



SITE AUDIT REPORT

Proposed Alex Avenue Public School, 28 Farmland Drive,
Schofields NSW 2762

Richard Crooks Constructions Pty Ltd

10 September 2019

19175_SAR155



NSW Site Auditor Scheme

Site Audit Statement

A site audit statement summarises the findings of a site audit. For full details of the site auditor's findings, evaluations and conclusions, refer to the associated site audit report.

This form was approved under the *Contaminated Land Management Act 1997* on 12 October 2017.

For information about completing this form, go to Part IV.

Part I: Site audit identification

Site audit statement no. SAS155

This site audit is a:

☐ ~~statutory audit~~

☒ non-statutory audit

within the meaning of the *Contaminated Land Management Act 1997*.

Site auditor details

(As accredited under the *Contaminated Land Management Act 1997*)

Name Rebeka Hall

Company Zoic Environmental Pty Ltd

Address Suite 1, Level 9, 189 Kent St SYDNEY NSW

Postcode 2000

Phone 02 9251 8070

Email rebeka.hall@zoic.com.au

Site details

Address 28 Farmland Drive Schofields NSW

Postcode 2762

Property description

(Attach a separate list if several properties are included in the site audit.)

Lots 1 and 2 in DP1244925

Local government area Blacktown City Council

Area of site (include units, e.g. hectares) Approx. 2.5Ha

Current zoning SP2: Infrastructure: Educational Establishment

Regulation and notification

To the best of my knowledge:

☐ ~~the site is the subject of a declaration, order, agreement, proposal or notice under the Contaminated Land Management Act 1997 or the Environmentally Hazardous Chemicals Act 1985, as follows: (provide the no. if applicable)~~

☐ ~~Declaration no.~~

☐ ~~Order no.~~

☐ ~~Proposal no.~~

☐ ~~Notice no.~~

☒ **the site is not** the subject of a declaration, order, proposal or notice under the *Contaminated Land Management Act 1997* or the *Environmentally Hazardous Chemicals Act 1985*.

To the best of my knowledge:

☐ ~~the site has been notified to the EPA under section 60 of the Contaminated Land Management Act 1997~~

☒ the site **has not** been notified to the EPA under section 60 of the *Contaminated Land Management Act 1997*.

Site audit commissioned by

Name Tom Hemmett

Company Richard Crooks Constructions Pty Ltd

Address Level 3, 4 Broadcast Way, Artarmon NSW

Postcode 2064

Phone 02 9902 4700

Email HemmettT@richardcrooks.com.au

~~Contact details for contact person (if different from above)~~

~~Name~~_____

~~Phone~~_____

~~Email~~_____

~~Nature of statutory requirements (not applicable for non-statutory audits)~~

~~☐ Requirements under the *Contaminated Land Management Act 1997*
(e.g. management order; please specify, including date of issue)~~

~~☐ Requirements imposed by an environmental planning instrument
(please specify, including date of issue)~~

~~☐ Development consent requirements under the *Environmental Planning and Assessment Act 1979* (please specify consent authority and date of issue)~~

~~☐ Requirements under other legislation (please specify, including date of issue)~~

Purpose of site audit

- ☒ **A1** To determine land use suitability

Intended uses of the land: Public primary school

~~OR~~

- ~~☐ **A2** To determine land use suitability subject to compliance with either an active or passive environmental management plan~~

~~Intended uses of the land:~~

~~OR~~

~~(Tick all that apply)~~

- ~~☐ **B1** To determine the nature and extent of contamination~~

- ~~☐ **B2** To determine the appropriateness of:~~

~~☐ an investigation plan~~

~~☐ a remediation plan~~

~~☐ a management plan~~

- ~~☐ **B3** To determine the appropriateness of a **site testing plan** to determine if groundwater is safe and suitable for its intended use as required by the *Temporary Water Restrictions Order for the Botany Sands Groundwater Resource 2017*~~

- ~~☐ **B4** To determine the compliance with an approved:~~

~~☐ **voluntary management proposal** or~~

~~☐ **management order** under the *Contaminated Land Management Act 1997*~~

- ~~☐ **B5** To determine if the land can be made suitable for a particular use (or uses) if the site is remediated or managed in accordance with a specified plan.~~

~~Intended uses of the land:~~

Information sources for site audit

EIS, Greencap

Titles of reports reviewed:

1. Environmental Investigation Services (EIS, 23 January 2019) Preliminary Environmental Site Assessment, 34-38 Schofields Road, Schofields NSW (Ref: E3.598KPrpt-rev1)
 2. Greencap Pty Ltd (Greencap, 14 August 2019) Detailed Site Investigation, Corner of Farmland Drive and future realignment of Pelican Road, Schofields NSW (Ref:C122140 :NB)
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3. Greencap (21 January 2019) Salinity Report, Corner of Farmland Drive and future realignment of Pelican Road, Schofields NSW (Ref: C107881: NXB)
4. Greencap (26 July 2019) Unexpected Finds Protocol - 34-38 Schofields Road, Schofields NSW (Ref: C107881:J163717 JG)
5. Greencap (30 July 2019) Waste Classification for two stockpiles located at 34-38 Schofields Road, Schofields NSW 2762 (Ref: C107881:J163171 JG)
6. Greencap (5 August 2019) Additional Waste Classification for two stockpiles (Incl. UFP & Bitumen Stockpiles) located at 34-38 Schofields Road, Schofields NSW 2762 (Ref: C107881:J163171 JG)
7. Greencap (6 August 2019) Letter Report explaining the Detailed Site Walkover and Additional Soil Investigation undertaken at 34-38 Schofields NSW 2762 (Ref: C107881:J163171 JG)
8. Greencap (23 August 2019) Excavated Natural Material Classification, 28 Farmland Drive, Schofields NSW 2762 (Ref: C107881 : JG).

Other information reviewed, including previous site audit reports and statements relating to the site:

JK Geotechnics (30 June 2017) Geotechnical Investigation, 34-38 Schofields Road, Schofields NSW (Ref: 30598Zrpt).

JK Geotechnics (8 April 2019) Additional Geotechnical Investigation, 34-38 Schofields Road, Schofields NSW (Ref: 30598PH3rpt).

Site audit report details

Title Site Audit Report Proposed Alex Avenue Public School, 28 Farmland Drive, Schofields NSW 2762

Report no. 19175_SAR155

Date 10 September 2019

Part II: Auditor's findings

Please complete either Section A1, Section A2 or Section B, not more than one section.
(Strike out the irrelevant sections.)

- Use **Section A1** where site investigation and/or remediation has been completed and a conclusion can be drawn on the suitability of land uses **without the implementation** of an environmental management plan.
- Use **Section A2** where site investigation and/or remediation has been completed and a conclusion can be drawn on the suitability of land uses **with the implementation** of an active or passive environmental management plan.
- Use **Section B** where the audit is to determine:
 - (B1) the nature and extent of contamination, and/or
 - (B2) the appropriateness of an investigation, remediation or management plan¹, and/or
 - (B3) the appropriateness of a site testing plan in accordance with the *Temporary Water Restrictions Order for the Botany Sands Groundwater Source 2017*, and/or
 - (B4) whether the terms of the approved voluntary management proposal or management order have been complied with, and/or
 - (B5) whether the site can be made suitable for a specified land use (or uses) if the site is remediated or managed in accordance with the implementation of a specified plan.

¹ For simplicity, this statement uses the term 'plan' to refer to both plans and reports.

Section A1

I certify that, in my opinion:

The **site is suitable** for the following uses:

(Tick all appropriate uses and strike out those not applicable.)

- ☐ ~~Residential, including substantial vegetable garden and poultry~~
- ☐ ~~Residential, including substantial vegetable garden, excluding poultry~~
- ☐ ~~Residential with accessible soil, including garden (minimal home grown produce contributing less than 10% fruit and vegetable intake), excluding poultry~~
- ☒ Day care centre, preschool, primary school
- ☐ ~~Residential with minimal opportunity for soil access, including units~~
- ☐ ~~Secondary school~~
- ☐ ~~Park, recreational open space, playing field~~
- ☐ ~~Commercial/industrial~~
- ☐ ~~Other (please specify):~~

OR

- ☐ ~~I certify that, in my opinion, the **site is not suitable** for any use due to the risk of harm from contamination.~~

Overall comments:

Any material surplus to site requirements must be classified in accordance with NSW EPA Waste Classification Guidelines (2014) for offsite disposal and transported to an appropriately licensed waste receiving facility.

Any material imported to site to achieve final design and landscaping levels must be certified as VENM (or ENM / other suitable material as defined in the waste exemptions).

~~Section A2~~

~~I certify that, in my opinion:~~

~~Subject to compliance with the **attached** environmental management plan² (EMP), the site is suitable for the following uses:~~

~~(Tick all appropriate uses and strike out those not applicable.)~~

- ~~☐ Residential, including substantial vegetable garden and poultry~~
- ~~☐ Residential, including substantial vegetable garden, excluding poultry~~
- ~~☐ Residential with accessible soil, including garden (minimal home grown produce contributing less than 10% fruit and vegetable intake), excluding poultry~~
- ~~☐ Day care centre, preschool, primary school~~
- ~~☐ Residential with minimal opportunity for soil access, including units~~
- ~~☐ Secondary school~~
- ~~☐ Park, recreational open space, playing field~~
- ~~☐ Commercial/industrial~~
- ~~☐ Other (please specify):~~

~~EMP details~~

~~Title~~

~~Author~~

~~Date~~

~~No. of pages~~

~~EMP summary~~

~~This EMP (attached) is required to be implemented to address residual contamination on the site.~~

~~The EMP: (Tick appropriate box and strike out the other option.)~~

- ~~☐ requires operation and/or maintenance of **active** control systems³~~
- ~~☐ requires maintenance of **passive** control systems only³~~

² Refer to Part IV for an explanation of an environmental management plan.

³ Refer to Part IV for definitions of active and passive control systems.

