794									X		X	X	X		
Perth Laboratory - NATA Site # 23736															
22	BHP18 0.9-1.0	Dec 19, 2018		Soil	S18-De31088					X			X	X	
23	BHP18 2.7-3.0	Dec 19, 2018		Soil	S18-De31089				X						
24	BHP18 3.5-3.8	Dec 19, 2018		Soil	S18-De31090				X		X	X			
25	BHP15 0.2-0.3	Dec 19, 2018		Soil	S18-De31091	X				X			X	X	
26	BHP15 0.9-1.0	Dec 19, 2018		Soil	S18-De31092					X			X	X	
27	BHP15 2.5-2.8	Dec 19, 2018		Soil	S18-De31093				X		X	X			
28	BHP14 0.2-0.3	Dec 19, 2018		Soil	S18-De31094					X			X	X	
29	BHP14 0.9-1.0	Dec 19, 2018		Soil	S18-De31095					X			X	X	
30	BHP14 2.5-2.8	Dec 19, 2018		Soil	S18-De31096				X						
31	BHP14 3.3-3.5	Dec 19, 2018		Soil	S18-De31097				X		X	X			
32	BHP11 0.2-0.3	Dec 19, 2018		Soil	S18-De31098					X			X	X	
33	BHP11 0.9-1.0	Dec 19, 2018		Soil	S18-De31099					X			X	X	

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Project Name: UON HCCD
Project ID: NTLEN213472

Order No.:
Report #: 634424
Phone: 02 4016 2300
Fax: 02 4016 2380

Received: Dec 20, 2018 9:00 AM
Due: Jan 8, 2019
Priority: 10 Day
Contact Name: Paul Wright

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	Asbestos Absence /Presence	HOLD	Acid Sulfate Soils Field pH Test	Eurofins | mgt Suite B13	Chromium Reducible Sulfur Suite	Moisture Set	Moisture Set	Eurofins | mgt Suite B7A	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X		X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794									X		X	X	X		
Perth Laboratory - NATA Site # 23736															
34	BHP11 2.8-2.9	Dec 19, 2018		Soil	S18-De31100				X						
35	BHP11 3.3-3.5	Dec 19, 2018		Soil	S18-De31101				X		X	X			
36	BHP19 0.1-0.3	Dec 19, 2018		Soil	S18-De31102					X			X	X	
37	BHP19 1.5-1.6	Dec 19, 2018		Soil	S18-De31103					X			X	X	
38	BHP19 3.1-3.3	Dec 19, 2018		Soil	S18-De31104				X		X	X			
39	BHP16 0.0-0.2	Dec 19, 2018		Soil	S18-De31105					X			X	X	
40	BHP16 0.6-0.7	Dec 19, 2018		Soil	S18-De31106					X			X	X	
41	BHP16 2.8-3.0	Dec 19, 2018		Soil	S18-De31107				X		X	X			
42	QC5	Dec 19, 2018		Soil	S18-De31108					X			X	X	
43	TRIP SPIKE 2	Dec 19, 2018		Water	S18-De31109										X
44	TRIP BLANK 2	Dec 19, 2018		Water	S18-De31110										X
45	ACM1	Dec 19, 2018		Building	S18-De31111		X								

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NATA # 1261
Site # 1254 & 14271

Sydney
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Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

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

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name: Coffey Environments P/L N'castle
Address: Lot 101, 19 Warabrook Boulevard
Warabrook
NSW 2304

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Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X		X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794									X		X	X	X		
Perth Laboratory - NATA Site # 23736															
				Materials											
46	ACM2	Dec 19, 2018		Building Materials	S18-De31112		X								
47	ACM3	Dec 19, 2018		Building Materials	S18-De31113		X								
48	SS1	Dec 19, 2018		Soil	S18-De31114	X				X			X	X	
49	SS2	Dec 19, 2018		Soil	S18-De31115	X				X			X	X	
50	BHP12 1.9-2.0	Dec 18, 2018		Soil	S18-De31116			X							
51	BHP12 2.5-2.6	Dec 18, 2018		Soil	S18-De31117			X							
52	BHP12 3.0-3.1	Dec 18, 2018		Soil	S18-De31118			X							
53	BHP13 0.9-1.0	Dec 18, 2018		Soil	S18-De31119			X							
54	BHP20 0.5-0.6	Dec 19, 2018		Soil	S18-De31120			X							
55	BHP20 1.9-2.0	Dec 18, 2018		Soil	S18-De31121			X							

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Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X		X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794									X		X	X	X		
Perth Laboratory - NATA Site # 23736															
56	BHP20 2.4-2.5	Dec 18, 2018		Soil	S18-De31122			X							
57	BHP10 0.9-1.0	Dec 18, 2018		Soil	S18-De31123			X							
58	BHP8 1.9-2.0	Dec 19, 2018		Soil	S18-De31124			X							
59	BHP9 0.6-0.7	Dec 19, 2018		Soil	S18-De31125			X							
60	BHP9 1.8-1.9	Dec 19, 2018		Soil	S18-De31126			X							
61	BHP9 2.4-2.5	Dec 19, 2018		Soil	S18-De31127			X							
62	BHP9 3.0-3.1	Dec 19, 2018		Soil	S18-De31128			X							
63	BHP10 2.2-2.3	Dec 19, 2018		Soil	S18-De31129			X							
64	BHP18 1.9-2.0	Dec 19, 2018		Soil	S18-De31130			X							
65	BHP15 1.8-2.0	Dec 19, 2018		Soil	S18-De31131			X							
66	BHP14 1.8-2.0	Dec 19, 2018		Soil	S18-De31132			X							
67	BHP11 1.2-1.3	Dec 19, 2018		Soil	S18-De31133			X							

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Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X		X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794									X		X	X	X		
Perth Laboratory - NATA Site # 23736															
68	BHP11 1.9-2.0	Dec 19, 2018		Soil	S18-De31134			X							
69	BHP19 1.0-1.1	Dec 19, 2018		Soil	S18-De31135			X							
70	BHP19 2.2-2.3	Dec 19, 2018		Soil	S18-De31136			X							
71	BHP16 1.6-1.7	Dec 19, 2018		Soil	S18-De31137			X							
72	QC6	Dec 19, 2018		Soil	S18-De31138			X							
Test Counts						9	3	23	13	29	10	39	39	29	4

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. This report replaces any interim results previously issued.

Holding Times

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

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

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

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

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to “non-bonded / friable”.
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory’s remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments

Eurofins | mgt accreditation number 1261, corporate site 1254 and 14271 is currently in progress of a controlled transition to a new custom built location at 6 Monterey Road, Dandenong South, Victoria 3175. All results on this report denoted as being performed by Eurofins | mgt 2-5 Kingston Town Close, Oakleigh Victoria 3166 corporate site 1254, will have been performed on either Oakleigh or new Dandenong South site.

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
N/A	Not applicable

Asbestos Counter/Identifier:

Chamath JHM Annakkage	Senior Analyst-Asbestos (NSW)

Authorised by:

Sayeed Abu	Senior Analyst-Asbestos (NSW)



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please click here.

Eurofins | mgt shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins | mgt be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Coffey Environments Pty Ltd Newcastle
Lot 101, 19 Warabrook Boulevard
Warabrook
NSW 2304

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Paul Wright**

Report **634424-S**
Project name UON HCCD
Project ID NTLEN213472
Received Date Dec 20, 2018

Client Sample ID			**BHP12 0.2-0.3**	**BHP12 0.9-1.0**	**BHP13 0.2-0.3**	**BHP13 1.9-2.0**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-De31067**	**S18-De31068**	**S18-De31069**	**S18-De31070**
Date Sampled			**Dec 18, 2018**	**Dec 18, 2018**	**Dec 18, 2018**	**Dec 18, 2018**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	57	< 50	72	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	63	< 50
TRH C10-36 (Total)	50	mg/kg	57	< 50	135	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	87	77	87	80
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	120	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	120	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	1.3	< 0.5	2.0	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	1.6	0.6	2.2	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.8	1.2	2.5	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	0.9	< 0.5	1.2	< 0.5
Benzo(a)pyrene	0.5	mg/kg	1.0	< 0.5	1.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	1.2	< 0.5	1.7	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	0.8	< 0.5	1.3	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	0.6	< 0.5
Chrysene	0.5	mg/kg	0.9	< 0.5	1.1	< 0.5

Client Sample ID			BHP12 0.2-0.3	BHP12 0.9-1.0	BHP13 0.2-0.3	BHP13 1.9-2.0
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-De31067**	**S18-De31068**	**S18-De31069**	**S18-De31070**
Date Sampled			**Dec 18, 2018**	**Dec 18, 2018**	**Dec 18, 2018**	**Dec 18, 2018**
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	2.3	< 0.5	3.0	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	0.7	< 0.5	1.1	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	1.7	< 0.5	1.4	< 0.5
Pyrene	0.5	mg/kg	2.2	< 0.5	3.0	< 0.5
Total PAH*	0.5	mg/kg	11.7	< 0.5	15.9	< 0.5
2-Fluorobiphenyl (surr.)	1	%	131	108	121	113
p-Terphenyl-d14 (surr.)	1	%	135	102	114	114
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	131	117	102	146
Tetrachloro-m-xylene (surr.)	1	%	106	99	91	116
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PCB*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibutylchlorendate (surr.)	1	%	131	117	102	146
Tetrachloro-m-xylene (surr.)	1	%	106	99	91	116

Client Sample ID			BHP12 0.2-0.3	BHP12 0.9-1.0	BHP13 0.2-0.3	BHP13 1.9-2.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-De31067	S18-De31068	S18-De31069	S18-De31070
Date Sampled			Dec 18, 2018	Dec 18, 2018	Dec 18, 2018	Dec 18, 2018
Test/Reference	LOR	Unit				
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	< 1	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
Tetrachlorophenols - Total	1	mg/kg	< 1	< 1	< 1	< 1
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	< 1	< 1
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
4-Nitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
Dinoseb	20	mg/kg	< 20	< 20	< 20	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	< 20	< 20
Phenol-d6 (surr.)	1	%	130	89	109	99
Heavy Metals						
Arsenic	2	mg/kg	14	3.4	19	8.6
Cadmium	0.4	mg/kg	1.1	< 0.4	0.8	< 0.4
Chromium	5	mg/kg	26	< 5	5.5	< 5
Copper	5	mg/kg	240	< 5	61	37
Lead	5	mg/kg	190	7.4	140	66
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.3
Nickel	5	mg/kg	13	< 5	7.8	< 5
Zinc	5	mg/kg	1200	< 5	190	120
% Moisture	1	%	10	19	5.6	19

Client Sample ID			BHP13 2.5-2.6	BHP20 0.2-0.3	BHP20 1.2-1.3	BHP20 2.9-3.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-De31071	S18-De31072	S18-De31073	S18-De31074
Date Sampled			Dec 18, 2018	Dec 18, 2018	Dec 18, 2018	Dec 18, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	< 20	< 20	-
TRH C10-C14	20	mg/kg	-	< 20	< 20	-
TRH C15-C28	50	mg/kg	-	< 50	< 50	-
TRH C29-C36	50	mg/kg	-	< 50	< 50	-
TRH C10-36 (Total)	50	mg/kg	-	< 50	< 50	-

Client Sample ID			BHP13 2.5-2.6	BHP20 0.2-0.3	BHP20 1.2-1.3	BHP20 2.9-3.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-De31071	S18-De31072	S18-De31073	S18-De31074
Date Sampled			Dec 18, 2018	Dec 18, 2018	Dec 18, 2018	Dec 18, 2018
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.1	mg/kg	-	< 0.1	< 0.1	-
Toluene	0.1	mg/kg	-	< 0.1	< 0.1	-
Ethylbenzene	0.1	mg/kg	-	< 0.1	< 0.1	-
m&p-Xylenes	0.2	mg/kg	-	< 0.2	< 0.2	-
o-Xylene	0.1	mg/kg	-	< 0.1	< 0.1	-
Xylenes - Total	0.3	mg/kg	-	< 0.3	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	-	83	73	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	< 0.5	< 0.5	-
TRH C6-C10	20	mg/kg	-	< 20	< 20	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20	< 20	-
TRH >C10-C16	50	mg/kg	-	< 50	< 50	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	< 50	< 50	-
TRH >C16-C34	100	mg/kg	-	< 100	< 100	-
TRH >C34-C40	100	mg/kg	-	< 100	< 100	-
TRH >C10-C40 (total)*	100	mg/kg	-	< 100	< 100	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	< 0.5	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	0.6	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	1.2	1.2	-
Acenaphthene	0.5	mg/kg	-	< 0.5	< 0.5	-
Acenaphthylene	0.5	mg/kg	-	< 0.5	< 0.5	-
Anthracene	0.5	mg/kg	-	< 0.5	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	-	< 0.5	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	-	< 0.5	< 0.5	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	-	< 0.5	< 0.5	-
Benzo(g.h.i)perylene	0.5	mg/kg	-	< 0.5	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5	< 0.5	-
Chrysene	0.5	mg/kg	-	< 0.5	< 0.5	-
Dibenz(a.h)anthracene	0.5	mg/kg	-	< 0.5	< 0.5	-
Fluoranthene	0.5	mg/kg	-	< 0.5	< 0.5	-
Fluorene	0.5	mg/kg	-	< 0.5	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	< 0.5	< 0.5	-
Naphthalene	0.5	mg/kg	-	< 0.5	< 0.5	-
Phenanthrene	0.5	mg/kg	-	< 0.5	< 0.5	-
Pyrene	0.5	mg/kg	-	< 0.5	< 0.5	-
Total PAH*	0.5	mg/kg	-	< 0.5	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	-	110	109	-
p-Terphenyl-d14 (surr.)	1	%	-	108	108	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	< 0.1	-
4.4'-DDD	0.05	mg/kg	-	< 0.05	< 0.05	-
4.4'-DDE	0.05	mg/kg	-	< 0.05	< 0.05	-
4.4'-DDT	0.05	mg/kg	-	< 0.05	< 0.05	-
a-BHC	0.05	mg/kg	-	< 0.05	< 0.05	-
Aldrin	0.05	mg/kg	-	< 0.05	< 0.05	-
b-BHC	0.05	mg/kg	-	< 0.05	< 0.05	-
d-BHC	0.05	mg/kg	-	< 0.05	< 0.05	-
Dieldrin	0.05	mg/kg	-	< 0.05	< 0.05	-

Client Sample ID			BHP13 2.5-2.6	BHP20 0.2-0.3	BHP20 1.2-1.3	BHP20 2.9-3.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-De31071	S18-De31072	S18-De31073	S18-De31074
Date Sampled			Dec 18, 2018	Dec 18, 2018	Dec 18, 2018	Dec 18, 2018
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Endosulfan I	0.05	mg/kg	-	< 0.05	< 0.05	-
Endosulfan II	0.05	mg/kg	-	< 0.05	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	< 0.05	-
Endrin	0.05	mg/kg	-	< 0.05	< 0.05	-
Endrin aldehyde	0.05	mg/kg	-	< 0.05	< 0.05	-
Endrin ketone	0.05	mg/kg	-	< 0.05	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	-	< 0.05	< 0.05	-
Heptachlor	0.05	mg/kg	-	< 0.05	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	< 0.05	-
Methoxychlor	0.2	mg/kg	-	< 0.2	< 0.2	-
Toxaphene	1	mg/kg	-	< 1	< 1	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.1	< 0.1	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.1	< 0.1	-
Dibutylchlorendate (surr.)	1	%	-	134	113	-
Tetrachloro-m-xylene (surr.)	1	%	-	105	95	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	-	< 0.5	< 0.5	-
Aroclor-1221	0.1	mg/kg	-	< 0.1	< 0.1	-
Aroclor-1232	0.5	mg/kg	-	< 0.5	< 0.5	-
Aroclor-1242	0.5	mg/kg	-	< 0.5	< 0.5	-
Aroclor-1248	0.5	mg/kg	-	< 0.5	< 0.5	-
Aroclor-1254	0.5	mg/kg	-	< 0.5	< 0.5	-
Aroclor-1260	0.5	mg/kg	-	< 0.5	< 0.5	-
Total PCB*	0.5	mg/kg	-	< 0.5	< 0.5	-
Dibutylchlorendate (surr.)	1	%	-	134	113	-
Tetrachloro-m-xylene (surr.)	1	%	-	105	95	-
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	-	< 0.5	< 0.5	-
2.4-Dichlorophenol	0.5	mg/kg	-	< 0.5	< 0.5	-
2.4.5-Trichlorophenol	1	mg/kg	-	< 1	< 1	-
2.4.6-Trichlorophenol	1	mg/kg	-	< 1	< 1	-
2.6-Dichlorophenol	0.5	mg/kg	-	< 0.5	< 0.5	-
4-Chloro-3-methylphenol	1	mg/kg	-	< 1	< 1	-
Pentachlorophenol	1	mg/kg	-	< 1	< 1	-
Tetrachlorophenols - Total	1	mg/kg	-	< 1	< 1	-
Total Halogenated Phenol*	1	mg/kg	-	< 1	< 1	-
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	-	< 20	< 20	-
2-Methyl-4.6-dinitrophenol	5	mg/kg	-	< 5	< 5	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	< 0.2	< 0.2	-
2-Nitrophenol	1	mg/kg	-	< 1	< 1	-
2.4-Dimethylphenol	0.5	mg/kg	-	< 0.5	< 0.5	-
2.4-Dinitrophenol	5	mg/kg	-	< 5	< 5	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	< 0.4	< 0.4	-
4-Nitrophenol	5	mg/kg	-	< 5	< 5	-
Dinoseb	20	mg/kg	-	< 20	< 20	-

Client Sample ID			BHP13 2.5-2.6	BHP20 0.2-0.3	BHP20 1.2-1.3	BHP20 2.9-3.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-De31071	S18-De31072	S18-De31073	S18-De31074
Date Sampled			Dec 18, 2018	Dec 18, 2018	Dec 18, 2018	Dec 18, 2018
Test/Reference	LOR	Unit				
Phenols (non-Halogenated)						
Phenol	0.5	mg/kg	-	< 0.5	< 0.5	-
Total Non-Halogenated Phenol*	20	mg/kg	-	< 20	< 20	-
Phenol-d6 (surr.)	1	%	-	101	63	-
Heavy Metals						
Arsenic	2	mg/kg	-	3.0	2.4	-
Cadmium	0.4	mg/kg	-	< 0.4	< 0.4	-
Chromium	5	mg/kg	-	8.2	< 5	-
Copper	5	mg/kg	-	12	< 5	-
Lead	5	mg/kg	-	44	8.8	-
Mercury	0.1	mg/kg	-	< 0.1	< 0.1	-
Nickel	5	mg/kg	-	< 5	< 5	-
Zinc	5	mg/kg	-	53	< 5	-
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.2	-	-	8.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.0	-	-	7.4
Reaction Ratings*[S05]		comment	4.0	-	-	2.0
Chromium Suite						
pH-KCL	0.1	pH Units	8.9	-	-	9.3
Acid trail - Titratable Actual Acidity	2	mol H+/t	< 2	-	-	< 2
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	< 0.02	-	-	< 0.02
Chromium Reducible Sulfur[S04]	0.005	% S	0.24	-	-	0.052
Chromium Reducible Sulfur -acidity units	3	mol H+/t	150	-	-	33
Sulfur - KCl Extractable	0.02	% S	n/a	-	-	n/a
HCl Extractable Sulfur	0.02	% S	n/a	-	-	n/a
Net Acid soluble sulfur	0.02	% S	n/a	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite[S02]	0.02	% S	n/a	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	2.0	-	-	9.5
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	390	-	-	1900
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)[S03]	0.02	% S	0.63	-	-	3.1
ANC Fineness Factor		factor	1.5	-	-	1.5
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	< 0.02	-	-	< 0.02
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	< 10	-	-	< 10
CRS Suite - Liming Rate[S01]	1	kg CaCO3/t	< 1	-	-	< 1
Extraneous Material						
<2mm Fraction	0.005	g	30	-	-	28
>2mm Fraction	0.005	g	< 0.005	-	-	4.9
Analysed Material	0.1	%	100	-	-	85
Extraneous Material	0.1	%	< 0.1	-	-	15
% Moisture	1	%	20	7.7	23	22

Client Sample ID Sample Matrix Eurofins | mgt Sample No. Date Sampled Test/Reference	LOR	Unit	BHP10 0.2-0.3 Soil S18-De31075 Dec 18, 2018	BHP10 1.7-1.8 Soil S18-De31076 Dec 18, 2018	BHP8 0.2-0.3 Soil S18-De31077 Dec 18, 2018	BHP8 0.9-1.0 Soil S18-De31078 Dec 18, 2018
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	57	< 50	600	420
TRH C29-C36	50	mg/kg	< 50	< 50	260	230
TRH C10-36 (Total)	50	mg/kg	57	< 50	860	650
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	75	84	80	80
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	800	590
TRH >C34-C40	100	mg/kg	< 100	< 100	140	130
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	940	720
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	1.6	< 0.5	45	30
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	1.9	0.6	45	31
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	2.1	1.2	45	31
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	6.8	2.0
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	0.9	1.0
Anthracene	0.5	mg/kg	0.5	< 0.5	16	7.0
Benz(a)anthracene	0.5	mg/kg	1.5	< 0.5	30	20
Benzo(a)pyrene	0.5	mg/kg	1.2	< 0.5	31	23
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	1.3	< 0.5	34	27
Benzo(g.h.i)perylene	0.5	mg/kg	0.7	< 0.5	20	17
Benzo(k)fluoranthene	0.5	mg/kg	0.7	< 0.5	13	8.3
Chrysene	0.5	mg/kg	1.3	< 0.5	27	19
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	4.2	< 0.5
Fluoranthene	0.5	mg/kg	3.4	< 0.5	80	56
Fluorene	0.5	mg/kg	< 0.5	< 0.5	6.0	2.0
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	0.7	< 0.5	19	16
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	0.7	< 0.5
Phenanthrene	0.5	mg/kg	1.9	< 0.5	73	33
Pyrene	0.5	mg/kg	3.0	< 0.5	75	51
Total PAH*	0.5	mg/kg	16.2	< 0.5	436.6	282.3
2-Fluorobiphenyl (surr.)	1	%	111	124	129	127
p-Terphenyl-d14 (surr.)	1	%	109	121	123	121

Client Sample ID			BHP10 0.2-0.3	BHP10 1.7-1.8	BHP8 0.2-0.3	BHP8 0.9-1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-De31075	S18-De31076	S18-De31077	S18-De31078
Date Sampled			Dec 18, 2018	Dec 18, 2018	Dec 18, 2018	Dec 18, 2018
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.1	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	102	117	108	113
Tetrachloro-m-xylene (surr.)	1	%	88	106	89	88
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PCB*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibutylchlorendate (surr.)	1	%	102	117	108	113
Tetrachloro-m-xylene (surr.)	1	%	88	106	89	88
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	< 1	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
Tetrachlorophenols - Total	1	mg/kg	< 1	< 1	< 1	< 1
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	< 1	< 1

Client Sample ID			BHP10 0.2-0.3	BHP10 1.7-1.8	BHP8 0.2-0.3	BHP8 0.9-1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-De31075	S18-De31076	S18-De31077	S18-De31078
Date Sampled			Dec 18, 2018	Dec 18, 2018	Dec 18, 2018	Dec 18, 2018
Test/Reference	LOR	Unit				
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
4-Nitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
Dinoseb	20	mg/kg	< 20	< 20	< 20	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	< 20	< 20
Phenol-d6 (surr.)	1	%	127	120	114	120
Heavy Metals						
Arsenic	2	mg/kg	15	3.1	10	22
Cadmium	0.4	mg/kg	< 0.4	< 0.4	0.4	3.6
Chromium	5	mg/kg	5.3	< 5	20	20
Copper	5	mg/kg	150	< 5	200	380
Lead	5	mg/kg	210	15	740	640
Mercury	0.1	mg/kg	< 0.1	< 0.1	0.2	0.4
Nickel	5	mg/kg	7.8	< 5	13	19
Zinc	5	mg/kg	240	15	320	870
% Moisture	1	%	3.4	2.8	8.9	8.8

Client Sample ID			QC1	BHP9 0.2-0.5	BHP9 1.0-1.1	BHP9 3.4-3.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-De31079	S18-De31080	S18-De31081	S18-De31082
Date Sampled			Dec 18, 2018	Dec 18, 2018	Dec 18, 2018	Dec 18, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	-
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	-
TRH C15-C28	50	mg/kg	450	< 50	< 50	-
TRH C29-C36	50	mg/kg	220	< 50	< 50	-
TRH C10-36 (Total)	50	mg/kg	670	< 50	< 50	-
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	71	86	83	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	-
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	-

Client Sample ID			QC1	BHP9 0.2-0.5	BHP9 1.0-1.1	BHP9 3.4-3.5
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-De31079**	**S18-De31080**	**S18-De31081**	**S18-De31082**
Date Sampled			**Dec 18, 2018**	**Dec 18, 2018**	**Dec 18, 2018**	**Dec 18, 2018**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	-
TRH >C16-C34	100	mg/kg	620	< 100	< 100	-
TRH >C34-C40	100	mg/kg	120	< 100	< 100	-
TRH >C10-C40 (total)*	100	mg/kg	740	< 100	< 100	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	34	< 0.5	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	35	0.6	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	35	1.2	1.2	-
Acenaphthene	0.5	mg/kg	2.9	< 0.5	< 0.5	-
Acenaphthylene	0.5	mg/kg	0.8	< 0.5	< 0.5	-
Anthracene	0.5	mg/kg	10	< 0.5	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	24	< 0.5	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	26	< 0.5	< 0.5	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	30	< 0.5	< 0.5	-
Benzo(g.h.i)perylene	0.5	mg/kg	18	< 0.5	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	9.5	< 0.5	< 0.5	-
Chrysene	0.5	mg/kg	22	< 0.5	< 0.5	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Fluoranthene	0.5	mg/kg	71	< 0.5	< 0.5	-
Fluorene	0.5	mg/kg	3.4	< 0.5	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	17	< 0.5	< 0.5	-
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Phenanthrene	0.5	mg/kg	50	< 0.5	< 0.5	-
Pyrene	0.5	mg/kg	62	< 0.5	< 0.5	-
Total PAH*	0.5	mg/kg	346.6	< 0.5	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	124	124	118	-
p-Terphenyl-d14 (surr.)	1	%	119	124	128	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Toxaphene	1	mg/kg	< 1	< 1	< 1	-

Client Sample ID			QC1	BHP9 0.2-0.5	BHP9 1.0-1.1	BHP9 3.4-3.5
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-De31079**	**S18-De31080**	**S18-De31081**	**S18-De31082**
Date Sampled			**Dec 18, 2018**	**Dec 18, 2018**	**Dec 18, 2018**	**Dec 18, 2018**
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Dibutylchlorendate (surr.)	1	%	115	113	111	-
Tetrachloro-m-xylene (surr.)	1	%	97	136	107	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Total PCB*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Dibutylchlorendate (surr.)	1	%	115	113	111	-
Tetrachloro-m-xylene (surr.)	1	%	97	136	107	-
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	-
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	-
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	< 1	-
Pentachlorophenol	1	mg/kg	< 1	< 1	< 1	-
Tetrachlorophenols - Total	1	mg/kg	< 1	< 1	< 1	-
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	< 1	-
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	< 20	-
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	< 5	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
2-Nitrophenol	1	mg/kg	< 1	< 1	< 1	-
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	< 5	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4	-
4-Nitrophenol	5	mg/kg	< 5	< 5	< 5	-
Dinoseb	20	mg/kg	< 20	< 20	< 20	-
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	< 20	-
Phenol-d6 (surr.)	1	%	114	113	106	-
Heavy Metals						
Arsenic	2	mg/kg	11	11	2.7	-
Cadmium	0.4	mg/kg	0.6	2.3	< 0.4	-
Chromium	5	mg/kg	13	75	< 5	-
Copper	5	mg/kg	220	120	< 5	-
Lead	5	mg/kg	400	230	6.1	-
Mercury	0.1	mg/kg	0.3	< 0.1	< 0.1	-
Nickel	5	mg/kg	14	9.6	< 5	-
Zinc	5	mg/kg	360	430	< 5	-

Client Sample ID			QC1	BHP9 0.2-0.5	BHP9 1.0-1.1	BHP9 3.4-3.5
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-De31079**	**S18-De31080**	**S18-De31081**	**S18-De31082**
Date Sampled			**Dec 18, 2018**	**Dec 18, 2018**	**Dec 18, 2018**	**Dec 18, 2018**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	-	-	-	8.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	-	-	-	7.1
Reaction Ratings*[S05]		comment	-	-	-	2.0
Chromium Suite						
pH-KCL	0.1	pH Units	-	-	-	9.2
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	-	< 2
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	-	-	< 0.02
Chromium Reducible Sulfur[S04]	0.005	% S	-	-	-	0.035
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	-	-	22
Sulfur - KCl Extractable	0.02	% S	-	-	-	n/a
HCl Extractable Sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur	0.02	% S	-	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite[S02]	0.02	% S	-	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	-	-	-	1.9
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	-	-	-	380
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)[S03]	0.02	% S	-	-	-	0.61
ANC Fineness Factor		factor	-	-	-	1.5
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	-	-	-	< 0.02
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	-	< 10
CRS Suite - Liming Rate[S01]	1	kg CaCO3/t	-	-	-	< 1
Extraneous Material						
<2mm Fraction	0.005	g	-	-	-	45
>2mm Fraction	0.005	g	-	-	-	1.3
Analysed Material	0.1	%	-	-	-	97
Extraneous Material	0.1	%	-	-	-	2.8
% Moisture	1	%	8.9	18	2.1	17

Client Sample ID			BHP9 3.8-3.9	QC3	BHP18 0.2-0.3	BHP18 0.9-1.0
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-De31083**	**S18-De31084**	**S18-De31087**	**S18-De31088**
Date Sampled			**Dec 18, 2018**	**Dec 18, 2018**	**Dec 19, 2018**	**Dec 19, 2018**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	-	< 20	31	< 20
TRH C15-C28	50	mg/kg	-	97	360	< 50
TRH C29-C36	50	mg/kg	-	66	260	< 50
TRH C10-36 (Total)	50	mg/kg	-	163	651	< 50
BTEX						
Benzene	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	-	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	78	76	84

Client Sample ID			BHP9 3.8-3.9	QC3	BHP18 0.2-0.3	BHP18 0.9-1.0
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-De31083**	**S18-De31084**	**S18-De31087**	**S18-De31088**
Date Sampled			**Dec 18, 2018**	**Dec 18, 2018**	**Dec 19, 2018**	**Dec 19, 2018**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	-	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	-	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	-	130	540	< 100
TRH >C34-C40	100	mg/kg	-	< 100	150	< 100
TRH >C10-C40 (total)*	100	mg/kg	-	130	690	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	1.3	7.1	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	1.6	7.4	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	1.8	7.6	1.2
Acenaphthene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	-	< 0.5	0.7	< 0.5
Anthracene	0.5	mg/kg	-	< 0.5	2.0	< 0.5
Benz(a)anthracene	0.5	mg/kg	-	0.9	5.7	< 0.5
Benzo(a)pyrene	0.5	mg/kg	-	1.0	5.3	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	-	1.3	6.3	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	-	0.7	3.3	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5	2.3	< 0.5
Chrysene	0.5	mg/kg	-	0.9	5.0	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	-	2.1	11	< 0.5
Fluorene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	0.6	3.1	< 0.5
Naphthalene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	-	0.9	6.2	< 0.5
Pyrene	0.5	mg/kg	-	2.0	10	< 0.5
Total PAH*	0.5	mg/kg	-	10.4	60.9	< 0.5
2-Fluorobiphenyl (surr.)	1	%	-	128	118	118
p-Terphenyl-d14 (surr.)	1	%	-	130	113	113
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05

Client Sample ID			BHP9 3.8-3.9	QC3	BHP18 0.2-0.3	BHP18 0.9-1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-De31083	S18-De31084	S18-De31087	S18-De31088
Date Sampled			Dec 18, 2018	Dec 18, 2018	Dec 19, 2018	Dec 19, 2018
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Methoxychlor	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Toxaphene	1	mg/kg	-	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	-	117	134	113
Tetrachloro-m-xylene (surr.)	1	%	-	105	110	106
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Aroclor-1221	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Aroclor-1242	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Aroclor-1248	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Aroclor-1254	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Aroclor-1260	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Total PCB*	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Dibutylchlorendate (surr.)	1	%	-	117	134	113
Tetrachloro-m-xylene (surr.)	1	%	-	105	110	106
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	-	< 1	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	-	< 1	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	-	< 1	< 1	< 1
Pentachlorophenol	1	mg/kg	-	< 1	< 1	< 1
Tetrachlorophenols - Total	1	mg/kg	-	< 1	< 1	< 1
Total Halogenated Phenol*	1	mg/kg	-	< 1	< 1	< 1
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	-	< 20	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	-	< 5	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
2-Nitrophenol	1	mg/kg	-	< 1	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	-	< 5	< 5	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	< 0.4	< 0.4	< 0.4
4-Nitrophenol	5	mg/kg	-	< 5	< 5	< 5
Dinoseb	20	mg/kg	-	< 20	< 20	< 20
Phenol	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	-	< 20	< 20	< 20
Phenol-d6 (surr.)	1	%	-	119	111	105
Heavy Metals						
Arsenic	2	mg/kg	-	47	240	15
Cadmium	0.4	mg/kg	-	0.8	1.3	< 0.4
Chromium	5	mg/kg	-	5.8	11	< 5
Copper	5	mg/kg	-	99	150	< 5

Client Sample ID			BHP9 3.8-3.9	QC3	BHP18 0.2-0.3	BHP18 0.9-1.0
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-De31083**	**S18-De31084**	**S18-De31087**	**S18-De31088**
Date Sampled			**Dec 18, 2018**	**Dec 18, 2018**	**Dec 19, 2018**	**Dec 19, 2018**
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	-	220	1100	6.4
Mercury	0.1	mg/kg	-	< 0.1	0.5	< 0.1
Nickel	5	mg/kg	-	11	23	< 5
Zinc	5	mg/kg	-	220	580	21
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.1	-	-	-
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.2	-	-	-
Reaction Ratings*[S05]		comment	2.0	-	-	-
Chromium Suite						
pH-KCL	0.1	pH Units	9.3	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	< 2	-	-	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	< 0.02	-	-	-
Chromium Reducible Sulfur[S04]	0.005	% S	0.032	-	-	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	20	-	-	-
Sulfur - KCl Extractable	0.02	% S	n/a	-	-	-
HCl Extractable Sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite[S02]	0.02	% S	n/a	-	-	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	1.9	-	-	-
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	380	-	-	-
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)[S03]	0.02	% S	0.61	-	-	-
ANC Fineness Factor		factor	1.5	-	-	-
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	< 0.02	-	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	< 10	-	-	-
CRS Suite - Liming Rate[S01]	1	kg CaCO3/t	< 1	-	-	-
Extraneous Material						
<2mm Fraction	0.005	g	42	-	-	-
>2mm Fraction	0.005	g	< 0.005	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture	1	%	17	8.1	11	4.5

Client Sample ID			BHP18 2.7-3.0	BHP18 3.5-3.8	BHP15 0.2-0.3	BHP15 0.9-1.0
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-De31089**	**S18-De31090**	**S18-De31091**	**S18-De31092**
Date Sampled			**Dec 19, 2018**	**Dec 19, 2018**	**Dec 19, 2018**	**Dec 19, 2018**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	-	< 20	< 20
TRH C10-C14	20	mg/kg	-	-	< 20	58
TRH C15-C28	50	mg/kg	-	-	260	420
TRH C29-C36	50	mg/kg	-	-	190	240
TRH C10-36 (Total)	50	mg/kg	-	-	450	718

Client Sample ID			BHP18 2.7-3.0	BHP18 3.5-3.8	BHP15 0.2-0.3	BHP15 0.9-1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-De31089	S18-De31090	S18-De31091	S18-De31092
Date Sampled			Dec 19, 2018	Dec 19, 2018	Dec 19, 2018	Dec 19, 2018
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.1	mg/kg	-	-	< 0.1	< 0.1
Toluene	0.1	mg/kg	-	-	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	-	-	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	-	-	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	-	-	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	-	-	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	-	57	80
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	-	< 0.5	2.7
TRH C6-C10	20	mg/kg	-	-	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	-	< 20	< 20
TRH >C10-C16	50	mg/kg	-	-	< 50	89
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	-	< 50	86
TRH >C16-C34	100	mg/kg	-	-	400	580
TRH >C34-C40	100	mg/kg	-	-	100	120
TRH >C10-C40 (total)*	100	mg/kg	-	-	500	789
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	-	2.4	6.7
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	-	2.7	6.9
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	-	2.9	7.2
Acenaphthene	0.5	mg/kg	-	-	< 0.5	2.4
Acenaphthylene	0.5	mg/kg	-	-	< 0.5	< 0.5
Anthracene	0.5	mg/kg	-	-	1.2	4.4
Benz(a)anthracene	0.5	mg/kg	-	-	2.3	6.0
Benzo(a)pyrene	0.5	mg/kg	-	-	1.8	5.0
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	-	-	2.2	5.4
Benzo(g.h.i)perylene	0.5	mg/kg	-	-	0.9	2.8
Benzo(k)fluoranthene	0.5	mg/kg	-	-	0.8	1.9
Chrysene	0.5	mg/kg	-	-	1.8	5.4
Dibenz(a.h)anthracene	0.5	mg/kg	-	-	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	-	-	4.3	14
Fluorene	0.5	mg/kg	-	-	< 0.5	1.6
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	-	0.9	2.4
Naphthalene	0.5	mg/kg	-	-	< 0.5	3.5
Phenanthrene	0.5	mg/kg	-	-	4.2	19
Pyrene	0.5	mg/kg	-	-	3.9	13
Total PAH*	0.5	mg/kg	-	-	24.3	86.8
2-Fluorobiphenyl (surr.)	1	%	-	-	99	93
p-Terphenyl-d14 (surr.)	1	%	-	-	92	83
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	-	-	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	-	-	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	-	-	< 0.05	< 0.05
a-BHC	0.05	mg/kg	-	-	< 0.05	< 0.05
Aldrin	0.05	mg/kg	-	-	< 0.05	< 0.05
b-BHC	0.05	mg/kg	-	-	< 0.05	< 0.05
d-BHC	0.05	mg/kg	-	-	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	-	-	< 0.05	< 0.05

Client Sample ID Sample Matrix Eurofins | mgt Sample No. Date Sampled Test/Reference	LOR	Unit	BHP18 2.7-3.0 Soil S18-De31089 Dec 19, 2018	BHP18 3.5-3.8 Soil S18-De31090 Dec 19, 2018	BHP15 0.2-0.3 Soil S18-De31091 Dec 19, 2018	BHP15 0.9-1.0 Soil S18-De31092 Dec 19, 2018
Organochlorine Pesticides						
Endosulfan I	0.05	mg/kg	-	-	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	-	-	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	-	< 0.05	< 0.05
Endrin	0.05	mg/kg	-	-	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	-	-	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	-	-	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	-	-	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	-	-	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	-	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	-	< 0.05	< 0.05
Methoxychlor	0.2	mg/kg	-	-	< 0.2	< 0.2
Toxaphene	1	mg/kg	-	-	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	-	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	-	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	-	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	-	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	-	-	148	133
Tetrachloro-m-xylene (surr.)	1	%	-	-	112	118
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	-	-	< 0.5	< 0.5
Aroclor-1221	0.1	mg/kg	-	-	< 0.1	< 0.1
Aroclor-1232	0.5	mg/kg	-	-	< 0.5	< 0.5
Aroclor-1242	0.5	mg/kg	-	-	< 0.5	< 0.5
Aroclor-1248	0.5	mg/kg	-	-	< 0.5	< 0.5
Aroclor-1254	0.5	mg/kg	-	-	< 0.5	< 0.5
Aroclor-1260	0.5	mg/kg	-	-	< 0.5	< 0.5
Total PCB*	0.5	mg/kg	-	-	< 0.5	< 0.5
Dibutylchlorendate (surr.)	1	%	-	-	148	133
Tetrachloro-m-xylene (surr.)	1	%	-	-	112	118
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	-	-	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	-	-	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	-	-	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	-	-	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	-	-	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	-	-	< 1	< 1
Pentachlorophenol	1	mg/kg	-	-	< 1	< 1
Tetrachlorophenols - Total	1	mg/kg	-	-	< 1	< 1
Total Halogenated Phenol*	1	mg/kg	-	-	< 1	< 1
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	-	-	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	-	-	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	-	< 0.2	< 0.2
2-Nitrophenol	1	mg/kg	-	-	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	-	-	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	-	-	< 5	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	-	< 0.4	< 0.4
4-Nitrophenol	5	mg/kg	-	-	< 5	< 5
Dinoseb	20	mg/kg	-	-	< 20	< 20