Site Audit Statement

~~Purpose of the EMP:~~

~~Description of the nature of the residual contamination:~~

~~Summary of the actions required by the EMP:~~

~~How the EMP can reasonably be made to be legally enforceable:~~

~~How there will be appropriate public notification:~~

~~Overall comments:~~

Section B

Purpose of the plan⁴ which is the subject of this audit:

I certify that, in my opinion:

(B1)

☐ The nature and extent of the contamination ~~has been appropriately determined~~

☐ The nature and extent of the contamination ~~has not been appropriately determined~~

~~AND/OR (B2)~~

☐ The investigation, remediation or management plan ~~is appropriate for the purpose stated above~~

☐ The investigation, remediation or management plan ~~is not appropriate for the purpose stated above~~

~~AND/OR (B3)~~

☐ The site testing plan:

☐ ~~is appropriate to determine~~

☐ ~~is not appropriate to determine~~

~~if groundwater is safe and suitable for its intended use as required by the Temporary Water Restrictions Order for the Botany Sands Groundwater Resource 2017~~

~~AND/OR (B4)~~

☐ The terms of the approved voluntary management proposal^{*} or management order^{**} (strike out as appropriate):

☐ ~~have been complied with~~

☐ ~~have not been complied with~~

~~^{*}voluntary management proposal no.:~~

~~^{**}management order no.:~~

~~AND/OR (B5)~~

☐ The site ~~can be made suitable~~ for the following uses:

~~(Tick all appropriate uses and strike out those not applicable.)~~

⁴ For simplicity, this statement uses the term 'plan' to refer to both plans and reports.

Site Audit Statement

- ☐ Residential, including substantial vegetable garden and poultry
- ☐ Residential, including substantial vegetable garden, excluding poultry
- ☐ Residential with accessible soil, including garden (minimal home-grown produce contributing less than 10% fruit and vegetable intake), excluding poultry
- ☐ Day care centre, preschool, primary school
- ☐ Residential with minimal opportunity for soil access, including units
- ☐ Secondary school
- ☐ Park, recreational open space, playing field
- ☐ Commercial/industrial
- ☐ Other (please specify):

IF the site is remediated/managed* in accordance with the following plan (attached):

*Strike out as appropriate

Plan title

Plan author

Plan date

No. of pages

SUBJECT to compliance with the following condition(s):

Overall comments:

Part III: Auditor's declaration

I am accredited as a site auditor by the NSW Environment Protection Authority (EPA) under the *Contaminated Land Management Act 1997*.

Accreditation no. 0802

I certify that:

- I have completed the site audit free of any conflicts of interest as defined in the *Contaminated Land Management Act 1997*, and
- with due regard to relevant laws and guidelines, I have examined and am familiar with the reports and information referred to in Part I of this site audit, and
- on the basis of inquiries I have made of those individuals immediately responsible for making those reports and obtaining the information referred to in this statement, those reports and that information are, to the best of my knowledge, true, accurate and complete, and
- this statement is, to the best of my knowledge, true, accurate and complete.

I am aware that there are penalties under the *Contaminated Land Management Act 1997* for wilfully making false or misleading statements.

Signed



Date

10 September 2019

Part IV: Explanatory notes

To be complete, a site audit statement form must be issued with all four parts.

How to complete this form

Part I

Part I identifies the auditor, the site, the purpose of the audit and the information used by the auditor in making the site audit findings.

Part II

Part II contains the auditor's opinion of the suitability of the site for specified uses or of the appropriateness of an investigation, or remediation plan or management plan which may enable a particular use. It sets out succinct and definitive information to assist decision-making about the use or uses of the site or a plan or proposal to manage or remediate the site.

The auditor is to complete either Section A1 or Section A2 or Section B of Part II, **not** more than one section.

Section A1

In Section A1 the auditor may conclude that the land is *suitable* for a specified use or uses OR *not suitable* for any beneficial use due to the risk of harm from contamination.

By certifying that the site is *suitable*, an auditor declares that, at the time of completion of the site audit, no further investigation or remediation or management of the site was needed to render the site fit for the specified use(s). **Conditions must not be** imposed on a Section A1 site audit statement. Auditors may include **comments** which are key observations in light of the audit which are not directly related to the suitability of the site for the use(s). These observations may cover aspects relating to the broader environmental context to aid decision-making in relation to the site.

Section A2

In Section A2 the auditor may conclude that the land is *suitable* for a specified use(s) subject to a condition for implementation of an environmental management plan (EMP).

Environmental management plan

Within the context of contaminated sites management, an EMP (sometimes also called a 'site management plan') means a plan which addresses the integration of environmental mitigation and monitoring measures for soil, groundwater and/or hazardous ground gases throughout an existing or proposed land use. An EMP succinctly describes the nature and location of contamination remaining on site and states what the objectives of the plan are, how contaminants will be managed, who will be responsible for the plan's implementation and over what time frame actions specified in the plan will take place.

By certifying that the site is suitable subject to implementation of an EMP, an auditor declares that, at the time of completion of the site audit, there was sufficient information satisfying guidelines made or approved under the *Contaminated Land Management Act 1997*

(CLM Act) to determine that implementation of the EMP was feasible and would enable the specified use(s) of the site and no further investigation or remediation of the site was needed to render the site fit for the specified use(s).

Implementation of an EMP is required to ensure the site remains suitable for the specified use(s). The plan should be legally enforceable: for example, a requirement of a notice under the CLM Act or a development consent condition issued by a planning authority. There should also be appropriate public notification of the plan, e.g. on a certificate issued under s.149 of the *Environmental Planning and Assessment Act 1979*.

Active or passive control systems

Auditors must specify whether the EMP requires operation and/or maintenance of active control systems or requires maintenance of passive control systems only. Active management systems usually incorporate mechanical components and/or require monitoring and, because of this, regular maintenance and inspection are necessary. Most active management systems are applied at sites where if the systems are not implemented an unacceptable risk may occur. Passive management systems usually require minimal management and maintenance and do not usually incorporate mechanical components.

Auditor's comments

Auditors may also include **comments** which are key observations in light of the audit which are not directly related to the suitability of the site for the use(s). These observations may cover aspects relating to the broader environmental context to aid decision-making in relation to the site.

Section B

In Section B the auditor draws conclusions on the nature and extent of contamination, and/or suitability of plans relating to the investigation, remediation or management of the land, and/or the appropriateness of a site testing plan in accordance with the *Temporary Water Restrictions Order for the Botany Sands Groundwater Source 2017*, and/or whether the terms of an approved voluntary management proposal or management order made under the CLM Act have been complied with, and/or whether the site can be made suitable for a specified land use or uses if the site is remediated or managed in accordance with the implementation of a specified plan.

By certifying that a site *can be made suitable* for a use or uses if remediated or managed in accordance with a specified plan, the auditor declares that, at the time the audit was completed, there was sufficient information satisfying guidelines made or approved under the CLM Act to determine that implementation of the plan was feasible and would enable the specified use(s) of the site in the future.

For a site that *can be made suitable*, any **conditions** specified by the auditor in Section B should be limited to minor modifications or additions to the specified plan. However, if the auditor considers that further audits of the site (e.g. to validate remediation) are required, the auditor must note this as a condition in the site audit statement. The condition must not specify an individual auditor, only that further audits are required.

Auditors may also include **comments** which are observations in light of the audit which provide a more complete understanding of the environmental context to aid decision-making in relation to the site.

Part III

In **Part III** the auditor certifies their standing as an accredited auditor under the CLM Act and makes other relevant declarations.

Where to send completed forms

In addition to furnishing a copy of the audit statement to the person(s) who commissioned the site audit, statutory site audit statements must be sent to

- the **NSW Environment Protection Authority**:
nswauditors@epa.nsw.gov.au or as specified by the EPA

AND

- the **local council** for the land which is the subject of the audit.



SCHEDULE OF LINES

No.	BEARING	DISTANCE
51	167°53'50"	7.34
52	177°26'40"	20.705

SCHEDULE OF CURVED BOUNDARIES

No.	BEARING	CHORD	ARC	RADIUS
1	94°26'05"	24.31	24.315	358
2	92°42'50"	2.415	2.415	295
3	85°11'20"	52.79	52.93	208
10	92°33'00"	0.695	0.695	279
11	82°03'00"	27.795	27.82	192
12	78°54'00"	7.27	7.27	208
13	81°05'35"	21.4	21.41	192
14	66°25'25"	5.08	5.08	258
15	80°35'30"	5	5	208
16	82°47'00"	10.92	10.92	208
17	89°20'25"	21.03	21.04	192

REFERENCE MARKS

No.	BEARING	DISTANCE	DESCRIPTION
D	98°37'00"	1.465	R.M. G.I.P. FD D.P.1203646
E	342°29'30"	3.415 & 13.195	R.M. D.H. & W. FD D.P.1208330
F	330°46'25"	1.25 & 14.45	R.M. D.H. & W. FD & D.P.1208330
			R.M. S.S.M.193158 FD
G	296°14'00"	5.24 & 20.035	R.M. D.H. & W. FD D.P.1208330
H	317°23'05"	1.16 & 14.47	R.M. D.H. & W. FD & D.P.1208330
			R.M. S.S.M.193159 FD
I	323°47'40"	1.45 & 14.225	R.M. D.H. & W. FD & D.P.1208330
			R.M. S.S.M.193183 FD
J	342°22'20"	3.485 & 12.825	R.M. D.H. & W. FD D.P.1208332
K	182°08'25"	4.04 & 14.2	R.M. D.H. & W. FD D.P.1208330
L	48°07'00"	8.98	R.M. D.H. & W. FD D.P.1208330
M	113°43'20"	4.29 & 17.19	R.M. S.S.M.193166 FD & D.P.1208330
			R.M. D.H. & W. FD
N	223°32'00"	0.925	R.M. G.I.P. FD D.P.1189372
Q	159°26'45"	3.525	R.M. D.H. & W. FD D.P.1231233
R	356°04'05"	4.585	R.M. G.I.P. FD D.P.1231233
S	254°38'25"	6.525	R.M. G.I.P. FD D.P.1231233
U	318°49'40"	6.235	R.M. G.I.P. FD D.P.1231233
V	222°07'50"	4.545	R.M. D.H. & W. FD D.P.1231233
X	228°43'40"	3.305	R.M. G.I.P. PLACED

'A' - PROPOSED RIGHT OF ACCESS & EASEMENT FOR SERVICES 6 WIDE
'B' - PROPOSED RIGHT OF ACCESS & EASEMENT FOR SERVICES 10 WIDE

Boundary of Site covered by Site Audit Statement SAS155 dated 10 September 2019, prepared by R Hall of Zoic Environmental Pty Ltd

SURVEYOR
Name: ANDREW RICHARD THOMAS
Date: 10 JULY 2018
Reference: 023-17

PLAN OF
LAND PROPOSED TO BE ACQUIRED WITHIN
LOT 4 D.P.1208329 & LOT 121 D.P.1203646

LGA: BLACKTOWN
Locality: SCHOFIELDS
Reduction Ratio: 1: 800
Lengths are in metres

Registered
20.07.2018

DP1244925



Quality Management

Document Distribution

Issue/Revision	Issue 1	Revision 1	Revision 2
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Prepared by	Auditor with assistance from: • Joshua Lloyd • Fiona Wong		
Signature			
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This report was prepared in accordance with the scope of services set out in the contract between Zoic Environmental Pty Ltd, ABN 23 154 745 525, and the client.

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Executive Summary

This Audit was commissioned by Richard Crooks Constructions Pty Ltd (RCC) to provide an independent review of the appropriateness of environmental works completed at the proposed Alex Avenue Public School, located at 28 Farmland Drive, Schofields, NSW ("the site").

The site occupies approximately 2.5 hectares and is identified Lots 1 and 2 in DP1244925. The boundary of this Audit is shown in the survey plan included in Appendix A.

This Site Audit Report (SAR) and associated Site Audit Statement (SAS) considers investigation and validation sampling works conducted by EIS and Greencap to form an opinion on whether the site is suitable for public primary school use.

This Audit is currently being prepared as a non-statutory Audit, and has been prepared in accordance with relevant guidelines made or approved by NSW EPA.

Based on information from title deeds and aerial photographs, the site has been used for rural purposes since 1890s.

Potential sources of contamination based on site history included uncontrolled filling, general use of pesticides and historical agricultural uses. Potential contaminants in soil included heavy metals, total recoverable hydrocarbons (TRH), polycyclic aromatic hydrocarbons (PAH), monocyclic aromatic hydrocarbons (BTEXN), organochlorine pesticides (OCP), organophosphate pesticides (OPP), phenol, polychlorinated biphenyls (PCB) and asbestos.

Based on data presented in EIS (21 January 2019) preliminary site investigation (PSI) and Greencap (14 August 2019) detailed site investigation (DSI) no contamination was identified above the adopted guidelines, and therefore no remedial action plan (RAP) was required.

Based on the information provided by Greencap and RCC, excess soils generated from site preparation and earthworks activities were excavated for offsite disposal. One unexpected find (stained soil with metal inclusions) was encountered in the western portion of the site. Removal of the unexpected find was cleared by Greencap. Additional test pitting was conducted by Greencap within the vicinity of the unexpected find as part of the waste classification and detailed site inspection (26 July 2019) to confirm that no visual and/or olfactory contamination remaining.

The Auditor considers that waste from the site has been appropriately classified and disposed.

The investigation and validation works reviewed are considered to have met the requirements of NSW EPA (2017), other relevant guidelines endorsed under s.105 of the CLM Act and the objectives of the Audit. Where the consultant's work deviated from the guidelines, the Auditor has discussed this within the SAR and is satisfied that these omissions do not affect the conclusions of the Audit.

On this basis a Section A Site Audit Statement (SAS) will be issued certifying that, in the opinion of the Auditor, the site is suitable for primary school use. As earthworks are currently underway and construction activities still to commence, the following comments will be added to the SAS:

- Any material surplus to site requirements must be classified in accordance with NSW EPA Waste Classification Guidelines (2014) for offsite disposal and transported to an appropriately licensed waste receiving facility.
- Any material imported to site to achieve final design and landscaping levels must be certified as VENM (or ENM / other suitable material as defined in the waste exemptions).



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1 Introduction

This Audit was commissioned by Richard Crooks Constructions Pty Ltd (RCC) to provide an independent review of the appropriateness of environmental works completed at the proposed Alex Avenue Public School, located at 28 Farmland Drive, Schofields, NSW 2762("the site").

This Site Audit Report (SAR155) and associated Site Audit Statement (SAS155) were produced by Rebeka Hall (Accreditation No. 0802) employed by Zoic Environmental Pty Ltd (Zoic). Fiona Wong and Joshua Lloyd of Zoic provided assistance during the course of the Audit.

The site occupies approximately 2.5 hectares and is identified Lots 1 and 2 in DP1244925. The boundary of this Audit is shown in the survey plan included in Appendix A.

This Site Audit Report (SAR) and associated Site Audit Statement (SAS) considers investigation and validation works conducted by EIS and Greencap to form an opinion on whether the site is suitable for public primary school use.

This Audit is being prepared as a non-statutory Audit. To the knowledge of the Auditor, this Audit has not been triggered by any requirement under the Contaminated Land Management Act 1997, any environmental planning instrument, development consent under the Environmental Planning and Assessment Act 1979 nor requirements under other legislation.

This SAR makes reference to guidelines that were originally issued by the environmental regulator under the names of the NSW Environmental Protection Authority (EPA), NSW Department of Environmental and Conservation (DEC), NSW Department of Environment and Climate Change (DECC), NSW Department of Environment, Climate Change and Water (DECCW) and NSW Office of Environment & Heritage (OEH) part of the Department of Premier and Cabinet. For the purpose of currency, the organisation is referred to as EPA in this report. EPA approved guidelines will be referenced by the name of the organisation at the time of publication.

1.1 Site Background

1.1.1 Regulatory Requirements for Audit

At present there is no statutory requirement triggering this Audit. This Audit is currently non-statutory.

1.1.2 Previous Site Audit

The Auditor is unaware of any previous Audits having been conducted at the site.

1.2 Overview of Site Audit Process

The Audit has been conducted in accordance with the requirements of the CLM Act 1997, as amended, which (in Part 1, Section 4 definitions) states:

"site audit" means a review:

- a. That relates to management (whether under this Act or otherwise) of the actual or possible contamination of land; and
- b. That is conducted for the purpose of determining any one or more of the following matters:
 - i. The nature and extent of any contamination of the land,



- ii. The nature and extent of any management of actual or possible contamination of the land,
- iii. Whether the land is suitable for any specified use or range of uses,
- iv. What management remains necessary before the land is suitable for any specified use or range of uses, and
- v. The suitability and appropriateness of a plan of management, long-term management plan or a voluntary management proposal.

NSW EPA (2017) Contaminated Land Management Guidelines for the NSW Site Auditor Scheme (3rd Edition), describes the site assessment and audit process as:

1. **The Consultant is commissioned to assess contamination.** The contaminated site consultant designs and undertakes the site assessment and, where required, all remediation and validation activities to achieve the objectives specified by the owner or developer; and
2. **The Site auditor reviews the Consultant's work.** The site owner or developer commissions the site auditor to review the consultant's work. The auditor prepares a site audit report and a site audit statement at the conclusion of the review, which are given to the owner or developer.

Part 4, Section 53B (6) of the CLM Act 1997, as amended, describes that Audits conducted by EPA accredited Auditors must take the following matters into account:

- The provisions of the CLM Act and the CLM Regulations;
- The guidelines made or approved by the EPA; and
- The provisions of any environmental planning instruments applying to the site.

1.3 Guidelines Made or Approved by EPA under the CLM Act

Guidelines made by EPA under Section 105 of the CLM Act 1997 at the time of this report are:

- EPA (1995a) Contaminated Sites: Guidelines for the Vertical Mixing of Soil on Former Broad-Acre Agricultural Land. NSW EPA, Sydney;
- EPA (1995b) Contaminated Sites: Sampling Design Guidelines. NSW EPA, Sydney;
- EPA (1997) Contaminated Sites: Guidelines for Assessing Banana Plantation Sites. NSW EPA, Sydney;
- DEC (2005) Contaminated Sites: Guidelines for Assessing Former Orchards and Market Gardens. NSW DEC, Sydney;
- DEC (2007) Guidelines for Assessment and Management of Groundwater Contamination. NSW DEC Sydney;
- DECCW (2009) Guidelines for Implementing the POEO (Underground Petroleum Storage Systems) Regulation 2008;
- OEH (2011) Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites. NSW OEH, Sydney;
- EPA (2015) Contaminated Sites: Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 2009. NSW EPA, Sydney;
- NSW EPA (2016) Designing Sampling Programs for sites Potentially Contaminated by PFAS; and
- EPA (2017) Contaminated Land Management Guidelines for the NSW Site Auditor Scheme (3rd Edition). NSW EPA, Sydney.



Guidelines approved by EPA under Section 105 of the CLM Act 1997 at the time of this report are:

- NSW Agricultural/CMPS&F (1996) Guidelines for the Assessment and Clean Up of Cattle Tick Dip Sites for Residential Purposes, NSW Agricultural and CMPS&F Environmental, Canberra.
- Lock, W. H., (1996) Composite Sampling, National Environmental Health Forum Monographs, Soil Series No. 3, National Environmental Health Forum, SA Health Commission, Adelaide;
- NEPC (1999) National Environment Protection (Assessment of Site Contamination) Measure, Schedule A and Schedules B(1)-B(9). National Environment Protection Council, Adelaide as amended in April 2013 [referred to herein as NEPM (2013)];
- Department of Health and Ageing and EnHealth Council (2002) Environmental Health Risk Assessment: Guidelines for Assessing Human Health Risks from Environmental Hazards. Commonwealth of Australia, Canberra;
- WA DoH (2009) Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia;
- NHMRC/NRMMC (2011) Australian Drinking Water Guidelines. National Health and Medical Research Council and National Resource Management Ministerial Council of Australia and New Zealand (Updated November 2016);
- CRC Care (2011) Technical Report No. 10 Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater;
- CRC Care (2013) Technical Report No. 23 Petroleum Hydrocarbon Vapour Intrusion Assessment;
- Protection of the Environment Operations (Underground Petroleum Storage Systems Regulation) 2014;
- Protection of the Environment Operations (General) Amendment (Underground Petroleum Storage Systems Regulation) 2017;
- HEPA (2018) PFAS National Environmental Management Plan [NEMP]; and
- ANZG (2018) Australian and New Zealand Guidelines for Fresh and Marine Water Quality.