Client Sample ID Sample Matrix Eurofins | mgt Sample No. Date Sampled Test/Reference	LOR	Unit	BHP18 2.7-3.0 Soil S18-De31089 Dec 19, 2018	BHP18 3.5-3.8 Soil S18-De31090 Dec 19, 2018	BHP15 0.2-0.3 Soil S18-De31091 Dec 19, 2018	BHP15 0.9-1.0 Soil S18-De31092 Dec 19, 2018
Phenols (non-Halogenated)						
Phenol	0.5	mg/kg	-	-	< 0.5	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	-	-	< 20	< 20
Phenol-d6 (surr.)	1	%	-	-	85	85
Heavy Metals						
Arsenic	2	mg/kg	-	-	83	40
Cadmium	0.4	mg/kg	-	-	0.7	0.8
Chromium	5	mg/kg	-	-	17	25
Copper	5	mg/kg	-	-	1900	2600
Lead	5	mg/kg	-	-	2200	1800
Mercury	0.1	mg/kg	-	-	1.9	1.2
Nickel	5	mg/kg	-	-	36	29
Zinc	5	mg/kg	-	-	460	550
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.8	9.3	-	-
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.4	3.9	-	-
Reaction Ratings*[S05]		comment	2.0	4.0	-	-
Chromium Suite						
pH-KCL	0.1	pH Units	-	8.8	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	< 2	-	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	< 0.02	-	-
Chromium Reducible Sulfur[S04]	0.005	% S	-	0.44	-	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	270	-	-
Sulfur - KCl Extractable	0.02	% S	-	n/a	-	-
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite[S02]	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	-	3.4	-	-
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	-	690	-	-
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)[S03]	0.02	% S	-	1.1	-	-
ANC Fineness Factor		factor	-	1.5	-	-
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	-	< 0.02	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	< 10	-	-
CRS Suite - Liming Rate[S01]	1	kg CaCO3/t	-	< 1	-	-
Extraneous Material						
<2mm Fraction	0.005	g	-	44	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture	1	%	-	25	17	13

Client Sample ID Sample Matrix Eurofins | mgt Sample No. Date Sampled Test/Reference	LOR	Unit	BHP15 2.5-2.8 Soil S18-De31093 Dec 19, 2018	BHP14 0.2-0.3 Soil S18-De31094 Dec 19, 2018	BHP14 0.9-1.0 Soil S18-De31095 Dec 19, 2018	BHP14 2.5-2.8 Soil S18-De31096 Dec 19, 2018
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	< 20	< 20	-
TRH C10-C14	20	mg/kg	-	< 20	< 20	-
TRH C15-C28	50	mg/kg	-	51	< 50	-
TRH C29-C36	50	mg/kg	-	< 50	< 50	-
TRH C10-36 (Total)	50	mg/kg	-	51	< 50	-
BTEX						
Benzene	0.1	mg/kg	-	< 0.1	< 0.1	-
Toluene	0.1	mg/kg	-	< 0.1	< 0.1	-
Ethylbenzene	0.1	mg/kg	-	< 0.1	< 0.1	-
m&p-Xylenes	0.2	mg/kg	-	< 0.2	< 0.2	-
o-Xylene	0.1	mg/kg	-	< 0.1	< 0.1	-
Xylenes - Total	0.3	mg/kg	-	< 0.3	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	-	77	85	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	< 0.5	< 0.5	-
TRH C6-C10	20	mg/kg	-	< 20	< 20	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20	< 20	-
TRH >C10-C16	50	mg/kg	-	< 50	< 50	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	< 50	< 50	-
TRH >C16-C34	100	mg/kg	-	< 100	< 100	-
TRH >C34-C40	100	mg/kg	-	< 100	< 100	-
TRH >C10-C40 (total)*	100	mg/kg	-	< 100	< 100	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	0.8	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	1.1	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	1.4	1.2	-
Acenaphthene	0.5	mg/kg	-	< 0.5	< 0.5	-
Acenaphthylene	0.5	mg/kg	-	< 0.5	< 0.5	-
Anthracene	0.5	mg/kg	-	< 0.5	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	-	0.5	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	-	0.7	< 0.5	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	-	0.8	< 0.5	-
Benzo(g.h.i)perylene	0.5	mg/kg	-	0.5	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5	< 0.5	-
Chrysene	0.5	mg/kg	-	< 0.5	< 0.5	-
Dibenz(a.h)anthracene	0.5	mg/kg	-	< 0.5	< 0.5	-
Fluoranthene	0.5	mg/kg	-	1.2	< 0.5	-
Fluorene	0.5	mg/kg	-	< 0.5	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	< 0.5	< 0.5	-
Naphthalene	0.5	mg/kg	-	< 0.5	< 0.5	-
Phenanthrene	0.5	mg/kg	-	0.6	< 0.5	-
Pyrene	0.5	mg/kg	-	1.1	< 0.5	-
Total PAH*	0.5	mg/kg	-	5.4	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	-	104	60	-
p-Terphenyl-d14 (surr.)	1	%	-	96	59	-

Client Sample ID			BHP15 2.5-2.8	BHP14 0.2-0.3	BHP14 0.9-1.0	BHP14 2.5-2.8
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-De31093	S18-De31094	S18-De31095	S18-De31096
Date Sampled			Dec 19, 2018	Dec 19, 2018	Dec 19, 2018	Dec 19, 2018
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	< 0.1	-
4.4'-DDD	0.05	mg/kg	-	< 0.05	< 0.05	-
4.4'-DDE	0.05	mg/kg	-	< 0.05	< 0.05	-
4.4'-DDT	0.05	mg/kg	-	< 0.05	< 0.05	-
a-BHC	0.05	mg/kg	-	< 0.05	< 0.05	-
Aldrin	0.05	mg/kg	-	< 0.05	< 0.05	-
b-BHC	0.05	mg/kg	-	< 0.05	< 0.05	-
d-BHC	0.05	mg/kg	-	< 0.05	< 0.05	-
Dieldrin	0.05	mg/kg	-	< 0.05	< 0.05	-
Endosulfan I	0.05	mg/kg	-	< 0.05	< 0.05	-
Endosulfan II	0.05	mg/kg	-	< 0.05	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	< 0.05	-
Endrin	0.05	mg/kg	-	< 0.05	< 0.05	-
Endrin aldehyde	0.05	mg/kg	-	< 0.05	< 0.05	-
Endrin ketone	0.05	mg/kg	-	< 0.05	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	-	< 0.05	< 0.05	-
Heptachlor	0.05	mg/kg	-	< 0.05	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	< 0.05	-
Methoxychlor	0.2	mg/kg	-	< 0.2	< 0.2	-
Toxaphene	1	mg/kg	-	< 1	< 1	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.1	< 0.1	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.1	< 0.1	-
Dibutylchlorendate (surr.)	1	%	-	135	132	-
Tetrachloro-m-xylene (surr.)	1	%	-	101	125	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	-	< 0.5	< 0.5	-
Aroclor-1221	0.1	mg/kg	-	< 0.1	< 0.1	-
Aroclor-1232	0.5	mg/kg	-	< 0.5	< 0.5	-
Aroclor-1242	0.5	mg/kg	-	< 0.5	< 0.5	-
Aroclor-1248	0.5	mg/kg	-	< 0.5	< 0.5	-
Aroclor-1254	0.5	mg/kg	-	< 0.5	< 0.5	-
Aroclor-1260	0.5	mg/kg	-	< 0.5	< 0.5	-
Total PCB*	0.5	mg/kg	-	< 0.5	< 0.5	-
Dibutylchlorendate (surr.)	1	%	-	135	132	-
Tetrachloro-m-xylene (surr.)	1	%	-	101	125	-
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	-	< 0.5	< 0.5	-
2.4-Dichlorophenol	0.5	mg/kg	-	< 0.5	< 0.5	-
2.4.5-Trichlorophenol	1	mg/kg	-	< 1	< 1	-
2.4.6-Trichlorophenol	1	mg/kg	-	< 1	< 1	-
2.6-Dichlorophenol	0.5	mg/kg	-	< 0.5	< 0.5	-
4-Chloro-3-methylphenol	1	mg/kg	-	< 1	< 1	-
Pentachlorophenol	1	mg/kg	-	< 1	< 1	-
Tetrachlorophenols - Total	1	mg/kg	-	< 1	< 1	-
Total Halogenated Phenol*	1	mg/kg	-	< 1	< 1	-

Client Sample ID Sample Matrix Eurofins | mgt Sample No. Date Sampled Test/Reference	LOR	Unit	BHP15 2.5-2.8 Soil S18-De31093 Dec 19, 2018	BHP14 0.2-0.3 Soil S18-De31094 Dec 19, 2018	BHP14 0.9-1.0 Soil S18-De31095 Dec 19, 2018	BHP14 2.5-2.8 Soil S18-De31096 Dec 19, 2018
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	-	< 20	< 20	-
2-Methyl-4.6-dinitrophenol	5	mg/kg	-	< 5	< 5	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	< 0.2	< 0.2	-
2-Nitrophenol	1	mg/kg	-	< 1	< 1	-
2.4-Dimethylphenol	0.5	mg/kg	-	< 0.5	< 0.5	-
2.4-Dinitrophenol	5	mg/kg	-	< 5	< 5	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	< 0.4	< 0.4	-
4-Nitrophenol	5	mg/kg	-	< 5	< 5	-
Dinoseb	20	mg/kg	-	< 20	< 20	-
Phenol	0.5	mg/kg	-	< 0.5	< 0.5	-
Total Non-Halogenated Phenol*	20	mg/kg	-	< 20	< 20	-
Phenol-d6 (surr.)	1	%	-	91	57	-
Heavy Metals						
Arsenic	2	mg/kg	-	96	10	-
Cadmium	0.4	mg/kg	-	< 0.4	< 0.4	-
Chromium	5	mg/kg	-	13	< 5	-
Copper	5	mg/kg	-	360	< 5	-
Lead	5	mg/kg	-	290	7.4	-
Mercury	0.1	mg/kg	-	< 0.1	< 0.1	-
Nickel	5	mg/kg	-	18	< 5	-
Zinc	5	mg/kg	-	160	< 5	-
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.3	-	-	9.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.5	-	-	7.7
Reaction Ratings*[S05]		comment	2.0	-	-	2.0
Chromium Suite						
pH-KCL	0.1	pH Units	9.5	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	< 2	-	-	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	< 0.02	-	-	-
Chromium Reducible Sulfur[S04]	0.005	% S	0.015	-	-	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	< 3	-	-	-
Sulfur - KCl Extractable	0.02	% S	n/a	-	-	-
HCl Extractable Sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite[S02]	0.02	% S	n/a	-	-	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	6.2	-	-	-
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	1200	-	-	-
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)[S03]	0.02	% S	2.0	-	-	-
ANC Fineness Factor		factor	1.5	-	-	-
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	< 0.02	-	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	< 10	-	-	-
CRS Suite - Liming Rate[S01]	1	kg CaCO3/t	< 1	-	-	-
Extraneous Material						
<2mm Fraction	0.005	g	33	-	-	-
>2mm Fraction	0.005	g	7.1	-	-	-
Analysed Material	0.1	%	82	-	-	-
Extraneous Material	0.1	%	18	-	-	-

Client Sample ID			BHP15 2.5-2.8	BHP14 0.2-0.3	BHP14 0.9-1.0	BHP14 2.5-2.8
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-De31093	S18-De31094	S18-De31095	S18-De31096
Date Sampled			Dec 19, 2018	Dec 19, 2018	Dec 19, 2018	Dec 19, 2018
Test/Reference	LOR	Unit				
% Moisture	1	%	14	9.1	5.3	-

Client Sample ID			BHP14 3.3-3.5	BHP11 0.2-0.3	BHP11 0.9-1.0	BHP11 2.8-2.9
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-De31097	S18-De31098	S18-De31099	S18-De31100
Date Sampled			Dec 19, 2018	Dec 19, 2018	Dec 19, 2018	Dec 19, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	< 20	< 20	-
TRH C10-C14	20	mg/kg	-	< 20	< 20	-
TRH C15-C28	50	mg/kg	-	< 50	< 50	-
TRH C29-C36	50	mg/kg	-	< 50	< 50	-
TRH C10-36 (Total)	50	mg/kg	-	< 50	< 50	-
BTEX						
Benzene	0.1	mg/kg	-	< 0.1	< 0.1	-
Toluene	0.1	mg/kg	-	< 0.1	< 0.1	-
Ethylbenzene	0.1	mg/kg	-	< 0.1	< 0.1	-
m&p-Xylenes	0.2	mg/kg	-	< 0.2	< 0.2	-
o-Xylene	0.1	mg/kg	-	< 0.1	< 0.1	-
Xylenes - Total	0.3	mg/kg	-	< 0.3	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	-	65	65	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	< 0.5	< 0.5	-
TRH C6-C10	20	mg/kg	-	< 20	< 20	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20	< 20	-
TRH >C10-C16	50	mg/kg	-	< 50	< 50	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	< 50	< 50	-
TRH >C16-C34	100	mg/kg	-	< 100	< 100	-
TRH >C34-C40	100	mg/kg	-	< 100	< 100	-
TRH >C10-C40 (total)*	100	mg/kg	-	< 100	< 100	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	< 0.5	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	0.6	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	1.2	1.2	-
Acenaphthene	0.5	mg/kg	-	< 0.5	< 0.5	-
Acenaphthylene	0.5	mg/kg	-	< 0.5	< 0.5	-
Anthracene	0.5	mg/kg	-	< 0.5	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	-	< 0.5	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	-	< 0.5	< 0.5	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	-	< 0.5	< 0.5	-
Benzo(g.h.i)perylene	0.5	mg/kg	-	< 0.5	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5	< 0.5	-
Chrysene	0.5	mg/kg	-	< 0.5	< 0.5	-
Dibenz(a.h)anthracene	0.5	mg/kg	-	< 0.5	< 0.5	-
Fluoranthene	0.5	mg/kg	-	< 0.5	< 0.5	-
Fluorene	0.5	mg/kg	-	< 0.5	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	< 0.5	< 0.5	-
Naphthalene	0.5	mg/kg	-	< 0.5	< 0.5	-

Client Sample ID			BHP14 3.3-3.5	BHP11 0.2-0.3	BHP11 0.9-1.0	BHP11 2.8-2.9
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-De31097	S18-De31098	S18-De31099	S18-De31100
Date Sampled			Dec 19, 2018	Dec 19, 2018	Dec 19, 2018	Dec 19, 2018
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Phenanthrene	0.5	mg/kg	-	< 0.5	< 0.5	-
Pyrene	0.5	mg/kg	-	< 0.5	< 0.5	-
Total PAH*	0.5	mg/kg	-	< 0.5	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	-	122	120	-
p-Terphenyl-d14 (surr.)	1	%	-	118	121	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	< 0.1	-
4.4'-DDD	0.05	mg/kg	-	< 0.05	< 0.05	-
4.4'-DDE	0.05	mg/kg	-	< 0.05	< 0.05	-
4.4'-DDT	0.05	mg/kg	-	< 0.05	< 0.05	-
a-BHC	0.05	mg/kg	-	< 0.05	< 0.05	-
Aldrin	0.05	mg/kg	-	< 0.05	< 0.05	-
b-BHC	0.05	mg/kg	-	< 0.05	< 0.05	-
d-BHC	0.05	mg/kg	-	< 0.05	< 0.05	-
Dieldrin	0.05	mg/kg	-	< 0.05	< 0.05	-
Endosulfan I	0.05	mg/kg	-	< 0.05	< 0.05	-
Endosulfan II	0.05	mg/kg	-	< 0.05	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	< 0.05	-
Endrin	0.05	mg/kg	-	< 0.05	< 0.05	-
Endrin aldehyde	0.05	mg/kg	-	< 0.05	< 0.05	-
Endrin ketone	0.05	mg/kg	-	< 0.05	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	-	< 0.05	< 0.05	-
Heptachlor	0.05	mg/kg	-	< 0.05	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	< 0.05	-
Methoxychlor	0.2	mg/kg	-	< 0.2	< 0.2	-
Toxaphene	1	mg/kg	-	< 1	< 1	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.1	< 0.1	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.1	< 0.1	-
Dibutylchlorendate (surr.)	1	%	-	150	127	-
Tetrachloro-m-xylene (surr.)	1	%	-	139	115	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	-	< 0.5	< 0.5	-
Aroclor-1221	0.1	mg/kg	-	< 0.1	< 0.1	-
Aroclor-1232	0.5	mg/kg	-	< 0.5	< 0.5	-
Aroclor-1242	0.5	mg/kg	-	< 0.5	< 0.5	-
Aroclor-1248	0.5	mg/kg	-	< 0.5	< 0.5	-
Aroclor-1254	0.5	mg/kg	-	< 0.5	< 0.5	-
Aroclor-1260	0.5	mg/kg	-	< 0.5	< 0.5	-
Total PCB*	0.5	mg/kg	-	< 0.5	< 0.5	-
Dibutylchlorendate (surr.)	1	%	-	150	127	-
Tetrachloro-m-xylene (surr.)	1	%	-	139	115	-
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	-	< 0.5	< 0.5	-
2.4-Dichlorophenol	0.5	mg/kg	-	< 0.5	< 0.5	-
2.4.5-Trichlorophenol	1	mg/kg	-	< 1	< 1	-
2.4.6-Trichlorophenol	1	mg/kg	-	< 1	< 1	-

Client Sample ID Sample Matrix Eurofins | mgt Sample No. Date Sampled Test/Reference	LOR	Unit	BHP14 3.3-3.5 Soil S18-De31097 Dec 19, 2018	BHP11 0.2-0.3 Soil S18-De31098 Dec 19, 2018	BHP11 0.9-1.0 Soil S18-De31099 Dec 19, 2018	BHP11 2.8-2.9 Soil S18-De31100 Dec 19, 2018
Phenols (Halogenated)						
2.6-Dichlorophenol	0.5	mg/kg	-	< 0.5	< 0.5	-
4-Chloro-3-methylphenol	1	mg/kg	-	< 1	< 1	-
Pentachlorophenol	1	mg/kg	-	< 1	< 1	-
Tetrachlorophenols - Total	1	mg/kg	-	< 1	< 1	-
Total Halogenated Phenol*	1	mg/kg	-	< 1	< 1	-
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	-	< 20	< 20	-
2-Methyl-4.6-dinitrophenol	5	mg/kg	-	< 5	< 5	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	< 0.2	< 0.2	-
2-Nitrophenol	1	mg/kg	-	< 1	< 1	-
2.4-Dimethylphenol	0.5	mg/kg	-	< 0.5	< 0.5	-
2.4-Dinitrophenol	5	mg/kg	-	< 5	< 5	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	< 0.4	< 0.4	-
4-Nitrophenol	5	mg/kg	-	< 5	< 5	-
Dinoseb	20	mg/kg	-	< 20	< 20	-
Phenol	0.5	mg/kg	-	< 0.5	< 0.5	-
Total Non-Halogenated Phenol*	20	mg/kg	-	< 20	< 20	-
Phenol-d6 (surr.)	1	%	-	119	115	-
Heavy Metals						
Arsenic	2	mg/kg	-	6.8	4.6	-
Cadmium	0.4	mg/kg	-	< 0.4	< 0.4	-
Chromium	5	mg/kg	-	26	19	-
Copper	5	mg/kg	-	71	57	-
Lead	5	mg/kg	-	32	42	-
Mercury	0.1	mg/kg	-	< 0.1	< 0.1	-
Nickel	5	mg/kg	-	< 5	< 5	-
Zinc	5	mg/kg	-	27	31	-
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	8.9	-	-	8.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.8	-	-	7.4
Reaction Ratings*[S05]		comment	4.0	-	-	4.0
Chromium Suite						
pH-KCL	0.1	pH Units	8.7	-	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	< 2	-	-	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	< 0.02	-	-	-
Chromium Reducible Sulfur[S04]	0.005	% S	0.19	-	-	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	120	-	-	-
Sulfur - KCl Extractable	0.02	% S	n/a	-	-	-
HCl Extractable Sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur	0.02	% S	n/a	-	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	-
Net Acid soluble sulfur - equivalent S% pyrite[S02]	0.02	% S	n/a	-	-	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	0.90	-	-	-
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	180	-	-	-
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)[S03]	0.02	% S	0.29	-	-	-
ANC Fineness Factor		factor	1.5	-	-	-
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	< 0.02	-	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	< 10	-	-	-
CRS Suite - Liming Rate[S01]	1	kg CaCO3/t	< 1	-	-	-

Client Sample ID			BHP14 3.3-3.5	BHP11 0.2-0.3	BHP11 0.9-1.0	BHP11 2.8-2.9
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-De31097	S18-De31098	S18-De31099	S18-De31100
Date Sampled			Dec 19, 2018	Dec 19, 2018	Dec 19, 2018	Dec 19, 2018
Test/Reference	LOR	Unit				
Extraneous Material						
<2mm Fraction	0.005	g	41	-	-	-
>2mm Fraction	0.005	g	< 0.005	-	-	-
Analysed Material	0.1	%	100	-	-	-
Extraneous Material	0.1	%	< 0.1	-	-	-
% Moisture	1	%	19	11	12	-

Client Sample ID			BHP11 3.3-3.5	BHP19 0.1-0.3	BHP19 1.5-1.6	BHP19 3.1-3.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-De31101	S18-De31102	S18-De31103	S18-De31104
Date Sampled			Dec 19, 2018	Dec 19, 2018	Dec 19, 2018	Dec 19, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	< 20	< 20	-
TRH C10-C14	20	mg/kg	-	< 20	< 20	-
TRH C15-C28	50	mg/kg	-	110	< 50	-
TRH C29-C36	50	mg/kg	-	83	< 50	-
TRH C10-36 (Total)	50	mg/kg	-	193	< 50	-
BTEX						
Benzene	0.1	mg/kg	-	< 0.1	< 0.1	-
Toluene	0.1	mg/kg	-	< 0.1	< 0.1	-
Ethylbenzene	0.1	mg/kg	-	< 0.1	< 0.1	-
m&p-Xylenes	0.2	mg/kg	-	< 0.2	< 0.2	-
o-Xylene	0.1	mg/kg	-	< 0.1	< 0.1	-
Xylenes - Total	0.3	mg/kg	-	< 0.3	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	-	60	76	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	< 0.5	< 0.5	-
TRH C6-C10	20	mg/kg	-	< 20	< 20	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20	< 20	-
TRH >C10-C16	50	mg/kg	-	< 50	< 50	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	< 50	< 50	-
TRH >C16-C34	100	mg/kg	-	170	< 100	-
TRH >C34-C40	100	mg/kg	-	< 100	< 100	-
TRH >C10-C40 (total)*	100	mg/kg	-	170	< 100	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	< 0.5	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	0.6	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	1.2	1.2	-
Acenaphthene	0.5	mg/kg	-	< 0.5	< 0.5	-
Acenaphthylene	0.5	mg/kg	-	< 0.5	< 0.5	-
Anthracene	0.5	mg/kg	-	< 0.5	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	-	< 0.5	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	-	< 0.5	< 0.5	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	-	0.6	< 0.5	-
Benzo(g.h.i)perylene	0.5	mg/kg	-	< 0.5	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5	< 0.5	-
Chrysene	0.5	mg/kg	-	< 0.5	< 0.5	-

Client Sample ID			BHP11 3.3-3.5	BHP19 0.1-0.3	BHP19 1.5-1.6	BHP19 3.1-3.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-De31101	S18-De31102	S18-De31103	S18-De31104
Date Sampled			Dec 19, 2018	Dec 19, 2018	Dec 19, 2018	Dec 19, 2018
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Dibenz(a.h)anthracene	0.5	mg/kg	-	< 0.5	< 0.5	-
Fluoranthene	0.5	mg/kg	-	0.7	< 0.5	-
Fluorene	0.5	mg/kg	-	< 0.5	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	< 0.5	< 0.5	-
Naphthalene	0.5	mg/kg	-	< 0.5	< 0.5	-
Phenanthrene	0.5	mg/kg	-	< 0.5	< 0.5	-
Pyrene	0.5	mg/kg	-	0.7	< 0.5	-
Total PAH*	0.5	mg/kg	-	2	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	-	124	125	-
p-Terphenyl-d14 (surr.)	1	%	-	117	126	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	< 0.1	-
4.4'-DDD	0.05	mg/kg	-	< 0.05	< 0.05	-
4.4'-DDE	0.05	mg/kg	-	< 0.05	< 0.05	-
4.4'-DDT	0.05	mg/kg	-	< 0.05	< 0.05	-
a-BHC	0.05	mg/kg	-	< 0.05	< 0.05	-
Aldrin	0.05	mg/kg	-	< 0.05	< 0.05	-
b-BHC	0.05	mg/kg	-	< 0.05	< 0.05	-
d-BHC	0.05	mg/kg	-	< 0.05	< 0.05	-
Dieldrin	0.05	mg/kg	-	< 0.05	< 0.05	-
Endosulfan I	0.05	mg/kg	-	< 0.05	< 0.05	-
Endosulfan II	0.05	mg/kg	-	< 0.05	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	< 0.05	-
Endrin	0.05	mg/kg	-	< 0.05	< 0.05	-
Endrin aldehyde	0.05	mg/kg	-	< 0.05	< 0.05	-
Endrin ketone	0.05	mg/kg	-	< 0.05	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	-	< 0.05	< 0.05	-
Heptachlor	0.05	mg/kg	-	< 0.05	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	< 0.05	-
Methoxychlor	0.2	mg/kg	-	< 0.2	< 0.2	-
Toxaphene	1	mg/kg	-	< 1	< 1	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.1	< 0.1	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.1	< 0.1	-
Dibutylchlorendate (surr.)	1	%	-	124	126	-
Tetrachloro-m-xylene (surr.)	1	%	-	105	115	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	-	< 0.5	< 0.5	-
Aroclor-1221	0.1	mg/kg	-	< 0.1	< 0.1	-
Aroclor-1232	0.5	mg/kg	-	< 0.5	< 0.5	-
Aroclor-1242	0.5	mg/kg	-	< 0.5	< 0.5	-
Aroclor-1248	0.5	mg/kg	-	< 0.5	< 0.5	-
Aroclor-1254	0.5	mg/kg	-	< 0.5	< 0.5	-
Aroclor-1260	0.5	mg/kg	-	< 0.5	< 0.5	-
Total PCB*	0.5	mg/kg	-	< 0.5	< 0.5	-
Dibutylchlorendate (surr.)	1	%	-	124	126	-
Tetrachloro-m-xylene (surr.)	1	%	-	105	115	-

Client Sample ID Sample Matrix Eurofins | mgt Sample No. Date Sampled Test/Reference	LOR	Unit	BHP11 3.3-3.5 Soil S18-De31101 Dec 19, 2018	BHP19 0.1-0.3 Soil S18-De31102 Dec 19, 2018	BHP19 1.5-1.6 Soil S18-De31103 Dec 19, 2018	BHP19 3.1-3.3 Soil S18-De31104 Dec 19, 2018
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	-	< 0.5	< 0.5	-
2.4-Dichlorophenol	0.5	mg/kg	-	< 0.5	< 0.5	-
2.4.5-Trichlorophenol	1	mg/kg	-	< 1	< 1	-
2.4.6-Trichlorophenol	1	mg/kg	-	< 1	< 1	-
2.6-Dichlorophenol	0.5	mg/kg	-	< 0.5	< 0.5	-
4-Chloro-3-methylphenol	1	mg/kg	-	< 1	< 1	-
Pentachlorophenol	1	mg/kg	-	< 1	< 1	-
Tetrachlorophenols - Total	1	mg/kg	-	< 1	< 1	-
Total Halogenated Phenol*	1	mg/kg	-	< 1	< 1	-
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	-	< 20	< 20	-
2-Methyl-4.6-dinitrophenol	5	mg/kg	-	< 5	< 5	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	< 0.2	< 0.2	-
2-Nitrophenol	1	mg/kg	-	< 1	< 1	-
2.4-Dimethylphenol	0.5	mg/kg	-	< 0.5	< 0.5	-
2.4-Dinitrophenol	5	mg/kg	-	< 5	< 5	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	< 0.4	< 0.4	-
4-Nitrophenol	5	mg/kg	-	< 5	< 5	-
Dinoseb	20	mg/kg	-	< 20	< 20	-
Phenol	0.5	mg/kg	-	< 0.5	< 0.5	-
Total Non-Halogenated Phenol*	20	mg/kg	-	< 20	< 20	-
Phenol-d6 (surr.)	1	%	-	98	113	-
Heavy Metals						
Arsenic	2	mg/kg	-	49	19	-
Cadmium	0.4	mg/kg	-	0.9	< 0.4	-
Chromium	5	mg/kg	-	11	< 5	-
Copper	5	mg/kg	-	1200	550	-
Lead	5	mg/kg	-	1000	250	-
Mercury	0.1	mg/kg	-	1.2	0.5	-
Nickel	5	mg/kg	-	38	16	-
Zinc	5	mg/kg	-	510	270	-
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.0	-	-	8.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.6	-	-	7.8
Reaction Ratings*[S05]		comment	2.0	-	-	4.0
Chromium Suite						
pH-KCL	0.1	pH Units	9.1	-	-	9.4
Acid trail - Titratable Actual Acidity	2	mol H+/t	< 2	-	-	< 2
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	< 0.02	-	-	< 0.02
Chromium Reducible Sulfur[S04]	0.005	% S	0.087	-	-	0.18
Chromium Reducible Sulfur -acidity units	3	mol H+/t	54	-	-	110
Sulfur - KCl Extractable	0.02	% S	n/a	-	-	n/a
HCl Extractable Sulfur	0.02	% S	n/a	-	-	n/a
Net Acid soluble sulfur	0.02	% S	n/a	-	-	n/a
Net Acid soluble sulfur - acidity units	10	mol H+/t	n/a	-	-	n/a
Net Acid soluble sulfur - equivalent S% pyrite[S02]	0.02	% S	n/a	-	-	n/a
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	2.0	-	-	18
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	410	-	-	3500

Client Sample ID			BHP11 3.3-3.5	BHP19 0.1-0.3	BHP19 1.5-1.6	BHP19 3.1-3.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-De31101	S18-De31102	S18-De31103	S18-De31104
Date Sampled			Dec 19, 2018	Dec 19, 2018	Dec 19, 2018	Dec 19, 2018
Test/Reference	LOR	Unit				
Chromium Suite						
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)[S03]	0.02	% S	0.65	-	-	5.7
ANC Fineness Factor		factor	1.5	-	-	1.5
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	< 0.02	-	-	< 0.02
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	< 10	-	-	< 10
CRS Suite - Liming Rate[S01]	1	kg CaCO3/t	< 1	-	-	< 1
Extraneous Material						
<2mm Fraction	0.005	g	29	-	-	29
>2mm Fraction	0.005	g	1.2	-	-	< 0.005
Analysed Material	0.1	%	96	-	-	100
Extraneous Material	0.1	%	4.0	-	-	< 0.1
% Moisture	1	%	17	15	19	30

Client Sample ID			BHP16 0.0-0.2	BHP16 0.6-0.7	BHP16 2.8-3.0	QC5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-De31105	S18-De31106	S18-De31107	S18-De31108
Date Sampled			Dec 19, 2018	Dec 19, 2018	Dec 19, 2018	Dec 19, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	-	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	-	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	-	140
TRH C29-C36	50	mg/kg	< 50	< 50	-	140
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	-	280
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	76	97	-	81
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	-	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	-	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	-	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	-	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	-	220
TRH >C34-C40	100	mg/kg	< 100	< 100	-	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	-	220
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	-	1.2
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	-	1.4
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	-	1.7
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5

Client Sample ID Sample Matrix Eurofins | mgt Sample No. Date Sampled Test/Reference	LOR	Unit	BHP16 0.0-0.2 Soil S18-De31105 Dec 19, 2018	BHP16 0.6-0.7 Soil S18-De31106 Dec 19, 2018	BHP16 2.8-3.0 Soil S18-De31107 Dec 19, 2018	QC5 Soil S18-De31108 Dec 19, 2018
Polycyclic Aromatic Hydrocarbons						
Anthracene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	-	0.8
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	-	0.9
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	-	1.2
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	-	0.6
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	-	0.8
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Fluoranthene	0.5	mg/kg	0.7	< 0.5	-	1.3
Fluorene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	-	0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	-	0.7
Pyrene	0.5	mg/kg	0.6	< 0.5	-	1.4
Total PAH*	0.5	mg/kg	1.3	< 0.5	-	8.2
2-Fluorobiphenyl (surr.)	1	%	122	103	-	104
p-Terphenyl-d14 (surr.)	1	%	122	92	-	92
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Toxaphene	1	mg/kg	< 1	< 1	-	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Dibutylchlorendate (surr.)	1	%	132	123	-	117
Tetrachloro-m-xylene (surr.)	1	%	91	118	-	94

Client Sample ID			BHP16 0.0-0.2	BHP16 0.6-0.7	BHP16 2.8-3.0	QC5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S18-De31105	S18-De31106	S18-De31107	S18-De31108
Date Sampled			Dec 19, 2018	Dec 19, 2018	Dec 19, 2018	Dec 19, 2018
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Total PCB*	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Dibutylchlorendate (surr.)	1	%	132	123	-	117
Tetrachloro-m-xylene (surr.)	1	%	91	118	-	94
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	-	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	-	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	-	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1	-	< 1
Tetrachlorophenols - Total	1	mg/kg	< 1	< 1	-	< 1
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	-	< 1
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	-	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	-	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
2-Nitrophenol	1	mg/kg	< 1	< 1	-	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	-	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	-	< 0.4
4-Nitrophenol	5	mg/kg	< 5	< 5	-	< 5
Dinoseb	20	mg/kg	< 20	< 20	-	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	-	< 20
Phenol-d6 (surr.)	1	%	115	90	-	87
Heavy Metals						
Arsenic	2	mg/kg	91	< 2	-	73
Cadmium	0.4	mg/kg	< 0.4	< 0.4	-	2.1
Chromium	5	mg/kg	17	< 5	-	18
Copper	5	mg/kg	160	< 5	-	460
Lead	5	mg/kg	1100	7.5	-	900
Mercury	0.1	mg/kg	0.7	< 0.1	-	0.5
Nickel	5	mg/kg	24	< 5	-	25
Zinc	5	mg/kg	250	< 5	-	670
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	-	-	9.1	-
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	-	-	7.6	-
Reaction Ratings*[S05]		comment	-	-	4.0	-

Client Sample ID			BHP16 0.0-0.2	BHP16 0.6-0.7	BHP16 2.8-3.0	QC5
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-De31105**	**S18-De31106**	**S18-De31107**	**S18-De31108**
Date Sampled			**Dec 19, 2018**	**Dec 19, 2018**	**Dec 19, 2018**	**Dec 19, 2018**
Test/Reference	LOR	Unit				
Chromium Suite						
pH-KCL	0.1	pH Units	-	-	9.6	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	-	< 2	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	-	< 0.02	-
Chromium Reducible Sulfur[S04]	0.005	% S	-	-	0.023	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	-	14	-
Sulfur - KCl Extractable	0.02	% S	-	-	n/a	-
HCl Extractable Sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur	0.02	% S	-	-	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	-	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite[S02]	0.02	% S	-	-	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	-	-	6.5	-
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	-	-	1300	-
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)[S03]	0.02	% S	-	-	2.1	-
ANC Fineness Factor		factor	-	-	1.5	-
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	-	-	< 0.02	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	-	< 10	-
CRS Suite - Liming Rate[S01]	1	kg CaCO3/t	-	-	< 1	-
Extraneous Material						
<2mm Fraction	0.005	g	-	-	39	-
>2mm Fraction	0.005	g	-	-	2.7	-
Analysed Material	0.1	%	-	-	94	-
Extraneous Material	0.1	%	-	-	6.4	-
% Moisture	1	%	6.0	3.1	16	12

Client Sample ID			SS1	SS2
Sample Matrix			**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-De31114**	**S18-De31115**
Date Sampled			**Dec 19, 2018**	**Dec 19, 2018**
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				
TRH C6-C9	20	mg/kg	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20
TRH C15-C28	50	mg/kg	1500	67
TRH C29-C36	50	mg/kg	2600	150
TRH C10-36 (Total)	50	mg/kg	4100	217
BTEX				
Benzene	0.1	mg/kg	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	89	94

Client Sample ID			SS1	SS2
Sample Matrix			Soil	Soil
Eurofins | mgt Sample No.			S18-De31114	S18-De31115
Date Sampled			Dec 19, 2018	Dec 19, 2018
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50
TRH >C16-C34	100	mg/kg	3200	160
TRH >C34-C40	100	mg/kg	1600	< 100
TRH >C10-C40 (total)*	100	mg/kg	4800	160
Polycyclic Aromatic Hydrocarbons				
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	0.7
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	1.0
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.3
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	0.6
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	0.8
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	1.3
Fluorene	0.5	mg/kg	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	0.7
Pyrene	0.5	mg/kg	< 0.5	1.2
Total PAH*	0.5	mg/kg	< 0.5	5.1
2-Fluorobiphenyl (surr.)	1	%	95	90
p-Terphenyl-d14 (surr.)	1	%	81	80
Organochlorine Pesticides				
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05

Client Sample ID			SS1	SS2
Sample Matrix			Soil	Soil
Eurofins | mgt Sample No.			S18-De31114	S18-De31115
Date Sampled			Dec 19, 2018	Dec 19, 2018
Test/Reference	LOR	Unit		
Organochlorine Pesticides				
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2
Toxaphene	1	mg/kg	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	106	106
Tetrachloro-m-xylene (surr.)	1	%	95	85
Polychlorinated Biphenyls				
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5
Total PCB*	0.5	mg/kg	< 0.5	< 0.5
Dibutylchlorendate (surr.)	1	%	106	106
Tetrachloro-m-xylene (surr.)	1	%	95	85
Phenols (Halogenated)				
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1
Tetrachlorophenols - Total	1	mg/kg	< 1	< 1
Total Halogenated Phenol*	1	mg/kg	< 1	< 1
Phenols (non-Halogenated)				
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2
2-Nitrophenol	1	mg/kg	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4
4-Nitrophenol	5	mg/kg	< 5	< 5
Dinoseb	20	mg/kg	< 20	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20
Phenol-d6 (surr.)	1	%	82	77
Heavy Metals				
Arsenic	2	mg/kg	3.6	6.2
Cadmium	0.4	mg/kg	< 0.4	0.5
Chromium	5	mg/kg	< 5	9.5
Copper	5	mg/kg	29	59

Client Sample ID			SS1	SS2
Sample Matrix			**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-De31114**	**S18-De31115**
Date Sampled			**Dec 19, 2018**	**Dec 19, 2018**
Test/Reference	LOR	Unit		
Heavy Metals				
Lead	5	mg/kg	50	120
Mercury	0.1	mg/kg	< 0.1	0.8
Nickel	5	mg/kg	< 5	6.2
Zinc	5	mg/kg	70	190
% Moisture	1	%	2.8	4.4