In addition to the above, the Auditor has given due regard to the provisions of the NSW Government's framework for managing waste under the Protection of the Environment Operations Act 1997 (NSW) (POEO Act 1997) and Waste Avoidance and Recovery Act 2001.

Where relevant, consideration has also been given to technical guidance on the assessment of contamination in NSW as presented on the EPA website (<http://www.epa.nsw.gov.au/clm/otherguidance.htm>).

1.4 Reports Reviewed

During the course of the Audit, the following reports were provided to the Auditor:

- Environmental Investigation Services (EIS, 23 January 2019) Preliminary Environmental Site Assessment, 34-38 Schofields Road, Schofields NSW (Ref: E3.598KPrpt-rev1), referred to as the EIS (23 January 2019) PSI in this SAR;
- Greencap Pty Ltd (Greencap, 14 August 2019) Detailed Site Investigation, Corner of Farmland Drive and future realignment of Pelican Road, Schofields NSW (Ref: C122140 : NB), referred to as the Greencap (14 August 2019) DSI in this SAR;
- Greencap (21 January 2019) Salinity Report, Corner of Farmland Drive and future realignment of Pelican Road, Schofields NSW (Ref: C107881: NXB);



- Greencap (26 July 2019) Unexpected Finds Protocol - 34-38 Schofields Road, Schofields NSW (Ref: C107881:J163717 JG);
- Greencap (30 July 2019) Waste Classification for two stockpiles located at 34-38 Schofields Road, Schofields NSW 2762 (Ref: C107881:J163171 JG);
- Greencap (5 August 2019) Additional Waste Classification for two stockpiles (Incl. UFP & Bitumen Stockpiles) located at 34-38 Schofields Road, Schofields NSW 2762 (Ref: C107881:J163171 JG);
- Greencap (6 August 2019) Letter Report explaining the Detailed Site Walkover and Additional Soil Investigation undertaken at 34-38 Schofields NSW 2762 (Ref: C107881:J163171 JG); and
- Greencap (23 August 2019) Excavated Natural Material Classification, 28 Farmland Drive, Schofields NSW 2762 (Ref: C107881 : JG).

Other information provided which was considered as part of this Audit included:

- JK Geotechnics (30 June 2017) Geotechnical Investigation, 34-38 Schofields Road, Schofields NSW (Ref: 30598Zrpt); and
- JK Geotechnics (8 April 2019) Additional Geotechnical Investigation, 34-38 Schofields Road, Schofields NSW (Ref: 30598PH3rpt).

1.5 Site Inspection

The Audit Assistant (Fiona Wong) visited the site on 11 July 2019 with representatives from RCC (Isaac Pinkerton, Tom Hemmett and Joel Coubrough). At the time of the site inspection, earthworks were underway in the eastern portion of the site where topsoil has been stripped and stockpiled. Two fly tipped stockpiles were noted onsite:

- The first stockpile was observed in the western of the site which comprised demolition debris such as timber and sandstone brick.
- The second stockpile was observed in the northern/north western corner of the site which was covered with vegetation.

No asbestos containing material (ACM) fragments and other visual/olfactory signs of contamination were noted during the site visit.

During the site meeting, RCC indicated that a temporary easement will be constructed along the eastern site boundary, which will be approximately 6m wide, to enable the adjacent neighbour to have access to the main road (Farmland Drive). This easement will return to site after construction of the new road on the adjoining property is completed.

1.6 Audit Correspondence

The Auditor provided feedback to the consultant during the course of the Audit in the form of interim advice letters or email correspondence. A copy of these letters or relevant email correspondence is included in Appendix B together with any relevant consultant responses. Where appropriate, these are referred to in the SAR.



2 Site Identification and Description

This section provides detail on land use, surrounding properties and summarises potential sensitive human health and environmental receptors. This information has been sourced from the reports referenced in Section 1.4.

2.1 Site Identification

The site location is shown in consultant's figures reproduced in Appendix A. The site identification and land use details include:

Table 2.1: Site Identification

Title	Details
Street Address:	28 Farmland Drive, Schofields NSW
Property Description:	Lots 1 and 2 in DP1244925
Current Site Ownership:	NSW Department of Education
Geographical Coordinates:	-33.699841, 150.884628
Property Size:	Approx. 2.5 hectares
Local Government Area:	Blacktown City Council
Zoning – Existing:	SP2: Infrastructure: Educational Establishment (Blacktown Local Environmental Plan 2015)
Zoning – Previous:	Not provided. However, the absence of this information is not considered to affect the outcome of this SAR.

2.2 Surrounding Land Use

The site is located in a former rural area which is undergoing low density residential redevelopment with immediate adjoining land uses described as follows:

Table 2.2: Immediate Site Surrounds

Title	Details
North:	Residential properties and Schofields Road
East:	Residential properties under construction
South:	Vacant land and Jerralong Drive
West:	Vacant land and beyond Schofields Railway Station



2.3 Site Condition

2.3.1 Current (Prior to Development)

The site was noted by Greencap to be vacant, grassed land with sparse tree cover clustered in the south western corner of the site, with no sealed surfaces or built structures present. Small mounds located along the southern boundary where presumed to be fill material.

2.3.2 Proposed

The proposed school development will involve:

- Construction of a two storey library, administration and staff building (Block A), comprising school administrative spaces, library, staff rooms and offices, special programs rooms, amenities, canteen, interview rooms and presentation spaces;
- Construction of four two-storey classroom buildings containing 40 home bases (Block B), comprising learning spaces and studios, covered outdoor learning spaces, practical activity areas and amenities;
- Construction of a single storey assembly hall (Block C) with a performance stage and integrated covered outdoor learning area;
- Associated site landscaping and open space;
- Pedestrian access points along both Farmland Drive and the future Pelican Road;
- Substation on the north-east corner of the site.

2.4 Auditor Discussion

The information required by OEH (2011), in regard to site identification and condition, was generally provided, and is consistent with observations made during site inspection conducted as part of this Audit. Where the information was not provided, the Auditor contacted RCC or Greencap to obtain the necessary information.



3 Stages of Work

3.1 Summary of Works

Table 3.1 provides a summary of the investigation and validation sampling works that have occurred across the site:

Table 3.1: Summary of Environmental Works Completed

Date	Report Objectives, Scope and Outcomes
EIS 23 January 2019 Preliminary Environmental Site Assessment, 34-38 Schofields NSW E30598KPrpt-rev1	The objective of the report was 'to make a preliminary assessment of the potential for site contamination via the identification of potential contamination sources and contaminants of concern' The scope of work included: • Review of site information, including background and site history information • A walkover site inspection • Preparation of a report The findings of the report were as follows: • EIS was of the opinion that the historical land uses and potential sources of contamination identified would not preclude the proposed development of the school. • Parts of the northern section (i.e. the former grazing land) that are currently unpaved and likely to be excavated for the proposed development are likely to pose a low to moderate risk to the site receptors as there is an increased risk of exposure to soil • It was recommended further investigation be conducted (Stage 2) to assess the areas of concern identified (namely areas of filling where present, former use of agricultural activities and possibly use of pesticides). • A waste classification will be required for off-site disposal of any surplus materials excavated for the proposed development.
Greencap 14 August 2019 Detailed Site Investigation, Proposed Alex Avenue Public School Ref: C122140 : NB	The objective of the report was 'to identify potential sources of contamination and contaminants of concern on the site, evaluate the presence of contamination in the identified areas of concern, close out any data gaps specified in the Preliminary Site Investigation (PSI) report for the site and assess site suitability for its intended use as a Primary School'. The scope of work included: • Review of the PSI (EIS, August 2017). • Review of local topography, geology, hydrogeology, acid sulfate soils risks, and salinity risks maps • A site walkover • Test pitting, soil logging and soil sampling at 35 locations across the site extending 0.5m into the underlying natural soils • Collection of soil samples for testing • Preparation of a DSI report The findings of the report were as follows: • Sample analysis results indicated no elevated concentrations of the chemicals of potential concern (COPCs). • This DSI did not identify any unacceptable human health or ecological risk associated with the surface soil quality. It was concluded that the surface soil within the site boundary is suitable for its intended use as a primary school, consistent with 'Residential A' land use as defined in the NEPM. • Any material to be taken off-site must be classified in accordance with the NSW EPA Waste Classification Guidelines (2014). • Site Auditor is to be provided with all documentation regarding soil import/ export and waste disposal.



Date

Report Objectives, Scope and Outcomes

	• Implementation of the Unexpected Finds Protocol (UFP) to manage any residual risk due to potential unexpected finds on the site.
Greencap 21 January 2019 Salinity Report, Proposed Alex Avenue Public School, Schofields NSW C107881: NXB	The objective of this report was to address the salinity findings reported by EIS (2017) and assess the risk of dryland salinity. The scope of work included: • Desktop review of site history • Detailed site walkover • Collection of samples from 5 test pit locations for salinity analytical testing • Preparation of a salinity report The findings of the report were as follows: • The investigation did not reveal any analysis results that require further investigation, nor any significant soil salinity contamination or sources of salinity on the site. The findings of this assessment identified no evidence of any current existing significant salinity contamination or risk on the site. Therefore, the site is considered suitable for the intended land use as a primary school and is unlikely to require significant salinity-specific management. • Potential data gaps are noted to include groundwater data and watertable depth which were not available for the site and its surrounds. As a result of this investigation, Greencap recommended maintenance of proper drainage controls on the site during site development/construction.
Greencap 26 July 2019 Unexpected Finds Protocol - 34-38 Schofields Road, Schofields NSW C107881:J163717 JG	The objective of the unexpected finds protocol is to specify the procedures and controls to be implemented in the event that any unexpected soil and/or groundwater contamination is identified during the earthworks and construction phase at the site.
Greencap 30 July 2019 Waste Classification for two stockpiles located at 34-38 Schofields Road, Schofields NSW 2762 C107881:J163171 JG	The waste classification was prepared for stockpiles SPA and SPB. Both stockpiles were in their original position observed by Greencap during their inspection with stockpiles comprising dumped materials from an unknown source(s). The combined estimated volume was approx. 30m3 which was classified as General Solid Waste (non putrescible).
Greencap 5 August 2019 Additional Waste Classification for two stockpiles (Incl. UFP & Bitumen Stockpiles) located at 34-38 Schofields Road, Schofields NSW 2762 C107881:J163171 JG	The waste classification was prepared for stockpiles SP3 and SP4 which were generated from the bitumen material removed from the eastern portion of the site and an unexpected find (stained soil with metal fragments) in the western portion of the site, respectively. The combined estimated volume as approx. 23m3 which was classified as General Solid Waste (non putrescible).
Greencap 6 August 2019 Letter Report explaining the Detailed Site Walkover and Additional Soil Investigation undertaken at 34-38 Schofields NSW 2762 C107881:J163171 JG	The objective of this letter was to provide an update to the Auditor on the observations made during a detailed site walkover in July 2019 and additional works that were completed since the January 2019 DSI. The scope of works involved: • A detailed site walkover, including: - Inspection of scraped and stockpiled natural topsoil - Inspection of exposed natural clays - Cut and fill / application of reworked natural material