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

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
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Jan 03, 2019	14 Day
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Jan 03, 2019	14 Day
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jan 03, 2019	14 Day
- Method: LTM-ORG-2010 TRH C6-C40			
Eurofins | mgt Suite B7A			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jan 03, 2019	14 Day
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Sydney	Jan 03, 2019	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (Halogenated)	Sydney	Jan 03, 2019	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (non-Halogenated)	Sydney	Jan 03, 2019	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Sydney	Jan 03, 2019	28 Day
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Organochlorine Pesticides	Sydney	Jan 03, 2019	14 Day
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Polychlorinated Biphenyls	Sydney	Jan 03, 2019	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Acid Sulfate Soils Field pH Test	Brisbane	Jan 10, 2019	7 Days
- Method: LTM-GEN-7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests			
Chromium Reducible Sulfur Suite			
Chromium Suite	Brisbane	Jan 10, 2019	6 Week
- Method: LTM-GEN-7070			
Extraneous Material	Brisbane	Jan 10, 2019	6 Week
- Method: LTM-GEN-7050/7070			
% Moisture	Sydney	Dec 27, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

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Site # 23736

Company Name: Coffey Environments P/L N'castle
Address: Lot 101, 19 Warabrook Boulevard
Warabrook
NSW 2304

Project Name: UON HCCD
Project ID: NTLEN213472

Order No.:
Report #: 634424
Phone: 02 4016 2300
Fax: 02 4016 2380

Received: Dec 20, 2018 9:00 AM
Due: Jan 8, 2019
Priority: 10 Day
Contact Name: Paul Wright

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	Asbestos Absence /Presence	HOLD	Acid Sulfate Soils Field pH Test	Eurofins | mgt Suite B13	Chromium Reducible Sulfur Suite	Moisture Set	Moisture Set	Eurofins | mgt Suite B7A	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X		X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794									X		X	X	X		
Perth Laboratory - NATA Site # 23736															
External Laboratory															
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**										
1	BHP12 0.2-0.3	Dec 18, 2018		Soil	S18-De31067	X				X			X	X	
2	BHP12 0.9-1.0	Dec 18, 2018		Soil	S18-De31068					X			X	X	
3	BHP13 0.2-0.3	Dec 18, 2018		Soil	S18-De31069	X				X			X	X	
4	BHP13 1.9-2.0	Dec 18, 2018		Soil	S18-De31070					X			X	X	
5	BHP13 2.5-2.6	Dec 18, 2018		Soil	S18-De31071				X		X	X			
6	BHP20 0.2-0.3	Dec 18, 2018		Soil	S18-De31072	X				X			X	X	
7	BHP20 1.2-1.3	Dec 18, 2018		Soil	S18-De31073					X			X	X	
8	BHP20 2.9-3.0	Dec 18, 2018		Soil	S18-De31074				X		X	X			
9	BHP10 0.2-0.3	Dec 18, 2018		Soil	S18-De31075	X				X			X	X	

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Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X		X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794									X		X	X	X		
Perth Laboratory - NATA Site # 23736															
10	BHP10 1.7-1.8	Dec 18, 2018		Soil	S18-De31076					X			X	X	
11	BHP8 0.2-0.3	Dec 18, 2018		Soil	S18-De31077	X				X			X	X	
12	BHP8 0.9-1.0	Dec 18, 2018		Soil	S18-De31078					X			X	X	
13	QC1	Dec 18, 2018		Soil	S18-De31079					X			X	X	
14	BHP9 0.2-0.5	Dec 18, 2018		Soil	S18-De31080	X				X			X	X	
15	BHP9 1.0-1.1	Dec 18, 2018		Soil	S18-De31081					X			X	X	
16	BHP9 3.4-3.5	Dec 18, 2018		Soil	S18-De31082				X		X	X			
17	BHP9 3.8-3.9	Dec 18, 2018		Soil	S18-De31083				X		X	X			
18	QC3	Dec 18, 2018		Soil	S18-De31084					X			X	X	
19	TRIP SPIKE	Dec 18, 2018		Water	S18-De31085										X
20	TRIP BLANK	Dec 18, 2018		Water	S18-De31086										X
21	BHP18 0.2-0.3	Dec 19, 2018		Soil	S18-De31087					X			X	X	

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Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	Asbestos Absence /Presence	HOLD	Acid Sulfate Soils Field pH Test	Eurofins | mgt Suite B13	Chromium Reducible Sulfur Suite	Moisture Set	Moisture Set	Eurofins | mgt Suite B7A	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X		X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794									X		X	X	X		
Perth Laboratory - NATA Site # 23736															
22	BHP18 0.9-1.0	Dec 19, 2018		Soil	S18-De31088					X			X	X	
23	BHP18 2.7-3.0	Dec 19, 2018		Soil	S18-De31089				X						
24	BHP18 3.5-3.8	Dec 19, 2018		Soil	S18-De31090				X		X	X			
25	BHP15 0.2-0.3	Dec 19, 2018		Soil	S18-De31091	X				X			X	X	
26	BHP15 0.9-1.0	Dec 19, 2018		Soil	S18-De31092					X			X	X	
27	BHP15 2.5-2.8	Dec 19, 2018		Soil	S18-De31093				X		X	X			
28	BHP14 0.2-0.3	Dec 19, 2018		Soil	S18-De31094					X			X	X	
29	BHP14 0.9-1.0	Dec 19, 2018		Soil	S18-De31095					X			X	X	
30	BHP14 2.5-2.8	Dec 19, 2018		Soil	S18-De31096				X						
31	BHP14 3.3-3.5	Dec 19, 2018		Soil	S18-De31097				X		X	X			
32	BHP11 0.2-0.3	Dec 19, 2018		Soil	S18-De31098					X			X	X	
33	BHP11 0.9-1.0	Dec 19, 2018		Soil	S18-De31099					X			X	X	

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Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	Asbestos Absence /Presence	HOLD	Acid Sulfate Soils Field pH Test	Eurofins | mgt Suite B13	Chromium Reducible Sulfur Suite	Moisture Set	Moisture Set	Eurofins | mgt Suite B7A	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X		X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794									X		X	X	X		
Perth Laboratory - NATA Site # 23736															
34	BHP11 2.8-2.9	Dec 19, 2018		Soil	S18-De31100				X						
35	BHP11 3.3-3.5	Dec 19, 2018		Soil	S18-De31101				X		X	X			
36	BHP19 0.1-0.3	Dec 19, 2018		Soil	S18-De31102					X			X	X	
37	BHP19 1.5-1.6	Dec 19, 2018		Soil	S18-De31103					X			X	X	
38	BHP19 3.1-3.3	Dec 19, 2018		Soil	S18-De31104				X		X	X			
39	BHP16 0.0-0.2	Dec 19, 2018		Soil	S18-De31105					X			X	X	
40	BHP16 0.6-0.7	Dec 19, 2018		Soil	S18-De31106					X			X	X	
41	BHP16 2.8-3.0	Dec 19, 2018		Soil	S18-De31107				X		X	X			
42	QC5	Dec 19, 2018		Soil	S18-De31108					X			X	X	
43	TRIP SPIKE 2	Dec 19, 2018		Water	S18-De31109										X
44	TRIP BLANK 2	Dec 19, 2018		Water	S18-De31110										X
45	ACM1	Dec 19, 2018		Building	S18-De31111		X								

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Site # 23736

Company Name: Coffey Environments P/L N'castle
Address: Lot 101, 19 Warabrook Boulevard
Warabrook
NSW 2304

Project Name: UON HCCD
Project ID: NTLEN213472

Order No.:
Report #: 634424
Phone: 02 4016 2300
Fax: 02 4016 2380

Received: Dec 20, 2018 9:00 AM
Due: Jan 8, 2019
Priority: 10 Day
Contact Name: Paul Wright

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	Asbestos Absence /Presence	HOLD	Acid Sulfate Soils Field pH Test	Eurofins | mgt Suite B13	Chromium Reducible Sulfur Suite	Moisture Set	Moisture Set	Eurofins | mgt Suite B7A	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X		X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794									X		X	X	X		
Perth Laboratory - NATA Site # 23736															
				Materials											
46	ACM2	Dec 19, 2018		Building Materials	S18-De31112		X								
47	ACM3	Dec 19, 2018		Building Materials	S18-De31113		X								
48	SS1	Dec 19, 2018		Soil	S18-De31114	X				X			X	X	
49	SS2	Dec 19, 2018		Soil	S18-De31115	X				X			X	X	
50	BHP12 1.9-2.0	Dec 18, 2018		Soil	S18-De31116			X							
51	BHP12 2.5-2.6	Dec 18, 2018		Soil	S18-De31117			X							
52	BHP12 3.0-3.1	Dec 18, 2018		Soil	S18-De31118			X							
53	BHP13 0.9-1.0	Dec 18, 2018		Soil	S18-De31119			X							
54	BHP20 0.5-0.6	Dec 19, 2018		Soil	S18-De31120			X							
55	BHP20 1.9-2.0	Dec 18, 2018		Soil	S18-De31121			X							

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Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X		X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794									X		X	X	X		
Perth Laboratory - NATA Site # 23736															
56	BHP20 2.4-2.5	Dec 18, 2018		Soil	S18-De31122			X							
57	BHP10 0.9-1.0	Dec 18, 2018		Soil	S18-De31123			X							
58	BHP8 1.9-2.0	Dec 19, 2018		Soil	S18-De31124			X							
59	BHP9 0.6-0.7	Dec 19, 2018		Soil	S18-De31125			X							
60	BHP9 1.8-1.9	Dec 19, 2018		Soil	S18-De31126			X							
61	BHP9 2.4-2.5	Dec 19, 2018		Soil	S18-De31127			X							
62	BHP9 3.0-3.1	Dec 19, 2018		Soil	S18-De31128			X							
63	BHP10 2.2-2.3	Dec 19, 2018		Soil	S18-De31129			X							
64	BHP18 1.9-2.0	Dec 19, 2018		Soil	S18-De31130			X							
65	BHP15 1.8-2.0	Dec 19, 2018		Soil	S18-De31131			X							
66	BHP14 1.8-2.0	Dec 19, 2018		Soil	S18-De31132			X							
67	BHP11 1.2-1.3	Dec 19, 2018		Soil	S18-De31133			X							

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Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X		X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794									X		X	X	X		
Perth Laboratory - NATA Site # 23736															
68	BHP11 1.9-2.0	Dec 19, 2018		Soil	S18-De31134			X							
69	BHP19 1.0-1.1	Dec 19, 2018		Soil	S18-De31135			X							
70	BHP19 2.2-2.3	Dec 19, 2018		Soil	S18-De31136			X							
71	BHP16 1.6-1.7	Dec 19, 2018		Soil	S18-De31137			X							
72	QC6	Dec 19, 2018		Soil	S18-De31138			X							
Test Counts						9	3	23	13	29	10	39	39	29	4

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure, April 2011 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.2 2018
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.2 where no positive PFAS results have been reported have been reviewed and no data was affected.

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

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.5			0.5	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.5			0.5	Pass	
Aroclor-1242	mg/kg	< 0.5			0.5	Pass	
Aroclor-1248	mg/kg	< 0.5			0.5	Pass	
Aroclor-1254	mg/kg	< 0.5			0.5	Pass	
Aroclor-1260	mg/kg	< 0.5			0.5	Pass	
Total PCB*	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Phenols (Halogenated)							
2-Chlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4.5-Trichlorophenol	mg/kg	< 1			1	Pass	
2.4.6-Trichlorophenol	mg/kg	< 1			1	Pass	
2.6-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
4-Chloro-3-methylphenol	mg/kg	< 1			1	Pass	
Pentachlorophenol	mg/kg	< 1			1	Pass	
Tetrachlorophenols - Total	mg/kg	< 1			1	Pass	
Method Blank							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	mg/kg	< 20			20	Pass	
2-Methyl-4.6-dinitrophenol	mg/kg	< 5			5	Pass	
2-Methylphenol (o-Cresol)	mg/kg	< 0.2			0.2	Pass	
2-Nitrophenol	mg/kg	< 1			1	Pass	
2.4-Dimethylphenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dinitrophenol	mg/kg	< 5			5	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/kg	< 0.4			0.4	Pass	
4-Nitrophenol	mg/kg	< 5			5	Pass	
Dinoseb	mg/kg	< 20			20	Pass	
Phenol	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
TRH C6-C9	%	99			70-130	Pass	
TRH C10-C14	%	113			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	95			70-130	Pass	
Toluene	%	98			70-130	Pass	
Ethylbenzene	%	101			70-130	Pass	
m&p-Xylenes	%	103			70-130	Pass	
o-Xylene	%	103			70-130	Pass	
Xylenes - Total	%	103			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	127			70-130	Pass	
TRH C6-C10	%	97			70-130	Pass	
TRH >C10-C16	%	122			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	103			70-130	Pass	
Acenaphthylene	%	107			70-130	Pass	
Anthracene	%	111			70-130	Pass	
Benz(a)anthracene	%	103			70-130	Pass	
Benzo(a)pyrene	%	110			70-130	Pass	
Benzo(b&j)fluoranthene	%	103			70-130	Pass	
Benzo(g.h.i)perylene	%	113			70-130	Pass	
Benzo(k)fluoranthene	%	107			70-130	Pass	
Chrysene	%	109			70-130	Pass	
Dibenz(a.h)anthracene	%	113			70-130	Pass	
Fluoranthene	%	104			70-130	Pass	
Fluorene	%	107			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	113			70-130	Pass	
Naphthalene	%	107			70-130	Pass	
Phenanthrene	%	112			70-130	Pass	
Pyrene	%	105			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
4.4'-DDD	%	93			70-130	Pass	
4.4'-DDE	%	115			70-130	Pass	
4.4'-DDT	%	107			70-130	Pass	
a-BHC	%	128			70-130	Pass	
Aldrin	%	115			70-130	Pass	
b-BHC	%	126			70-130	Pass	
d-BHC	%	128			70-130	Pass	
Dieldrin	%	128			70-130	Pass	
Endosulfan I	%	118			70-130	Pass	
Endosulfan II	%	128			70-130	Pass	
Endosulfan sulphate	%	121			70-130	Pass	
Endrin	%	127			70-130	Pass	
Endrin aldehyde	%	126			70-130	Pass	
Endrin ketone	%	126			70-130	Pass	
g-BHC (Lindane)	%	128			70-130	Pass	
Heptachlor	%	117			70-130	Pass	
Heptachlor epoxide	%	130			70-130	Pass	
Hexachlorobenzene	%	124			70-130	Pass	
Methoxychlor	%	122			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	91			70-130	Pass	
LCS - % Recovery							
Phenols (Halogenated)							
2-Chlorophenol	%	100			30-130	Pass	
2.4-Dichlorophenol	%	95			30-130	Pass	
2.4.5-Trichlorophenol	%	101			30-130	Pass	
2.4.6-Trichlorophenol	%	107			30-130	Pass	
2.6-Dichlorophenol	%	100			30-130	Pass	
4-Chloro-3-methylphenol	%	82			30-130	Pass	
Pentachlorophenol	%	79			30-130	Pass	
Tetrachlorophenols - Total	%	107			30-130	Pass	
LCS - % Recovery							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	%	96			30-130	Pass	
2-Methyl-4.6-dinitrophenol	%	83			30-130	Pass	
2-Methylphenol (o-Cresol)	%	95			30-130	Pass	
2-Nitrophenol	%	105			30-130	Pass	
2.4-Dimethylphenol	%	86			30-130	Pass	
2.4-Dinitrophenol	%	109			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	%	93			30-130	Pass	
4-Nitrophenol	%	75			30-130	Pass	
Dinoseb	%	109			30-130	Pass	
Phenol	%	88			30-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	108			70-130	Pass	
Cadmium	%	122			70-130	Pass	
Chromium	%	101			70-130	Pass	
Copper	%	97			70-130	Pass	
Lead	%	100			70-130	Pass	
Mercury	%	96			70-130	Pass	
Nickel	%	98			70-130	Pass	
Zinc	%	102			70-130	Pass	
LCS - % Recovery							
Chromium Suite							
Chromium Reducible Sulfur	%	109			70-130	Pass	
Acid Neutralising Capacity (ANCbt)	%	96			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S19-Ja01415	NCP	%	107			70-130	Pass	
Acenaphthylene	S19-Ja01415	NCP	%	115			70-130	Pass	
Anthracene	S19-Ja01415	NCP	%	123			70-130	Pass	
Benz(a)anthracene	S19-Ja01415	NCP	%	117			70-130	Pass	
Benzo(a)pyrene	S19-Ja01415	NCP	%	117			70-130	Pass	
Benzo(b&j)fluoranthene	S19-Ja01415	NCP	%	111			70-130	Pass	
Benzo(g.h.i)perylene	S19-Ja01415	NCP	%	129			70-130	Pass	
Benzo(k)fluoranthene	S19-Ja01415	NCP	%	109			70-130	Pass	
Chrysene	S19-Ja01415	NCP	%	116			70-130	Pass	
Dibenz(a.h)anthracene	S19-Ja01415	NCP	%	128			70-130	Pass	
Fluoranthene	S19-Ja01415	NCP	%	108			70-130	Pass	
Fluorene	S19-Ja01415	NCP	%	116			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Indeno(1.2.3-cd)pyrene	S19-Ja01415	NCP	%	130			70-130	Pass	
Naphthalene	S19-Ja01415	NCP	%	101			70-130	Pass	
Phenanthrene	S19-Ja01415	NCP	%	124			70-130	Pass	
Pyrene	S19-Ja01415	NCP	%	107			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
a-BHC	S19-Ja02058	NCP	%	127			70-130	Pass	
Aldrin	S19-Ja02058	NCP	%	128			70-130	Pass	
b-BHC	S19-Ja02058	NCP	%	127			70-130	Pass	
d-BHC	S19-Ja02058	NCP	%	124			70-130	Pass	
Dieldrin	S19-Ja02058	NCP	%	127			70-130	Pass	
Endosulfan I	S19-Ja02058	NCP	%	127			70-130	Pass	
Endosulfan II	S19-Ja02058	NCP	%	128			70-130	Pass	
Endosulfan sulphate	S19-Ja02058	NCP	%	124			70-130	Pass	
Endrin	S19-Ja02058	NCP	%	114			70-130	Pass	
Endrin aldehyde	S19-Ja02058	NCP	%	113			70-130	Pass	
Endrin ketone	S19-Ja02058	NCP	%	123			70-130	Pass	
g-BHC (Lindane)	S19-Ja02058	NCP	%	128			70-130	Pass	
Heptachlor epoxide	S19-Ja02058	NCP	%	127			70-130	Pass	
Spike - % Recovery									
Phenols (Halogenated)				Result 1					
2-Chlorophenol	S19-Ja01415	NCP	%	164			30-130	Fail	Q08
2.4-Dichlorophenol	S19-Ja01415	NCP	%	110			30-130	Pass	
2.4.5-Trichlorophenol	S19-Ja01415	NCP	%	38			30-130	Pass	
2.4.6-Trichlorophenol	S19-Ja01415	NCP	%	40			30-130	Pass	
2.6-Dichlorophenol	S19-Ja01415	NCP	%	38			30-130	Pass	
4-Chloro-3-methylphenol	S19-Ja01415	NCP	%	179			30-130	Fail	Q08
Pentachlorophenol	S19-Ja01415	NCP	%	77			30-130	Pass	
Tetrachlorophenols - Total	S19-Ja01415	NCP	%	25			30-130	Fail	Q08
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2-Cyclohexyl-4.6-dinitrophenol	S19-Ja01415	NCP	%	101			30-130	Pass	
2-Methyl-4.6-dinitrophenol	S19-Ja01415	NCP	%	152			30-130	Fail	Q08
2-Methylphenol (o-Cresol)	S19-Ja01415	NCP	%	168			30-130	Fail	Q08
2-Nitrophenol	S19-Ja01415	NCP	%	47			30-130	Pass	
2.4-Dimethylphenol	S19-Ja01415	NCP	%	175			30-130	Fail	Q08
2.4-Dinitrophenol	S19-Ja01415	NCP	%	102			70-130	Pass	
3&4-Methylphenol (m&p-Cresol)	S19-Ja01415	NCP	%	181			30-130	Fail	Q08
4-Nitrophenol	S19-Ja01415	NCP	%	17			30-130	Fail	Q08
Dinoseb	S19-Ja01415	NCP	%	246			30-130	Fail	Q08
Phenol	S19-Ja01415	NCP	%	180			30-130	Fail	Q08
Spike - % Recovery									
Heavy Metals				Result 1					
Copper	S18-De29134	NCP	%	85			70-130	Pass	
Zinc	S18-De29134	NCP	%	83			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S18-De31072	CP	%	98			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S18-De31072	CP	%	95			70-130	Pass	
Toluene	S18-De31072	CP	%	95			70-130	Pass	
Ethylbenzene	S18-De31072	CP	%	96			70-130	Pass	
m&p-Xylenes	S18-De31072	CP	%	97			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
o-Xylene	S18-De31072	CP	%	98			70-130	Pass	
Xylenes - Total	S18-De31072	CP	%	97			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S18-De31072	CP	%	92			70-130	Pass	
TRH C6-C10	S18-De31072	CP	%	101			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1260	S18-De31072	CP	%	96			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	S18-De31076	CP	%	97			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S18-De31076	CP	%	106			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4.4'-DDD	S18-De31597	NCP	%	127			70-130	Pass	
4.4'-DDE	S18-De28985	NCP	%	114			70-130	Pass	
4.4'-DDT	S18-De31597	NCP	%	125			70-130	Pass	
Heptachlor	S18-De28985	NCP	%	113			70-130	Pass	
Hexachlorobenzene	S18-De28985	NCP	%	116			70-130	Pass	
Methoxychlor	S18-De28985	NCP	%	73			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S18-De31084	CP	%	112			70-130	Pass	
Cadmium	S18-De31084	CP	%	114			70-130	Pass	
Chromium	S18-De31084	CP	%	96			70-130	Pass	
Lead	S18-De31084	CP	%	92			70-130	Pass	
Mercury	S18-De31084	CP	%	94			70-130	Pass	
Nickel	S18-De31084	CP	%	94			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Cadmium	S18-De29133	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S18-De31069	CP	%	5.6	5.5	3.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S18-De31070	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S18-De31070	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S18-De31070	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S18-De31070	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S18-De31070	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S18-De31070	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S18-De31070	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S18-De31070	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S18-De31070	CP	mg/kg	< 20	< 20	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S18-De31070	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S18-De31070	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S18-De31070	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S18-De31070	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S18-De31070	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S18-De31070	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S18-De31070	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S18-De31070	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S18-De31070	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S18-De31070	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S18-De31070	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S18-De31070	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S18-De31070	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S18-De31070	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S18-De31070	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S18-De31070	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S18-De31070	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S18-De31070	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S18-De31070	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S18-De31070	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Toxaphene	S18-De31070	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	S18-De31070	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1221	S18-De31070	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	S18-De31070	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1242	S18-De31070	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1248	S18-De31070	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1254	S18-De31070	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1260	S18-De31070	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	S18-De31071	CP	pH Units	9.2	9.1	pass	30%	Pass	
Reaction Ratings*	S18-De31071	CP	comment	4.0	4.0	pass	30%	Pass	
Duplicate									
Chromium Suite				Result 1	Result 2	RPD			
pH-KCL	S18-De31071	CP	pH Units	8.9	8.9	<1	30%	Pass	
Acid trail - Titratable Actual Acidity	S18-De31071	CP	mol H+/t	< 2	< 2	<1	30%	Pass	
sulfidic - TAA equiv. S% pyrite	S18-De31071	CP	% pyrite S	< 0.02	< 0.02	<1	30%	Pass	
Chromium Reducible Sulfur	S18-De31071	CP	% S	0.24	0.24	4.0	30%	Pass	
Chromium Reducible Sulfur -acidity units	S18-De31071	CP	mol H+/t	150	150	4.0	30%	Pass	
Sulfur - KCl Extractable	S18-De31071	CP	% S	n/a	n/a	n/a	30%	Pass	
HCl Extractable Sulfur	S18-De31071	CP	% S	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur	S18-De31071	CP	% S	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur - acidity units	S18-De31071	CP	mol H+/t	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur - equivalent S% pyrite	S18-De31071	CP	% S	n/a	n/a	n/a	30%	Pass	
Acid Neutralising Capacity (ANCbt)	S18-De31071	CP	%CaCO3	2.0	1.8	11	30%	Pass	
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)	S18-De31071	CP	% S	0.63	0.56	11	30%	Pass	
ANC Fineness Factor	S18-De31071	CP	factor	1.5	1.5	<1	30%	Pass	
CRS Suite - Net Acidity (Sulfur Units)	S18-De31071	CP	% S	< 0.02	< 0.02	<1	30%	Pass	

Duplicate									
Chromium Suite				Result 1	Result 2	RPD			
CRS Suite - Net Acidity (Acidity Units)	S18-De31071	CP	mol H+/t	< 10	< 10	<1	30%	Pass	
CRS Suite - Liming Rate	S18-De31071	CP	kg CaCO3/t	< 1	< 1	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S18-De31081	CP	mg/kg	2.7	2.7	1.0	30%	Pass	
Chromium	S18-De31081	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Copper	S18-De31081	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Lead	S18-De31081	CP	mg/kg	6.1	6.6	8.0	30%	Pass	
Mercury	S18-De31081	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S18-De31081	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S18-De31081	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S18-De31081	CP	%	2.1	2.4	11	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S18-De31084	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S18-De31084	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S18-De31084	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S18-De31084	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S18-De31084	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S18-De31084	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S18-De31084	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S18-De31084	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S18-De31084	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S18-De31084	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S18-De31084	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S18-De31084	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S18-De31084	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S18-De31084	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S18-De31084	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S18-De31084	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S18-De31084	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S18-De31084	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S18-De31084	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S18-De31084	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S18-De31084	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S18-De31084	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S18-De31084	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S18-De31084	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S18-De31084	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S18-De31084	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S18-De31084	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S18-De31084	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S18-De31084	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Toxaphene	S18-De31084	CP	mg/kg	< 1	< 1	<1	30%	Pass	

Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	S18-De31084	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1221	S18-De31084	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	S18-De31084	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1242	S18-De31084	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1248	S18-De31084	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1254	S18-De31084	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1260	S18-De31084	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S18-De31088	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S18-De31088	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S18-De31088	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S18-De31088	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S18-De31088	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S18-De31088	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S18-De31088	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S18-De31088	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S18-De31088	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	S18-De31091	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S18-De31091	CP	mg/kg	260	190	33	30%	Fail	Q15
TRH C29-C36	S18-De31091	CP	mg/kg	190	160	17	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S18-De31091	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S18-De31091	CP	mg/kg	400	300	28	30%	Pass	
TRH >C34-C40	S18-De31091	CP	mg/kg	100	< 100	13	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S18-De31091	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S18-De31091	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S18-De31091	CP	mg/kg	1.2	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S18-De31091	CP	mg/kg	2.3	1.0	<1	30%	Pass	
Benzo(a)pyrene	S18-De31091	CP	mg/kg	1.8	0.9	<1	30%	Pass	
Benzo(b&j)fluoranthene	S18-De31091	CP	mg/kg	2.2	1.1	<1	30%	Pass	
Benzo(g.h.i)perylene	S18-De31091	CP	mg/kg	0.9	0.6	<1	30%	Pass	
Benzo(k)fluoranthene	S18-De31091	CP	mg/kg	0.8	< 0.5	<1	30%	Pass	
Chrysene	S18-De31091	CP	mg/kg	1.8	0.9	<1	30%	Pass	
Dibenz(a.h)anthracene	S18-De31091	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S18-De31091	CP	mg/kg	4.3	< 0.5	<1	30%	Pass	
Fluorene	S18-De31091	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S18-De31091	CP	mg/kg	0.9	0.5	<1	30%	Pass	
Naphthalene	S18-De31091	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S18-De31091	CP	mg/kg	4.2	1.1	<1	30%	Pass	
Pyrene	S18-De31091	CP	mg/kg	3.9	1.6	<1	30%	Pass	

Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	S18-De31091	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	S18-De31091	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	S18-De31091	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	S18-De31091	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.6-Dichlorophenol	S18-De31091	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	S18-De31091	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	S18-De31091	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	S18-De31091	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	S18-De31091	CP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	S18-De31091	CP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	S18-De31091	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
2-Nitrophenol	S18-De31091	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4-Dimethylphenol	S18-De31091	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	S18-De31091	CP	mg/kg	< 5	< 5	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	S18-De31091	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	S18-De31091	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	S18-De31091	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	S18-De31091	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	S18-De31101	CP	pH Units	9.0	9.2	pass	30%	Pass	
Reaction Ratings*	S18-De31101	CP	comment	2.0	2.0	pass	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S18-De31102	CP	%	15	17	16	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S18-De31103	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S18-De31103	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S18-De31103	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S18-De31103	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S18-De31103	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S18-De31103	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S18-De31103	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S18-De31103	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S18-De31103	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S18-De31103	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S18-De31103	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S18-De31103	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S18-De31103	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S18-De31103	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S18-De31103	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S18-De31103	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S18-De31103	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S18-De31103	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S18-De31103	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Endosulfan II	S18-De31103	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S18-De31103	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S18-De31103	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S18-De31103	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S18-De31103	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S18-De31103	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S18-De31103	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S18-De31103	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S18-De31103	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S18-De31103	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Toxaphene	S18-De31103	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	S18-De31103	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1221	S18-De31103	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	S18-De31103	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1242	S18-De31103	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1248	S18-De31103	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1254	S18-De31103	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1260	S18-De31103	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	S18-De31108	CP	mg/kg	< 20	31	57	30%	Fail	Q15
TRH C15-C28	S18-De31108	CP	mg/kg	140	220	44	30%	Fail	Q15
TRH C29-C36	S18-De31108	CP	mg/kg	140	230	48	30%	Fail	Q15
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S18-De31108	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S18-De31108	CP	mg/kg	220	350	45	30%	Fail	Q15
TRH >C34-C40	S18-De31108	CP	mg/kg	< 100	140	49	30%	Fail	Q15
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S18-De31108	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S18-De31108	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S18-De31108	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S18-De31108	CP	mg/kg	0.8	1.0	<1	30%	Pass	
Benzo(a)pyrene	S18-De31108	CP	mg/kg	0.9	1.2	<1	30%	Pass	
Benzo(b&j)fluoranthene	S18-De31108	CP	mg/kg	1.2	1.4	<1	30%	Pass	
Benzo(g.h.i)perylene	S18-De31108	CP	mg/kg	0.6	0.8	<1	30%	Pass	
Benzo(k)fluoranthene	S18-De31108	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S18-De31108	CP	mg/kg	0.8	1.0	<1	30%	Pass	
Dibenz(a.h)anthracene	S18-De31108	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S18-De31108	CP	mg/kg	1.3	1.6	<1	30%	Pass	
Fluorene	S18-De31108	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S18-De31108	CP	mg/kg	0.5	0.7	<1	30%	Pass	
Naphthalene	S18-De31108	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S18-De31108	CP	mg/kg	0.7	0.9	<1	30%	Pass	
Pyrene	S18-De31108	CP	mg/kg	1.4	1.8	<1	30%	Pass	
Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	S18-De31108	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	S18-De31108	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	S18-De31108	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	S18-De31108	CP	mg/kg	< 1	< 1	<1	30%	Pass	

Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2.6-Dichlorophenol	S18-De31108	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	S18-De31108	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	S18-De31108	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	S18-De31108	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	S18-De31108	CP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	S18-De31108	CP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	S18-De31108	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
2-Nitrophenol	S18-De31108	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4-Dimethylphenol	S18-De31108	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	S18-De31108	CP	mg/kg	< 5	< 5	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	S18-De31108	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	S18-De31108	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	S18-De31108	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	S18-De31108	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Comments

Eurofins | mgt accreditation number 1261, corporate site 1254 and 14271 is currently in progress of a controlled transition to a new custom built location at 6 Monterey Road, Dandenong South, Victoria 3175. All results on this report denoted as being performed by Eurofins | mgt 2-5 Kingston Town Close, Oakleigh Victoria 3166 corporate site 1254, will have been performed on either Oakleigh or new Dandenong South site.

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
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference
Q15	The RPD reported passes Eurofins | mgt's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.
S01	Liming rate is calculated and reported on a dry weight basis assuming use of fine agricultural lime (CaCO3) and using a safety factor of 1.5 to allow for non-homogeneous mixing and poor reactivity of lime. For conversion of Liming Rate from 'kg/t dry weight' to 'kg/m3 in-situ soil' multiply 'reported results' x 'wet bulk density of soil in t/m3'
S02	Retained Acidity is Reported when the pHKCl is less than pH 4.5
S03	Acid Neutralising Capacity is only required if the pHKCl if greater than or equal to pH 6.5
S04	Acid Sulfate Soil Samples have a 24 hour holding time unless frozen or dried within that period
S05	Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Authorised By

Andrew Black	Analytical Services Manager
Andrew Sullivan	Senior Analyst-Organic (NSW)
Gabriele Cordero	Senior Analyst-Metal (NSW)
Myles Clark	Senior Analyst-SPOCAS (QLD)
Nibha Vaidya	Senior Analyst-Asbestos (NSW)



Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please click here.

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Coffey Environments Pty Ltd Newcastle
Lot 101, 19 Warabrook Boulevard
Warabrook
NSW 2304

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Paul Wright**

Report **634424-W**
Project name UON HCCD
Project ID NTLEN213472
Received Date Dec 20, 2018

Client Sample ID			R20**TRIP SPIKE**	**TRIP BLANK**	R20**TRIP SPIKE 2**	**TRIP BLANK 2**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**S18-De31085**	**S18-De31086**	**S18-De31109**	**S18-De31110**
Date Sampled			**Dec 18, 2018**	**Dec 18, 2018**	**Dec 19, 2018**	**Dec 19, 2018**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.01	mg/L	110	< 0.01	85	< 0.01
TRH C6-C10	0.02	mg/L	74	< 0.02	75	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	-	< 0.02	-	< 0.02
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	0.02	mg/L	78	< 0.02	80	< 0.02
BTEX						
Benzene	0.001	mg/L	100	< 0.001	130	< 0.001
Toluene	0.001	mg/L	98	< 0.001	110	< 0.001
Ethylbenzene	0.001	mg/L	98	< 0.001	95	< 0.001
m&p-Xylenes	0.002	mg/L	94	< 0.002	91	< 0.002
o-Xylene	0.001	mg/L	100	< 0.001	97	< 0.001
Xylenes - Total	0.003	mg/L	97	< 0.003	93	< 0.003
4-Bromofluorobenzene (surr.)	1	%	99	105	66	124

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

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
Total Recoverable Hydrocarbons	Sydney	Dec 27, 2018	7 Day
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Dec 27, 2018	7 Day
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Dec 27, 2018	14 Day
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			

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Address: Lot 101, 19 Warabrook Boulevard
Warabrook
NSW 2304

Project Name: UON HCCD
Project ID: NTLEN213472

Order No.:
Report #: 634424
Phone: 02 4016 2300
Fax: 02 4016 2380

Received: Dec 20, 2018 9:00 AM
Due: Jan 8, 2019
Priority: 10 Day
Contact Name: Paul Wright

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	Asbestos Absence /Presence	HOLD	Acid Sulfate Soils Field pH Test	Eurofins | mgt Suite B13	Chromium Reducible Sulfur Suite	Moisture Set	Moisture Set	Eurofins | mgt Suite B7A	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X		X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794									X		X	X	X		
Perth Laboratory - NATA Site # 23736															
External Laboratory															
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**										
1	BHP12 0.2-0.3	Dec 18, 2018		Soil	S18-De31067	X				X			X	X	
2	BHP12 0.9-1.0	Dec 18, 2018		Soil	S18-De31068					X			X	X	
3	BHP13 0.2-0.3	Dec 18, 2018		Soil	S18-De31069	X				X			X	X	
4	BHP13 1.9-2.0	Dec 18, 2018		Soil	S18-De31070					X			X	X	
5	BHP13 2.5-2.6	Dec 18, 2018		Soil	S18-De31071				X		X	X			
6	BHP20 0.2-0.3	Dec 18, 2018		Soil	S18-De31072	X				X			X	X	
7	BHP20 1.2-1.3	Dec 18, 2018		Soil	S18-De31073					X			X	X	
8	BHP20 2.9-3.0	Dec 18, 2018		Soil	S18-De31074				X		X	X			
9	BHP10 0.2-0.3	Dec 18, 2018		Soil	S18-De31075	X				X			X	X	

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Project Name: UON HCCD
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Received: Dec 20, 2018 9:00 AM
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Contact Name: Paul Wright

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	Asbestos Absence /Presence	HOLD	Acid Sulfate Soils Field pH Test	Eurofins | mgt Suite B13	Chromium Reducible Sulfur Suite	Moisture Set	Moisture Set	Eurofins | mgt Suite B7A	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X		X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794									X		X	X	X		
Perth Laboratory - NATA Site # 23736															
10	BHP10 1.7-1.8	Dec 18, 2018		Soil	S18-De31076					X			X	X	
11	BHP8 0.2-0.3	Dec 18, 2018		Soil	S18-De31077	X				X			X	X	
12	BHP8 0.9-1.0	Dec 18, 2018		Soil	S18-De31078					X			X	X	
13	QC1	Dec 18, 2018		Soil	S18-De31079					X			X	X	
14	BHP9 0.2-0.5	Dec 18, 2018		Soil	S18-De31080	X				X			X	X	
15	BHP9 1.0-1.1	Dec 18, 2018		Soil	S18-De31081					X			X	X	
16	BHP9 3.4-3.5	Dec 18, 2018		Soil	S18-De31082				X		X	X			
17	BHP9 3.8-3.9	Dec 18, 2018		Soil	S18-De31083				X		X	X			
18	QC3	Dec 18, 2018		Soil	S18-De31084					X			X	X	
19	TRIP SPIKE	Dec 18, 2018		Water	S18-De31085										X
20	TRIP BLANK	Dec 18, 2018		Water	S18-De31086										X
21	BHP18 0.2-0.3	Dec 19, 2018		Soil	S18-De31087					X			X	X	

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Company Name: Coffey Environments P/L N'castle
Address: Lot 101, 19 Warabrook Boulevard
Warabrook
NSW 2304

Project Name: UON HCCD
Project ID: NTLEN213472

Order No.:
Report #: 634424
Phone: 02 4016 2300
Fax: 02 4016 2380

Received: Dec 20, 2018 9:00 AM
Due: Jan 8, 2019
Priority: 10 Day
Contact Name: Paul Wright

Eurofins | mgt Analytical Services Manager : Andrew Black

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Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X		X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794									X		X	X	X		
Perth Laboratory - NATA Site # 23736															
22	BHP18 0.9-1.0	Dec 19, 2018		Soil	S18-De31088					X			X	X	
23	BHP18 2.7-3.0	Dec 19, 2018		Soil	S18-De31089				X						
24	BHP18 3.5-3.8	Dec 19, 2018		Soil	S18-De31090				X		X	X			
25	BHP15 0.2-0.3	Dec 19, 2018		Soil	S18-De31091	X				X			X	X	
26	BHP15 0.9-1.0	Dec 19, 2018		Soil	S18-De31092					X			X	X	
27	BHP15 2.5-2.8	Dec 19, 2018		Soil	S18-De31093				X		X	X			
28	BHP14 0.2-0.3	Dec 19, 2018		Soil	S18-De31094					X			X	X	
29	BHP14 0.9-1.0	Dec 19, 2018		Soil	S18-De31095					X			X	X	
30	BHP14 2.5-2.8	Dec 19, 2018		Soil	S18-De31096				X						
31	BHP14 3.3-3.5	Dec 19, 2018		Soil	S18-De31097				X		X	X			
32	BHP11 0.2-0.3	Dec 19, 2018		Soil	S18-De31098					X			X	X	
33	BHP11 0.9-1.0	Dec 19, 2018		Soil	S18-De31099					X			X	X	

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Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X		X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794									X		X	X	X		
Perth Laboratory - NATA Site # 23736															
34	BHP11 2.8-2.9	Dec 19, 2018		Soil	S18-De31100				X						
35	BHP11 3.3-3.5	Dec 19, 2018		Soil	S18-De31101				X		X	X			
36	BHP19 0.1-0.3	Dec 19, 2018		Soil	S18-De31102					X			X	X	
37	BHP19 1.5-1.6	Dec 19, 2018		Soil	S18-De31103					X			X	X	
38	BHP19 3.1-3.3	Dec 19, 2018		Soil	S18-De31104				X		X	X			
39	BHP16 0.0-0.2	Dec 19, 2018		Soil	S18-De31105					X			X	X	
40	BHP16 0.6-0.7	Dec 19, 2018		Soil	S18-De31106					X			X	X	
41	BHP16 2.8-3.0	Dec 19, 2018		Soil	S18-De31107				X		X	X			
42	QC5	Dec 19, 2018		Soil	S18-De31108					X			X	X	
43	TRIP SPIKE 2	Dec 19, 2018		Water	S18-De31109										X
44	TRIP BLANK 2	Dec 19, 2018		Water	S18-De31110										X
45	ACM1	Dec 19, 2018		Building	S18-De31111		X								

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Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X		X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794									X		X	X	X		
Perth Laboratory - NATA Site # 23736															
				Materials											
46	ACM2	Dec 19, 2018		Building Materials	S18-De31112		X								
47	ACM3	Dec 19, 2018		Building Materials	S18-De31113		X								
48	SS1	Dec 19, 2018		Soil	S18-De31114	X				X			X	X	
49	SS2	Dec 19, 2018		Soil	S18-De31115	X				X			X	X	
50	BHP12 1.9-2.0	Dec 18, 2018		Soil	S18-De31116			X							
51	BHP12 2.5-2.6	Dec 18, 2018		Soil	S18-De31117			X							
52	BHP12 3.0-3.1	Dec 18, 2018		Soil	S18-De31118			X							
53	BHP13 0.9-1.0	Dec 18, 2018		Soil	S18-De31119			X							
54	BHP20 0.5-0.6	Dec 19, 2018		Soil	S18-De31120			X							
55	BHP20 1.9-2.0	Dec 18, 2018		Soil	S18-De31121			X							

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Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X		X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794									X		X	X	X		
Perth Laboratory - NATA Site # 23736															
56	BHP20 2.4-2.5	Dec 18, 2018		Soil	S18-De31122			X							
57	BHP10 0.9-1.0	Dec 18, 2018		Soil	S18-De31123			X							
58	BHP8 1.9-2.0	Dec 19, 2018		Soil	S18-De31124			X							
59	BHP9 0.6-0.7	Dec 19, 2018		Soil	S18-De31125			X							
60	BHP9 1.8-1.9	Dec 19, 2018		Soil	S18-De31126			X							
61	BHP9 2.4-2.5	Dec 19, 2018		Soil	S18-De31127			X							
62	BHP9 3.0-3.1	Dec 19, 2018		Soil	S18-De31128			X							
63	BHP10 2.2-2.3	Dec 19, 2018		Soil	S18-De31129			X							
64	BHP18 1.9-2.0	Dec 19, 2018		Soil	S18-De31130			X							
65	BHP15 1.8-2.0	Dec 19, 2018		Soil	S18-De31131			X							
66	BHP14 1.8-2.0	Dec 19, 2018		Soil	S18-De31132			X							
67	BHP11 1.2-1.3	Dec 19, 2018		Soil	S18-De31133			X							

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Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X		X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794									X		X	X	X		
Perth Laboratory - NATA Site # 23736															
68	BHP11 1.9-2.0	Dec 19, 2018		Soil	S18-De31134			X							
69	BHP19 1.0-1.1	Dec 19, 2018		Soil	S18-De31135			X							
70	BHP19 2.2-2.3	Dec 19, 2018		Soil	S18-De31136			X							
71	BHP16 1.6-1.7	Dec 19, 2018		Soil	S18-De31137			X							
72	QC6	Dec 19, 2018		Soil	S18-De31138			X							
Test Counts						9	3	23	13	29	10	39	39	29	4

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure, April 2011 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.2 2018
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.2 where no positive PFAS results have been reported have been reviewed and no data was affected.

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

QC Data General Comments

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

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Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	112			70-130	Pass	
TRH C6-C10	%	91			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	96			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	118			70-130	Pass	
Toluene	%	108			70-130	Pass	
Ethylbenzene	%	107			70-130	Pass	
m&p-Xylenes	%	109			70-130	Pass	
o-Xylene	%	107			70-130	Pass	
Xylenes - Total	%	108			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S18-De31289	NCP	%	101			70-130	Pass	
TRH C6-C10	S18-De31289	NCP	%	83			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S18-De31289	NCP	%	87			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S18-De31289	NCP	%	115			70-130	Pass	
Toluene	S18-De31289	NCP	%	105			70-130	Pass	
Ethylbenzene	S18-De31289	NCP	%	101			70-130	Pass	
m&p-Xylenes	S18-De31289	NCP	%	91			70-130	Pass	
o-Xylene	S18-De31289	NCP	%	103			70-130	Pass	
Xylenes - Total	S18-De31289	NCP	%	95			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S18-De31285	NCP	mg/L	0.02	0.02	<1	30%	Pass	
TRH C6-C10	S18-De31285	NCP	mg/L	0.07	0.08	9.0	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S18-De31285	NCP	mg/L	0.07	0.07	10	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S18-De31285	NCP	mg/L	0.013	0.014	11	30%	Pass	
Toluene	S18-De31285	NCP	mg/L	0.007	0.010	<1	30%	Pass	
Ethylbenzene	S18-De31285	NCP	mg/L	0.002	0.002	10	30%	Pass	
m&p-Xylenes	S18-De31285	NCP	mg/L	0.004	0.004	14	30%	Pass	
o-Xylene	S18-De31285	NCP	mg/L	0.004	0.005	19	30%	Pass	
Xylenes - Total	S18-De31285	NCP	mg/L	0.008	0.009	3.0	30%	Pass	

Comments

Eurofins | mgt accreditation number 1261, corporate site 1254 and 14271 is currently in progress of a controlled transition to a new custom built location at 6 Monterey Road, Dandenong South, Victoria 3175. All results on this report denoted as being performed by Eurofins | mgt 2-5 Kingston Town Close, Oakleigh Victoria 3166 corporate site 1254, will have been performed on either Oakleigh or new Dandenong South site.

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
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
R20	This sample is a Trip Spike and therefore all results are reported as a percentage

Authorised By

Andrew Black Analytical Services Manager



Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please click here.

Eurofins | mgt shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins | mgt be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

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Sample Receipt Advice

Company name:	**Coffey Environments P/L N'castle**
Contact name:	Paul Wright
Project name:	HCCD - SITE 1
Project ID:	NTLE213472
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Jan 11, 2019 2:41 PM
Eurofins | mgt reference:	**635450**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 21.5 degrees Celsius.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Andrew Black on Phone : (+61) 2 9900 8490 or by e.mail: AndrewBlack@eurofins.com

Results will be delivered electronically via e.mail to Paul Wright - paul.wright@coffey.com.

Coffey Environments Pty Ltd Newcastle
Lot 101, 19 Warabrook Boulevard
Warabrook
NSW 2304

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Paul Wright**

Report **635450-S**
Project name HCCD - SITE 1
Project ID NTLE213472
Received Date Jan 11, 2019

Client Sample ID			**MW01 2.8-3.0**	**MW01 3.8-4.0**	**MW01 4.8-5.0**	**MW01 5.8-6.0**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S19-Ja05460**	**S19-Ja05461**	**S19-Ja05462**	**S19-Ja05463**
Date Sampled			**Jan 09, 2019**	**Jan 09, 2019**	**Jan 09, 2019**	**Jan 09, 2019**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.5	9.1	9.3	9.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.6	4.3	6.9	7.3
Reaction Ratings*[S05]		comment	2.0	4.0	4.0	4.0
Chromium Suite						
pH-KCL	0.1	pH Units	-	9.2	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	< 2	-	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	< 0.02	-	-
Chromium Reducible Sulfur[S04]	0.005	% S	-	0.095	-	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	59	-	-
Sulfur - KCl Extractable	0.02	% S	-	n/a	-	-
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite[S02]	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	-	1.2	-	-
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	-	240	-	-
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)[S03]	0.02	% S	-	0.38	-	-
ANC Fineness Factor		factor	-	1.5	-	-
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	-	< 0.02	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	< 10	-	-
CRS Suite - Liming Rate[S01]	1	kg CaCO3/t	-	< 1	-	-
Extraneous Material						
<2mm Fraction	0.005	g	-	160	-	-
>2mm Fraction	0.005	g	-	< 0.005	-	-
Analysed Material	0.1	%	-	100	-	-
Extraneous Material	0.1	%	-	< 0.1	-	-
% Moisture	1	%	-	17	-	-

Client Sample ID			MW02 2.8-3.0	MW02 3.8-4.0	MW02 4.8-5.0	MW02 5.8-6.0
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S19-Ja05464**	**S19-Ja05465**	**S19-Ja05466**	**S19-Ja05467**
Date Sampled			**Jan 09, 2019**	**Jan 09, 2019**	**Jan 09, 2019**	**Jan 09, 2019**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.6	8.9	9.1	9.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.7	7.1	6.9	7.7
Reaction Ratings*[S05]		comment	2.0	4.0	2.0	2.0
Chromium Suite						
pH-KCL	0.1	pH Units	-	9.4	9.5	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	< 2	< 2	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	< 0.02	< 0.02	-
Chromium Reducible Sulfur[S04]	0.005	% S	-	0.049	0.032	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	31	20	-
Sulfur - KCl Extractable	0.02	% S	-	n/a	n/a	-
HCl Extractable Sulfur	0.02	% S	-	n/a	n/a	-
Net Acid soluble sulfur	0.02	% S	-	n/a	n/a	-
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	n/a	-
Net Acid soluble sulfur - equivalent S% pyrite[S02]	0.02	% S	-	n/a	n/a	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	-	1.5	1.7	-
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	-	300	330	-
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)[S03]	0.02	% S	-	0.49	0.53	-
ANC Fineness Factor		factor	-	1.5	1.5	-
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	-	< 0.02	< 0.02	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	< 10	< 10	-
CRS Suite - Liming Rate[S01]	1	kg CaCO3/t	-	< 1	< 1	-
Extraneous Material						
<2mm Fraction	0.005	g	-	220	210	-
>2mm Fraction	0.005	g	-	0.48	5.3	-
Analysed Material	0.1	%	-	100	98	-
Extraneous Material	0.1	%	-	0.2	2.4	-
% Moisture	1	%	-	16	16	-

Client Sample ID			MW03 2.8-3.0	MW03 3.8-4.0	MW03 4.8-5.0	MW03 5.8-6.0
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S19-Ja05468**	**S19-Ja05469**	**S19-Ja05470**	**S19-Ja05471**
Date Sampled			**Jan 09, 2019**	**Jan 09, 2019**	**Jan 09, 2019**	**Jan 09, 2019**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	9.5	9.1	9.4	9.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	7.8	3.0	7.6	7.4
Reaction Ratings*[S05]		comment	2.0	4.0	1.0	4.0
Chromium Suite						
pH-KCL	0.1	pH Units	-	9.0	-	-
Acid trail - Titratable Actual Acidity	2	mol H+/t	-	< 2	-	-
sulfidic - TAA equiv. S% pyrite	0.02	% pyrite S	-	< 0.02	-	-
Chromium Reducible Sulfur[S04]	0.005	% S	-	0.28	-	-
Chromium Reducible Sulfur -acidity units	3	mol H+/t	-	170	-	-
Sulfur - KCl Extractable	0.02	% S	-	n/a	-	-
HCl Extractable Sulfur	0.02	% S	-	n/a	-	-
Net Acid soluble sulfur	0.02	% S	-	n/a	-	-

Client Sample ID			MW03 2.8-3.0	MW03 3.8-4.0	MW03 4.8-5.0	MW03 5.8-6.0
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S19-Ja05468**	**S19-Ja05469**	**S19-Ja05470**	**S19-Ja05471**
Date Sampled			**Jan 09, 2019**	**Jan 09, 2019**	**Jan 09, 2019**	**Jan 09, 2019**
Test/Reference	LOR	Unit				
Chromium Suite						
Net Acid soluble sulfur - acidity units	10	mol H+/t	-	n/a	-	-
Net Acid soluble sulfur - equivalent S% pyrite[S02]	0.02	% S	-	n/a	-	-
Acid Neutralising Capacity (ANCbt)	0.01	%CaCO3	-	2.0	-	-
Acid Neutralising Capacity - acidity (a-ANCbt)	2	mol H+/t	-	390	-	-
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)[S03]	0.02	% S	-	0.63	-	-
ANC Fineness Factor		factor	-	1.5	-	-
CRS Suite - Net Acidity (Sulfur Units)	0.02	% S	-	< 0.02	-	-
CRS Suite - Net Acidity (Acidity Units)	10	mol H+/t	-	< 10	-	-
CRS Suite - Liming Rate[S01]	1	kg CaCO3/t	-	< 1	-	-
Extraneous Material						
<2mm Fraction	0.005	g	-	250	-	-
>2mm Fraction	0.005	g	-	5.7	-	-
Analysed Material	0.1	%	-	98	-	-
Extraneous Material	0.1	%	-	2.2	-	-
% Moisture	1	%	-	21	-	-

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

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
Acid Sulfate Soils Field pH Test	Brisbane	Jan 15, 2019	7 Days
- Method: LTM-GEN-7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests			
Chromium Reducible Sulfur Suite			
Chromium Suite	Brisbane	Jan 15, 2019	6 Week
- Method: LTM-GEN-7070			
Extraneous Material	Brisbane	Jan 15, 2019	6 Week
- Method: LTM-GEN-7050/7070			
% Moisture	Brisbane	Jan 11, 2019	14 Day
- Method: LTM-GEN-7080 Moisture			

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NATA # 1261
Site # 23736

Company Name: Coffey Environments P/L N'castle
Address: Lot 101, 19 Warabrook Boulevard
Warabrook
NSW 2304

Project Name: HCCD - SITE 1
Project ID: NTLE213472

Order No.:
Report #: 635450
Phone: 02 4016 2300
Fax: 02 4016 2380

Received: Jan 11, 2019 2:41 PM
Due: Jan 18, 2019
Priority: 5 Day
Contact Name: Paul Wright

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Acid Sulfate Soils Field pH Test	Chromium Reducible Sulfur Suite	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	MW01 2.8-3.0	Jan 09, 2019		Soil	S19-Ja05460	X		
2	MW01 3.8-4.0	Jan 09, 2019		Soil	S19-Ja05461	X	X	X
3	MW01 4.8-5.0	Jan 09, 2019		Soil	S19-Ja05462	X		
4	MW01 5.8-6.0	Jan 09, 2019		Soil	S19-Ja05463	X		
5	MW02 2.8-3.0	Jan 09, 2019		Soil	S19-Ja05464	X		
6	MW02 3.8-4.0	Jan 09, 2019		Soil	S19-Ja05465	X	X	X
7	MW02 4.8-5.0	Jan 09, 2019		Soil	S19-Ja05466	X	X	X
8	MW02 5.8-6.0	Jan 09, 2019		Soil	S19-Ja05467	X		
9	MW03 2.8-3.0	Jan 09, 2019		Soil	S19-Ja05468	X		

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Contact Name: Paul Wright

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Acid Sulfate Soils Field pH Test	Chromium Reducible Sulfur Suite	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
10	MW03 3.8-4.0	Jan 09, 2019		Soil	S19-Ja05469	X	X	X
11	MW03 4.8-5.0	Jan 09, 2019		Soil	S19-Ja05470	X		
12	MW03 5.8-6.0	Jan 09, 2019		Soil	S19-Ja05471	X		
Test Counts						12	4	4

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure, April 2011 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.2 2018
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.2 where no positive PFAS results have been reported have been reviewed and no data was affected.

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

QC Data General Comments

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

Quality Control Results

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery									
Chromium Suite									
Chromium Reducible Sulfur			%	107			70-130	Pass	
Acid Neutralising Capacity (ANCbt)			%	99			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	S19-Ja05460	CP	pH Units	9.5	9.5	pass	30%	Pass	
Reaction Ratings*	S19-Ja05460	CP	comment	2.0	2.0	pass	30%	Pass	
Duplicate									
Chromium Suite				Result 1	Result 2	RPD			
pH-KCL	S19-Ja04957	NCP	pH Units	9.7	9.7	<1	30%	Pass	
Acid trail - Titratable Actual Acidity	S19-Ja04957	NCP	mol H+/t	< 2	< 2	<1	30%	Pass	
sulfidic - TAA equiv. S% pyrite	S19-Ja04957	NCP	% pyrite S	< 0.02	< 0.02	<1	30%	Pass	
Chromium Reducible Sulfur	S19-Ja04957	NCP	% S	0.011	0.011	<1	30%	Pass	
Chromium Reducible Sulfur -acidity units	S19-Ja04957	NCP	mol H+/t	< 3	< 3	<1	30%	Pass	
Sulfur - KCl Extractable	S19-Ja04957	NCP	% S	n/a	n/a	n/a	30%	Pass	
HCl Extractable Sulfur	S19-Ja04957	NCP	% S	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur	S19-Ja04957	NCP	% S	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur - acidity units	S19-Ja04957	NCP	mol H+/t	n/a	n/a	n/a	30%	Pass	
Net Acid soluble sulfur - equivalent S% pyrite	S19-Ja04957	NCP	% S	n/a	n/a	n/a	30%	Pass	
Acid Neutralising Capacity (ANCbt)	S19-Ja04957	NCP	%CaCO3	0.95	0.96	1.0	30%	Pass	
Acid Neutralising Capacity - equivalent S% pyrite (s-ANCbt)	S19-Ja04957	NCP	% S	0.30	0.31	1.0	30%	Pass	
ANC Fineness Factor	S19-Ja04957	NCP	factor	1.5	1.5	<1	30%	Pass	
CRS Suite - Net Acidity (Sulfur Units)	S19-Ja04957	NCP	% S	< 0.02	< 0.02	<1	30%	Pass	
CRS Suite - Net Acidity (Acidity Units)	S19-Ja04957	NCP	mol H+/t	< 10	< 10	<1	30%	Pass	
CRS Suite - Liming Rate	S19-Ja04957	NCP	kg CaCO3/t	< 1	< 1	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S19-Ja05461	CP	%	17	16	6.0	30%	Pass	
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	S19-Ja05470	CP	pH Units	9.4	9.3	pass	30%	Pass	
Reaction Ratings*	S19-Ja05470	CP	comment	1.0	1.0	pass	30%	Pass	

Comments

Eurofins | mgt accreditation number 1261, corporate site 1254 and 14271 is currently in progress of a controlled transition to a new custom built location at 6 Monterey Road, Dandenong South, Victoria 3175. All results on this report denoted as being performed by Eurofins | mgt 2-5 Kingston Town Close, Oakleigh Victoria 3166 corporate site 1254, will have been performed on either Oakleigh or new Dandenong South site.

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
S01	Liming rate is calculated and reported on a dry weight basis assuming use of fine agricultural lime (CaCO3) and using a safety factor of 1.5 to allow for non-homogeneous mixing and poor reactivity of lime. For conversion of Liming Rate from 'kg/t dry weight' to 'kg/m3 in-situ soil' multiply 'reported results' x 'wet bulk density of soil in t/m3'
S02	Retained Acidity is Reported when the pHKCl is less than pH 4.5
S03	Acid Neutralising Capacity is only required if the pHKCl if greater than or equal to pH 6.5
S04	Acid Sulfate Soil Samples have a 24 hour holding time unless frozen or dried within that period
S05	Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Authorised By

Andrew Black	Analytical Services Manager
Myles Clark	Senior Analyst-SPOCAS (QLD)



Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please click here.

Eurofins | mgt shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins | mgt be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page 1 of 1 — 5584

coffey

Consigning Office: Warabrook

Report Results to: Paul Wright — Mobile: 0416 960 034 — Email: Sam.Ramsey @coffey.com

Invoices to: ADMIN — Phone: 0240162300 — Email: Paul.Wright @coffey.com

Project No: NTLE213472 — Task No: LAB

Project Name: HCCD - Site 1 — Laboratory: Eurofins MGT

Sampler's Name: S.Ramsey — Project Manager: P.Wright

Special Instructions:

Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)
	MW01 2.8-3.0	9/01/19	AM	Soil	Ziplock bag	
	MW01 3.8-4.0					
	MW01 4.8-5.0					
	MW01 5.8-6.0					
	MW02 2.8-3.0					
	MW02 3.8-4.0					
	MW02 4.8-5.0					
	MW02 5.8-6.0					
	MW03 2.8-3.0		PM			
	MW03 3.8-4.0					
	MW03 4.8-5.0					
	MW03 5.8-6.0					

Analysis Request Section

Chromium Reducible Sulfur

pH field Screen

NOTES

RELINQUISHED BY

Name: Sam Ramsey — Date: 10/01/19 →

Coffey Environments — Time:

Name: — Date: →

Company: — Time:

RECEIVED BY

Name: — Date:

Company: — Time:

Name: — Date:

Company: — Time:

Sample Receipt Advice: (Lab Use Only)

All Samples Recieved in Good Condition ☐

All Documentation is in Proper Order ☐

Samples Received Properly Chilled ☐

Lab. Ref/Batch No.

***Container Type & Preservation Codes:** **P** - Plastic, **G**- Glass Bottle, **J** - Glass Jar, **V**- Vial, **Z** - Ziplock Bag, **N** - Nitric Acid Preserved, **C** - Hydrochloric Acid Preserved, **S** - Sulphuric Acid Preserved, **I** - Ice, **ST** - Sodium Thiosulfate, **NP** - No Preservative, **OP** - Other Preservative

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CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page 1 of ~~2~~ 5 — 5579

coffey

Consigning Office: Warabrook

Report Results to: Paul Wright — Mobile: — Email: Paul.Wright @coffey.com

Invoices to: Paul Wright GENERAL ADMIN — Phone: 02 4016 2300 — Email: Paul.Wright @coffey.com

Project No: NTLEN213472 — Task No: LAB

Project Name: UON, ~~Honeysuckle~~ HCC — Laboratory: Eurofins MGT

Sampler's Name: S. Ransey — Project Manager: P. Wright

Special Instructions:

Analysis Request Section

Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)	Suite B7(A)	Suite B13	Asbestos (PA)	Chromium Reducible Sulfur	pH Field screen	NOTES
	BHP12 0.2-0.3	18/12	PM	soil	Jar + Ziplock	Standard	\	\	\			please hold all samples.
	BHP12 0.9-1.0						\	\				
	BHP12 1.9-2.0											
	BHP12 2.5-2.6											
	BHP12 3.0-3.1											
	BHP13 0.2-0.3						\	\	\			
	BHP13 0.9-1.0											
	BHP13 1.9-2.0						\	\				
	BHP13 2.5-2.6								\	\		
	BHP20 0.2-0.3		AM				\	\	\			
	BHP20 0.5-0.6											
	BHP20 1.2-1.3						\	\				Please Send QC2 & QC4 to ALS
	BHP20 1.9-2.0											
	BHP20 2.4-2.5											
	BHP20 2.9-3.0								\	\		
	BHP10 0.2-0.3		PM				\	\	\			
	BHP10 0.9-1.0											
	BHP10 1.7-1.8						\	\				

16/5 15

RELINQUISHED BY			RECEIVED BY		
Name: S. Ransey	Date: 19/12/18	→	Name:	Date:	
Coffey Environments	Time:		Company:	Time:	
Name:	Date:	→	Name:	Date:	
Company:	Time:		Company:	Time:	

Sample Receipt Advice: (Lab Use Only)

- All Samples Recieved in Good Condition ☐
- All Documentation is in Proper Order ☐
- Samples Received Properly Chilled ☐
- Lab. Ref/Batch No.

***Container Type & Preservation Codes:** **P** - Plastic, **G**- Glass Bottle, **J** - Glass Jar, **V**- Vial, **Z** - Ziplock Bag, **N** - Nitric Acid Preserved, **C** - Hydrochloric Acid Preserved, **S** - Sulphuric Acid Preserved, **I** - Ice, **ST** - Sodium Thiosulfate, **NP** - No Preservative, **OP** - Other Preservative

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CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page 2 of 2 5 5580

coffey

Consigning Office: Warabrook

Report Results to: Paul Wright Mobile: Email: Paul.Wright @coffey.com

Invoices to: GENERAL ADMIN Phone: 024016 2300 Email: Paul.Wright @coffey.com

Project No: NTLEN213472 Task No: Lab

Project Name: VON, ~~Honeysuckle~~ HCSD Laboratory: Eurofins

Sampler's Name: S. Ramsey Project Manager: P. Wright

Special Instructions:

Analysis Request Section

Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)	Suite B7 (A)	Suite B13	Asbestos (P/A)	Chromium (reducible sulfur)	pH Field Screen	Suite B4	NOTES
	~~BHP10 0.2-0.3~~ BHP8 0.2-0.3	18/12	AM	Soil	Jar + Ziplock	Standard							
	~~BHP10 0.9~~ BHP8 0.9-1.0												
	BHP8 1.9-2.0												
	QC1				Jar								
	QC2				Jar								
	BHP9-0.2-0.5		PM		Jar + Ziplock								
	-0.6-0.7												
	-1.0-1.1												
	-1.8-1.9												
	-2.4-2.5		AM										
	-3.0-3.1												
	-3.4-3.5												
	-3.8-3.9												
	QC3				Jar								
	QC4				Jar								
	Trip Spike		PM	WATER	2x Vials								
	Trip Blank			WATER	2x Vials								
	BHP10 2.2-2.3		PM	Soil	Jar + Ziplock								

Please Send QC2 & QC4 to ALS

RELINQUISHED BY			RECEIVED BY		
Name:	Date:	→	Name:	Date:	
Coffey Environments	Time:		Company:	Time:	
Name:	Date:	→	Name:	Date:	
Company:	Time:		Company:	Time:	

Sample Receipt Advice: (Lab Use Only)

All Samples Recieved in Good Condition ☐

All Documentation is in Proper Order ☐

Samples Received Properly Chilled ☐

Lab. Ref/Batch No.

***Container Type & Preservation Codes:** **P** - Plastic, **G**- Glass Bottle, **J** - Glass Jar, **V**- Vial, **Z** - Ziplock Bag, **N** - Nitric Acid Preserved, **C** - Hydrochloric Acid Preserved, **S** - Sulphuric Acid Preserved, **I** - Ice, **ST** - Sodium Thiosulfate, **NP** - No Preservative, **OP** - Other Preservative

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CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page 5 of 5 — 5581

coffey

Consigning Office: Warrabrook

Report Results to: Paul Wright — Mobile: — Email: Paul.Wright @coffey.com

Invoices to: General. Admin — Phone: 02 4016 2300 — Email: Paul.Wright @coffey.com

Project No: NTLEN213472 — Task No:

Project Name: VoN, HCCD — Laboratory: Eurofins

Sampler's Name: S. Ramsey — Project Manager: Paul Wright

Special Instructions:

Analysis Request Section

Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)
	BHP18 0.2-0.3	19/12	AM	Soil	Jar + Ziplock	STD
	0.9-1.0					
	1.9-2.0					
	2.7-3.0					
	3.5-3.8					
	BHP15 0.2-0.3					
	0.9-1.0					
	1.8-2.0					
	2.5-2.8					
	BHP14 0.2-0.3					
	0.9-1.0					
	1.8-2.0					
	2.5-2.8					
	3.3-3.5					
	BHP11 0.2-0.3					
	0.9-1.0					
	1.2-1.3					
	1.9-2.0					

Suite B7(A) — Suite B13 — Asbestos (P/A) — Chromium reducible sulf — pH (Field screen)

NOTES

RELINQUISHED BY

Name: S. Ramsey — Date: 19/12/18 →

Coffey Environments — Time: ~~2:30~~

Name: — Date: →

Company: — Time:

RECEIVED BY

Name: — Date:

Company: — Time:

Name: — Date:

Company: — Time:

Sample Receipt Advice: (Lab Use Only)

All Samples Recieved in Good Condition ☐

All Documentation is in Proper Order ☐

Samples Received Properly Chilled ☐

Lab. Ref/Batch No.

***Container Type & Preservation Codes:** **P** - Plastic, **G**- Glass Bottle, **J** - Glass Jar, **V**- Vial, **Z** - Ziplock Bag, **N** - Nitric Acid Preserved, **C** - Hydrochloric Acid Preserved, **S** - Sulphuric Acid Preserved, **I** - Ice, **ST** - Sodium Thiosulfate, **NP** - No Preservative, **OP** - Other Preservative

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CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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coffey

Consigning Office:

Report Results to: Paul Wright — Mobile: — Email: Paul.Wright @coffey.com

Invoices to: General Admin — Phone: 0240162300 — Email: Paul.Wright @coffey.com

Project No: NTLENR13472 — Task No:

Project Name: VON, HCCD — Laboratory: Eurofins

Sampler's Name: S. Ramsey — Project Manager: P. Wright

Special Instructions:

Analysis Request Section

Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)
	BHP11 2.8-2.9	19/12	AM	Soil	Jar+Ziplock	STD
	3.3-3.5					
	BHP19 0.1-0.3					
	1.0-1.1					
	1.5-1.6					
	2.2-2.3					
	3.1-3.3					
	BHP16 0.0-0.2					
	0.6-0.7					
	1.6-1.7					
	2.8-3.0					
	QC5				Jar	
	QC6				Jar	
	Trip Spike			Water	2x Vials	
	Trip blank			Water	2x Vials	
	ACM1		PM	Fragment	bag	
	ACM2					
	ACM3					

Analysis Request Section columns: Suite B7(A); Suite B13; Asbestos ID's (F/A); Chromium Reducible Sulfur; plated screen; Suite B14; NOTES

RELINQUISHED BY

Name: S. Ramsey — Date: 19/12/18

Coffey Environments — Time:

Name: — Date:

Company: — Time:

RECEIVED BY

Name: — Date:

Company: — Time:

Name: — Date:

Company: — Time:

Sample Receipt Advice: (Lab Use Only)

All Samples Recieved in Good Condition ☐

All Documentation is in Proper Order ☐

Samples Received Properly Chilled ☐

Lab. Ref/Batch No.

***Container Type & Preservation Codes:** **P** - Plastic, **G**- Glass Bottle, **J** - Glass Jar, **V**- Vial, **Z** - Ziplock Bag, **N** - Nitric Acid Preserved, **C** - Hydrochloric Acid Preserved, **S** - Sulphuric Acid Preserved, **I** - Ice, **ST** - Sodium Thiosulfate, **NP** - No Preservative, **OP** - Other Preservative

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CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page 1 of 5 — 5583

coffey

Consigning Office: Warabrook

Report Results to: P.Wright — Mobile: — Email: Paul.Wright @coffey.com

Invoices to: General - Admin — Phone: 0240162300 — Email: Paul.Wright @coffey.com

Project No: NTLEN213472 — Task No: Lab

Project Name: UON, HCCD — Laboratory: Eurofins

Sampler's Name: S.Ramsey — Project Manager: P.Wright

Special Instructions:

Analysis Request Section

Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)
	SS1	19/12	PM	Soil	Jar+Ziplock	STD
	SS2	↓	↓	↓	↓	↓

Suite B 7(A)
Suite B 13
Asbestos (F/A)
Chromium Reducible Sulfur
eff. field screen

NOTES

RELINQUISHED BY

Name: S.Ramsey — Date: 19/12/18 →
Coffey Environments — Time:

Name: — Date: →
Company: — Time:

RECEIVED BY

Name: — Date:
Company: — Time:

Name: — Date:
Company: — Time:

Sample Receipt Advice: (Lab Use Only)

All Samples Recieved in Good Condition ☐
All Documentation is in Proper Order ☐
Samples Received Properly Chilled ☐
Lab. Ref/Batch No.

***Container Type & Preservation Codes:** **P** - Plastic, **G**- Glass Bottle, **J** - Glass Jar, **V**- Vial, **Z** - Ziplock Bag, **N** - Nitric Acid Preserved, **C** - Hydrochloric Acid Preserved, **S** - Sulphuric Acid Preserved, **I** - Ice, **ST** - Sodium Thiosulfate, **NP** - No Preservative, **OP** - Other Preservative

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ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1839095**	Page	: 1 of 7
Client	: **COFFEY ENVIRONMENTS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: PAUL WRIGHT	Contact	: Customer Services ES
Address	: LEVEL 19, 799 PACIFIC HIGHWAY Tower B - Citadel Tower CHATSWOOD NSW, AUSTRALIA 2067	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 4016 2300	Telephone	: +61-2-8784 8555
Project	: NTLEN213472 VON HCCD	Date Samples Received	: 28-Dec-2018 11:25
Order number	:	Date Analysis Commenced	: 31-Dec-2018
C-O-C number	: ----	Issue Date	: 09-Jan-2019 11:38
Sampler	: S. Ramsay		
Site	:		
Quote number	: EN/222		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics, Smithfield, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW

General Comments

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

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

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

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

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

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

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

- EP071: Results of sample QC2 have been confirmed by re-extraction and re-analysis.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	QC2	QC4	----	----	----
			Client sampling date / time	18-Dec-2018 00:00	18-Dec-2018 00:00	----	----	----
Compound	CAS Number	LOR	Unit	ES1839095-001	ES1839095-002	--------	--------	--------
				Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**11.3**	**6.6**	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**9**	**32**	----	----	----
Cadmium	7440-43-9	1	mg/kg	**1**	**1**	----	----	----
Chromium	7440-47-3	2	mg/kg	**9**	**6**	----	----	----
Copper	7440-50-8	5	mg/kg	**218**	**163**	----	----	----
Lead	7439-92-1	5	mg/kg	**406**	**152**	----	----	----
Nickel	7440-02-0	2	mg/kg	**9**	**9**	----	----	----
Zinc	7440-66-6	5	mg/kg	**394**	**276**	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	**0.2**	**0.1**	----	----	----
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	----	----	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	----	----	----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	----	----	----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	----	----	----
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	----	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	----	----	----
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	----	----	----
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	----	----	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	QC2	QC4	----	----	----
				Client sampling date / time	18-Dec-2018 00:00	18-Dec-2018 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES1839095-001	ES1839095-002	--------	--------	--------
					Result	Result	----	----	----
EP068A: Organochlorine Pesticides (OC) - Continued									
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	----	----	----
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	----	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg		<0.05	<0.05	----	----	----
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		<0.5	<0.5	----	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg		<0.5	<0.5	----	----	----
2-Methylphenol	95-48-7	0.5	mg/kg		<0.5	<0.5	----	----	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg		<1	<1	----	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg		<0.5	<0.5	----	----	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg		<0.5	<0.5	----	----	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg		<0.5	<0.5	----	----	----
2.6-Dichlorophenol	87-65-0	0.5	mg/kg		<0.5	<0.5	----	----	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg		<0.5	<0.5	----	----	----
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg		<0.5	<0.5	----	----	----
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg		<0.5	<0.5	----	----	----
Pentachlorophenol	87-86-5	2	mg/kg		<2	<2	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	----	----	----
Fluorene	86-73-7	0.5	mg/kg		**0.6**	<0.5	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg		**8.2**	**5.7**	----	----	----
Anthracene	120-12-7	0.5	mg/kg		**2.3**	**1.4**	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg		**15.3**	**7.8**	----	----	----
Pyrene	129-00-0	0.5	mg/kg		**14.6**	**6.7**	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		**4.3**	**2.7**	----	----	----
Chrysene	218-01-9	0.5	mg/kg		**3.7**	**2.4**	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		**4.7**	**3.0**	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		**1.8**	**1.2**	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		**4.9**	**2.4**	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		**2.3**	**1.2**	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	QC2	QC4	----	----	----
				Client sampling date / time	18-Dec-2018 00:00	18-Dec-2018 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES1839095-001	ES1839095-002	--------	--------	--------
					Result	Result	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		**2.7**	**1.5**	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg		**65.4**	**36.0**	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg		**6.3**	**3.2**	----	----	----
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg		**6.5**	**3.5**	----	----	----
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg		**6.8**	**3.7**	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	----	----	----
C10 - C14 Fraction	----	50	mg/kg		<50	<50	----	----	----
C15 - C28 Fraction	----	100	mg/kg		**100**	<100	----	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	<100	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg		**100**	<50	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg		<10	<10	----	----	----
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		**170**	<100	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg		**170**	<50	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg		<50	<50	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	----	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	----	----	----
^ **Sum of BTEX**	----	0.2	mg/kg		<0.2	<0.2	----	----	----
^ **Total Xylenes**	----	0.5	mg/kg		<0.5	<0.5	----	----	----
Naphthalene	91-20-3	1	mg/kg		<1	<1	----	----	----
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		**103**	**116**	----	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**129**	**130**	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	QC2	QC4	----	----	----
				Client sampling date / time	18-Dec-2018 00:00	18-Dec-2018 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES1839095-001	ES1839095-002	--------	--------	--------
					Result	Result	----	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		114	122	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		93.3	85.3	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		93.5	89.4	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		51.8	58.0	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		95.6	84.5	----	----	----
Anthracene-d10	1719-06-8	0.5	%		94.9	80.6	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		99.3	93.7	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		95.4	95.8	----	----	----
Toluene-D8	2037-26-5	0.2	%		97.4	94.1	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		97.5	96.4	----	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) 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	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130

QUALITY CONTROL REPORT

Work Order	: **ES1839095**	Page	: 1 of 8
Client	: **COFFEY ENVIRONMENTS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: PAUL WRIGHT	Contact	: Customer Services ES
Address	: LEVEL 19, 799 PACIFIC HIGHWAY Tower B - Citadel Tower CHATSWOOD NSW, AUSTRALIA 2067	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 4016 2300	Telephone	: +61-2-8784 8555
Project	: NTLEN213472 VON HCCD	Date Samples Received	: 28-Dec-2018
Order number	:	Date Analysis Commenced	: 31-Dec-2018
C-O-C number	: ----	Issue Date	: 09-Jan-2019
Sampler	: S. Ramsay		
Site	:		
Quote number	: EN/222		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

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

Signatories	*Position*	*Accreditation Category*
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics, Smithfield, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW

General Comments

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

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

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

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
= Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 2118184)									
EP1814967-040	Anonymous	EA055: Moisture Content	----	0.1	%	1.6	2.0	18.5	0% - 50%
ES1839097-006	Anonymous	EA055: Moisture Content	----	0.1	%	9.1	9.1	0.00	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 2119826)									
ES1838770-030	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	17	14	18.4	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	9	6	39.2	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	9	6	36.9	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	14	21	38.5	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	37	57	41.7	0% - 50%
		EG005T: Zinc	7440-66-6	5	mg/kg	68	75	8.92	0% - 50%
ES1839039-002	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	13	13	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	4	4	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	36	27	28.8	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	42	40	5.31	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	112	101	10.2	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2119827)									
ES1838770-030	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES1839039-002	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.1	<0.1	0.00	No Limit
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 2118386)									
ES1839095-001	QC2	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 2118385)									
ES1839095-001	QC2	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP068A: Organochlorine Pesticides (OC) (QC Lot: 2118385) - continued									
ES1839095-001	QC2	EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP075(SIM)A: Phenolic Compounds (QC Lot: 2118384)									
ES1839095-001	QC2	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.00	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2118384)									
ES1839095-001	QC2	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	0.6	21.1	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	0.6	0.6	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	8.2	9.0	9.03	0% - 50%
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	2.3	2.3	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2118384) - continued									
ES1839095-001	QC2	EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	15.3	15.2	0.00	0% - 20%
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	14.6	15.0	2.33	0% - 20%
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	4.3	4.6	5.41	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	3.7	3.9	5.99	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	4.7	4.8	3.79	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	1.8	2.0	12.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	4.9	5.6	12.9	0% - 50%
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	2.3	2.3	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	2.7	2.7	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	65.4	68.6	4.78	0% - 20%
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	6.3	7.0	11.4	0% - 50%
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2118181)									
ES1839094-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2118383)									
ES1839095-001	QC2	EP071: C15 - C28 Fraction	----	100	mg/kg	100	190	61.8	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	120	16.8	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2118181)									
ES1839094-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2118383)									
ES1839095-001	QC2	EP071: >C16 - C34 Fraction	----	100	mg/kg	170	270	43.2	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080: BTEXN (QC Lot: 2118181)									
ES1839094-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 2119826)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	90.9	86	126
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	89.7	83	113
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	88.2	76	128
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	87.6	86	120
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	85.3	80	114
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	92.4	87	123
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	103	80	122
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2119827)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	81.8	70	105
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 2118386)								
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	93.0	62	126
EP068A: Organochlorine Pesticides (OC) (QCLot: 2118385)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	95.5	69	113
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	95.2	65	117
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	97.2	67	119
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	97.0	68	116
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	92.0	65	117
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	95.9	67	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	96.6	69	115
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	96.8	62	118
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	97.4	63	117
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	98.4	66	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	98.2	64	116
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	97.2	66	116
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	96.6	67	115
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	92.9	67	123
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	97.7	69	115
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	96.5	69	121
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	97.4	56	120
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	112	62	124
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	111	66	120
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	109	64	122
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	104	54	130
EP075(SIM)A: Phenolic Compounds (QCLot: 2118384)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)A: Phenolic Compounds (QCLot: 2118384) - continued								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	6 mg/kg	91.6	71	125
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	6 mg/kg	96.9	72	124
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	6 mg/kg	90.2	71	123
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	12 mg/kg	93.7	67	127
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	6 mg/kg	86.7	54	114
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	6 mg/kg	97.2	68	126
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	6 mg/kg	98.9	66	120
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	6 mg/kg	95.5	70	120
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	6 mg/kg	91.6	70	116
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	6 mg/kg	86.7	54	114
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	6 mg/kg	81.2	60	114
EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	12 mg/kg	20.3	10	57
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2118384)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	96.8	77	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	95.6	72	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	91.7	73	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	98.0	72	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	97.2	75	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	94.7	77	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	95.3	73	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	97.1	74	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	94.0	69	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	95.4	75	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	92.4	68	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	96.8	74	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	92.9	70	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	97.9	61	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	96.8	62	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	93.7	63	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2118181)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	101	68	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2118383)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	107	75	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	104	77	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	99.2	71	129
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2118181)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	103	68	128