Date	Report Objectives, Scope and Outcomes
	- Foreign material stockpiles • 9 test pits were excavated within the 'cut and fill' area in the western portion of the site where an unexpected find was encountered. The outcomes of the additional investigation were as follows: • ENM assessment would be completed to confirm whether the inspected natural topsoil scrapped from site works can be classified as ENM. • No visual contamination was identified on the exposed natural clays • No visual contamination was identified during test pitting • Waste classification was conducted on the foreign material stockpiled for offsite disposal. The findings of ENM assessment and waste classification works were provided in separate reports.
Greencap 23 August 2019 ENM Report, 28 Farmland Drive Schofields NSW 2762 C107881 : JG	The objectives of this report were to conduct an ENM assessment for the scrapped topsoil generated from earth and site preparatory works at the site. The assessment was conducted in accordance with the requirements of The Excavated Natural Material Order 2014. Based on the findings of the assessment, Greencap concluded that: • Material from E1, E2, E4, E7, E8, E9 and E10 in Stockpile 1, can be classified as Excavated Natural Material (ENM). The estimated volume was approx. 1785m³ (2700 tonnes). • Stockpile 2, consisting of E11 to E13, as well as the material from E3, E5 and E6 of Stockpile 1, can be classified as General Solid Waste (GSW) non putrescible. The estimated volume was approx. 770m³ (1150 tonnes). Further to the above, Greencap also recommended that 'the client engage a suitably qualified environmental consultant to supervise the removal of E3, E5 & E6 from stockpile 1 and the subsequent transport/compiling of this material with stockpile 2'. It is noted by the Auditor that all the ENM material met site criteria and could remain onsite.

3.2 Auditor Discussion

The following chapters of this SAR contain details relevant to the site to the extent information is available.

The Auditor considers the works completed, followed an iterative process collecting information to characterise any contamination on the site followed by necessary validation works to confirm the site as suitable for public primary school use.



4 Evaluation of Conceptual Site Model

4.1 Site Condition

The site condition prior to commencement of the earthworks described in this SAR is summarised in this section. This information has been sourced from the reports listed in Section 1.4.

Table 4.1: General Site Condition

Title	Details
Topography and Drainage:	Section 5.2 in Greencap (14 August 2019) DSI states that 'the elevation of the site ranges generally between 37-43 mAHD. The site slopes down-gradient towards the south, with the highest elevation at the north-eastern corner of the site'. Section 2.4.4 in EIS (23 January 2019) PSI states that 'considering the topography, surface water runoff was assumed to flow to the south'. The above was confirmed during site inspection by Zoic (11 July 2019).
Boundary Condition (type & condition of fencing, soil stability & erosion):	Section 2.4.1 in EIS (23 January 2019) EIS states that 'the site was bound by timber and metal wire fencing along the northern and western boundaries. The eastern and southern boundaries were not defined at the time of the inspection'. The site was fenced during site inspection by Zoic (11 July 2019).
Visible Signs of Contamination:	Section 9.1 in Greencap (14 August 2019) DSI states that no visual signs of contamination was observed during the site walkover. The above was confirmed during site inspection by Zoic (11 July 2019).
Visible Signs of Plant Stress:	Section 9.1 in Greencap (14 August 2019) DSI states that 'there was no visual evidence of phytotoxic impact (i.e. plant stress or dieback) observed on the site with the exception of the bare patch of, otherwise-grass-covered, soil within proposed Lot 1 [in western portion of the site]'. The signs of plant stress were observed during the site inspection by Zoic (11 July 2019).
Presence of Drums, Wastes and Fill Materials:	Section 9.1 in Greencap (14 August 2019) DSI states that 'the two stockpiles of fill material identified in the EIS (23 January 2019) PSI report were located as described'. Section 2.4.3 in EIS (23 January 2019) PSI states that the 'two stockpiles were identified in the central area of the site. The stockpiles were of small volumes (i.e., less than 1 tonne) and made up of imported gravelly material'. Figure 2 in EIS (23 January 2019) PSI notes that scattered foreign material was observed in the area of exposed soil located in the northern portion of the site. Two fly tipped stockpiles were observed by Zoic (on 11 July 2019).
Odours:	Section 9.1 in Greencap (14 August 2019) DSI states that 'there was no olfactory evidence of odours detected on the site'. The above was confirmed during site inspection by Zoic (11 July 2019).
Condition of Buildings & Roads:	Section 9.1 in Greencap (14 August 2019) DSI states that 'there were no sealed surfaces or built structures (permanent or temporary) present on the site'. The above was confirmed during site inspection by Zoic (11 July 2019).
Quality of Surface Water:	None provided. The Auditor notes that there are no surface water features located within the site.
Flood Potential:	Section 7.3.1 in Greencap (14 August 2019) DSI states that 'the site is situated outside of identified flood-prone land according to Blacktown Local Environment Plan 2016 (Blacktown LEP) Flood Hazard Area Mapping. Furthermore, there are no mainstream or backwater flood-related development controls which apply to the site.



Title	Details
Relevant Local Sensitive Environments:	Section 2.4.5 in EIS (23 January 2019) PSI states that 'sensitive environments such as wetlands, ponds, creeks or extensive areas of natural vegetation were not identified on site. A small unnamed creek was observed running east to west approximately 170m south of the site'.

4.2 Site History

The site history is summarised in this section. This information has been sourced from the reports listed in Section 1.4:

Table 4.2: Site History

Title	Details
Previous Land Use & Chronological List:	Section 4.4 in EIS (23 January 2019) PSI provides a summary of previous land use and chronological list: • From at least 1956: Vacant and most likely part of a larger rural property possibly for grazing purposes. • 1961-1970: the northern portion of the site was possibly used as a horse track. • Prior to 1991 to present day: The site was largely vacant. Several small sheds and a building approx. 150m offsite to west of the site.
Previous Land Use Potentially Associated with PFAS:	Section 7.3.2 in Greencap (14 August 2019) states that 'the site is not identified as a per- and poly-fluoroalkyl substances (PFAS) investigation site and there are no identified PFAS Site investigations within a 500m distance to the site, under the NSW Government PFAS Investigation Program. In addition, based on desktop review of the site's historical land use, there was no identified bone fide source of PFAS contamination on or near the site. Consequently, the risk of PFAS contamination on the site is low'.
Land Titles:	Section 7.1 in Greencap (14 August 2019) DSI states that 'the site was privately owned from 1893 to 2010 which it is likely that it was used for farming purposes, before being acquired by the Minister for Education in 2019. There is no data to suggest the site has been historically used for any manufacturing or industrial purposes'. The Auditor has reviewed the historical title information and notes that the western portion of the site (Lot 1) was owned by Integral Energy Australia between 2009 and 2010, Landcom between 2010 and 2016 and JKN Station Pty Ltd between 2016 and 2019, before land ownership transferred to Minister for Education. The Auditor has reviewed online aerial photographs and notes that the site was generally vacant during this period.
Summary of Council Records:	Section 7.2 in Greencap (14 August 2019) DSI states that: • The site has not been declared to be significantly contaminated land under the Contaminated Land Management Act 1997 and Contaminated Land Management Amendment Act 2008. • The site is not subject to a management order nor are they subject of an approved voluntary management proposal or ongoing maintenance order.
EPA Records:	Section 4.2 in EIS (23 January 2019) PSI states that: • A search of the Contaminated Lands Register for notices identified NSW EPA did not list notices or declarations for the site under Section 58 of the CLM Act 1997. • A search of the public register under Section 60 of the CLM Act 1997 did not identify the site had been notified to NSW EPA. • A search of the public register under Section 308 of the PoEO Act 1997 reveals that:



Title	Details
	- A former license was listed for the site for sewage treatment and processing by small plants. - Licenses have been issued for railway and road construction works approximately 150m from the site. - Former licenses were also listed for surrounding water bodies, including the application of herbicides in areas approximately 120m from the site. On 8 July 2019 the Auditor checked that the above information was accurate at the time of preparation of the Interim Advice prepared. The Auditor has reviewed the Lotsearch report and notes that the former sewage treatment and processing plant was not located onsite.
SafeWork NSW Dangerous Goods Licenses/ USTs/ ASTs:	A search on the SafeWork NSW dangerous goods records was not completed. Section 9.1 in Greencap (14 August 2019) DSI states that: • 'There was no visual evidence of underground storage tanks (e.g. fill points, dip points, breather lines) or above ground storage tanks observed' Zoic did not observe any evidence of USTs or ASTs during the site visit. Given the site has predominantly been used for rural purposes, it is considered that the absence of this search does not affect the outcome of this SAR.
Summary of Aerial Photographs (on site and adjacent sites):	Table 4-1 in EIS (23 January 2019) PSI provides a summary of historical aerial photography: • 1965: the northern portion of the site appears to be part of a larger rural property. Surrounding areas appear to be vacant or used for rural and agricultural purposes, mainly grazing. • 1961: part of an oval track (possibly a horse track) noted in the northern portion of the site. Remainder of the site was unchanged from the last photograph. No visible changes in surrounding areas noted. • 1965: no apparent changes since the last photograph. • 1970: the oval track appears to be grown over. No other changes from last photograph. • 1982: the northern portion of the site appears to be vacant. No apparent changes from last photograph otherwise. • 1991: A series of small sheds and a larger structure were located approximately 150m to the west of the site. No apparent changes from last photograph. The Auditor notes that the structures observed by EIS are located offsite.
Summary of Historical Site Photos (where available):	None provided. The Auditor considers that the absence of this information does not affect the outcome of this SAR.
Description of Manufacturing / Industrial Processes and Location:	Section 4.4 in EIS (23 January 2019) PSI states that the site was part of a larger rural property which was possibly used for rural purposes, including agricultural, grazing and as a horse track. The majority of the site has been vacant since at least 1991.
Inventory of Chemicals and Wastes and their Location:	None provided. The Auditor considers that the absence of this information does not affect the outcome of this SAR.
Product Spill and Loss History:	None provided. The Auditor considers that the absence of this information does not affect the outcome of this SAR.
Discharges to Land, Air & Water:	None provided. The Auditor considers that the absence of this information does not affect the outcome of this SAR.
Complaint History:	None provided. The Auditor considers that the absence of this information does not affect the outcome of this SAR.