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2118383)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	96.5	77	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	105	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	75.6	63	131
EP080: BTEXN (QCLot: 2118181)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	98.4	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	101	67	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	100	65	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	102	66	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	107	68	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	112	63	119

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EG005T: Total Metals by ICP-AES (QCLot: 2119826)							
ES1838770-030	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	84.8	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	88.1	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	88.8	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	88.7	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	105	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	84.8	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	117	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2119827)							
ES1838770-030	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	101	70	130
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 2118386)							
ES1839095-001	QC2	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	106	70	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 2118385)							
ES1839095-001	QC2	EP068: gamma-BHC	58-89-9	0.5 mg/kg	112	70	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	116	70	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	120	70	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	107	70	130
		EP068: Endrin	72-20-8	2 mg/kg	128	70	130
		EP068: 4.4`-DDT	50-29-3	2 mg/kg	112	70	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP075(SIM)A: Phenolic Compounds (QCLot: 2118384)							
ES1839095-001	QC2	EP075(SIM): Phenol	108-95-2	10 mg/kg	90.1	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	90.0	70	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	90.4	60	130
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	95.1	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	40.8	20	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2118384)							
ES1839095-001	QC2	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	90.9	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	97.6	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2118181)							
ES1839094-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	104	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2118383)							
ES1839095-001	QC2	EP071: C10 - C14 Fraction	----	523 mg/kg	82.6	73	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	110	53	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	122	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2118181)							
ES1839094-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	104	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2118383)							
ES1839095-001	QC2	EP071: >C10 - C16 Fraction	----	860 mg/kg	97.0	73	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	110	53	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	114	52	132
EP080: BTEXN (QCLot: 2118181)							
ES1839094-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	95.8	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	98.9	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	100.0	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	99.6	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	104	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	102	70	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES1839095**	Page	: 1 of 5
Client	: **COFFEY ENVIRONMENTS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: PAUL WRIGHT	Telephone	: +61-2-8784 8555
Project	: NTLEN213472 VON HCCD	Date Samples Received	: 28-Dec-2018
Site	:	Issue Date	: 09-Jan-2019
Sampler	: S. Ramsay	No. of samples received	: 2
Order number	:	No. of samples analysed	: 2

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)								
Soil Glass Jar - Unpreserved (EA055)								
QC2,	QC4	**18-Dec-2018**	**----**	----	----	**31-Dec-2018**	01-Jan-2019	✓
EG005T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved (EG005T)								
QC2,	QC4	**18-Dec-2018**	**02-Jan-2019**	16-Jun-2019	✓	**02-Jan-2019**	16-Jun-2019	✓
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved (EG035T)								
QC2,	QC4	**18-Dec-2018**	**02-Jan-2019**	15-Jan-2019	✓	**03-Jan-2019**	15-Jan-2019	✓
EP066: Polychlorinated Biphenyls (PCB)								
Soil Glass Jar - Unpreserved (EP066)								
QC2,	QC4	**18-Dec-2018**	**31-Dec-2018**	01-Jan-2019	✓	**04-Jan-2019**	09-Feb-2019	✓
EP068A: Organochlorine Pesticides (OC)								
Soil Glass Jar - Unpreserved (EP068)								
QC2,	QC4	**18-Dec-2018**	**31-Dec-2018**	01-Jan-2019	✓	**04-Jan-2019**	09-Feb-2019	✓
EP075(SIM)A: Phenolic Compounds								
Soil Glass Jar - Unpreserved (EP075(SIM))								
QC2,	QC4	**18-Dec-2018**	**31-Dec-2018**	01-Jan-2019	✓	**04-Jan-2019**	09-Feb-2019	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved (EP075(SIM))								
QC2,	QC4	**18-Dec-2018**	**31-Dec-2018**	01-Jan-2019	✓	**04-Jan-2019**	09-Feb-2019	✓
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved (EP071)								
QC2,	QC4	**18-Dec-2018**	**31-Dec-2018**	01-Jan-2019	✓	**03-Jan-2019**	09-Feb-2019	✓
Soil Glass Jar - Unpreserved (EP080)								
QC2,	QC4	**18-Dec-2018**	**31-Dec-2018**	01-Jan-2019	✓	**31-Dec-2018**	01-Jan-2019	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Soil Glass Jar - Unpreserved (EP071)								
QC2,	QC4	**18-Dec-2018**	**31-Dec-2018**	01-Jan-2019	✓	**03-Jan-2019**	09-Feb-2019	✓
Soil Glass Jar - Unpreserved (EP080)								
QC2,	QC4	**18-Dec-2018**	**31-Dec-2018**	01-Jan-2019	✓	**31-Dec-2018**	01-Jan-2019	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080)							
QC2, QC4	**18-Dec-2018**	**31-Dec-2018**	01-Jan-2019	✓	**31-Dec-2018**	01-Jan-2019	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	5	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	5	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	2	**50.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	5	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	5	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Polychlorinated Biphenyls (PCB)	EP066	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 504)
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (2013) Schedule B(3) (Method 504,505)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM amended 2013.
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260B. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM amended 2013.

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

8/11/19

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

 5580

coffey

Consigning Office: Warabrook

Report Results to: Paul Wright — Mobile: — Email: Paul.Wright @coffey.com

Invoices to: GENERAL ADMIN — Phone: 024016 2300 — Email: Paul.Wright @coffey.com

Project No: NTLEN213472 — Task No: Lab

Project Name: VON, ~~Honeysuckle~~ HCSD — Laboratory: EUROFINS

Sampler's Name: S. Ramsey — Project Manager: P. Wright

Special Instructions:

Analysis Request Section

Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)
	~~BHP10 0.2-0.3~~ BHP8 0.2-0.3	18/12	AM	Soil	Jar + Ziplock	Standard
	~~BHP10 0.9~~ BHP8 0.9-1.0					
	BHP8 1.9-2.0					
	QC1				Jar	
1	QC2				Jar	
	BHP9-0.2-0.5		PM		Jar + ziplock	
	-0.6-0.7					
	-1.0-1.1					
	-1.8-1.9					
	-2.4-2.5					
	-3.0-3.1					
	-3.4-3.5					
	-3.8-3.9					
	QC3				Jar	
2	QC4				Jar	
	Trip Spike			WATER	2x Vials	
	Trip blank			WATER	2x Vials	
	BHP10 2.2-2.3		PM	Soil	Jar + Ziplock	

Suite B7(A) — Suite B13 — Asbestos (P/A) — Chromium (reducible S) (P/A) — pH Field Screen — Suite B4

NOTES

Environmental Division Sydney

Work Order Reference

ES1839095

Telephone : +61-2-8784 8555

RELINQUISHED BY		RECEIVED BY	
Name: S. Ramsey	Date: 19/12/18	Name: Vishal	Date: 28/12/2018
Coffey Environments	Time:	Company: ALS SYD	Time: 11:25 AM
Name:	Date:	Name:	Date:
Company:	Time:	Company:	Time:

Sample Receipt Advice: (Lab Use Only)

All Samples Recieved in Good Condition ☐

All Documentation is in Proper Order ☐

Samples Received Properly Chilled ☐

Lab. Ref/Batch No. 634424

***Container Type & Preservation Codes:** **P** - Plastic, **G**- Glass Bottle, **J** - Glass Jar, **V**- Vial, **Z** - Ziplock Bag, **N** - Nitric Acid Preserved, **C** - Hydrochloric Acid Preserved, **S** - Sulphuric Acid Preserved, **I** - Ice, **ST** - Sodium Thiosulfate, **NP** - No Preservative, **OP** - Other Preservative

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

 5580

coffey

Consigning Office: Warabrook

Report Results to: Paul Wright — Mobile: — Email: Paul.Wright @coffey.com

Invoices to: GENERAL ADMIN — Phone: 024016 2300 — Email: Paul.Wright @coffey.com

Project No: NTLEN213472 — Task No: Lab

Project Name: VON, ~~Honeysuckle~~ HCSD — Laboratory: Eurofins

Sampler's Name: S. Ramsey — Project Manager: P. Wright

Special Instructions:

Analysis Request Section

Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)
	~~BHP10 0.2-0.3~~ BHP8 0.2-0.3	18/12	AM	Soil	Jar + Ziplock	Standard
	~~BHP10 0.9~~ BHP8 0.9-1.0					
	BHP8 1.9-2.0					
	QC1				Jar	
1	QC2				Jar	
	BHP9-0.2-0.5		PM		Jar + ziplock	
	-0.6-0.7					
	-1.0-1.1					
	-1.8-1.9					
	-2.4-2.5					
	-3.0-3.1					
	-3.4-3.5					
	-3.8-3.9					
	QC3				Jar	
2	QC4				Jar	
	Trip Spike			WATER	2x Vials	
	Trip blank			WATER	2x Vials	
	BHP10 2.2-2.3		PM	Soil	Jar + Ziplock	

Suite B7(A)
Suite B13
Asbestos (P/A)
Chromium reducible sulph
pH Field screen
Suite B4

NOTES

RELINQUISHED BY

Name: S. Ramsey — Date: 19/12/18 →
Coffey Environments — Time:

Name: — Date: →
Company: — Time:

RECEIVED BY

Name: Vishal — Date: 28/12/2018
Company: ALS SYD — Time: 11:25 AM

Name: — Date:
Company: — Time:

Sample Receipt Advice: (Lab Use Only)

All Samples Recieved in Good Condition ☐
All Documentation is in Proper Order ☐
Samples Received Properly Chilled ☐
Lab. Ref/Batch No. 634424

***Container Type & Preservation Codes:** **P** - Plastic, **G**- Glass Bottle, **J** - Glass Jar, **V**- Vial, **Z** - Ziplock Bag, **N** - Nitric Acid Preserved, **C** - Hydrochloric Acid Preserved, **S** - Sulphuric Acid Preserved, **I** - Ice, **ST** - Sodium Thiosulfate, **NP** - No Preservative, **OP** - Other Preservative

GOWANS PRINTING (02) 9755 3545

Coffey Environments Pty Ltd Newcastle
Lot 101, 19 Warabrook Boulevard
Warabrook
NSW 2304

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Paul Wright**

Report **635947-W**
Project name HCCD-SITE 1
Project ID NTLEN213472
Received Date Jan 16, 2019

Client Sample ID			**MW01**	**MW02**	**MW03**	**QWC1**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**M19-Ja09362**	**M19-Ja09363**	**M19-Ja09364**	**M19-Ja09365**
Date Sampled			**Jan 15, 2019**	**Jan 15, 2019**	**Jan 15, 2019**	**Jan 15, 2019**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	105	109	122	141
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene[N07]	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(g.h.i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibenz(a.h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001

Client Sample ID			MW01	MW02	MW03	QWC1
Sample Matrix			Water	Water	Water	Water
Eurofins | mgt Sample No.			M19-Ja09362	M19-Ja09363	M19-Ja09364	M19-Ja09365
Date Sampled			Jan 15, 2019	Jan 15, 2019	Jan 15, 2019	Jan 15, 2019
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	56	82	61	106
p-Terphenyl-d14 (surr.)	1	%	116	93	150	54
Organochlorine Pesticides						
Chlordanes - Total	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
4.4'-DDD	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
4.4'-DDE	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
4.4'-DDT	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
a-BHC	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Aldrin	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
b-BHC	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
d-BHC	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Dieldrin	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Endosulfan I	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Endosulfan II	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Endosulfan sulphate	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Endrin	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Endrin aldehyde	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Endrin ketone	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
g-BHC (Lindane)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Heptachlor	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Heptachlor epoxide	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Hexachlorobenzene	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Methoxychlor	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Toxaphene	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
Aldrin and Dieldrin (Total)*	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
DDT + DDE + DDD (Total)*	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Vic EPA IWRG 621 OCP (Total)*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Vic EPA IWRG 621 Other OCP (Total)*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibutylchlorendate (surr.)	1	%	132	96	77	134
Tetrachloro-m-xylene (surr.)	1	%	75	57	94	73
Polychlorinated Biphenyls						
Aroclor-1016	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Aroclor-1221	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Aroclor-1232	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Aroclor-1242	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Aroclor-1248	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Aroclor-1254	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Aroclor-1260	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Total PCB*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibutylchlorendate (surr.)	1	%	132	96	77	134
Tetrachloro-m-xylene (surr.)	1	%	75	57	94	73

Client Sample ID			MW01	MW02	MW03	QWC1
Sample Matrix			Water	Water	Water	Water
Eurofins | mgt Sample No.			M19-Ja09362	M19-Ja09363	M19-Ja09364	M19-Ja09365
Date Sampled			Jan 15, 2019	Jan 15, 2019	Jan 15, 2019	Jan 15, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic (filtered)	0.001	mg/L	0.003	0.001	0.002	0.001
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	0.0006	< 0.0002
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	0.001	< 0.001
Copper (filtered)	0.001	mg/L	0.004	< 0.001	< 0.001	< 0.001
Lead (filtered)	0.001	mg/L	0.002	< 0.001	< 0.001	< 0.001
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel (filtered)	0.001	mg/L	0.008	< 0.001	0.012	< 0.001
Zinc (filtered)	0.005	mg/L	0.087	< 0.005	0.17	< 0.005

Client Sample ID			[R20]TRIP SPIKE	TRIP BLANK
Sample Matrix			Water	Water
Eurofins | mgt Sample No.			M19-Ja09366	M19-Ja09367
Date Sampled			Jan 15, 2019	Jan 15, 2019
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene[N02]	0.01	mg/L	120	< 0.01
TRH C6-C10	0.02	mg/L	79	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	-	< 0.02
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				
TRH C6-C9	0.02	mg/L	76	< 0.02
BTEX				
Benzene	0.001	mg/L	81	< 0.001
Toluene	0.001	mg/L	100	< 0.001
Ethylbenzene	0.001	mg/L	120	< 0.001
m&p-Xylenes	0.002	mg/L	110	< 0.002
o-Xylene	0.001	mg/L	120	< 0.001
Xylenes - Total	0.003	mg/L	110	< 0.003
4-Bromofluorobenzene (surr.)	1	%	61	121

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

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
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jan 16, 2019	7 Day
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons	Melbourne	Jan 16, 2019	7 Day
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Jan 16, 2019	7 Day
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Melbourne	Jan 16, 2019	14 Day
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			
Eurofins | mgt Suite B7 (filtered metals)			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jan 16, 2019	7 Day
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Melbourne	Jan 16, 2019	7 Day
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8 filtered	Melbourne	Jan 16, 2019	28 Day
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Eurofins | mgt Suite B13			
Organochlorine Pesticides	Melbourne	Jan 16, 2019	7 Day
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Polychlorinated Biphenyls	Melbourne	Jan 16, 2019	7 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			

eurofins | mgt

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NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name: Coffey Environments P/L N'castle
Address: Lot 101, 19 Warabrook Boulevard
Warabrook
NSW 2304

Project Name: HCCD-SITE 1
Project ID: NTLEN213472

Order No.:
Report #: 635947
Phone: 02 4016 2300
Fax: 02 4016 2380

Received: Jan 16, 2019 8:45 AM
Due: Jan 18, 2019
Priority: 2 Day
Contact Name: Paul Wright

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Eurofins | mgt Suite B13	Eurofins | mgt Suite B7 (filtered metals)	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	MW01	Jan 15, 2019		Water	M19-Ja09362	X	X	
2	MW02	Jan 15, 2019		Water	M19-Ja09363	X	X	
3	MW03	Jan 15, 2019		Water	M19-Ja09364	X	X	
4	QWC1	Jan 15, 2019		Water	M19-Ja09365	X	X	
5	TRIP SPIKE	Jan 15, 2019		Water	M19-Ja09366			X
6	TRIP BLANK	Jan 15, 2019		Water	M19-Ja09367			X
Test Counts						4	4	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure, April 2011 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.2 2018
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.2 where no positive PFAS results have been reported have been reviewed and no data was affected.

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

QC Data General Comments

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

eurofins | mgt

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g.h.i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a.h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1.2.3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/L	< 0.001			0.001	Pass	
4.4'-DDD	mg/L	< 0.0001			0.0001	Pass	
4.4'-DDE	mg/L	< 0.0001			0.0001	Pass	
4.4'-DDT	mg/L	< 0.0001			0.0001	Pass	
a-BHC	mg/L	< 0.0001			0.0001	Pass	
Aldrin	mg/L	< 0.0001			0.0001	Pass	
b-BHC	mg/L	< 0.0001			0.0001	Pass	
d-BHC	mg/L	< 0.0001			0.0001	Pass	
Dieldrin	mg/L	< 0.0001			0.0001	Pass	
Endosulfan I	mg/L	< 0.0001			0.0001	Pass	
Endosulfan II	mg/L	< 0.0001			0.0001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan sulphate	mg/L	< 0.0001			0.0001	Pass	
Endrin	mg/L	< 0.0001			0.0001	Pass	
Endrin aldehyde	mg/L	< 0.0001			0.0001	Pass	
Endrin ketone	mg/L	< 0.0001			0.0001	Pass	
g-BHC (Lindane)	mg/L	< 0.0001			0.0001	Pass	
Heptachlor	mg/L	< 0.0001			0.0001	Pass	
Heptachlor epoxide	mg/L	< 0.0001			0.0001	Pass	
Hexachlorobenzene	mg/L	< 0.0001			0.0001	Pass	
Methoxychlor	mg/L	< 0.0001			0.0001	Pass	
Toxaphene	mg/L	< 0.01			0.01	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/L	< 0.001			0.001	Pass	
Aroclor-1221	mg/L	< 0.001			0.001	Pass	
Aroclor-1232	mg/L	< 0.001			0.001	Pass	
Aroclor-1242	mg/L	< 0.001			0.001	Pass	
Aroclor-1248	mg/L	< 0.001			0.001	Pass	
Aroclor-1254	mg/L	< 0.001			0.001	Pass	
Aroclor-1260	mg/L	< 0.001			0.001	Pass	
Total PCB*	mg/L	< 0.001			0.001	Pass	
Method Blank							
Heavy Metals							
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Cadmium (filtered)	mg/L	< 0.0002			0.0002	Pass	
Chromium (filtered)	mg/L	< 0.001			0.001	Pass	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
Mercury (filtered)	mg/L	< 0.0001			0.0001	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	
Zinc (filtered)	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	111			70-130	Pass	
TRH C6-C10	%	117			70-130	Pass	
TRH >C10-C16	%	128			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	116			70-130	Pass	
TRH C10-C14	%	127			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	86			70-130	Pass	
Toluene	%	103			70-130	Pass	
Ethylbenzene	%	119			70-130	Pass	
m&p-Xylenes	%	112			70-130	Pass	
Xylenes - Total	%	109			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	96			70-130	Pass	
Acenaphthylene	%	91			70-130	Pass	
Anthracene	%	82			70-130	Pass	
Benz(a)anthracene	%	111			70-130	Pass	
Benzo(a)pyrene	%	107			70-130	Pass	
Benzo(b&j)fluoranthene	%	119			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(g.h.i)perylene	%	100			70-130	Pass	
Benzo(k)fluoranthene	%	108			70-130	Pass	
Chrysene	%	118			70-130	Pass	
Dibenz(a.h)anthracene	%	98			70-130	Pass	
Fluoranthene	%	109			70-130	Pass	
Fluorene	%	96			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	90			70-130	Pass	
Naphthalene	%	97			70-130	Pass	
Phenanthrene	%	101			70-130	Pass	
Pyrene	%	111			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic (filtered)	%	94			80-120	Pass	
Cadmium (filtered)	%	100			80-120	Pass	
Chromium (filtered)	%	95			80-120	Pass	
Copper (filtered)	%	95			80-120	Pass	
Lead (filtered)	%	99			80-120	Pass	
Mercury (filtered)	%	96			70-130	Pass	
Nickel (filtered)	%	94			80-120	Pass	
Zinc (filtered)	%	95			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S19-Ja08340	NCP	%	106			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	S19-Ja08340	NCP	%	106			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic (filtered)	M19-Ja09362	CP	%	97			70-130	Pass	
Cadmium (filtered)	M19-Ja09362	CP	%	96			70-130	Pass	
Chromium (filtered)	M19-Ja09362	CP	%	93			70-130	Pass	
Copper (filtered)	M19-Ja09362	CP	%	92			70-130	Pass	
Lead (filtered)	M19-Ja09362	CP	%	94			70-130	Pass	
Mercury (filtered)	M19-Ja09362	CP	%	93			70-130	Pass	
Nickel (filtered)	M19-Ja09362	CP	%	89			70-130	Pass	
Zinc (filtered)	M19-Ja09362	CP	%	94			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M19-Ja09367	CP	%	108			70-130	Pass	
TRH C6-C10	M19-Ja09367	CP	%	114			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M19-Ja09367	CP	%	114			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M19-Ja09367	CP	%	87			70-130	Pass	
Toluene	M19-Ja09367	CP	%	99			70-130	Pass	
Ethylbenzene	M19-Ja09367	CP	%	115			70-130	Pass	
m&p-Xylenes	M19-Ja09367	CP	%	119			70-130	Pass	
o-Xylene	M19-Ja09367	CP	%	120			70-130	Pass	
Xylenes - Total	M19-Ja09367	CP	%	119			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	B19-Ja08442	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	B19-Ja08442	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	B19-Ja08442	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	B19-Ja08442	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	B19-Ja08442	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	B19-Ja08442	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic (filtered)	M19-Ja09362	CP	mg/L	0.003	0.003	1.0	30%	Pass	
Cadmium (filtered)	M19-Ja09362	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium (filtered)	M19-Ja09362	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper (filtered)	M19-Ja09362	CP	mg/L	0.004	0.004	1.0	30%	Pass	
Lead (filtered)	M19-Ja09362	CP	mg/L	0.002	0.002	3.0	30%	Pass	
Mercury (filtered)	M19-Ja09362	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel (filtered)	M19-Ja09362	CP	mg/L	0.008	0.008	2.0	30%	Pass	
Zinc (filtered)	M19-Ja09362	CP	mg/L	0.087	0.084	3.0	30%	Pass	

Comments

Eurofins | mgt accreditation number 1261, corporate site 1254 and 14271 is currently in progress of a controlled transition to a new custom built location at 6 Monterey Road, Dandenong South, Victoria 3175. All results on this report denoted as being performed by Eurofins | mgt 2-5 Kingston Town Close, Oakleigh Victoria 3166 corporate site 1254, will have been performed on either Oakleigh or new Dandenong South site.

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
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
R20	This sample is a Trip Spike and therefore all results are reported as a percentage

Authorised By

Andrew Black	Analytical Services Manager
Chris Bennett	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)



Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please click here.

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CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page 1 of 1 — 5587

coffey

Consigning Office: Warabrook
Report Results to: Paul Wright — Mobile: 0204162300 — Email: Sam.Ramsey @coffey.com
Invoices to: ADMIN — Phone: 0240162300 — Email: Paul.Wright @coffey.com

Project No: NTLEN213472 — Task No: LAB
Project Name: HCCD - Site 1 — Laboratory: Eurofins MGT
Sampler's Name: S. Ramsey — Project Manager: P. Wright
Special Instructions:

Lab No.	Sample ID	Sample Date	Time	Matrix (Soil...etc)	Container Type & Preservative*	T-A-T (specify)
	MW01	15-1	AM	Water	P, A, 2xV	~~STD~~
	MW02	↓	↓	↓	↓	↓
	MW03	↓	↓	↓	↓	↓
	QWC1	↓	↓	↓	↓	↓
	Trip spike	↓	↓	↓	↓	↓
	Trip blank	↓	↓	↓	↓	2 day T-A-T

Analysis Request Section

Suite B13 | Suite B7 | Suite B4

NOTES

Please hold all samples.

2 day Turn around time

RELINQUISHED BY

Name: S. Ramsey — Date: 15/1/19
Coffey Environments — Time:

Name: — Date:
Company: — Time:

RECEIVED BY

Name: Zoran T — Date: 15/1/15
Company: Eurofins mgt — Time: 2-30 pm

Name: — Date: 16/1
Company: EF — Time: 8.45

Sample Receipt Advice: (Lab Use Only)

All Samples Recieved in Good Condition ☐
All Documentation is in Proper Order ☐
Samples Received Properly Chilled ☐
Lab. Ref/Batch No. 635947

***Container Type & Preservation Codes:** **P** - Plastic, **G**- Glass Bottle, **J** - Glass Jar, **V**- Vial, **Z** - Ziplock Bag, **N** - Nitric Acid Preserved, **C** - Hydrochloric Acid Preserved, **S** - Sulphuric Acid Preserved, **I** - Ice, **ST** - Sodium Thiosulfate, **NP** - No Preservative, **OP** - Other Preservative

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NATA # 1261 Site # 23736

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name: **Coffey Environments P/L N'castle**

Contact name: Paul Wright
Project name: HCCD-SITE 1
Project ID: NTLEN213472
COC number: Not provided
Turn around time: 2 Day
Date/Time received: Jan 16, 2019 8:45 AM
Eurofins | mgt reference: **635947**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 21 degrees Celsius.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☑ Sample containers for volatile analysis received with zero headspace.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Notes

ONLY VIALS PROVIDED FOR TS AND TB

Contact notes

If you have any questions with respect to these samples please contact:

Andrew Black on Phone : (+61) 2 9900 8490 or by e.mail: AndrewBlack@eurofins.com

Results will be delivered electronically via e.mail to Paul Wright - paul.wright@coffey.com.

eurofins | mgt

ABN– 50 005 085 521
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web : www.eurofins.com.au

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Project Name: HCCD-SITE 1
Project ID: NTLEN213472

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Received: Jan 16, 2019 8:45 AM
Due: Jan 18, 2019
Priority: 2 Day
Contact Name: Paul Wright

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Sample Detail						Eurofins | mgt Suite B13	Eurofins | mgt Suite B7 (filtered metals)	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	MW01	Jan 15, 2019		Water	M19-Ja09362	X	X	
2	MW02	Jan 15, 2019		Water	M19-Ja09363	X	X	
3	MW03	Jan 15, 2019		Water	M19-Ja09364	X	X	
4	QWC1	Jan 15, 2019		Water	M19-Ja09365	X	X	
5	TRIP SPIKE	Jan 15, 2019		Water	M19-Ja09366			X
6	TRIP BLANK	Jan 15, 2019		Water	M19-Ja09367			X
Test Counts						4	4	2

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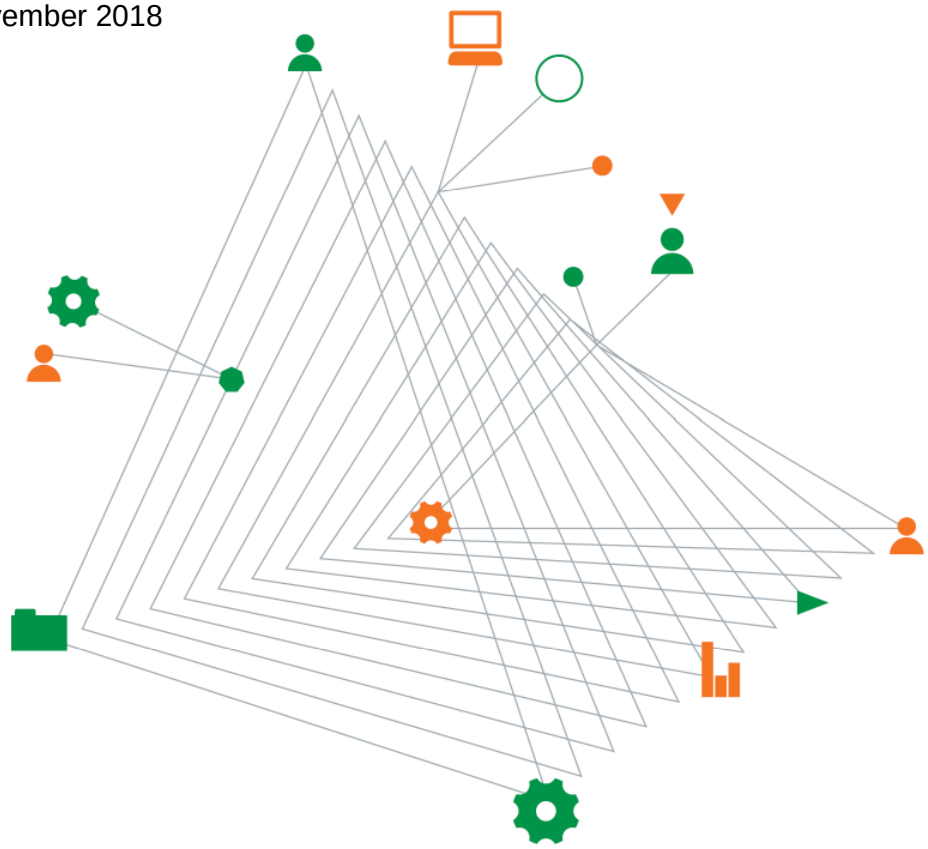
University of Newcastle

Honeysuckle City Campus Development - Site 1 - 16 Honeysuckle Drive, Newcastle

Mine Subsidence Remediation Strategy and Numerical Analysis Report

754-NTLGE213472-R06

16 November 2018



Experience comes to life when it is powered by expertise

University of Newcastle - Honeysuckle City Campus Development - Site 1 - Mine Subsidence Remediation Strategy and Numerical Analysis Revisit

Prepared for
University of Newcastle

Prepared by
Coffey Services Australia Pty Ltd
19 Warabrook Boulevard
Warabrook NSW 2304 Australia
ABN: 55 139 460 521

16 November 2018

Our ref: 754-NTLEN213472-R06.Rev1

Please find enclosed the report describing the findings of a revised mine subsidence assessment and remediation plan to assess potential ground movements using numerical analysis, for Site 1 of University of Newcastle's proposed Honeysuckle City Campus Development - located at 16 Honeysuckle Drive Newcastle.

Guidance on the uses and limitations of this report is presented in the attached sheet, 'Important Information about your Coffey Report', which should be read in conjunction with this report.

If you have any questions regarding this report or should you require further assistance on this project, please contact the undersigned.

For and on behalf of Coffey

Simon Baker
Senior Geotechnical Engineer

Quality information

Revision history

Revision	Description	Date	Author	Reviewer	Signatory
Version 0	Report	19/10/2018	Simon Baker	Ry Stone	Simon Baker
Revision 1	Report	16/11/2018	Simon Baker	Ry Stone	Simon Baker

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Executive Summary

Coffey Services Australia Pty Ltd, using numerical modelling has assessed the potential for mine subsidence and has developed a remediation strategy to limit potential mine subsidence at the proposed Site 1 of the Honeysuckle City Campus Development.

The details of the proposed development are still in planning; however, the initial building is to be up to five storeys in height with no basement with two future buildings up to eight stories with no basements.

The site is known to be underlain by abandoned bord-and-pillar mine workings in the Borehole Seam. These workings are part of the historic Wickham and Bullock Island Colliery workings. Historic records indicate that in 1897 this section of the workings was subject to a significant pillar crush event (pillar convergence).

Between 2004 and 2005, Coffey completed two mine subsidence assessments, which included drilling to confirm the extent of crushing (N08459/04-AG dated 9 July 2004 and N08459/04-AM dated 24 February 2005). In 2007, grouting was completed for the Lee Wharf Stage 3 (N08459/11-AP (Revision 1) dated 22 June 2007) located on the northern side of Honeysuckle Drive from the Site.

A 3D numerical analyse has been performed to model the historical crush event that occurred at the site at the time of active mining (August 1897). It was assessed that the model overestimated the amount of crush that actually occurred at some locations, however this variation was likely due to the variable mined heights resulting in different amounts of pillar crushing before ‘choking’ the mine bord and preventing further convergence.

After modelling this crush event, the strength of the coal was then degraded at 5% increments until reaching approximately 33% of the original coal strength (i.e. 22 increments). At this level of degradation, a series of coal pillars located at the eastern edge of the panel could potentially fail resulting in surface settlement of approximately 120mm at the site with peak values of 200mm to the north and east of the site.

To limit subsidence at the area to the north of the site was bulk filled with ash Lee Wharf Stage 3 (N08459/11-AP (Revision 1) dated 22 June 2007). Grouting was also commenced in the area of the site (GEOTWARA20903AD-AC 5 June 2013). During this assessment, Coffey has revised the remedial strategy for the site to include the following:

- Verify borehole GH2B has been filled
- Complete the filling of GH07 and GH08 with minimum 2MPa grout
- Fill borehole GH12 with minimum 2MPa grout
- Fill boreholes GH14, GH15B, GH18A and GH19 with minimum 5MPa grout

These grout locations are shown on Drawing 4. Based on the void heights recorded at the borehole locations, it is estimated each borehole may require in the order of 500m^3 of grout to fill with a total of 2000m^3 of 5MPa grout and approximately 1000m^3 of 2MPa grout.

The model was reset to after initial collapse and rerun with the 5% degradation as previously completed. Although the model suggests the area should now be stable, due to difficulties in the modelling process, a conservative approach to design is to be adopted. For structural design purposes, it is recommended that some residual subsidence parameters be allowed for as provided in Table 1.

Table 1: Summary of design parameters

Parameter	At southern limit	At limit of mine workings	At 5m from northern boundary of site	At northern limit of site
Subsidence (mm)	0	20	40	50
Tilt (mm/m)	0	1	2	3
Radius of curvature concave down tensile (km)	40	10	5	3
Strain tensile (mm/m)	0.25	1	2	3
Radius of curvature concave up compressive (km)	N/A	N/A	N/A	N/A
Strain compressive (mm/m)	0	0	0	0

These parameters have been developed with reference to Figures 10a to 10b of DgS Report (COF-008-1 dated 19 October 2018. These parameters are applicable for the serviceability case. As such, should an event of this magnitude occur, the building would need to remain safe servable and repairable.

1. Introduction

The University of Newcastle (UON) commissioned Coffey Services Australia Pty Ltd (Coffey) to reassess the potential for mine subsidence and to provide a remediation strategy to limit potential subsidence at the proposed Site 1 of the Honeysuckle City Campus Development (HCCD) referred to herein as the Site. As a part of this assessment, a numerical analysis of the mine workings located beneath the site and surrounding area was undertaken to assess the characteristics of the historical crush event in the area and the potential for future settlement given the existing grouting of the workings. It is noted this report presents the results of the updated modelling to include interfaces (potential slip planes with lower resistance) at the top and bottom of the pillars.

A revised grouting strategy for this development is proposed to achieve a solution acceptable to concerned stakeholders with respect to risk and cost.

The proposed developments for the Site include a five storey building on the western side of the location with future buildings across the remainder of the Site up to eight stories to be constructed over time. The Site location is provided on Drawing 1.

This report aims to:

1. Provide some clarity of the extent of crushing that previously occurred beneath the Site.
2. Assess whether any additional area of workings have the potential to converge (crush) at a future date resulting in surface movements.
3. Develop a grouting strategy that would reduce risk of unacceptable subsidence at the Site to a level that would be tolerable to the proposed development for both serviceability design and ultimate design.
4. Provide an explanation of the grouting solution to assist UON with their development application to the Subsidence Advisory NSW (SANSW).

This report presents in the results of a numerical modelling phase using FLAC3D. This assessment included the following:

- Develop a large scale numerical model including the geological features of the area.
- Assess the consequent ground deformations at different strength reduction of the coal material.
- Assess the strength reduction of the materials required to cause collapse of the pillars. The strength reduction required to achieve collapse is analogous to a factor of safety and is related to probability of collapse.
- Assess consequent ground deformations caused by pillar collapse.

To assess the FOS of the workings and resultant surface deflection, simulations of the pillar collapse were carried out by three dimensional numerical analyses using proprietary software FLAC3D. First, previous collapse areas were modelled. Movements were reset to zero followed by slowly degrading the strength of the coal within pillars to assess the impact of additional pillar collapse without grouting in place. The degradation phase was then rerun with grout in place.

The following report presents the findings of the updated numerical modelling using a smaller model to focus on the Site only using the methodology previously completed only with the addition of interfaces at the tops and bottoms of pillars. Although modelling was attempted with additional interfaces, to allow for different mined heights, this caused numerical instability and as such the model had to be run with less interfaces.

2. Background

The Site is known to be underlain by abandoned bord-and-pillar mine workings in the Borehole Seam by previously mined by the Wickham and Bullock Island Colliery (W&BIC). Nearby workings have also been formed by Australian Agricultural Company (AACo) from their New Winning Pit. The mine workings relative to the Site are shown on Drawing 2.

The main workings underlying the Site were developed by the W&BIC in the 1880's to 1890's and are shown on Record Tracing RT579. The W&BIC workings, at abandonment, extended to the west near Hannell Street across to the eastern edge of The Dyke, south to the old Harbour limit (which has moved north) and north to Port Waratah Coal Terminal.

The workings were developed with small pillars, 4.0m to 6.8m in width and an average width of 5.4m. The length of the pillars between cut-throughs ranges from 12m up to 25m. The height of bords (i.e. the workings) varied depending on whether they took only the middle bands (unhatched) or the 'Tops and Bottoms' (hatched or designated 't & b') on RT579.

From RT579, the three nearest seams sections are shown on Drawing 3, with a summary presented in Table 2.

Table 2: Summary of seam sections from RT 579 with locations shown on Delta Collieries overview plan

Section	Position relative to site	Seam Portion	Seam Thickness (m) (Lower Bound)	Seam Thickness (m) (Upper Bound)
88	150m north	Bottom	1.5	2.4?
89	180m north	Middle	1.7	2.5?
101	90m north west	Tops and Middle	2.6	3.9?
96	370m north west	Tops and Bottoms	4.8	7.2?
Notes **? - Addition of the upper bound values for each of the coal zones within the seam section. It is noted that all upper bound values are unlikely to occur at once.**				

As the average pillar width in the area is 5.4m, the width to height ratio is in the order of 1 $\left(\frac{W}{H} = 1\right)$ when the tops and bottoms were taken. This means the pillars may be considered to be slender. Slender pillars have a 'brittle' failure reducing in strength after reaching their peak capacity (Das 1985).

In the 1890's, a series of significant pillar crush (convergence) events occurred within the mine workings (August 1896, August 1897 and October 1897). The approximate boundaries are shown on the Delta Collieries over map. Underground inspections of the crushed area were performed following the event to assess the potential for water from the harbour breaking through into the mine and flooding the workings. Detailed accounts of these inspections are provided in the Newcastle Morning Herald and Miners Advocate. The inspections typically reported roof falls that extended to the base of the sandstone main roof (1.8m to 3.0m above the top of 'Top Coal') overlying the coal and silty shale immediate roof as well as breakage of coal from the sides of the pillars.

The movements continued over a period reported to be approximately several months as indicated by the sound of rock moving. Ultimately, it was determined that the mine workings were not subject to flooding and working was resumed in other portions of the mine.

The location of the W&BIC and the extent of pillar convergence during the crush event was developed after approximately 28 boreholes in the area (20 by Coffey N08459/04-AG 9 July 2004 and N08459/04-AM 24 February 2005 and 8 by Douglas Partners 18862C dated 1 September 2000). A summary of these boreholes is provided in Table 3. The convergence is based on the difference between the thickness of coal in the borehole and the thickness in the nearby boreholes outside the workings.

Table 3: Summary of mine subsidence assessment drilling

Borehole	Drilled by (year)	Ground surface RL (AHD) at time of drilling (m)	Depth to watertable at time of drilling (m)	Approximate depth to top of rock (m)	Depth to top of Borehole Seam coal (m)	Depth to base of Borehole Seam coal (m)	Borehole Seam thickness (m)	Depth to bottom of hole (m)	Estimated roof convergence (m)	Adopted unmined seam thickness for convergence estimate (m)
W1 (Unmined)	Douglas (2000)	~2.2	1.8	21.2	75.11	81.63	6.52	84.83	0	-
W2		~2.2	1.2	22.86	74.8 2	80.62	5.82 ?	81.46	0.83	6.65
BH1	Douglas (1992)	1.98	2	23.25	74	79.55	5.55	83.8	1.1	6.65
DB 2A	Douglas (1998)	3.63	3.6	30.5	?	?	?	78.32	?	6.4
DB 2B		3.14	2.1	28	73.76	78.98	5.22	84.25	1.18	6.4
DB 2C		3	2.5	29	72.93	> 78.62	> 5.69	78.62	< 0.71	6.4
DB 2E		1.88	2	26	69.77	75.6	5.83	75.6	0.47	6.3
DB 2G		2.34	1	29	73.9	79.61	5.71	81.63	1.04	6.65
BH 9A (Unmined)	Coffey Geosciences Pty Ltd (2003)	2.18	2.1	20.05	76.7	83.28	6.58	84	0	-
BH 9B		2.18	1.9	20.3	75.84	82.6	6.76	84	0	-
BH 9C		2.28	2	20.32	76.02	82.06	6.04	83.08	0.61	6.65
BH 9D		2.2	2	20.4	75.63	81.13	5.5	83.85	1.15	6.65
BH 10A (Unmined)		2.19	-	21.82	73.2	79.82	6.62	81.15	0	-
BH 10B		2.28	1.7	23.6	74.28	80.3	6.02	81.2	0.63	6.65
BH 11		2.17	2	20.4	75.3	82.05	6.75	84.2	0	-

Borehole	Drilled by (year)	Ground surface RL (AHD) at time of drilling (m)	Depth to watertable at time of drilling (m)	Approximate depth to top of rock (m)	Depth to top of Borehole Seam coal (m)	Depth to base of Borehole Seam coal (m)	Borehole Seam thickness (m)	Depth to bottom of hole (m)	Estimated roof convergence (m)	Adopted unmined seam thickness for convergence estimate (m)
BH 12		2.05	-	20.65	75.6	81.48	5.88	84.1	0.77	6.65
BH 13A	Coffey Geosciences Pty Ltd (2004, 2005)	2.36		33.1	73.62	78.51	4.89	81.35	1.56	6.45
BH 13B (Unmined)		2.17	1.4	26.7	69.37	75.63	6.26	77.25	0	-
BH 13C (E)		2.3	2.1	26.5	68.5	74.71	6.46	76.75	0	6.46
BH 13D		2.39	2	27.1	67.8	74.2	6.4	75.25	0	6.4
BH 14A (Unmined)		2.47		24.49	71.54	77.86	6.32	81.25	0	-
BH 14B		2.39		24.6	72.3	78.21	5.91	81	0.44	6.35
BH 14C		2.57		23.5	74.85	79.75	4.9	81.45	1.5	6.4
BH 15A		2.41	1.6	26.65	75.9	81.05	5.15	86.7	1.35	6.5
BH 15B		2.22	1.7	26.7	74.25	79.9	5.65	84.05	0.95	6.6
BH 16A		2.28	2	24.65	74.5	80.15	5.65	84.67	0.9	6.55
BH 16B		2.2	2.5	25.4	75.59	79.03	3.44	81.7	0.96	4.41(1)
BH 16C		2.15	2	24.3	75.25	81.1	5.85	84.7	0.8	6.65

Notes:

(1) Seam thickness reduced by fault throw of 2.1m from 6.5 to 4.4m as BH16B appears to have passed through the fault at seam level thereby not intersecting full seam thickness.

Using the above information, a mine grouting strategy was developed, N08459/04-AM 24 February 2005, grouting all areas of workings that had not converged to the full 1.5m.

Approval for the stabilisation work was obtained from the MSB and a copy of their letter is provided in Appendix A. The MSB letter indicates that the structure should be able to accommodate the following subsidence deformations:

- Maximum vertical subsidence = 100mm
- Maximum ground strains = +/- 1.45mm/m
- Maximum tilt = 2.4mm/m

In 2007, the area within angle of draw of Lee Wharf 3 (19 Honeysuckle Drive Newcastle) was grouted N08459/11-AP dated 22 June 2007. The grouting included the placement of grout barriers around the workings, with the middle portion filled with ash. In 2011, the grouting as per N08459/04-AM 24 February 2005, was commenced within the Site. Twenty-seven boreholes were drilled into the mine workings. Boreholes GH1, GH16, GH18, GH19 required redrilling either due to collapse of the borehole wall or from encountering a coal pillar at mine level. GH4 and GH5 were eliminated due to the difficulty in encountering small cut-throughs on the large drilling angles. The locations of the boreholes from this and the previous grouting stage are shown on Drawing 2. After drilling and verification of the boreholes, grouting was commenced from the eastern end of the Site.

A summary of these boreholes is given in Table 4 with grouting volumes shown in Table 5.

Table 4: Summary of grout borehole drilling

Grout Hole	Inclination from Vertical (°)	Depth to rock (m)	Approximate casing length (m)	Depth to top of caved interval/ roof void (m)	Depth to mine floor (m)	Total depth (m)	Roof Void height (m)	Caved / rubble thickness (m)	Mine Level Condition	Remarks
1	-	21.5	22	-	78	80	-	-	Edge of Pillar, Top of coal @ 71m+/-	Hole drifted into pillar
1A	-	21.1	21	68.3	79	79.2	2.7	8	Caved with rubble and voids	Redrill of 1
2B	5.75	24	24?	73.1	79.3	79.3	1.8	4.4	Caved with rubble and voids	planned angle hole
3B	12	24	36	76.5	79.9	80.8	0.5	3.4	Caved with rubble and voids	
4	Barrier Hole, not drilled due to difficulty in hitting crosscut.									
5	Barrier hole, not drilled due to difficulty in hitting crosscut.									
6	-	23.7	25	68.4	79.1	79.4	1.4	10.7	Caved with rubble and voids	
7	-	24	27	70.5	78.5	78.8	1.2	8	Caved with rubble and voids	
8A	3	24	70	74.5	79.5	80.3	0.5	5	Caved with rubble and voids	

Grout Hole	Inclination from Vertical (°)	Depth to rock (m)	Approximate casing length (m)	Depth to top of caved interval/ roof void (m)	Depth to mine floor (m)	Total depth (m)	Roof Void height (m)	Caved / rubble thickness (m)	Mine Level Condition	Remarks
9B	10	24	24	75.5	82.3	82.5	1.8	6.8	Caved with rubble and voids	Lost drill bit and last rod at mine level
10	14	24	24	77	Not reac hed	79.3	2.3?	-	Caved with and voids	Didn't drill to floor to lessen potential to lose bit
11	-	21.1	24.1	64.5	78.6	78.9	-	14.1	Caved with rubble and voids	
12	-	23	23.2	73.5	80.3	81	1.33	6.8	Caved with rubble and voids	
13A	-	25	25	75.6	>76. 8	76.8	0.45	>0.7 5	Caved with rubble and voids	Didn't drill to floor to lessen potential to lose bit
14	5 to 6	24	24	75.3	>76. 8	76.8	1.5	unk now n	Caved with rubble and voids	Didn't drill to floor to lessen potential to lose bit
15B	13	24	24	74.8	>78. 7	78.7	0.2 & 1.3	>3.9	Caved with rubble and voids	Didn't drill to floor to lessen potential to lose bit
16	-	23	23	72	79.6	81	0.2	NA	Pillar	Hole drifted into pillar
16A	-	23.4	23.5	71.3	79.7	79.7	1.5	6.9	Caved with rubble and voids	Redrill of 16
17	-	24	24	73.7	80.7	81	2.3	4.7	Caved with rubble and voids	
18	-	25	21	76.2	79.5	84	NA	NA	Pillar	Pillar in fault area, coal and sandstone
18A	-	24	25.5	74.7	81?	81	1.6	4.7?	Caved with rubble and voids	Redrill of 18
19A	5	25	27	72.8	>74. 8	74.8	1.4	>0.6	Caved with rubble and voids	Didn't drill to floor to lessen potential to lose bit
19B	5	24	27	72.8	>78. 3	78.3	2	>3.5	Caved with rubble and voids	* (redrill of 19A due to collapse of borehole)
20	-	25	21	72	79.7	79.7	1.6	6.1	Caved with rubble and voids	
21	-	25	21	73.5	81	81	0.5	7	Caved with rubble and voids	
22	-	24	24	72.2	79.2	79.3	0.7	6.3	Caved with rubble and voids	
23A	5	28.5	24	68.6	>76. 4	76.4	2.3	>5.5	Caved with rubble and voids	Moved hole on surface to avoid cable, didn't drill into floor to lessen potential to lose bit
24A	-	26	24	74.9	79.2	85.5	-	NA	Edge of Pillar 100% Water loss below 64.7m;	Pillar in fault area, broken coal in video moved hole to hit mine, but missed
25A	-	25	27	72	79	79.1	2	5	Caved with rubble and voids	

Table 5: Previous grouting onsite

Grout hole	Approximate amount of grout injected (m^3)	Status
1A	401	-
2B	539.5	May be filled
7	193	-
8	184	-
11	300.5	-
Totals	1613	-

A fault is positioned within the panel of workings that lie under the Site. This fault has no displacement shown on the RT566 Sheet 8, with approximately 3' (0.9m) to 4' (1.2m) shown on Sheet 4. RT579 has no displacement shown around the Site however, it was significant enough to slightly change the mining layout. The idealised Section AA is provided on Drawing 6.

Faults are planar fracture or discontinuity in a volume of rock and are therefore a predefined plane of weakness in which one side of the overburden can move more than the other more readily than in unfaulted areas. This means faults also have the potential to provide a slip plane should one side of the workings converge or crush more than the other. As such, areas around faults have the potential to have larger relative movements than away from the faults. For this reason, areas with faults often require additional or special treatment due to their higher risk potential.

3. Methodology for numerical modelling

3.1. Geometry and mesh

A pillar run initiated away from the Site can impact pillar stability at the Site and therefore, a large area of mine workings needs to be modelled to assess potential surface response behaviours at the Site and to reduce the impact of edge effects in the model.

To assess the 'global' stability of the workings, a large scale model with an area of 650m by 500m was originally developed (Coffey Report 754-NTLEN213472-R03. Final 1 May 2018). In the recent work, the model was reduced to the single area of workings with a mesh size of 390m by 250m. The elemental 'mesh' adopted extends sufficiently broadly to enable boundary fixities that can impact the analyses at the Site to be recognised and reduced. This included having a large barrier of coal around the pocket of workings in focus.

The vertical depth of the model was chosen to extend to a similar depth to the workings below the base of the workings (i.e. the model was extended to depth of 142m).

The revised model includes workings W&BIC only.

Drawing 2 presents plans of the 'Record Tracing' (that shows the surveyed mine workings in the Borehole Seam) relative to the Site.

From the Record Tracing, the outlines of pillars within the workings were first digitised using polylines in AutoCAD. The workings were rotated so that a principal stress corresponded with the x-axis (along the pillars). Once digitised, the geometry of the pillars was imported into FLAC3D.

The mesh was constructed using FLAC3D's inbuilt extrusion tool. The above outlines were converted to primitives before later division to result in pillars with typically 4 elements across the pillar.

To allow for easier identification in later stages, several features were grouped. These groups include:

5: Bord fault

8: Wickham and Bullock Island T&B bords

9: Wickham and Bullock Island Co main mined zone bords (i.e. 4m height)

10: Wickham and Bullock Island T&B pillars

11: Wickham and Bullock Island Co large pillars

12: Wickham and Bullock Island Co main mined zone pillars (i.e. 4m height)

13: Wickham and Bullock Island Co fault

14: Unmined

15: Unmined fault

16: Very large

Element grouping is illustrated in Figure 1.

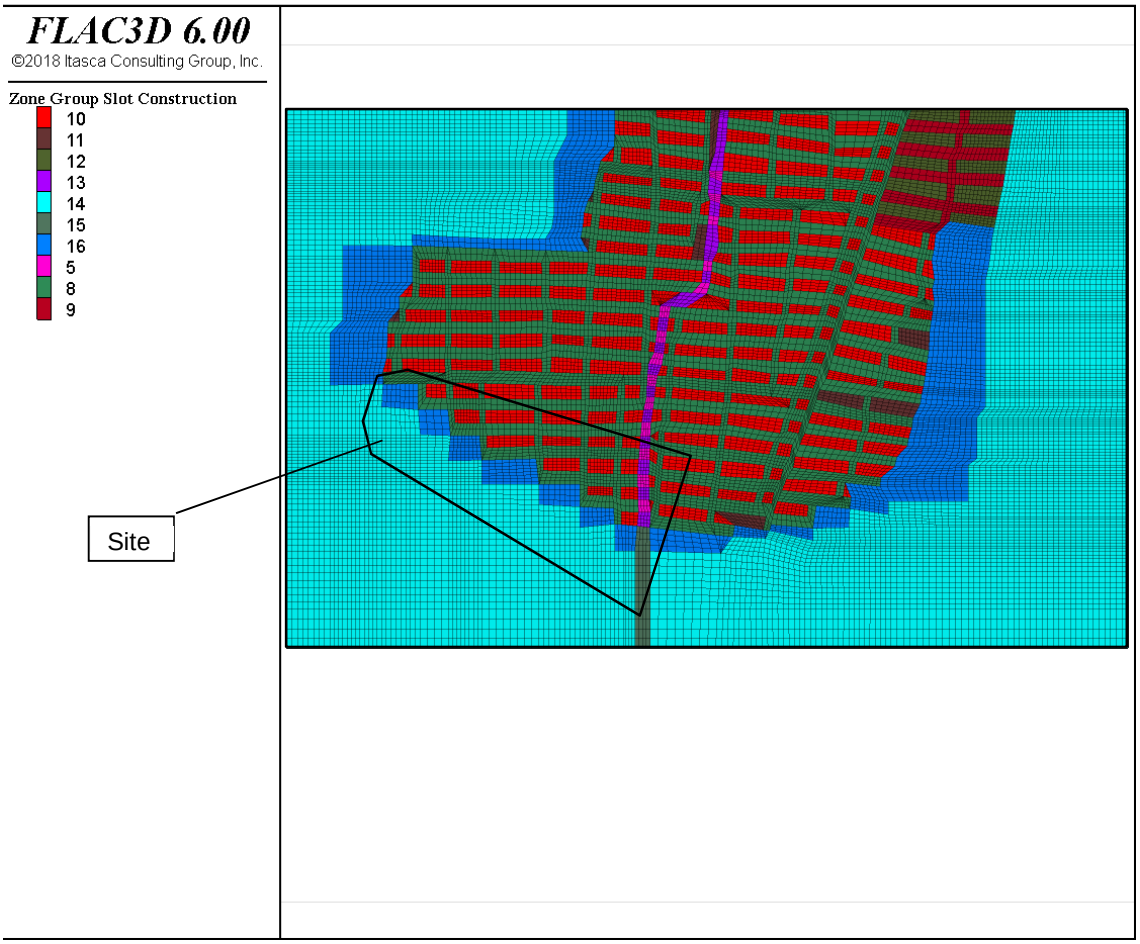


Figure 1: Element grouping at mine level

The grid was then extruded in three stages with the mesh coarsened at each stage to reduce the total number of elements. Around the pillars, these are generally 1.3m width for the W&BIC workings. The elements are increased in size as the mesh is coarsened away from the pillar.

To setup initial conditions, the western and northern boundaries were then fixed laterally while allowing vertical movement. Vertical displacements were fixed at the base of the model. The horizontal geostatic stresses were then applied to the southern and eastern boundaries.

3.2. Geotechnical model

The FLAC3D strain hardening/softening model with a Mohr-Coulomb failure criterion was adopted for the analyses. This model allows different cohesion values to be used depending on the strain. For the overburden rock, the FLAC3D strain hardening/softening ubiquitous joint model with a Mohr-Coulomb failure criterion was adopted to allow for planes of weakness into the rock mass in the attempt to simulate bedding and allow some separation along these joints. Initial values of material parameters were obtained based on approximations of borehole data using RocLab software and compared to published data.

The material parameters used for the overburden materials after calibration are summarised below in Table 5.

Table 6: Geotechnical Model of Layers Used For 3 Dimensional FLAC3D Analyses

Material	Sand units	Clay unit	Low to medium strength interbedded siltstone and sandstone	High to very high strength interbedded siltstone and sandstone	Waratah Sandstone
Elevation (z) (m)	6 to -19	-4 to -33	-6 to -57	-34 to -72	Below -80
Density (γ kN/m^3)	18	18	24	25.5	25.5
Youngs Modulus (E GPa)	0.03	0.02	0.15	1.5	4
Poisson's Ratio (ν)	0.35	0.4	0.25	0.25	0.25
Effective Cohesion (c' kPa)	1	5	150	700	1200
Friction Angle (ϕ °)	35	28	35	42	45
Dilation Angle (ψ °)	5	3	7	10	10
Tension (kPa)	0	0	0.5	30	150
Bedding plane tension	N/A	N/A	0	0	N/A
Bedding plane friction	N/A	N/A	35	35	N/A
Bedding plane cohesion	N/A	N/A	20	20	N/A

The ground is conservatively assumed to be drained with total stress (i.e. water level below mine level) despite the fact that the workings are submerged. This assumption causes the load applied to the mine pillars to be greater than possible because the effect of buoyancy on the effective weight of the ground has not been taken into account. This more closely resembles the loading at the end of mining.

Boundaries of the units were determined using drilling data from seven points. The boundaries were then simplified to two to three planes for each boundary.

The Borehole Seam in the area has a dip locally of up to 1 in 22. To simplify the construction of the model, the seam was assumed to be level with the additional depth to workings modelled by a higher ground surface level.

One dominate fault line was adopted in the model running through the Site. Due to difficulties in changing seam level, a displacement of the fault at mine level was not included in the model.

In both cases, the fault material was assumed to have the same strength of the respective surrounding rock of the same unit, however it was assumed to have reached its residual strength state (i.e. effective cohesion approximately 10% of peak strength $c'_{residual} = 0.1 \times c'_{peak}$).

Material parameters for the coal pillars were calibrated to published empirical data and derivation of these parameters is presented in Section 3.3.

For the model, the horizontal stress in the major principal direction (northeast to southwest or along the pillars) has been assumed to be equivalent to a coefficient of earth pressure at rest (k_o) (i.e.$\frac{\sigma_{h\,soil}}{k_0} = 1$) for the soil zone and increasing at rock level similar to 0.5 times change vertical stress in y direction (minor) (i.e. $\Delta\sigma_{hy\,rock} = 0.5\Delta\sigma_v$) and 0.75 times change vertical stress in x direction (major) (i.e. $\Delta\sigma_{hx\,rock} = 0.75\Delta\sigma_v$).

This means within the soil zone the horizontal pressure is approximately 9kPa times the depth while in the rock zone, the horizontal pressure is approximately 9kPa times depth of soil plus 12kPa times depth within rock in the y direction and 19kPa times depth within rock in the x direction.

An image of the model is presented in Figure 2.

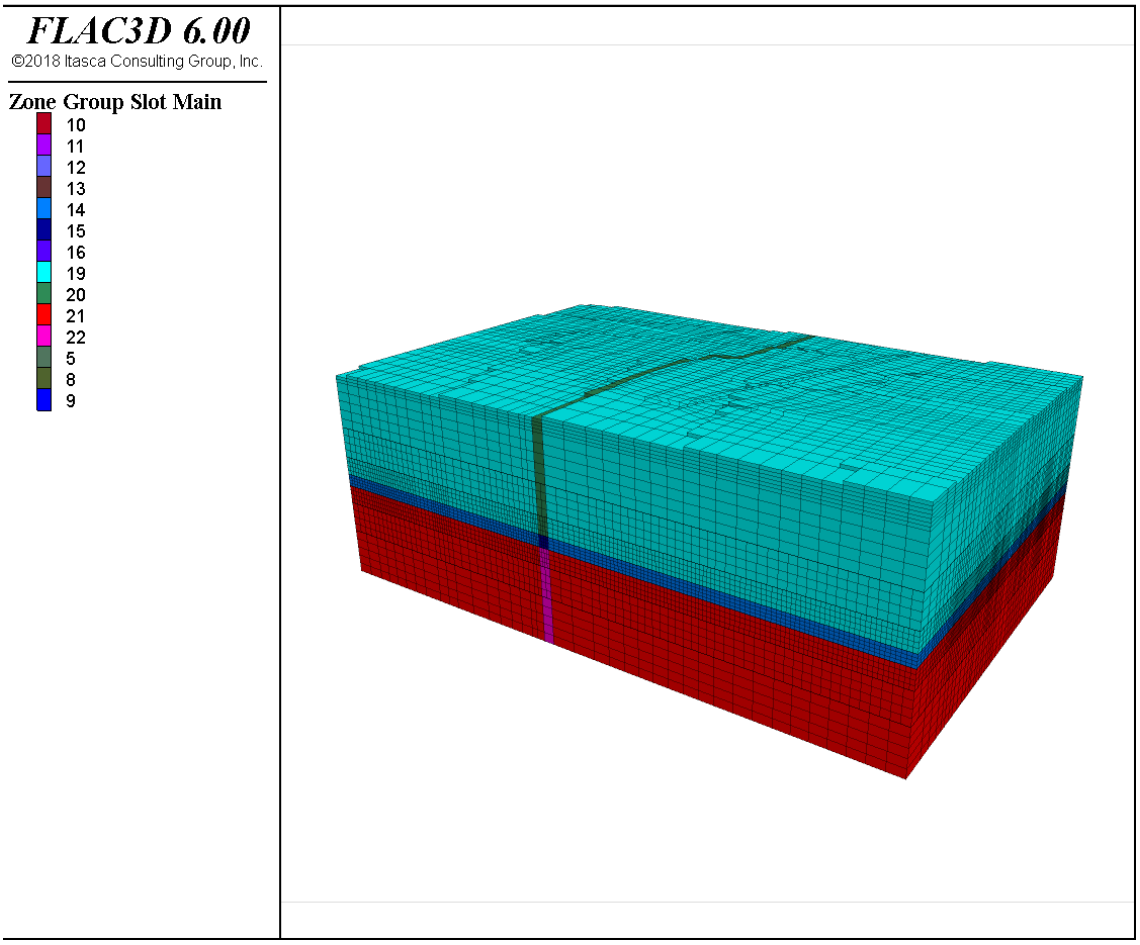


Figure 2: Full FLAC3D model showing group labels of the area

3.3. Calibration of coal pillar strength

A critical factor in understanding the stability of the workings is the strength of the coal pillars. The strength of a coal pillar relies on three aspects:

- The intact coal strength
- The effect of discontinuities controlling the rock mass behaviour
- The coal pillar geometry, affecting the degree of confinement within the coal pillar core

The intact coal strength of a seam will be dependent on the ‘quality’ of the coal. ‘Dull’ or silty coal will typically have a greater strength than the higher quality ‘bright’ or clean coal. The latter has predefined face cleats (essentially cleavage) aligned perpendicular to the primary regional stress

direction. Within a seam the overall seam strength will tend to vary depending on the variation of the distribution of the different quality layers within the coal.

The pillars were calibrated to an equivalent coal height of 6.5m using the strength calculation estimated using Equation 1 (Galvin 1998) which is suitable for pillars with a width to height ratio of >3.

$$Sp = 8.6 \times w^{0.51}/h^{0.84} \quad (1)$$

Where Sp = pillar strength, w = width and h = height in metres.

Sp = $8.6 \times 5.4^{0.51}/6.5^{0.84}$ = 4.2MPa for the 5.4m wide pillar, (typical of the second workings W&BIC)

= $8.6 \times 5.4^{0.51}/4^{0.84}$ = 6.3MPa for the 5.4m wide pillar and 4m high (first workings only within W&BIC). (Due to interface issues the pillars height remained at 8m with additional peak strength only)

= $8.6 \times 8^{0.51}/6.5^{0.84}$ = 5.2MPa for the 8m wide pillar, (large pillars within the W&BIC)

= $8.6 \times 10.5^{0.51}/6.5^{0.84}$ = 5.9MPa for the 10.5 m wide pillar, (typical of the pillars within the AACo New Winning Pit)

= $8.6 \times 20^{0.51}/6.5^{0.84}$ = 8.2MPa for the very large pillars and boundaries of the mine workings

The coal pillars have been modelled with:

- A peak strength as per Equation 1 above, before crushing of the pillar.
- A plastic phase that decreases in strength due to plastic deformation. Once the load on the pillar reaches its ultimate strength a strain softening phase is implemented at a volumetric plastic shear strain of 0.005 (0.5%).
- An after crush phase where the rubble within the bord provides confinement of the pillar. This is estimated to be 0.2m for the 20m wide pillar, 0.4m for the 10.5m wide pillars, 1.3m for the second worked W&BIC 5.4 m wide pillars, 0.7m for the first worked only W&BIC 5.4 m wide pillars and 0.8m for the larger 8m wide coal pillars within the W&BIC.
- Interfaces (weakening planes) added to the tops and bottoms of the pillars allowing the pillars to expand with less top and bottom confining.

The result of the pillar calibrations, with a course mesh similar to that used for the pillars within the model, are shown below in Figures 3 to 6 with the final parameters given in Tables 7 and 8.

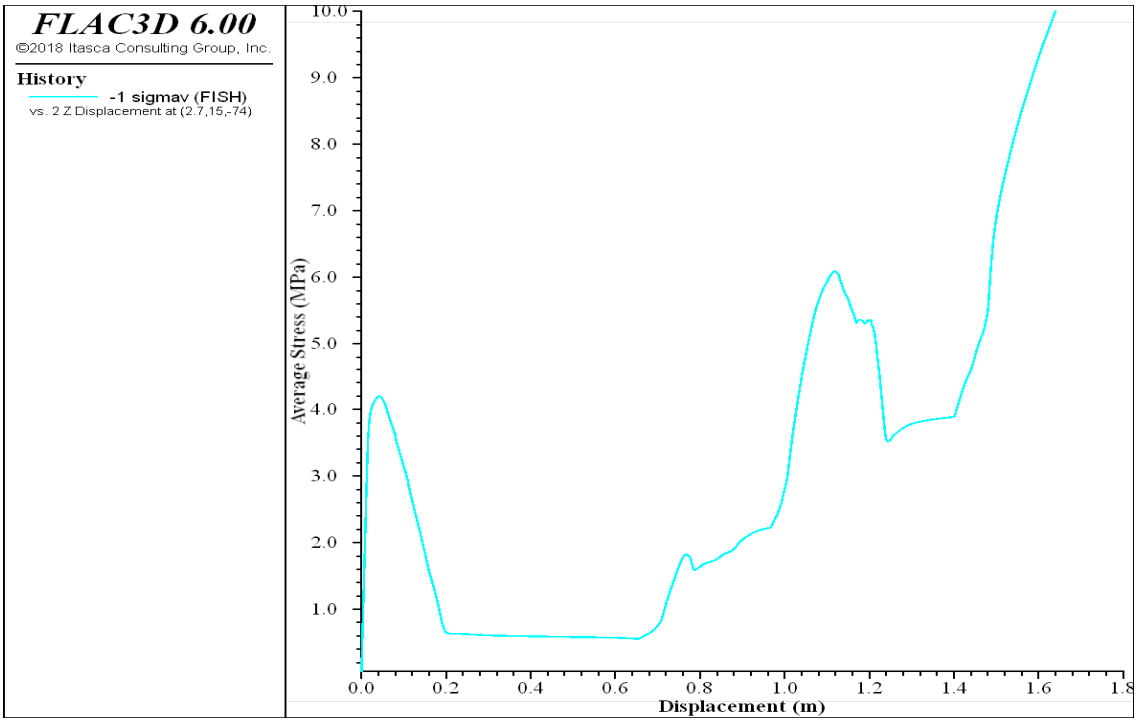


Figure 3: Pillar calibration for 5.4m wide secondary worked pillars

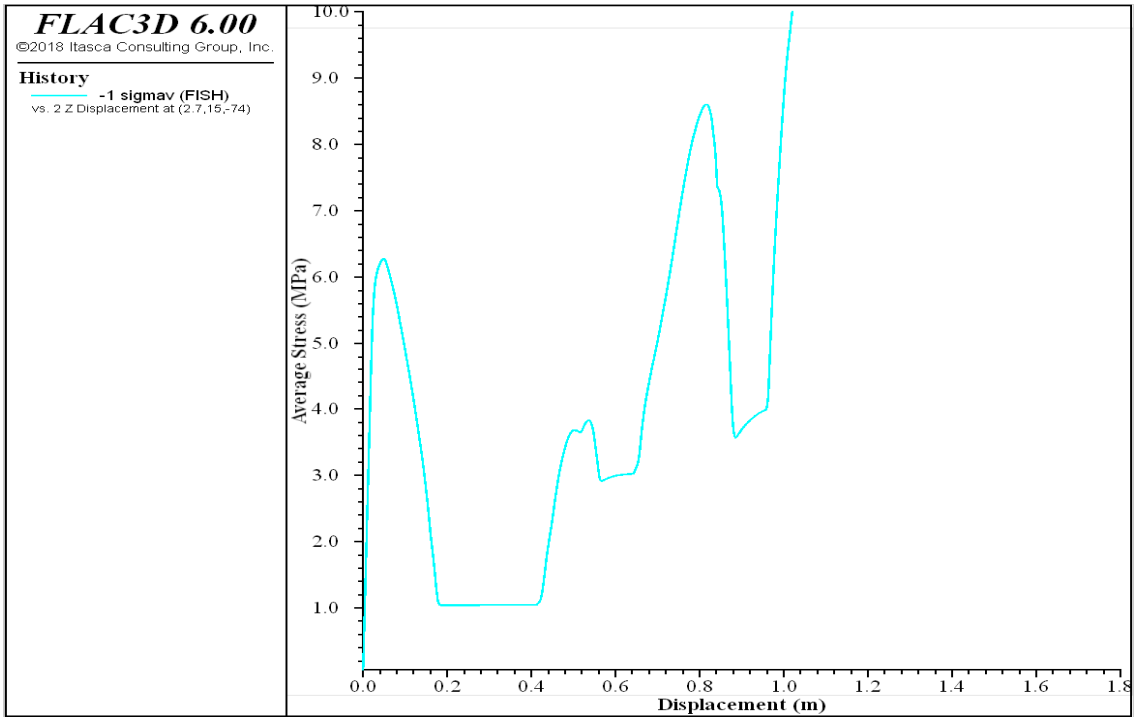


Figure 4: Pillar calibration for 5.4m wide first workings only (4m height) pillars

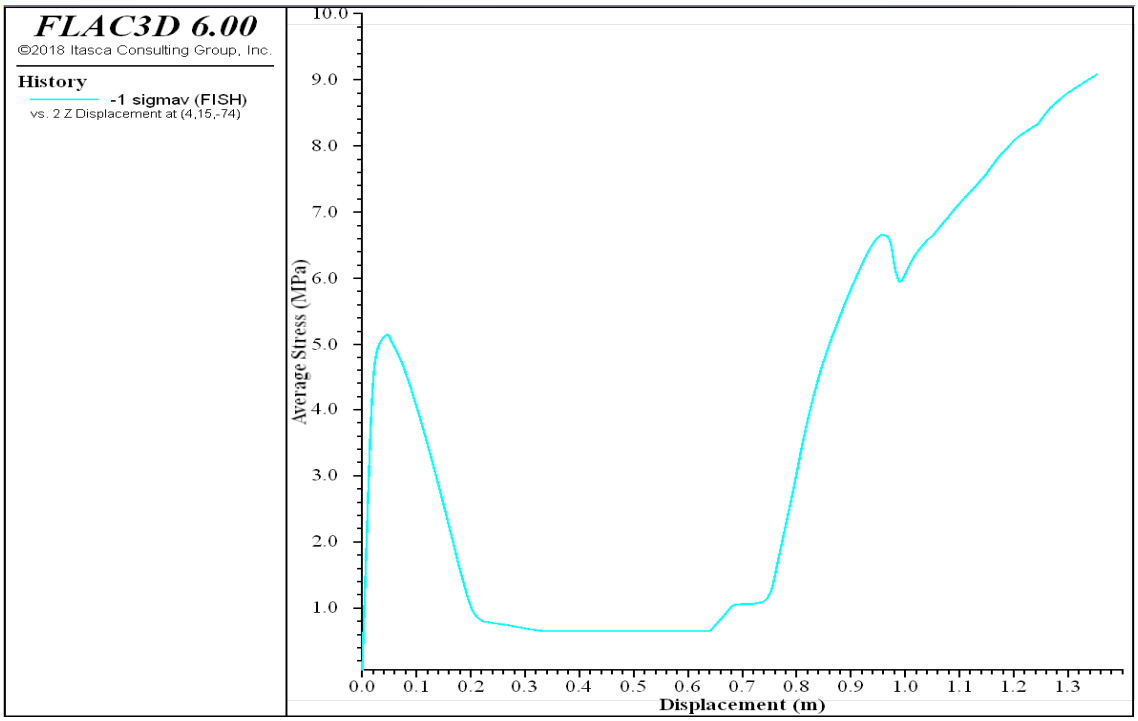


Figure 5: Pillar calibration for 8m wide pillars

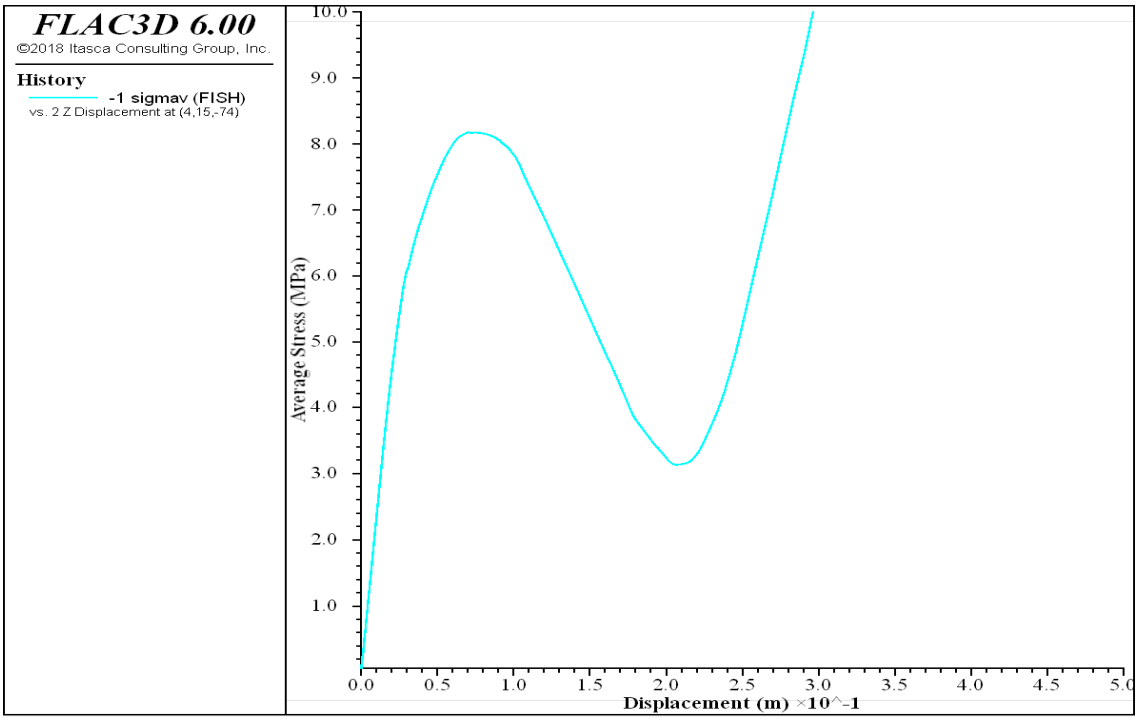


Figure 6: Pillar calibration for large 20m wide pillars

Table 7: Geotechnical model of coal pillars used for the three dimensional FLAC3D analysis

Unit	Calibrated Effective Cohesion (c' MPa)	Friction Angle Adopted (ϕ°)	Tension (kPa)	Young's Modulus (E GPa)	Poisson's Ratio (ν)
5.4m pillar coal second workings	0.93	28	10	2	0.3
5.4m pillar siltstone second workings	1.4	30	40	3	0.3
5.4m pillar coal first workings	1.43	28	10	2	0.3
5.4m pillar siltstone first workings	2.16	30	40	3	0.3
8m pillar coal second workings	0.97	28	10	2	0.3
8m pillar siltstone second workings	1.45	30	40	3	0.3
20m pillar coal	0.93	28	10	2	0.3
20m pillar siltstone	1.4	30	40	3	0.3

A series of two interfaces were adopted one at the top and one at the bottom.

Table 8: Geotechnical model of interfaces within coal pillars used for the three dimensional FLAC3D analysis

Unit	Peak Effective Cohesion (c' MPa)	Peak Friction Angle Adopted (ϕ°)	Residual Effective Cohesion (c' MPa)	Residual Friction Angle Adopted (ϕ°)	Tension (kPa)	Stiffness Normal (E GPa)	Stiffness Shear (E GPa)
Top Pillar	0.2	16	0.06	15	1	60	30
Bottom Pillar	0.2	16	0.05	15	1	40	20

4. Stages of calculation

The following stages were adopted in the calculations:

- Construction of the model, based on the x-y (flat) plane before 'extruding' to account for depths.
- Calibration of ground parameters with collected and inferred field data relevant to the area, including historical records and previous empirical relationships of pillar width and height to pillar strength.
- Apply the geostatic initial stresses to the model. For conservatism with respect to pillar stresses the ground water has been assumed to be below mine level.
- Progressively excavate the mining voids (bords and headings) to simulate the condition after mining was completed (although at the current bord height of 7.8m).
- Progressive reduction of strength and tension parameters of the pillars within the Wickham and Bullock Island area to induce the collapse that had occurred in the area.

- Reset displacements to zero while leaving stresses in place and perform progressive reduction of strength and tension parameters of all the remaining coal pillars within approximately 1/3 of its original strength in order to assess the strength reduction required to generate a collapsing pillar 'run' and to assess the extent of the pillar run. The overburden stresses are distributed according to relative stiffness of the coal in each area and amount of collapse of pillars in the area. The degree of deformation (to a condition of collapse) is assessed, including how that deformation transpires to potential surface movement.
- Add grout to known grouted areas and proposed areas and repeat previous step.
- The following report was then developed.

5. Results and discussion

5.1. Excavation of bords

After application of in situ field stresses, the bords were excavated in stages, as is required to prevent numerical instability during the analyses.

An output that summarises the final vertical stress after excavation (at completion of initial mining) is given below in Figure 7. This provides an image of the layout of workings, showing overburden stress being distributed between pillars' cores and the extent of mining.

From this the actual stresses in each of the pillars can be seen. Within the W&BIC workings the pillars have stresses in the order of 4MPa (3.3MPa yellow around the outside and 4.5MPa orange to red in the core). At the western portion of the workings the loads are much less at 3MPa to 3.5MPa.