Title	Details
Sewer & Service Plans:	None provided. The Auditor considers that the absence of this information does not affect the outcome of this SAR.
Local Site Knowledge:	None provided. The Auditor considers that the absence of this information does not affect the outcome of this SAR.
Local Literature Review:	None provided. The Auditor considers that the absence of this information does not affect the outcome of this SAR.
Permits, Licenses and Approvals:	Please refer to EPA records for further discussion.

4.3 Geology, Hydrogeology and Hydrology

The geology, hydrogeology and hydrology are summarised in this section. This information has been sourced from the reports listed in Section 1.4.

Table 4.3 Subsurface Conditions

Title	Details
Geology Map Conditions:	Section 3.1 in EIS (23 January 2019) PSI states that 'the site is underlain by Bringelly Shale of the Wianamatta Group, which typically consists of shale, carbonaceous claystone, claystone, laminite, fine to medium grained lithic sandstone, rare coal and tuff'.
Soil Map Conditions:	Section 5.2 in Greencap (14 August 2019) DSI states that 'the site soil landscape is the Blacktown Residual soil landscape'.
Acid Sulfate Soils:	Section 3.2 in EIS (23 January 2019) PSI states that the site 'is not located in an acid sulfate soil (ASS) risk area'.
Salinity:	Section 4.1 in Greencap (21 January 2019) Greencap Salinity Report states that 'the land directly west, adjacent to the site were identified as areas of high salinity hazard/risk, with minor overlap along the site's lower western boundary and far south-western corner'. Section 8.2 in Greencap (21 January 2019) Greencap Salinity Report states that: • No visible indicators of salinity were identified on proposed Lot 2 of the site such as bare and scaled soil patches, visible salt crystals or white crusts, black soil staining or salt-impacted vegetation growth; and • A visible indicator of salinity was identified on proposed Lot 1 of the site in the form of a bare/scaled patch of soil, suggesting dryland salinity impact to vegetation growth'.
Soil Classification Method:	Unified Soil Classification System (USCS)
Ground Conditions Summary from borehole records:	Section 9.2 in Greencap (14 August 2019) DSI states that 'surface soils generally consisted of silt material followed by clay. Below the silt material (natural top soils or fill material) was firm to stiff, red clay with moderate to high plasticity, generally mottled orange/yellow and grey, with grey mottling increasing with depth. Natural clay was generally encountered at depths between 0.2-0.3m Below Ground Level (BGL) across all sample locations, with coal inclusions noted within the natural residual clay. Based on the Auditor's understanding of the geology in the western Sydney area, reference to the 'coal inclusion' observed by Greencap is most likely to be charcoal in shallow profile from historical bushfires or bushfire control activities.



Title	Details
Location of Fill Materials:	Section 9.1 in Greencap (21 January 2019) DSI states that 'the two stockpiles of fill material identified in the PSI report were located as described'. Section 9.2.1 in Greencap (21 January 2019) DSI states that 'fill material consisted of brown clay-silt or silt and contained some organic plant root material and foreign material such as ceramic, plastic and bituminous asphalt fragments. The surface silt material encountered in the following test pits was deemed to be fill material: TP1, TP2, TP4, TP8, TP9 and TP12'. The Auditor notes that these test pits were located in the northern/north eastern portion of the site.
Regional Hydrogeology:	Based on the subsurface conditions, shallow groundwater may occur within the residual clay and weathered shale with regional aquifer within the underlying shale bedrock. Groundwater is anticipated to be at depths greater than 5m bgl.
Summary of Monitoring Wells:	Section 3.3 in EIS (23 January 2019) PSI states that there was one (1) registered bore located 976m south east of the site and was registered for monitoring purposes. The drillers log identified silty clay to a depth of 4.0m underlain by siltstone and shale bedrock. The standing water level (SWLs) in the bore was recorded at 4.5mBGL.
Depth to Groundwater:	Section 3.3 in EIS (23 January 2019) summarised the findings of the registered bore. The Auditor considers that perched groundwater occurs between 3-5mbgl.
Direction and Rate of Groundwater Flow:	Section 5.2 in Greencap (14 August 2019) DSI states that 'regional groundwater is expected to flow in a southern/south-western direction consistent with the regional topography'.
Use of Water Abstraction:	Section 3.3 in EIS (23 January 2019) PSI states that 'subsurface conditions at the site are likely to consist of residual soils overlying relatively shallow bedrock. The potential for viable groundwater abstraction and use of groundwater under these conditions is considered to be low'. The Auditor notes that the groundwater in this geological formation is saline.
Nearest Water Body:	Table 1 in Greencap (14 August 2019) DSI identified an unnamed creek approx. 275m south of the site and considered to be the nearest potential ecological receptor. At the time of inspection the creek was dry.
Direction of Surface Water Run Off:	Section 5.2 in Greencap (14 August 2019) DSI states that 'based on site topography, surface water runoff is expected to flow in a southern direction, towards the unnamed creek south of the site'
Background Water Quality:	None provided. The Auditor notes that no surface water features are present onsite.
Summary of Local Meteorology:	None provided. The Auditor considers that the absence of this information does not affect the outcome of this SAR.

4.4 Contaminants and Media

EIS (23 January 2019) PSI identified the following potentially contaminating activities and contaminants of concern associated with past and present site use. Locations are indicated on figures included in Appendix A.



Table 4.4 Summary of Potentially Contaminating Activities

Area	Activity	Potential Contaminants
Entire Site	Uncontrolled Filling	heavy metals (M8), total recoverable hydrocarbons (TRH), poly aromatic hydrocarbons (PAH), mono aromatic hydrocarbons (BTEXN), organochlorine pesticides (OCP), phenol, polychlorinated biphenyls (PCB) and asbestos
Entire Site	General use of pesticides	M8, OCPs and OPPs
Northern portion of the site	Historical agricultural uses - this could have resulted in contamination across the site via use of machinery, application of pesticides and possibly demolition of any historical structures.	M8, TRH, PAH, OCP, PCB and asbestos

The consultants considered the contaminants of potential concern (COPC) in soil only.

4.5 Auditor Discussion

The information required by OEH (2011), in regard to site condition and history, geology, hydrology and hydrogeology, has generally been provided, and is consistent with the Auditor's understanding of the site area. Those items not provided are listed above but their omission is not considered to affect the conclusions of this SAR.

The Auditor concurs with the consultant that the COPC identified for the site are those listed above and are therefore generally appropriate for the purposes of this SAR.



5 Sampling and Analysis Plan

This section provides a summary of the review of the sampling and analysis plan and associated methodologies adopted by the consultant(s) for the investigation and validation works conducted. This information has been sourced from the documents presented in Section 1.4. Detailed review is provided in Table E1 in Appendix E.

5.1 Auditor Discussion

The information required by OEH (2011) in regard to the sampling and analysis plan and associated methodologies, has been generally provided for all investigations phases characterising the site. The Auditor considers that this is appropriate given the conceptual model with the following exceptions:

- Whilst noting that the final sampling density did not meet NSW EPA (1995) minimum sampling density, the Auditor generally concurs with the justifications provided by Greencap and considers the sampling density rationale to be appropriate based on past landuses. The Auditor notes that the site was predominantly used as rural land in the past with no visual and/or olfactory signs of contamination observed in the 35 test pits excavated as part of the DSI.
- The Auditor notes that limited samples were analysed for PAH, OCP, OPP and PCB, however considers that this discrepancy does not affect the outcome of the audit based on the following justification provided by Greencap:
 - 'Aerial photographs do not indicate intense agricultural activity on site. The majority of the site is noted as greenfield with virgin soils. 5 samples collected were tested for OCP and OPP to close out these contaminants of potential concern. The results of the analysis on these samples were all non-detect. Furthermore, recent waste classification results also indicated non-detect for OCP and OPP. Therefore, there are multiple lines of evidence to conclude the OCP and OPP contamination risk on site is low (and no further investigation required).
 - Allowance for PAH analysis is made for cases (if encountered) where ash, tar or similar inclusions are observed within fill material. Site soils did not contain these inclusions, therefore PAH was only scheduled on a number of fill samples for general coverage. Minor bitumen inclusion was noted in TP1 (0.1-0.2), which returned a non-detect for PAH. Based on these, Greencap concluded that the existing lines of evidence was sufficient to conclude PAH contamination on site is low. This is also supported by the recent waste classification testing'.
- Whilst noting that assessment of asbestos was not completed in accordance with NEPM 2013 quantitative method, the Auditor does not consider this discrepancy to affect the outcome of the audit findings based on the justification provided by Greencap:
 - 'Greencap field consultants were on site with the necessary sieve equipment (7x7 mm sieve and scale). As test pitting exercise did not reveal any ACM fragments on site, quantitative test was not undertaken. Sieve testing has been undertaken in the scope of the recent waste classification sampling and no ACM was observed. AF/FA testing was also conducted for the fill material stockpiled onsite where friable asbestos was not recorded'.
- The Auditor notes that 1 triplicate sample was analysed for this investigation, which is below the NEPM requirement (1 duplicate and 1 triplicate samples per 20 primary samples). However, the Auditor notes that this minor discrepancy does not affect the outcome of this SAR.



Further comments on the consultants' reports are provided in the Interim Advice correspondence presented in Appendix B.