As no workings have failed at this stage, load has not yet started to shed to the limits of mining.

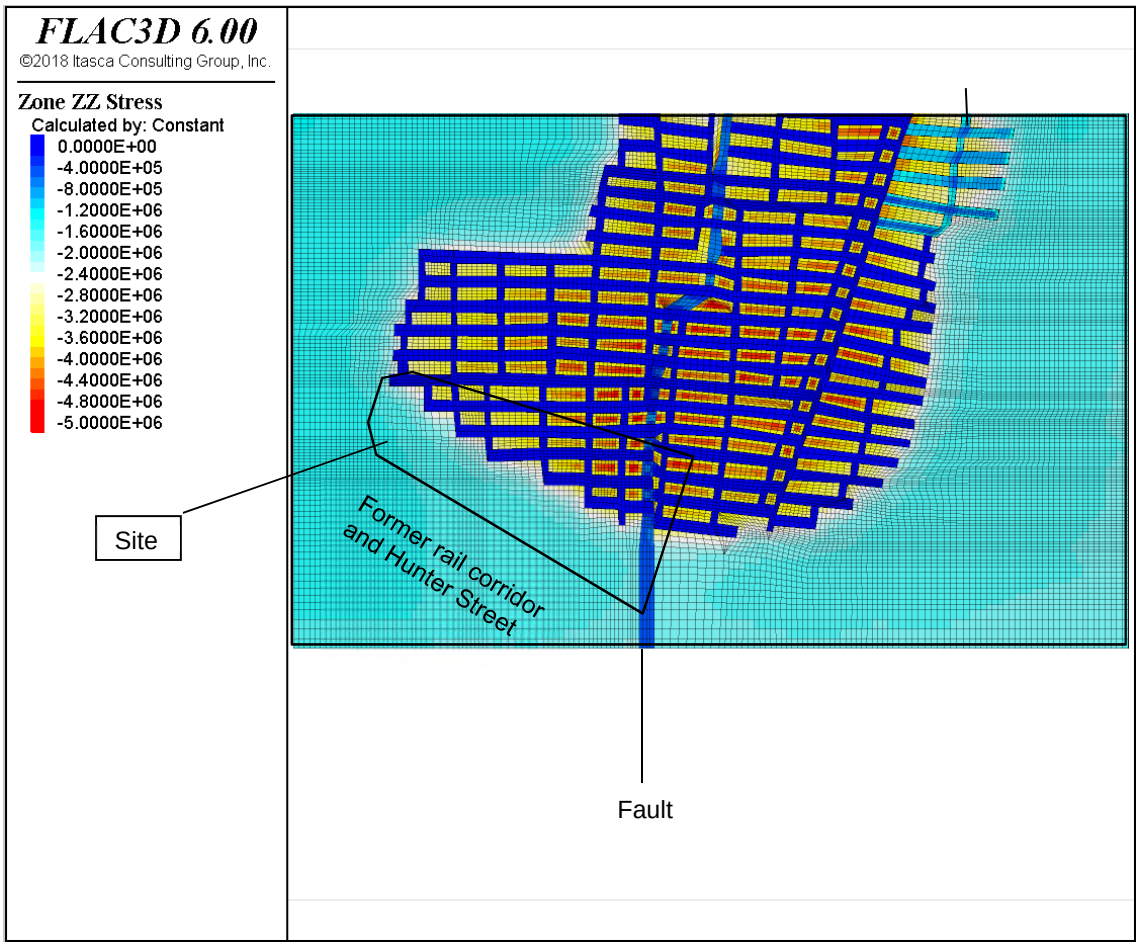


Figure 7: Stress profile after excavation of bords

5.2. Crush event within W&BIC

After initial mining, the pillars under the Site crushed (converged). As the model still had the workings as uncrushed, it was necessary to decrease the strength of the W&BIC workings to induce the crush event. For this stage, the strength of the W&BI workings was reduced by 3% per stage until the crush event was initiated. This occurred on the 3rd iteration meaning that the assumed intact strength of the coal in this area was approximately 91% less than what was previously calibrated. This means that the effective cohesion value for the coal within the W&BIC pillars is only 0.85MPa rather than the 0.93MPa originally calibrated.

The new stress profiles are shown on Figure 8, with the resultant displacements shown on Figure 9. Large stresses are present around the extent of mining.

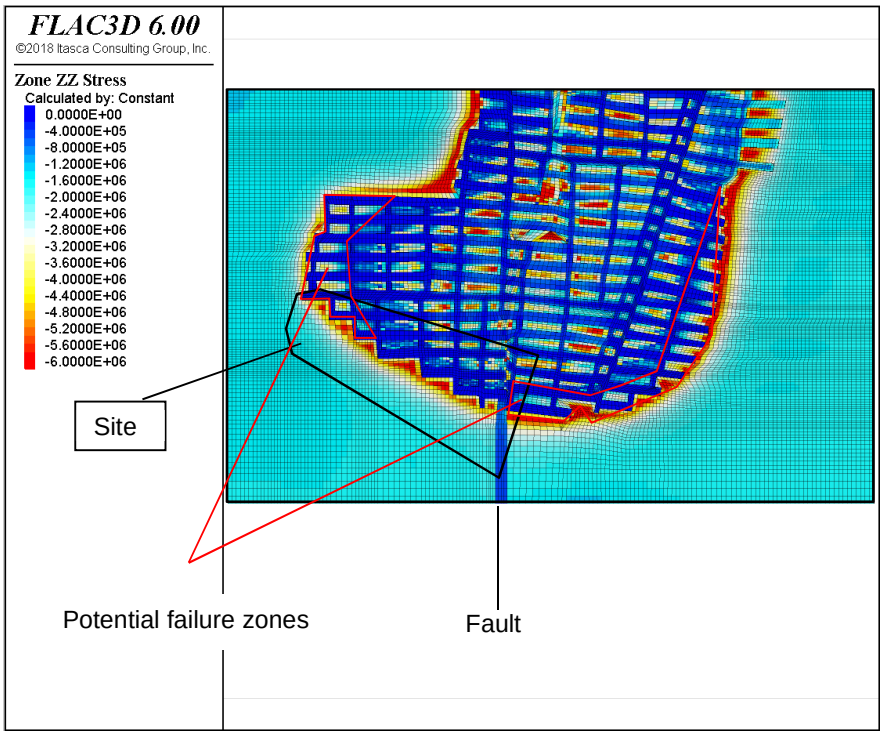


Figure 8: Stress profile after secondary mining

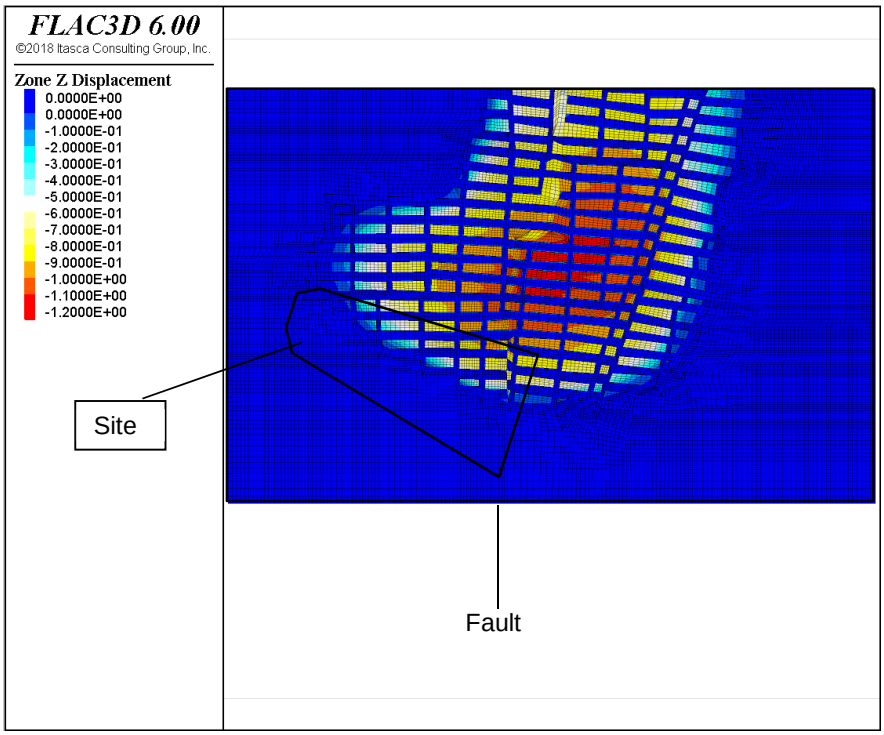


Figure 9: Crushing at mine level

The values obtained from the model versus the borehole data is provided in Table 9.

Table 9: Modelled crush versus borehole data from N08459/04-AM 24 February 2005

Borehole	Borehole Seam thickness (m)	Depth to bottom of hole (m)	Estimated roof convergence (m)	Modelled roof convergence (m)	Adopted unmined seam thickness for convergence estimate (m)
W1 (Unmined)	6.52	84.83	0		-
W2	5.82 ?	81.46	0.83	0.8	6.65
BH1	5.55	83.8	1.1	1.0	6.65
DB 2B	5.22	84.25	1.18	0.7	6.4
DB 2E	5.83	75.6	0.47	0.1	6.3
DB 2G	5.71	81.63	1.04	1.1	6.65
BH 9B	6.76	84	0	0.1	-
BH 9C	6.04	83.08	0.61	0.7	6.65
BH 9D	5.5	83.85	1.15	1.0	6.65
BH 10B	6.02	81.2	0.63	0.6	6.65
BH 11	6.75	84.2	0	0.0	-
BH 12	5.88	84.1	0.77	0.7	6.65
BH 13A	4.89	81.35	1.56	0.6	6.45
BH 14B	5.91	81	0.44	0.3	6.35
BH 14C	4.9	81.45	1.5	0.9	6.4
BH 15A	5.15	86.7	1.35	1.0	6.5
BH 15B	5.65	84.05	0.95	1.1	6.6
BH 16A	5.65	84.67	0.9	0.7	6.55
BH 16B	3.44	81.7	0.96	0.9	4.41(1)
BH 16C	5.85	84.7	0.8	0.8	6.65

Notes:

?: Approximated only

(1) : Disturbed by a fault

The above data from the model provides a reasonable agreement with the previous drilling data. The main anomaly is BH13A, which experienced much more estimated convergence in the model.

5.3. Gradual degradation of coal strength

To allow for the possible/conceivable slow degradation of coal strength, the coal strength in the numerical model was reduced by approximately 5% for each stage solved by the modelling. The resultant condition for generally every 5 increments is then saved for later examination. This results in the following reduction:

- $0.95^{5} = 0.77$
- $0.95^{10} = 0.60$
- $0.95^{15} = 0.46$
- $0.95^{22} = 0.33$

This is represented diagrammatically in Figure 10 for the 5.4m pillars after the revised peak effective cohesion of 0.85MPa.

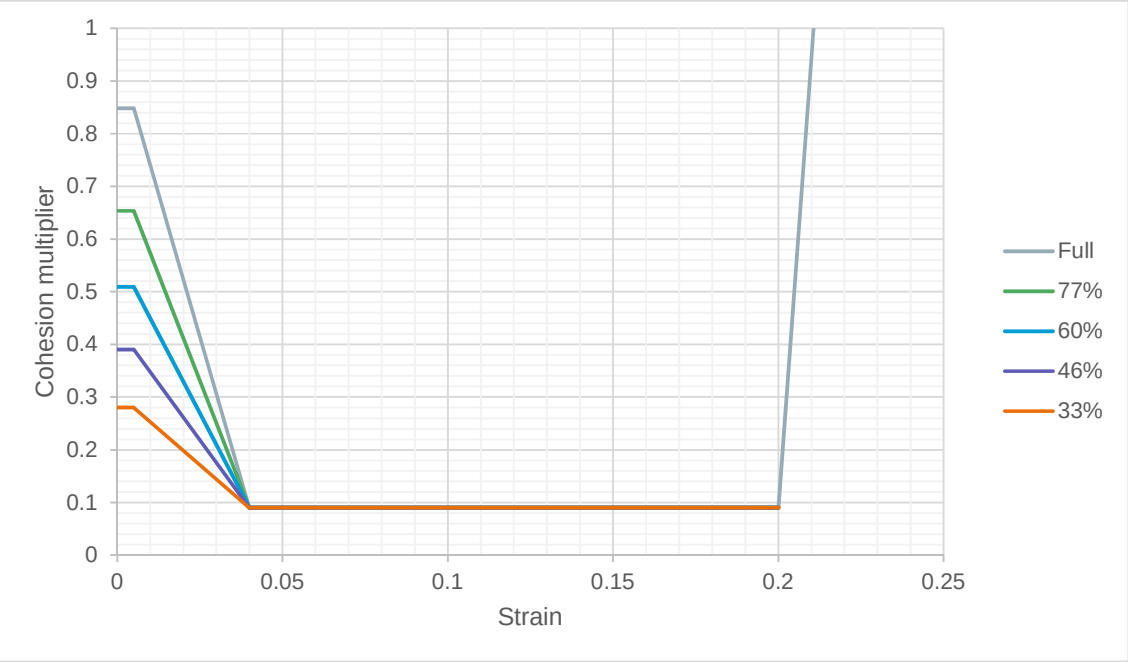


Figure 10: Change in the strain softening cohesion table of 5.4m wide pillars during the degradation of pillars

5.4. Without any grout output

Although the pillar crushing causes several forms of displacements, we have chosen to output the conceptual vertical displacement (settlement) and its distribution at the surface to demonstrate the effect of the future pillar crushing/convergence.

A sequence of the vertical displacement at surface level for the global model is shown in the following Figures 11 to 14 for the cases where the coal pillar strength is progressively reduced to 77%, 60%, 46% and 33% of its initial modelled strength. Values are shown in metres and are limited to 0.5m to increase likelihood of showing effects at the Site with contours at 20mm increments.

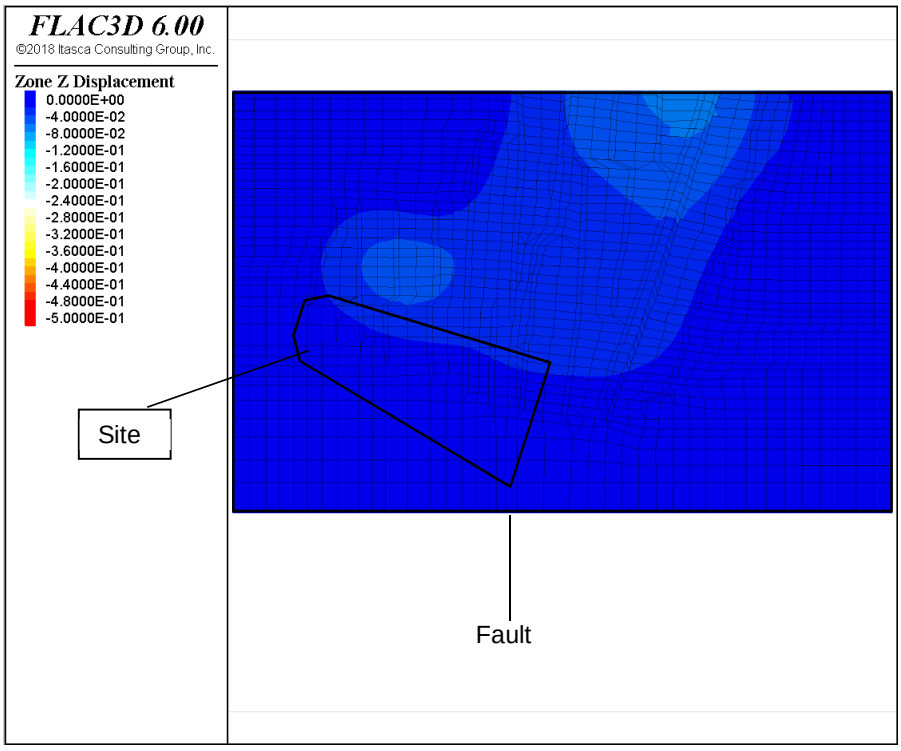


Figure 11: Conceptual vertical displacement with pillar coal at 77% strength no grout

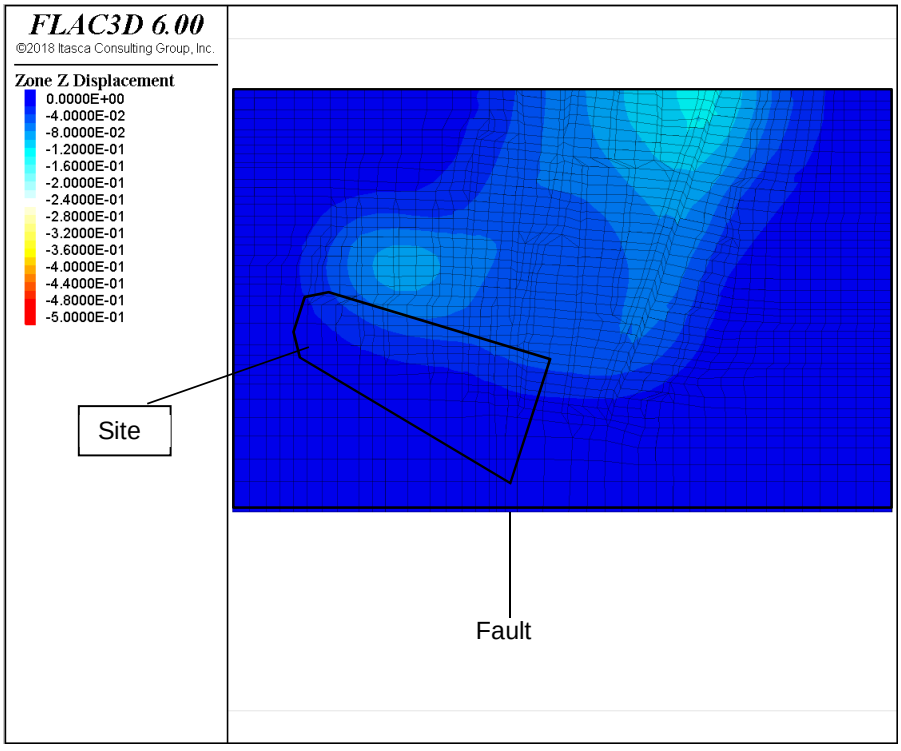


Figure 12: Conceptual vertical displacement with pillar coal at 60% strength no grout

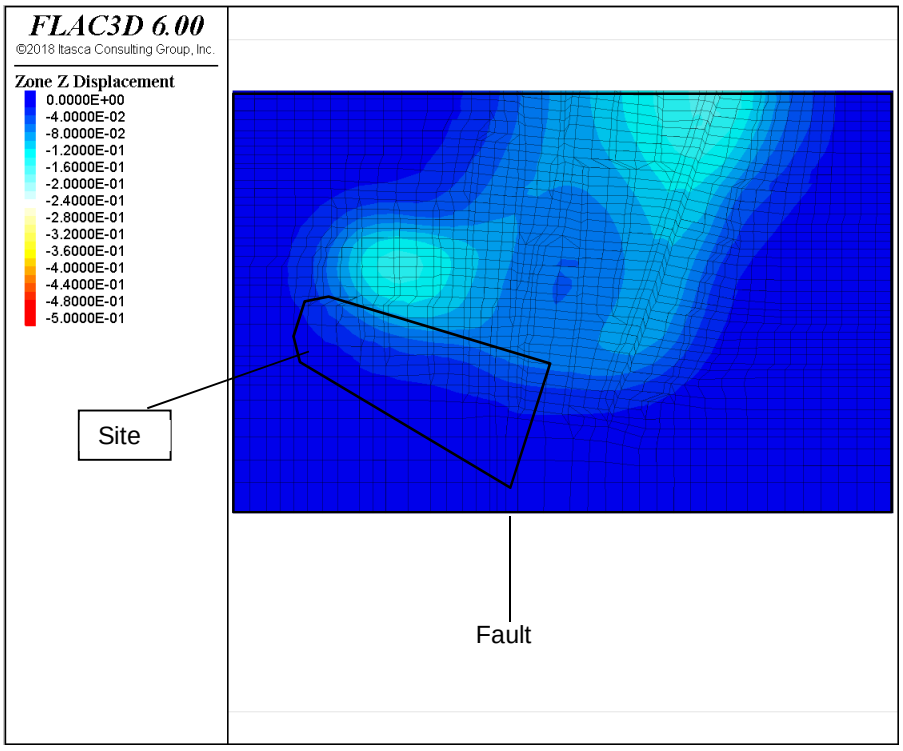


Figure 13: Conceptual vertical displacement with pillar coal at 46% strength no grout

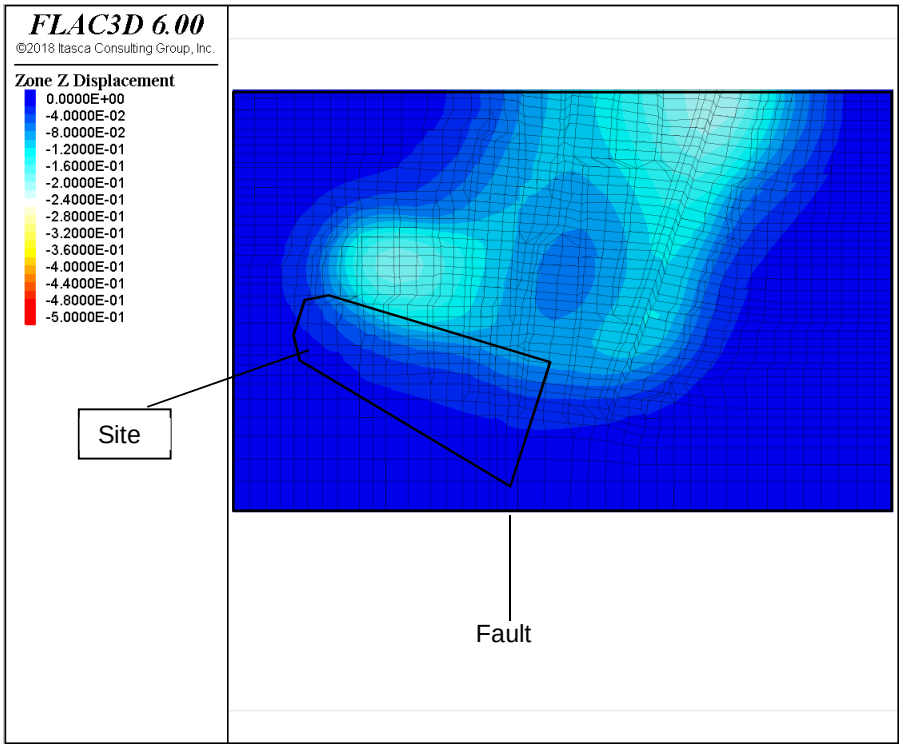


Figure 14: Conceptual vertical displacement with pillar coal at 33% strength no grout

This indicates that the future subsidence at the surface of the Site should be limited to about 120mm without grout with the maximum 200mm in the middle of the western portion of the panel of workings.

5.5. Existing and proposed grout

Before degrading the strength of the coal, grout is added to the model representing where it has already been emplaced as well as proposed locations. Existing grout locations within the model were based on Lee Wharf Stage 3 (N08459/11-AP (Revision 1) dated 22 June 2007).

Proposed grout locations include:

- GH2B (which is likely already filled), GH7, and GH8A which are partially filled and will be topped up only
- GH12, GH14B, GH15, GH18A and GH19A

Table 10: Grout/ash strength parameters.

Unit	Effective Cohesion (c' kPa)	Friction Angle Adopted (ϕ°)	Youngs Modulus (E MPa)	Poisson's Ratio (ν)
Old grout bottom 2m	30	30	120	0.3
Old grout 2m to 6m	100	32	360	0.3
Old grout top 2m	250	29	480	0.3
Ash grout bottom 2m	50	30	36	0.3
Ash grout 2m to 8m	50	30	36	0.3
Old grout bottom 2m	100	30	180	0.3
Old grout 2m to 6m	150	32	540	0.3

The model showing grout locations is shown in Figure 15.

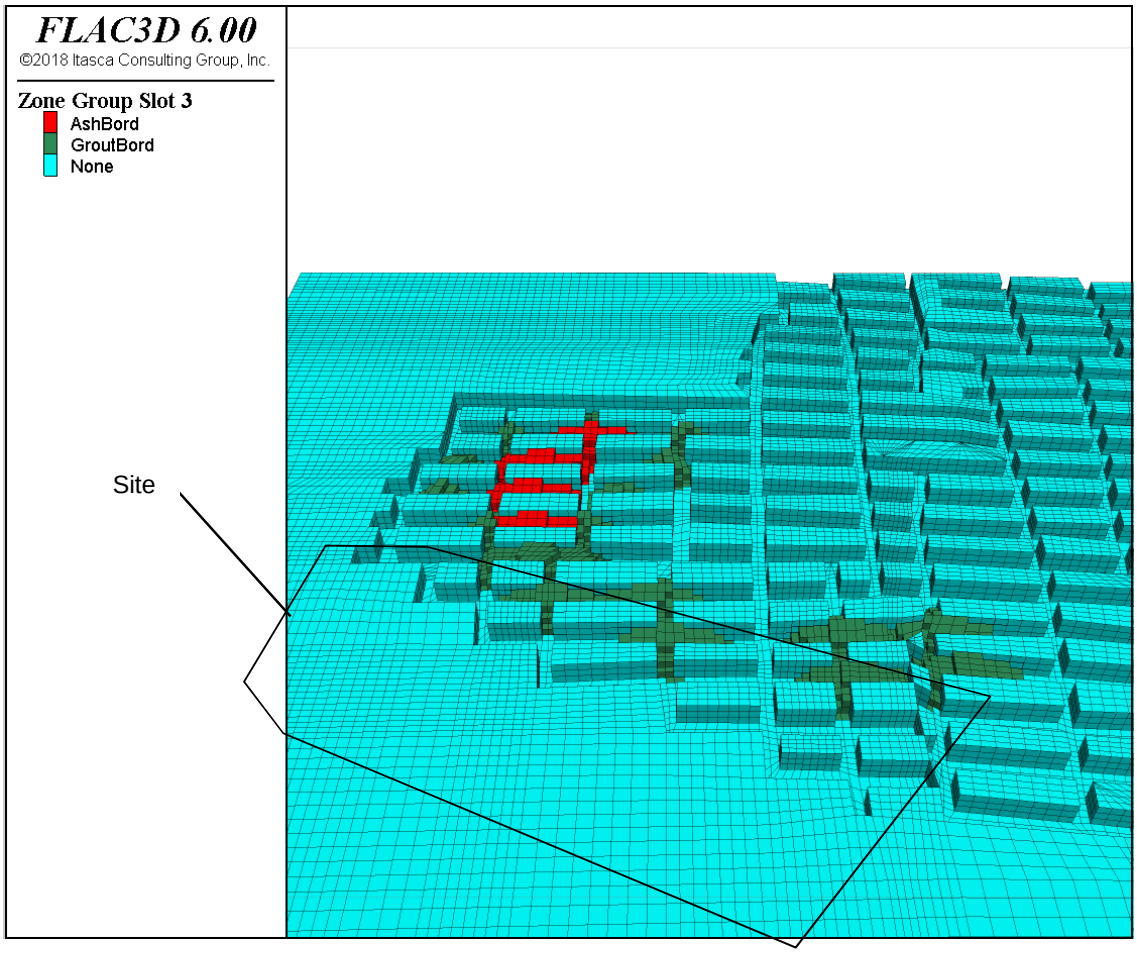


Figure 15: Existing grout locations

5.6. Output

Similar to before, the outputs below focus on the conceptual surface vertical displacement. The sequence below shows the same staging as Section 5.4 with grout.

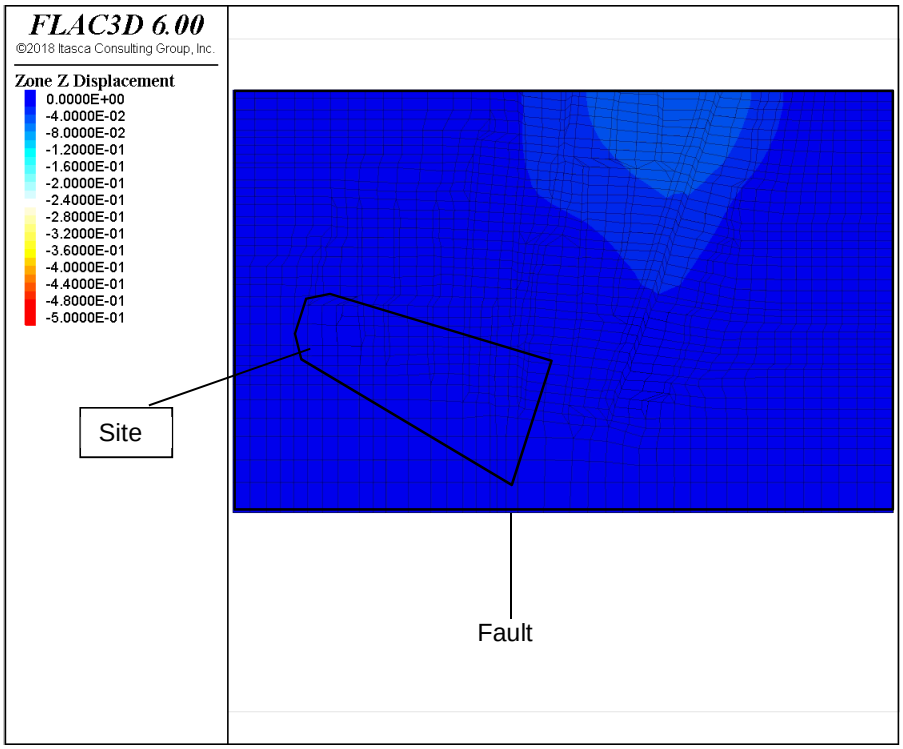


Figure 16: Conceptual vertical displacement with pillar coal at 77% strength, with grout locations

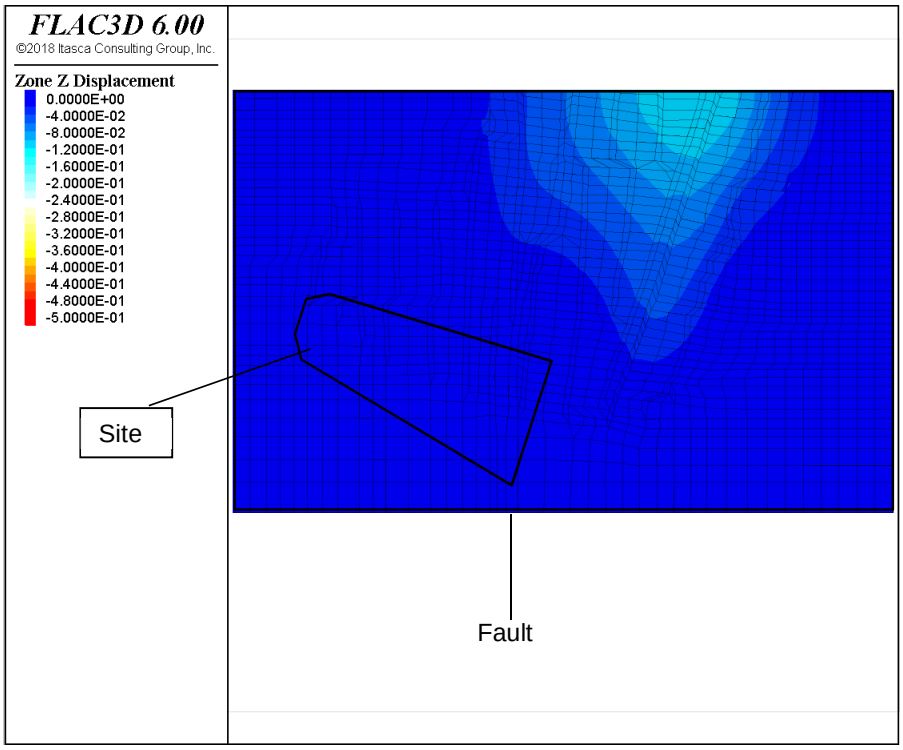


Figure 17: Conceptual vertical displacement with pillar coal at 60% strength, with grout locations

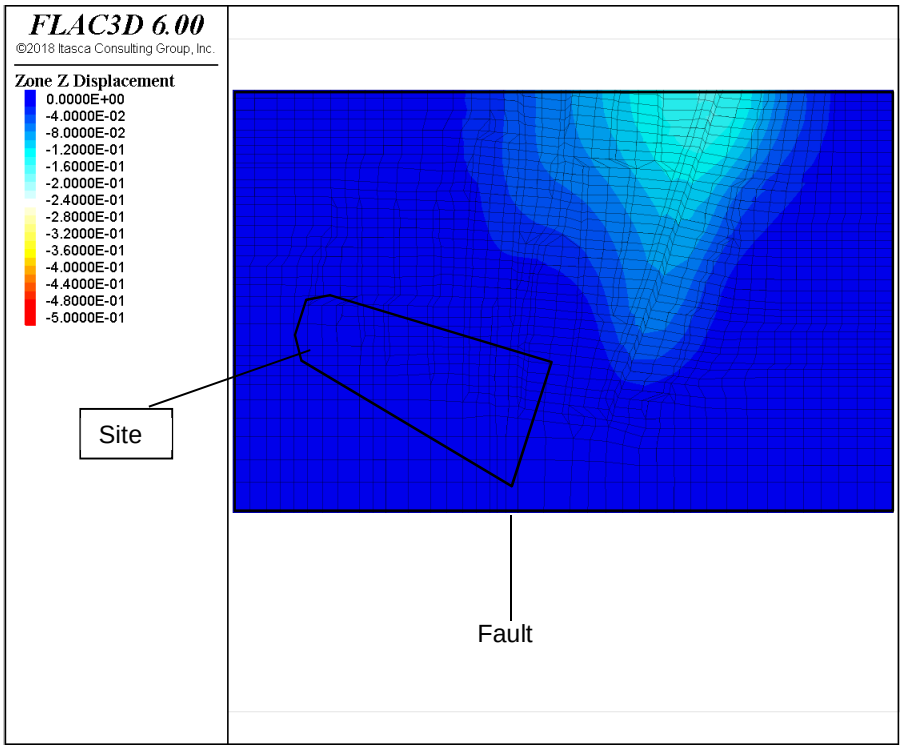


Figure 18: Conceptual vertical displacement with pillar coal at 46% strength, with grout locations

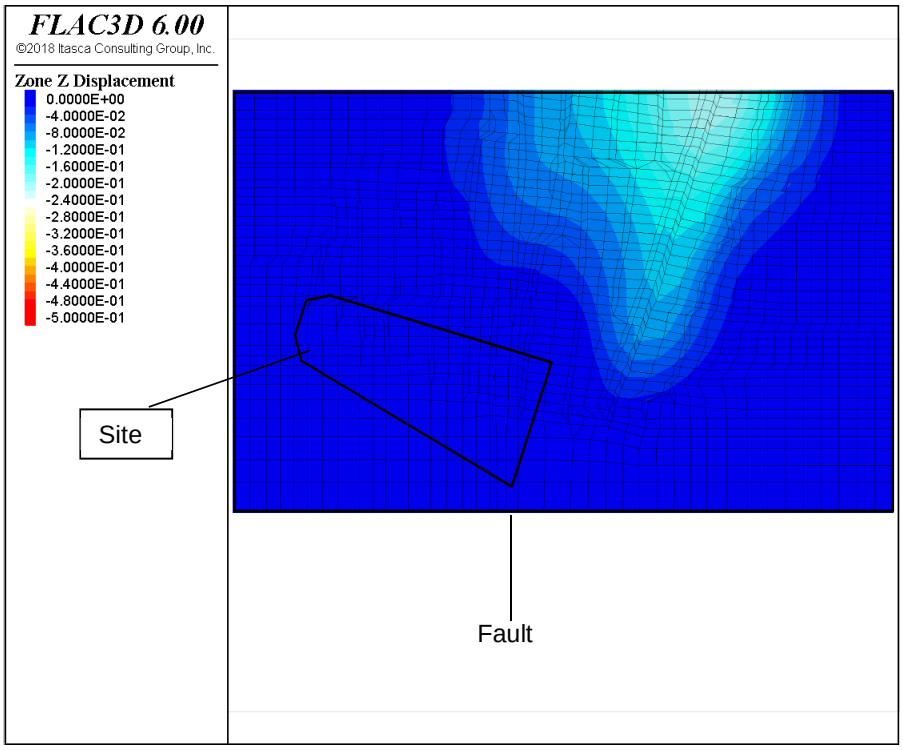


Figure 19: Conceptual vertical displacement with pillar coal at 33% strength, with grout locations

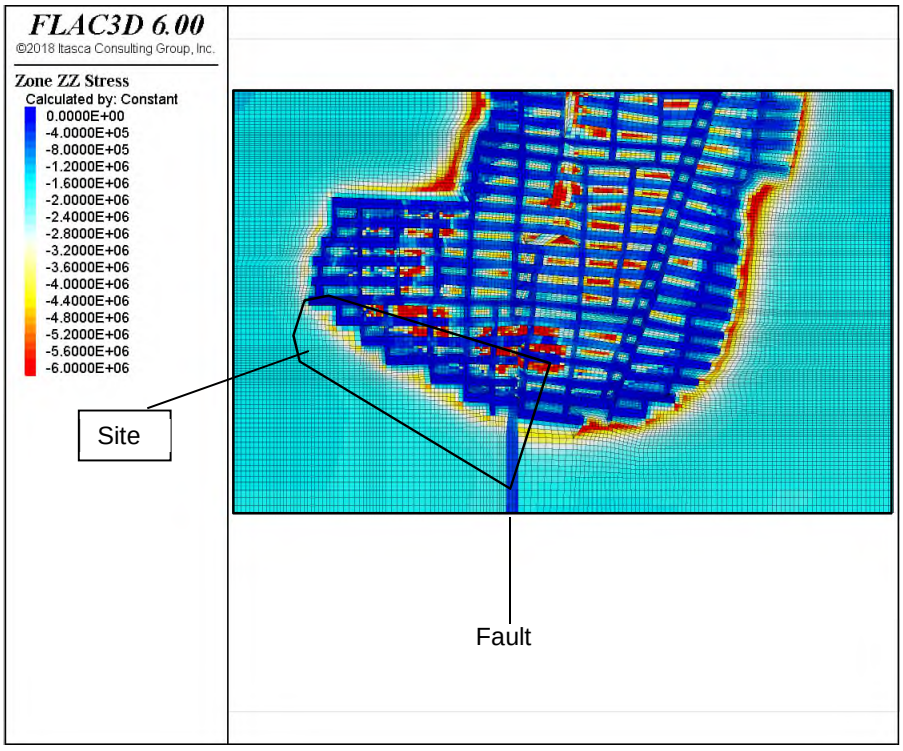


Figure 20: Conceptual vertical stress with pillar coal at 33% strength, with grout locations

Although the model indicates that the area may not subside, the grout has the effect of confining the pillars allowing the load to transfer to these pillars should subsidence occur elsewhere.

5.7. Potential residual subsidence parameters

Due to the size of the voids that remain at mine level and in turn, the uncertainty of the amount of crushing that can still occur given residual voids at mine level, some residual subsidence should be accounted for in the design.

In conjunction with an independent review, DgS Report (COF-008-1 dated 19 October 2018) Coffey has developed the parameters as provided in Table 11.

Table 11: Summary of design parameters

Parameter	At southern limit	At limit of mine workings	At 5m to 10m from northern boundary of site	At northern limit of site
Subsidence (mm)	0	20	40	50
Tilt (mm/m)	0	1	2	3
Radius of curvature concave down tensile (km)	40	10	5	3
Strain tensile (mm/m)	0.25	1	2	3
Radius of curvature concave up compressive (km)	N/A	N/A	N/A	N/A
Strain compressive (mm/m)	0	0	0	0

These parameters have been developed with reference to Figures 10a to 10b of DgS Report (COF-008-1 dated 19 October 2018). These parameters are applicable for the serviceability case. As such, should an event of this magnitude occur, the building would need to remain safe servable and repairable. These subsidence parameters are illustrated on Drawing 7.