The NSW EPA (2017) requires that an Auditor must check key requirements of the sampling and analysis plan by Greencap makes the following statements:

- The Auditor confirms that Greencap (14 August 2019) DSI included a general statement of the predetermined DQOs for field and laboratory procedures (including quantitative DQOs);
- The Auditor confirms that Greencap (14 August 2019) DSI included a plan to achieve pre-determined DQOs; and
- The Auditor confirms that Greencap (14 August 2019) DSI included procedures to be undertaken if the data did not meet the expected DQOs.



6 Evaluation of Site Criteria

6.1 Assessment Criteria for Soil

The soil assessment criteria used by the consultants included the following:

- NEPM (2013) HIL A for residential with garden/accessible soil land use which also includes childcare centres, preschools and primary schools;
- NEPM (2013) HSL A/B for low / high density residential land use in a sandy soil;
- NEPM (2013) EIL for urban residential and public open space;
- NEPM (2013) HSL guidelines for asbestos; and
- NEPM (2013) Management Limits for residential, parkland and public open space for a coarse soil.

6.2 Other Assessment Criteria

Where no Australia criterion is available, the limit of reporting (LOR) was adopted as a preliminary screening criterion. Where the concentration exceeds the LOR, reference criteria would be selected from national and international guidance as appropriate to determine the significance or otherwise of the detected analyte.

6.3 Waste Classification

Waste classification was conducted in accordance with EPA (2014) Waste Classification Guidelines: Part 1: Classifying Waste.

Excavated natural material assessment was conducted in accordance with EPA (2014) The Excavated Natural Material (ENM) Order.

6.4 Auditor Discussion

The Auditor considers that the adopted criteria were appropriate for the contaminants of concern identified for the guidelines present at the time of reporting, the environmental setting for the site and the proposed future primary school use.



7 Assessment of Investigation Results

The results for soil sampling completed at the site are summarised below. Refer to Appendix A and C for sample locations and analytical result summary tables respectively.

7.1 Soil Analytical Results

Table 7.1: Summary of Soil Results (mg/kg) (Greencap 2019)

Constituents	Num. of Samples	Max Result	HIL A/HSL A/B	EIL/ESL ²	ML ³	No. Samples > Criteria (Exceedance)
Arsenic	32	40	100	100	-	0
Cadmium	32	<0.4	20	-	-	0
Chromium	32	31	100	190	-	0
Copper	32	41	6000	95	-	0
Lead	32	43	300	1100	-	0
Mercury	32	<0.1	40	-	-	0
Nickel	32	23	400	30	-	0
Zinc	32	180	7400	230	-	0
F1 TRH C ₆ -C ₁₀ less BTEX	32	<20	45 (0-<1m) 70 (1-<2m) 110 (2-<4m) 200 (4m+)	180	700	0
F2 TRH >C ₁₀ -C ₁₆ less Naphthalene	32	<50	110 (0-<1m) 240 (1-<2m) 440 (2-3m) NL (>4m)	120	1000	0
F3 TRH >C ₁₆ -C ₃₄	32	<100	-	300	2500	0
F4 TPH C ₃₄ -C ₄₀	32	<100	-	2800	10000	0
Benzene	32	<0.1	0.5 (0-<1m) 0.5 (1-<2m) 0.5 (2-<4m) 0.5 (4m+)	50	-	0
Toluene	32	<0.1	160 (0-<1m) 220 (1-<2m) 310 (2-<4m) 540 (4m+)	85	-	0
Ethylbenzene	32	<0.1	55 (0-<1m)	70	-	0



Constituents	Num. of Samples	Max Result	HIL A/HSL A/B	EIL/ESL ²	ML ³	No. Samples > Criteria (Exceedance)
			NL (1-<2m) NL (2-<4m) NL (4m+)			
Xylene	32	<0.3	40 (0-<1m) 60 (1-<2m) 95 (2-<4m) 170 (4m+)	105	-	0
Naphthalene	32	<0.5	3 (0-<1m) NL (1-<2m) NL (2-<4m) NL (4m+)	170	-	0
BaP TEQ	6	1.2	2	-	-	0
BaP	6	<0.5	-	0.7	-	0
Total PAH	6	<0.5	300	-	-	0
PCB	5	<0.1	1	-	-	0
OCP (various)	5	<0.05-<1	6-300	-	-	0
OPP (various)	5	<0.2-<2	160	-	-	0
Bonded ACM	9	Not detected	0.01%	-	-	Presence/absence method
FA and AF	Not tested	-	0.001%	-	-	Not tested
All forms of asbestos	35	Not observed	No visible asbestos for surface soils	-	-	0

Notes:

1 NEPM (2013) HIL A soil vapour intrusion for sandy soil

2 NEPM (2013) EIL/ESL – Urban residential and open public space

3 NEPM (2013) Management limits Residential, parkland public open space, coarse soil

4 Laboratory results for TPH fractions determined prior to 2013 are different to those used in the NEPM (2013).

However, older data has been compared to the NEPM (2013) criteria to assist in determining site suitability.

Note that some ESL for TRH F2 applies for TRH >C10-C16 without subtraction of naphthalene, and ML for TRH F1 and TRH F2 apply for TRH C6-C10 and TRH >C10-C16 without subtraction of BTEX and naphthalene, respectively.

NL No Limit

No guideline

7.1.1 Auditor Discussion on Contamination Status of Soil

Based on the number of soil samples actually analysed, the sampling spread and soil type encountered at the site, the Auditor considers that soil was adequately characterised when the data set is considered as a whole.



From the information presented in Table 7.1, the Auditor draws the following conclusions regarding soil quality at the site:

All soil results submitted for analysis were recorded at concentrations below their respective assessment criteria (HIL/HSL-A and EIL/ESL), noting the following:

- Whilst noting that 32 soil samples collected out of 35 test pits were analysed as part of the DSI, Greencap has indicated that 'absence of chemical data at TP16, TP20, and TP22 is not considered a data gap due to the following lines of evidence:
 - TP16 and TP22 - natural soil profile, no fill material was encountered, PID did not indicate potential hydrocarbon contamination
 - TP20 - no visual or olfactory evidence of contamination was noted, PID did not indicate potential HC contamination.
 - An additional field investigation was undertaken on 26 July 2019 and samples were collected from stockpiled topsoil and fill material for waste classification purposes (inc. SPA and SPB) which provided additional confidence for the chemical status of the soils originating from the site.

The Auditor accepts the above discussion and conclusions drawn by Greencap.

Whilst noting that 5 soil samples were analysed for OCP, OPP and PCB, Greencap states that 'aerial photographs do not indicate intense agricultural activity on site. The majority of the site is noted as greenfield with virgin soils. Five samples collected were tested for OCP and OPP to close out these contaminants of potential concern. The results of the analysis on these samples were all non-detect. Furthermore, recent waste classification results also indicated non-detect for OCP and OPP. Therefore, there are multiple lines of evidence to conclude the OCP and OPP contamination risk on site is low (no further investigation required)'. The Auditor generally accepts this conclusion.

Whilst noting that 6 soil samples were analysed for PAH, Greencap has indicated that 'allowance for PAH analysis is made for cases (if encountered) where ash, tar or similar inclusions are observed within fill material. Site soils did not contain these inclusions therefore PAH was scheduled for a number of fill samples for general coverage. Minor bitumen inclusion was noted in TP1 (0.1-0.2), which returned non detect for PAH. Based on these, Greencap deems, the existing lines of evidence is sufficient to conclude PAH contamination on site is low'. This is also supported by the recent waste classification testing'. The Auditor generally accepts this conclusion.

It is noted that asbestos assessment was not completed in accordance with NEPM 2013 quantitation method, with a 9 soil samples submitted for presence/absence method. Greencap has indicated that ACM fragments were not observed during site inspection, therefore, asbestos assessment was not completed in accordance with NEPM sampling requirements.

Greencap subsequently completed 10L sieving samples during waste classification, with AF/FA testing also being conducted for the fill material stockpiled on-site. Given the site was formerly rural land, the absence of site indicators of asbestos containing materials the testing conducted is considered acceptable to evaluate the potential presence of ACM/AF/FA.

7.1.2 Aesthetics

Regarding aesthetics, Greencap in their response to IA01 (dated 2 August 2019) indicated that 'foreign material inclusions (e.g. terracotta pieces) that do not pose a contamination risk, may remain in-situ underneath sealed surfaces on site (e.g. Building footprints, pavements or asphalt



roadways). Garden accessible soils (top 100 mm in particular), on the other hand, are recommended to be cleared from foreign objects’.

The Auditor issued an interim advice 2 (6 August 2019) and requested ‘consideration be given if proposed areas of landscaping and play grounds will comprise the import of suitable ground surfaces thereby further reducing aesthetic concerns for future use’.

In their response to IA02 (dated 14 August 2019), Greencap concluded that ‘minor inclusions of foreign materials within the reworked natural soils would not cause an aesthetic problem (refer to NEPM 2013 Schedule B(1) Section 3.6.3). Exception to this are sharp objects / scrap metals, which may cause injuries during gardening activities. Therefore, any scrap metal or buried waste encountered during earthworks shall be managed as per the Unexpected Finds Protocol and taken off-site’.

To further address any potential aesthetic concerns, RCC also provided the proposed landscaping and ground cover for the non paved areas, as follows:

- Play Mulch Softfall – 100mm of DGB20 base course then 300mm of play mulch on top of the existing compacted subgrade material.
- Mass Planting – 300mm of topsoil then 75mm of mulch on top of existing compacted subgrade material.
- Turfing – 100mm of topsoil then turfing on top of existing compacted subgrade material.
- Rubber Softfall – 75mm DGB20 base course then 110mm rubber attenuation then 15mm Softfall on top of existing compacted subgrade material.
- Typical Play Mulch – 100mm drainage layer then 300mm organic mulch on top of existing compacted subgrade material.

Given the above the Auditor considers that aesthetics have been addressed given the final surface covers, and the ongoing implementation of the unexpected finds protocol.