These parameters generally conform to the parameters previously provided for the site (N08459/04-AM dated 24 February 2005) with some rounding up for conservatism and separating tensile and compressive strains. As it is proposed to grout both sides of the fault at the north-eastern corner of the Site, no additional subsidence parameters for the fault are recommended.

6. Conclusions and Recommendations

A 3D numerical analyse has been performed to model the historical crush event that occurred at the Site at the time of active mining (August 1897).

After modelling this crush event, the strength of coal was then degraded at 5% increments until reaching approximately 33% of the original coal strength (i.e. 22 increments). At this level of degradation, a series of coal pillars at the eastern edge of the panel of workings could potentially fail resulting in convergence of 200mm with 120mm at the Site.

Grout was then added to the model in existing and proposed locations. Proposed grout locations include:

- GH2B (which is likely already filled), GH7, and GH8A which are partially filled and will be topped up only
- GH12, GH14B, GH15, GH18A and GH19A

The model shows this grouting would effectively limit subsidence in the area.

Even though the model indicates that the area should not experience any future subsidence, some residual subsidence parameters are still recommended as provided in Table 11 and Drawings 7 to 8.

Guidance on the uses and limitations of this report is presented in the attached sheet, '*Important Information about your Coffey Report*', which should be read in conjunction with this report.

If you have any questions regarding this report or should you require further assistance on this project, please contact Ry Stone or the undersigned.

For and on behalf of Coffey



Simon Baker

Senior Geotechnical Engineer

References

Coffey Geosciences Report N08459/04-AG (9 July 2004);

Coffey Geosciences Report N08459/04-AM (24 February 2005);

Coffey Geosciences Report N08459/04-AM (24 February 2005);

Coffey Geosciences Report N08459/11-AP (Revision 1) (22 June 2007);

Coffey Geotechnics Report GEOTWARA20903AD-AC (5 June 2013);

M.N. Das, “Influence of width/height ratio on the post-failure behaviour of coal”, International Journal of Mining and Geological Engineering March 1986, Volume 4, Issue 1, PP79-87;

S. Ditton, DgS Report COF-008-1 dated 19 October 2018

Douglas Partners report 18862C (28 July 2000);

JM Galvin, BK Hebblewhite, MDG Salamon, BB Lin, “Establishing the Strength of Rectangular and Irregular Pillars”, ACARP Research Project No C5024 (1998);

L Holla, “Surface Subsidence Prediction in the Newcastle Coalfield”, Department of Mineral Resources, 1987;

Important information about your **Coffey** Report

As a client of Coffey you should know that site subsurface conditions cause more construction problems than any other factor. These notes have been prepared by Coffey to help you interpret and understand the limitations of your report.

Your report is based on project specific criteria

Your report has been developed on the basis of your unique project specific requirements as understood by Coffey and applies only to the site investigated. Project criteria typically include the general nature of the project; its size and configuration; the location of any structures on the site; other site improvements; the presence of underground utilities; and the additional risk imposed by scope-of-service limitations imposed by the client. Your report should not be used if there are any changes to the project without first asking Coffey to assess how factors that changed subsequent to the date of the report affect the report's recommendations. Coffey cannot accept responsibility for problems that may occur due to changed factors if they are not consulted.

Subsurface conditions can change

Subsurface conditions are created by natural processes and the activity of man. For example, water levels can vary with time, fill may be placed on a site and pollutants may migrate with time. Because a report is based on conditions which existed at the time of subsurface exploration, decisions should not be based on a report whose adequacy may have been affected by time. Consult Coffey to be advised how time may have impacted on the project.

Interpretation of factual data

Site assessment identifies actual subsurface conditions only at those points where samples are taken and when they are taken. Data derived from literature and external data source review, sampling and subsequent laboratory testing are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact on the proposed development and recommended actions. Actual conditions may differ from those inferred to exist, because no professional, no matter how qualified, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions. For this reason, owners should retain the services of Coffey through the development stage, to identify variances, conduct additional tests if required, and recommend solutions to problems encountered on site.

Your report will only give preliminary recommendations

Your report is based on the assumption that the site conditions as revealed through selective point sampling are indicative of actual conditions throughout an area. This assumption cannot be substantiated until project implementation has commenced and therefore your report recommendations can only be regarded as preliminary. Only Coffey, who prepared the report, is fully familiar with the background information needed to assess whether or not the report's recommendations are valid and whether or not changes should be considered as the project develops. If another party undertakes the implementation of the recommendations of this report there is a risk that the report will be misinterpreted and Coffey cannot be held responsible for such misinterpretation.

Your report is prepared for specific purposes and persons

To avoid misuse of the information contained in your report it is recommended that you confer with Coffey before passing your report on to another party who may not be familiar with the background and the purpose of the report. Your report should not be applied to any project other than that originally specified at the time the report was issued.

Interpretation by other design professionals

Costly problems can occur when other design professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, retain Coffey to work with other project design professionals who are affected by the report. Have Coffey explain the report implications to design professionals affected by them and then review plans and specifications produced to see how they incorporate the report findings.

Data should not be separated from the report*

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way. Logs, figures, drawings, etc. are customarily included in our reports and are developed by scientists, engineers or geologists based on their interpretation of field logs (assembled by field personnel) and laboratory evaluation of field samples. These logs etc. should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

Geoenvironmental concerns are not at issue

Your report is not likely to relate any findings, conclusions, or recommendations about the potential for hazardous materials existing at the site unless specifically required to do so by the client. Specialist equipment, techniques, and personnel are used to perform a geoenvironmental assessment. Contamination can create major health, safety and environmental risks. If you have no information about the potential for your site to be contaminated or create an environmental hazard, you are advised to contact Coffey for information relating to geoenvironmental issues.

Rely on Coffey for additional assistance

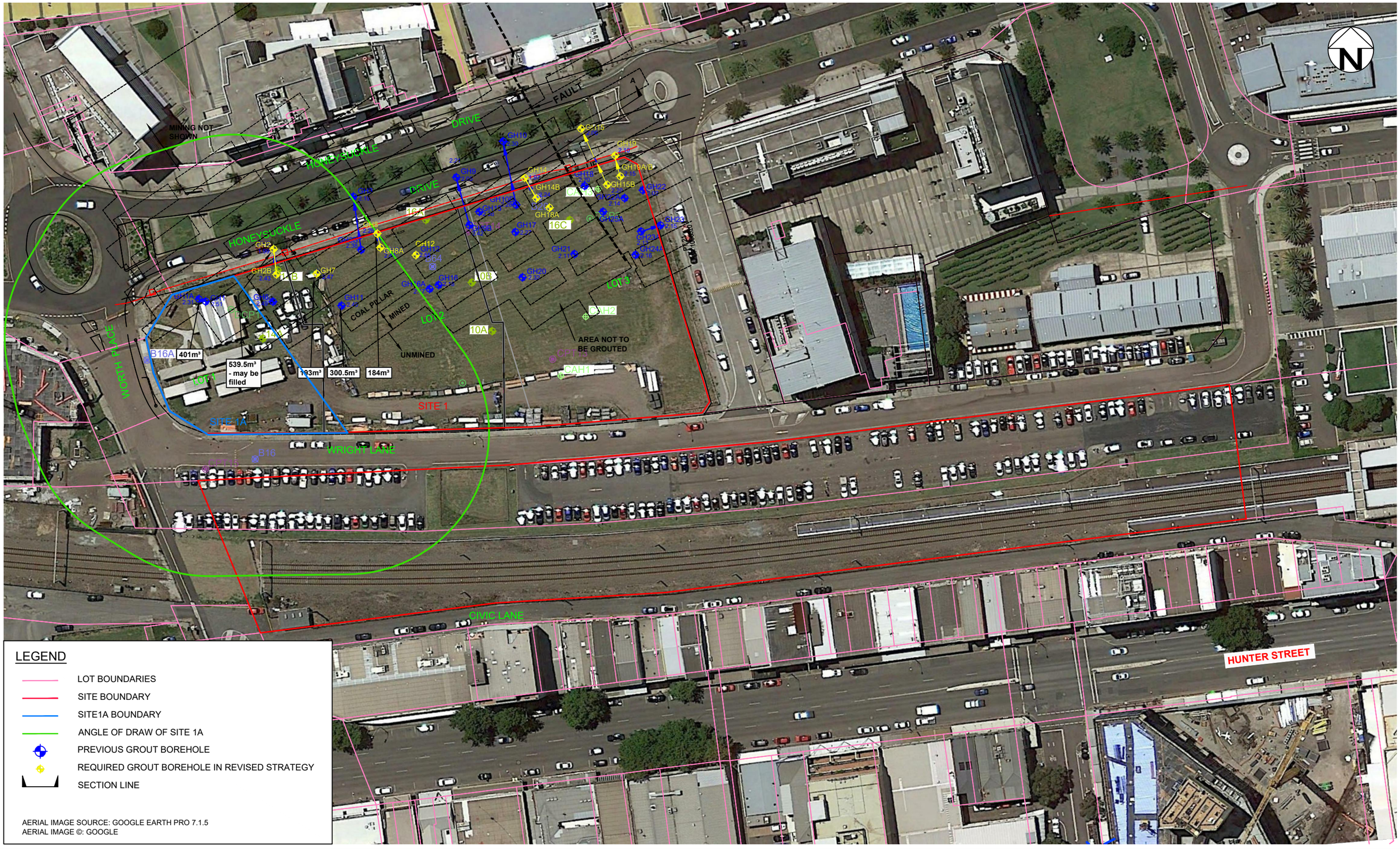
Coffey is familiar with a variety of techniques and approaches that can be used to help reduce risks for all parties to a project, from design to construction. It is common that not all approaches will be necessarily dealt with in your site assessment report due to concepts proposed at that time. As the project progresses through design towards construction, speak with Coffey to develop alternative approaches to problems that may be of genuine benefit both in time and cost.

Responsibility

Reporting relies on interpretation of factual information based on judgement and opinion and has a level of uncertainty attached to it, which is far less exact than the design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. To help prevent this problem, a number of clauses have been developed for use in contracts, reports and other documents. Responsibility clauses do not transfer appropriate liabilities from Coffey to other parties but are included to identify where Coffey's responsibilities begin and end. Their use is intended to help all parties involved to recognise their individual responsibilities. Read all documents from Coffey closely and do not hesitate to ask any questions you may have.

* For further information on this aspect reference should be made to "Guidelines for the Provision of Geotechnical information in Construction Contracts" published by the Institution of Engineers Australia, National headquarters, Canberra, 1987.

Drawings



LEGEND

- LOT BOUNDARIES
- SITE BOUNDARY
- SITE1A BOUNDARY
- ANGLE OF DRAW OF SITE 1A
- PREVIOUS GROUT BOREHOLE
- REQUIRED GROUT BOREHOLE IN REVISED STRATEGY
- SECTION LINE

AERIAL IMAGE SOURCE: GOOGLE EARTH PRO 7.1.5
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revision	no.	description	drawn	approved	date
	A	ORIGINAL ISSUE	SJB	PW	19/10/2018

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Scale (metres) 1:1000

drawn	SJB
approved	PW
date	19/10/2018
scale	AS SHOWN
original size	A3

coffey
A TETRA TECH COMPANY

client: UNIVERSITY OF NEWCASTLE

project: PROPOSED SITE 1 HONEYSUCKLE CITY CAMPUS DEVELOPMENT
HONEYSUCKLE DRIVE NEWCASTLE
MINE SUBSIDENCE ASSESSMENT

title: SITE LOCATION

project no: 754-NTLEN213472 | drawing no: DRAWING 1 | rev: A

PLOT DATE: 19/10/2018 12:25:44 PM DWG FILE: F:\ENVIRONMENTS\JOB FILES\NTLEN\NTLEN210000 - NTLEN219999\NTLEN213472 - UON, HONEYSUCKLE - DEVELOPMENTS\06 DRAWINGS\REPORT R06.DWG



LEGEND

- LOT BOUNDARIES
- SITE 1 BOUNDARY
- SITE1A BOUNDARY
- ANGLE OF DRAW OF SITE 1A
- GROUT BOREHOLE N08459/11-AP
- GROUT BOREHOLE GEOTWARA20903AD
- REQUIRED GROUT BOREHOLE IN REVISED STRATEGY
- SECTION LINE

BACKGROUND IMAGE SOURCE (TOP LEFT) : RT579 SHEET 1
IMAGE ©: WICKHAM AND BULLOCK ISLAND COLLIERY
BACKGROUND IMAGE SOURCE: RT566 SHEETS 1 AND 10
IMAGE ©: AUSTRALIAN AGRICULTURAL COMPANY

revision	no.	description	drawn	approved	date
	A	ORIGINAL ISSUE	SJB	PW	19/10/2018

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drawn	SJB
approved	PW
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scale	AS SHOWN
original size	A3

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client: UNIVERSITY OF NEWCASTLE

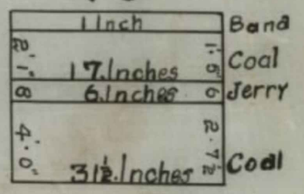
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HONEYSUCKLE DRIVE NEWCASTLE
MINE SUBSIDENCE ASSESSMENT

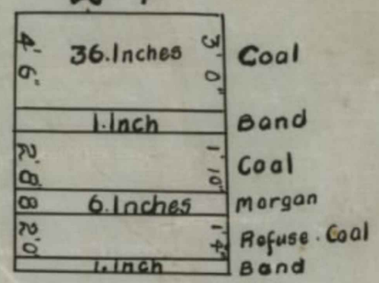
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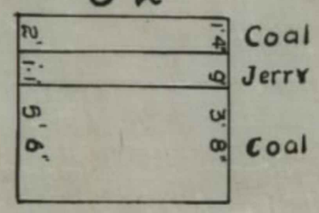
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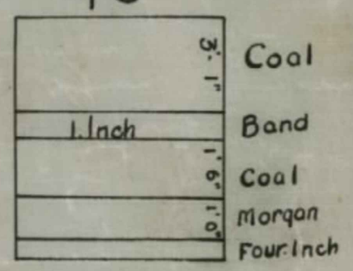
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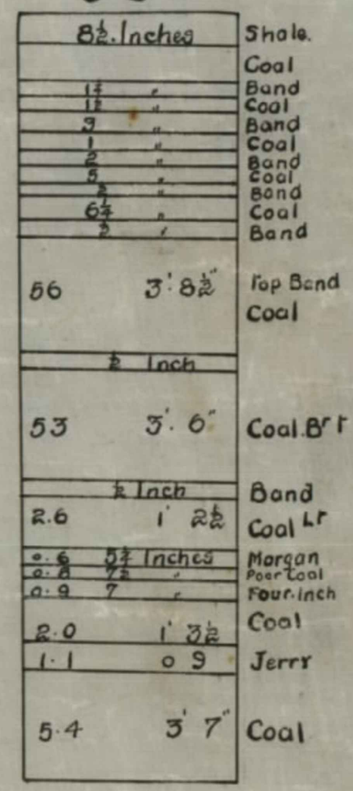
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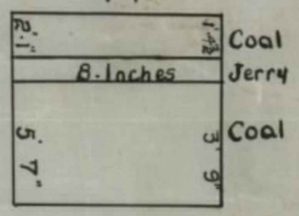


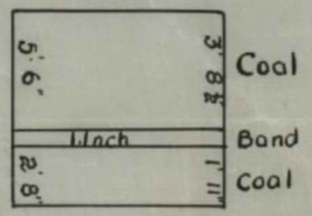


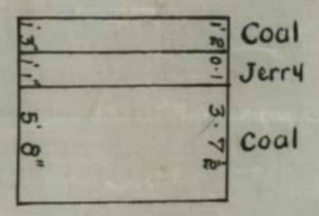


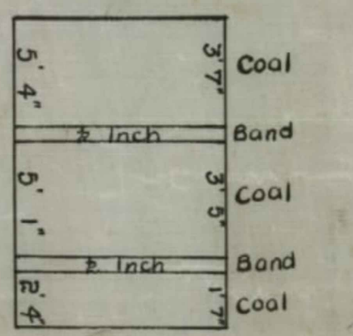


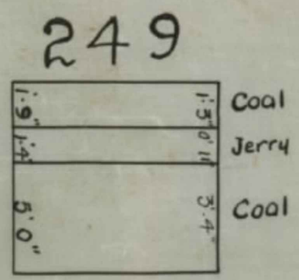


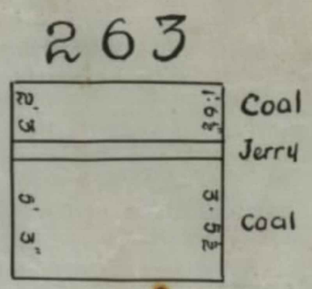












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approved	PW
date	19/10/2018
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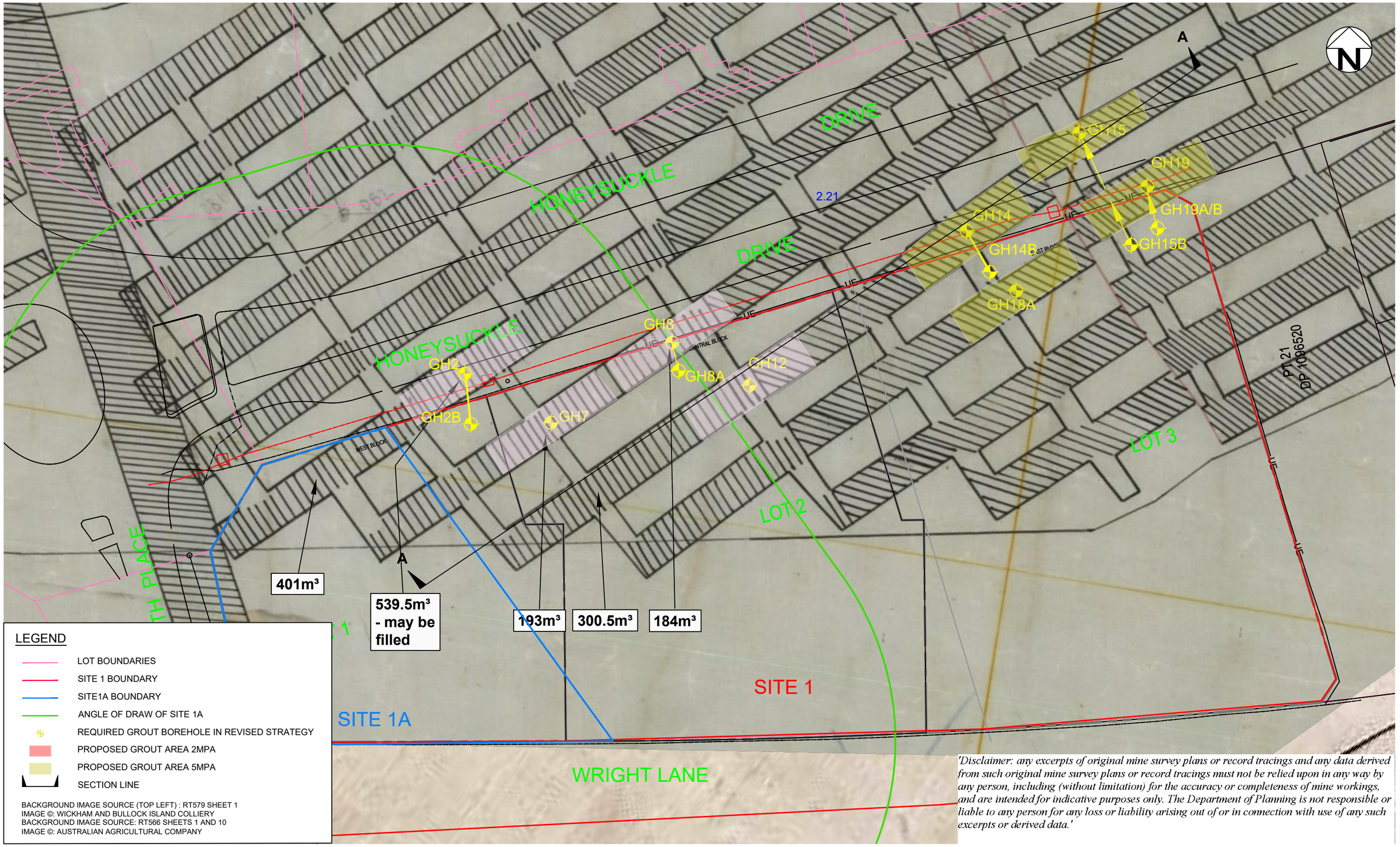
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project: PROPOSED SITE 1 HONEYSUCKLE CITY CAMPUS DEVELOPMENT
HONEYSUCKLE DRIVE NEWCASTLE
MINE SUBSIDENCE ASSESSMENT

title: WICKHAM AND BULLOCK ISLAND COLLIERY SEAM SECTIONS

project no: 754-NTLEN213472 | drawing no: DRAWING 3 | rev: A

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LEGEND

- LOT BOUNDARIES
- SITE 1 BOUNDARY
- SITE1A BOUNDARY
- ANGLE OF DRAW OF SITE 1A
- REQUIRED GROUT BOREHOLE IN REVISED STRATEGY
- PROPOSED GROUT AREA 2MPA
- PROPOSED GROUT AREA 5MPA
- SECTION LINE

BACKGROUND IMAGE SOURCE (TOP LEFT) : RT579 SHEET 1
IMAGE ©: WICKHAM AND BULLOCK ISLAND COLLIERY
BACKGROUND IMAGE SOURCE: RT566 SHEETS 1 AND 10
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drawn	SJB
approved	PW
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original size	A3

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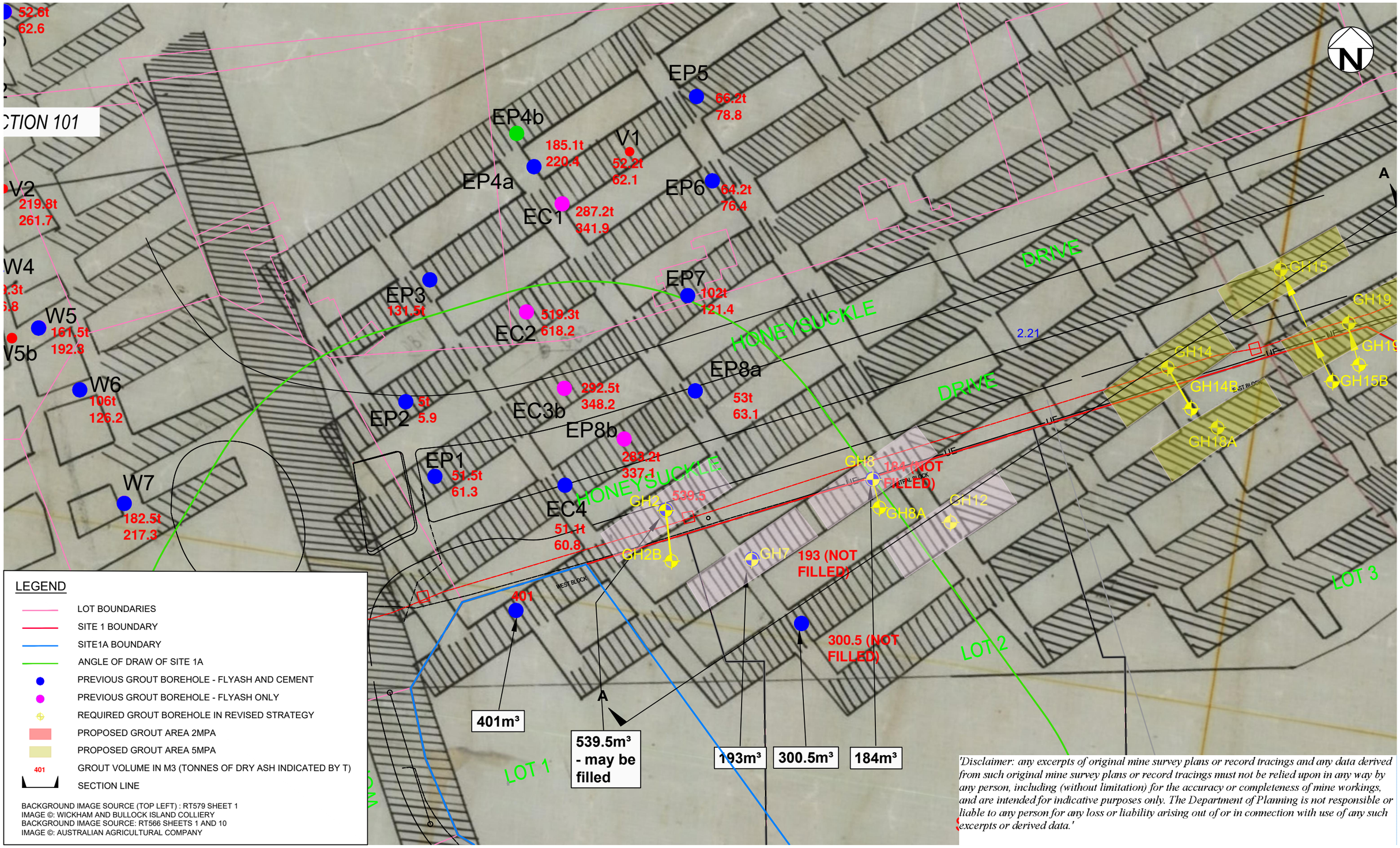
client: UNIVERSITY OF NEWCASTLE

project: PROPOSED SITE 1 HONEYSUCKLE CITY CAMPUS DEVELOPMENT
HONEYSUCKLE DRIVE NEWCASTLE
MINE SUBSIDENCE ASSESSMENT

title: PROPOSED GROUT LAYOUT

project no: 754-NTLEN213472 | drawing no: DRAWING 4 | rev: A

PLOT DATE: 19/10/2018 12:26:17 PM DWG FILE: F:\ENVIRONMENTS\JOB FILES\NTLEN\NTLEN210000 - NTLEN219999\NTLEN213472 - UON, HONEYSUCKLE - DEVELOPMENTS\09 DRAWINGS\REPORT R06.DWG



LEGEND

- LOT BOUNDARIES
- SITE 1 BOUNDARY
- SITE1A BOUNDARY
- ANGLE OF DRAW OF SITE 1A
- PREVIOUS GROUT BOREHOLE - FLYASH AND CEMENT
- PREVIOUS GROUT BOREHOLE - FLYASH ONLY
- REQUIRED GROUT BOREHOLE IN REVISED STRATEGY
- PROPOSED GROUT AREA 2MPA
- PROPOSED GROUT AREA 5MPA
- 401 — GROUT VOLUME IN M3 (TONNES OF DRY ASH INDICATED BY T)
- SECTION LINE

BACKGROUND IMAGE SOURCE (TOP LEFT) : RT579 SHEET 1
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BACKGROUND IMAGE SOURCE: RT566 SHEETS 1 AND 10
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revision	no.	description	drawn	approved	date
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approved	PW
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original size	A3

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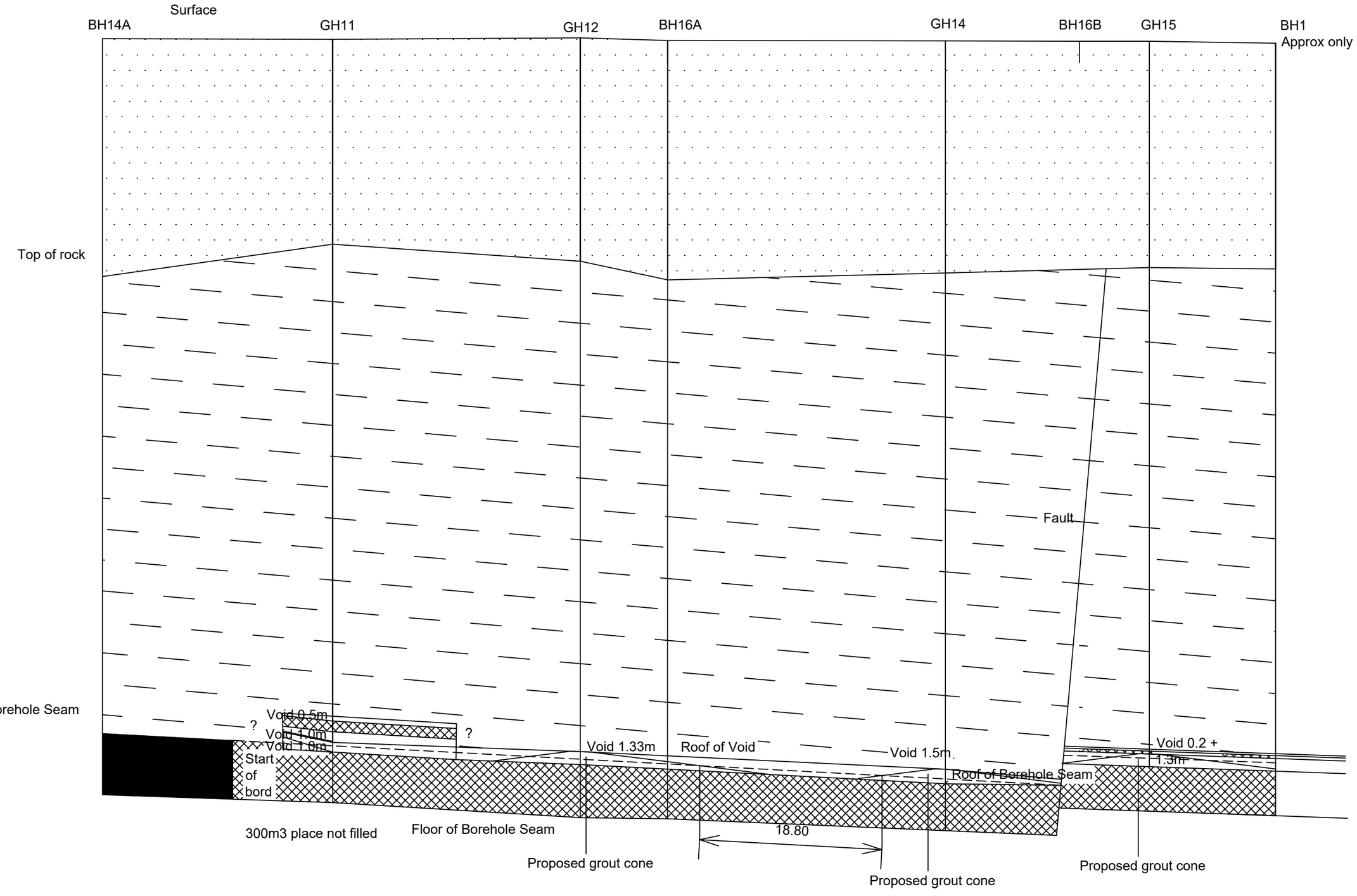
client: UNIVERSITY OF NEWCASTLE

project: PROPOSED SITE 1 HONEYSUCKLE CITY CAMPUS DEVELOPMENT
HONEYSUCKLE DRIVE NEWCASTLE
MINE SUBSIDENCE ASSESSMENT

title: PROPOSED GROUT LAYOUT WITH EXISTING GROUT LOCATIONS

project no: 754-NTLEN213472 | drawing no: DRAWING 5 | rev: A

PLOT DATE: 19/10/2018 12:26:27 PM DWG FILE: F:\ENVIRONMENTS\JOB FILES\NTLEN\NTLE\N210000 - NTLEN219999\NTLEN213472 - UON, HONEYSUCKLE - DEVELOPMENTS\06 DRAWINGS\REPORT R06.DWG



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Scale (metres) 1:400

drawn	SJB
approved	PW
date	19/10/2018
scale	NTS
original size	A3

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client: UNIVERSITY OF NEWCASTLE

project: PROPOSED SITE 1 HONEYSUCKLE CITY CAMPUS DEVELOPMENT
HONEYSUCKLE DRIVE NEWCASTLE
MINE SUBSIDENCE ASSESSMENT

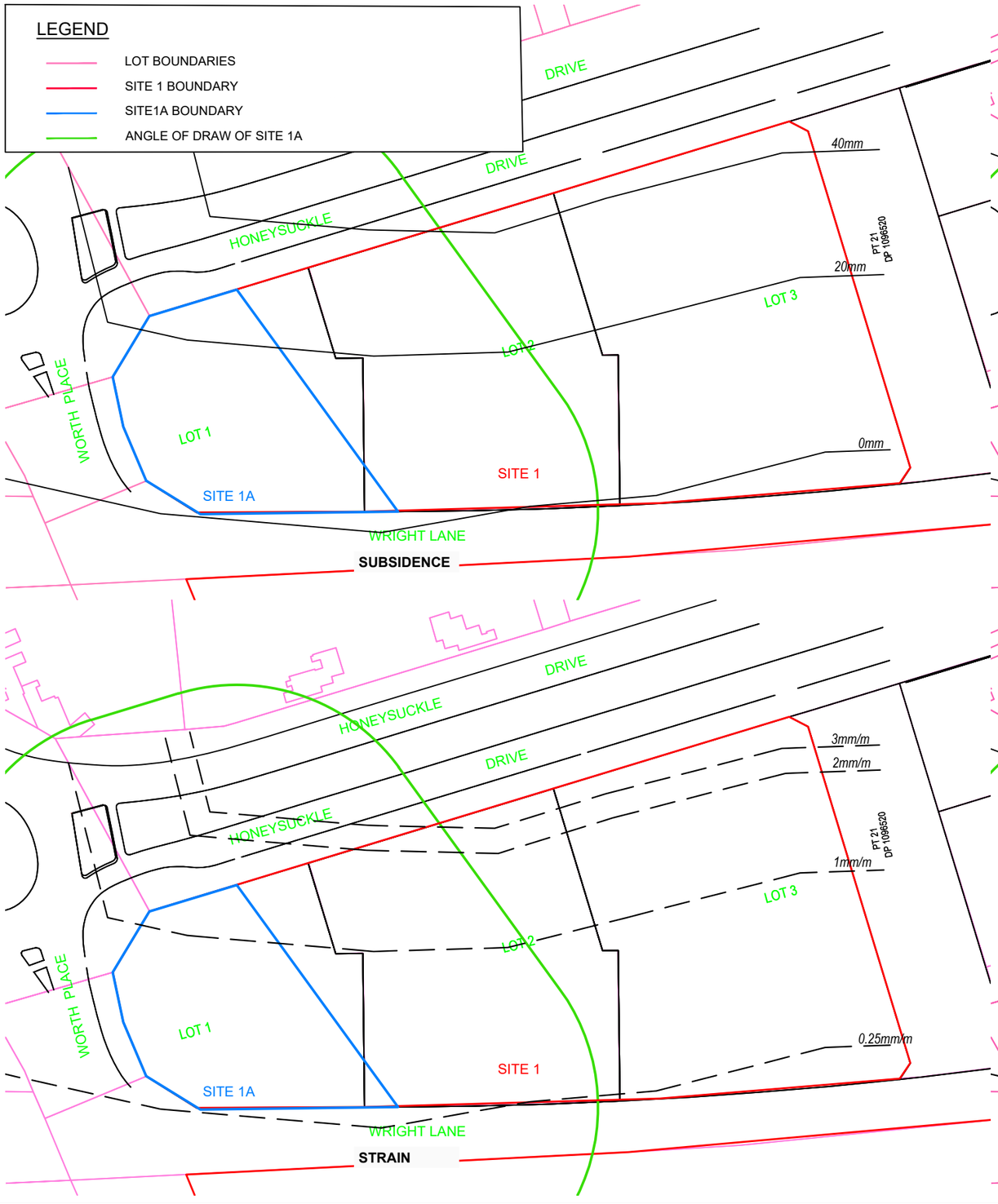
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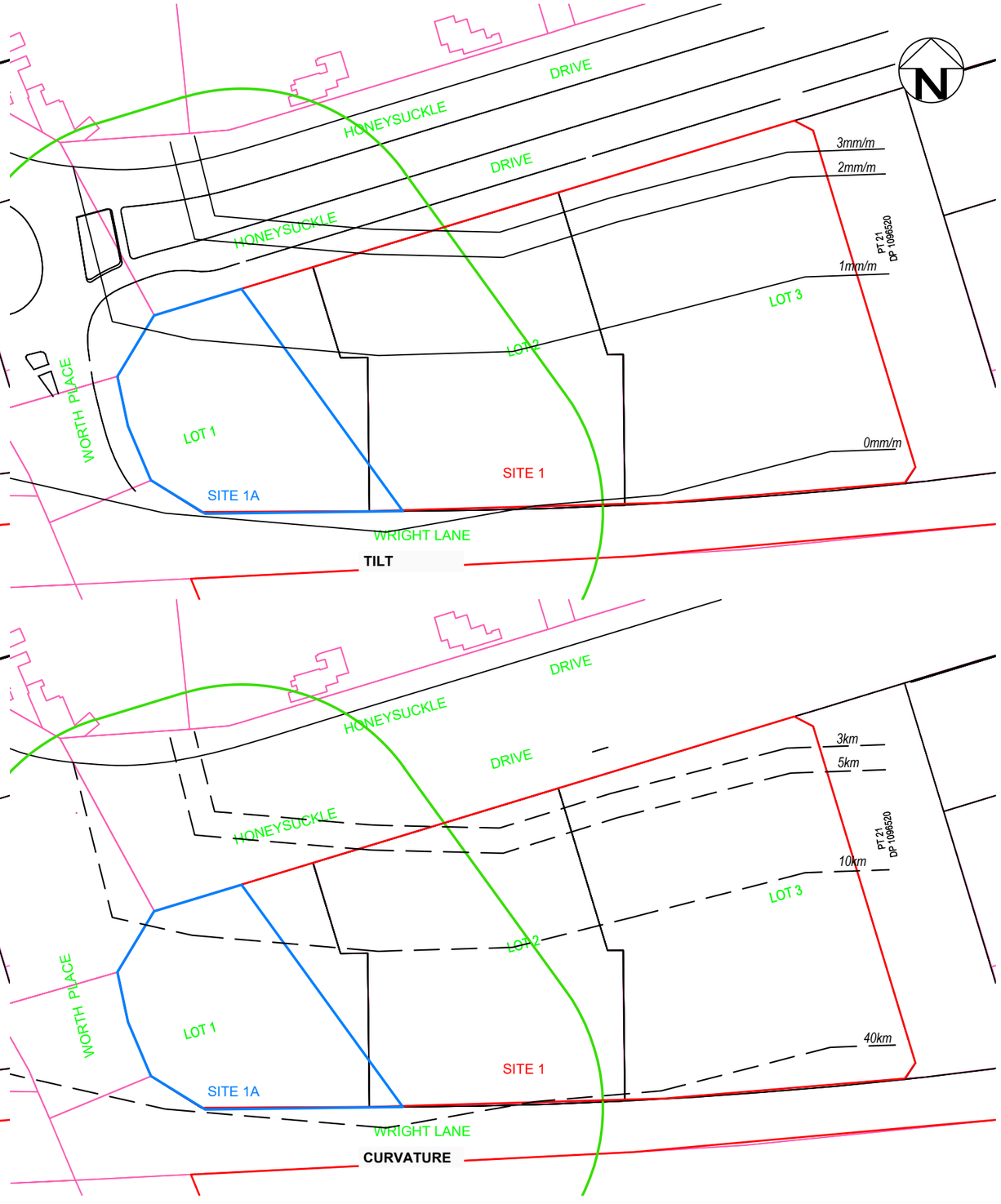
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LEGEND

- LOT BOUNDARIES
- SITE 1 BOUNDARY
- SITE1A BOUNDARY
- ANGLE OF DRAW OF SITE 1A



SUBSIDENCE



TILT

STRAIN

CURVATURE

revision	no.	description	drawn	approved	date
	A	ORIGINAL ISSUE	SJB	PW	19/10/2018

10 0 10 30 50

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drawn	SJB
approved	PW
date	16/11/2018
scale	AS SHOWN
original size	A3

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client: UNIVERSITY OF NEWCASTLE

project: PROPOSED SITE 1 HONEYSUCKLE CITY CAMPUS DEVELOPMENT
HONEYSUCKLE DRIVE NEWCASTLE
MINE SUBSIDENCE ASSESSMENT

title: PROPOSED SUBSIDENE DESIGN PARAMETERS

project no: 754-NTLEN213472 | drawing no: DRAWING 7 | rev: A

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