8 Evaluation of Quality Assurance (QA) and Quality Control (QC)

The EPA (2017) requires that an Auditor must check key requirements of the quality assurance and quality control of Consultant's work and makes the following statements:

- The Auditor confirms that the applicability and limitations of field sampling methodology are discussed and addressed in the consultants reports;
- The Auditor confirms that the consultant has ensured adequate calibration of field instruments (where used);
- The Auditor confirms that the consultant's reports have generally assessed the significance of the field determination of the results compared with the laboratory results and where not compatible has been explained by the consultant;
- The applicability and limitations of laboratory methodology are not discussed and addressed in the consultants reports. The Auditor is however satisfied that a NATA accredited method (where available) and laboratories were used by the consultant;
- The Auditor confirms that the methods used for site investigation were of sufficient precision, accuracy and sensitivity to achieve the assessment of risk;
- The laboratory results meet the accuracy criteria specified by the consultant for each performance method; and
- The consultant indicated that the results generally meet the criteria specified by the consultant in their DQO with some exceptions:
 - Only 32 soil samples collected out of 35 test pits were analysed as part of the DSI, with limited analysis for PAH, OCP, OPP and PCB. Based on the discussion presented in Section 7.1.1 the Auditor considers this discrepancy does not affect the outcome of this SAR
 - Asbestos assessment was not completed in accordance with NEPM 2013 quantitation method, with 9 soil samples submitted for presence/absence method. Greencap indicated that ACM fragments were not observed during site inspection and site works, nor from sieving testing completed during waste classification sampling event. Given the site was predominantly used for rural purposes, with no major buildings and/or structures present, the Auditor considers this discrepancy does not affect the outcome of this SAR. Further discussion is provided in Section 7.1.1.

The following QA/QC discrepancies were noted:

- Trip spike was not sampled - given volatile compounds were not a COPC for the site, this discrepancy does not affect the quality of the data set.
- Trip blank was not sampled - given soil contamination was not detected during the DSI, this discrepancy does not affect the quality of the data set.
- Rinsate was not collected - given nitrile gloves were used during sampling and changed between samples, and therefore this omission does not affect the quality of the data set.
- Triplicate sample not located onsite – Greencap responded that triplicate sample was collected from an offsite location. As such there are no triplicate samples available from the DSI. Given soil contamination was not detected during the DSI, this discrepancy does not materially affect the outcome of this SAR.
- The two primary lab matrix spike exceedances are not considered to affect the quality of data.



9 Evaluation of Validation Works

9.1 Validation Criteria

The validation criteria adopted by Greencap for soil during the earthworks is as presented in Section 6.

9.2 Summary of Validation Works

No remediation works were required for the site, rather the additional validation sampling completed by Greencap was to address data gaps identified by the Auditor in the initial information reviewed.

This section provides a summary of validation works completed as part of site preparation and earthworks activities only. Validation works included the following:

- Stripping of topsoil for offsite disposal as either
 - Excavated natural material (ENM) (western and eastern portions of TS1), or
 - General solid waste (GSW) (central portion of TS1 and TS2)
- Removal of fly tipped stockpiles SPA and SPB.
- Removal of the bitumen material from the eastern portion of the site (SP3)
- Removal of unexpected finds UF1 (stained soil with metal inclusions) in the western portion of the site (SP4)
- Excavation of 9 test pits within the 'cut and fill' area in the western portion of the site where an unexpected find UF1 was encountered.
- Inspection of exposed natural clays as part of the detailed site walkover to confirm whether visual soil contamination was present.

9.3 Review of Waste Classification and Off Site Disposal Works

A review of waste classification and offsite disposal information provided is summarised in Tables F1 and F2 in Appendix F, respectively.

9.4 Review of Imported or Reused Material

Review of imported fill material is provided in Table F3 in Appendix F.

9.5 Auditor Discussion of Validation Works

The Auditor provides the following discussion on validation works:

- Stockpiles SPA, SPB, SP3 and SP4 have been classified as General Solid Waste and removed offsite to a facility in St Marys. Refer to Appendix F for further details.
- Whilst validation samples have been collected by Greencap from the UF1 excavation as part of the waste classification assessment, these samples were not submitted for testing. In response to IA02, Greencap has indicated that 'waste classification report of SP4, which corresponds to



UF1, shows all samples tested in this material returned contaminant results below the health criteria for residential land use criteria (HIL-A and HSL-A). These results are also provided in our letter report dated 6 August 2019:

- natural background levels for metals,
- trace level hydrocarbon hits (may be naturally occurring as BTEXN and PAH were non-detect), and
- below laboratory limit of detection for all other contaminants analysed.

Therefore, it can be concluded that analysis of the validation samples collected from the footprint of the abovementioned material is not necessary'. The Auditor accepts this conclusion.

- No visual and/or olfactory signs of contamination were observed by Greencap from the additional test pits excavated within the vicinity of UF1.
- Topsoil stockpiles (Stockpile 1 and Stockpile 2, as denoted in the Greencap (23 August 2019) ENM report) were classified as Excavated Natural Material and General Solid Waste, respectively. The Auditor concurs with the classifications provided by Greencap noting that all the material is considered suitable to remain onsite.
- Other than the abovementioned removal works, the Auditor understands that no other remedial works were required at the site. This is supported by the data reported in earlier sections of this SAR.

9.5.1 Waste Classification and Offsite Disposal Works

The **waste classification** documents have been reviewed and the Auditor considers that the waste classification documents have been prepared in general accordance with the EPA (2014) Waste Classification Guidelines Part 1: Classifying Waste.

The **ENM assessment** document has been reviewed and the Auditor considers that the ENM assessment has been prepared in general accordance with the EPA (2014) The Excavated Natural Material Order.

In accordance with the EPA (2017) Contaminated Land Management Guidelines for the NSW Site Auditor Scheme (3rd edition), the Auditor has checked the following regarding **waste disposal**:

- The volume disposed offsite was in general accordance with the estimated volume generated onsite, with marginal discrepancy. This discrepancy can be associated with the assumptions used by the consultant in determining volume estimates versus the actual volume generated as part of excavation activities. On this basis the Auditor considers this discrepancy to be acceptable.
- Disposal dockets have been provided that match the disposal volume.
- The receiving landfill (Hi-Quality at St Marys, EPL 5857) is licensed to receive 'soil that meets the General Solid Waste Classification (assessed against the CT1 thresholds, Table 1) of the Waste Classification Guidelines as in force from time to time with the exception of the maximum threshold values for contaminants specified in the 'Other Limits' column'.

The Auditor notes that one of the lead results exceeded CT1 limit (email dated 27 August 2019) and requested further clarification from the facility. The facility manager indicated that they have reviewed the waste classification reports provided by RCC and confirmed that the facility is licensed to accept the waste prior to disposal (email dated 27 August 2019).



The Auditor conducted a statistical analysis of the lead results obtained from all four stockpiles that were disposed to the St Marys facility and notes that the 95%UCL concentration is less than CT1. On this basis and given that the volume of material is relatively small (approx. 50m³), the Auditor considers this discrepancy to be acceptable.

- At the time of this SAR, the topsoil stockpiles (stockpiles 1 and 2) had not been removed and remain onsite. The Auditor notes that Greencap proposes to segregate materials from E3, E5 and E6 in Stockpile 1 before taking the stockpile offsite as ENM and requires material segregation to be conducted in accordance with procedure as described in Section 8 in the Greencap (23 August 2019) ENM report. The Auditor notes that stockpiles 1 and 2 (comprising topsoil) are chemically suitable to remain onsite.
- The Auditor has not been provided with details of the waste transporter and is unable to comment on whether the waste transporter is licensed to transport the waste generated from site.

Based on the above, the Auditor considers that waste from the site has been appropriately classified and disposed.



10 Compliance with Regulatory Guidelines

Guidelines currently approved by the NSW EPA under Section 105 of the CLM Act are listed in Section 1.2 of this SAR. Where relevant, the Auditor has used this guideline in assessing the works conducted by the consultants.

The consultant's departures from the above guidelines are discussed in the preceding sections of this SAR. The Auditor considers that these departures do not detract from the quality of the data set or any associated conclusions made for the purposes of this SAR.

The Auditor considers that the work completed by the consultant was of sufficient quality to achieve the objectives of this SAR and confirm site suitability.

Approvals and licences under relevant NSW legislation for the works discussed in this SAR are as follows:

- SEPP Remediation of Land – Not applicable as no remediation was required.
- Waste Classification Guidelines (EPA 2014) – Based on a review of the results provided the Auditor is satisfied that waste classification was conducted in accordance with the guidelines.
- Excavated Natural Material Order (EPA 2014) – Based on a review of the results provided the Auditor is satisfied that ENM assessment was conducted in accordance with the guidelines.
- POEO (Waste) Regulation 2014 – Tipping dockets were provided for General Solid Waste that match the approximate volumes presented in the waste documentation provided by RCC. The receiving landfills were licensed to treat and dispose of the waste. However, no information is available on confirmation of tipping at the receiving facility for ENM. No information was provided on the licences for transportation of waste.
- NSW WHS Regulation 2017 – The Auditor is unable to comment on the adherence to WHS Regulation with the information provided.
- NSW EPA/Council – The Auditor is unable to comment on potential discharge of potentially contaminated water to surface water bodies or stormwater drains.
- Aquifer Interference Policy and NSW DPI Water Permit under Water Management Act 2000 – No dewatering was required.
- Guidelines on the Duty to Report Contamination (EPA 2015) – The Auditor considers that there is no contamination onsite that would require notification to the EPA.



11 Assessing Urban Redevelopment Sites

The EPA (2017) Contaminated Land Management Guidelines for the NSW Site Auditor Scheme (3rd edition) describes that in assessing the suitability of a site for an existing or proposed land use in an urban context, Auditors should ensure that the contaminated land consultants have followed the decision process for assessing urban redevelopment sites (Appendix A of EPA 2017).

For the purposes of the following assessment, the proposed land use of the site is **public primary school**:

- The Consultants site assessment and validation reports follow applicable guidelines listed in Section 1.3. The departures from the guidelines are listed in the preceding sections of this report. Where departures were noted these results were discussed and either included considering the shortcomings or omitted from consideration. Notwithstanding these departures, the Auditor considers there is sufficient information provided to enable a conclusion to be made on the suitability of the site.
- OEH (2011) provides guidance as to assessment, remediation and validation reporting processes and content. The OEH (2011) has generally been followed through the carrying out of soil investigation and subsequent validation works.
- Aesthetic inspections were carried out by the environmental consultant throughout investigation activities, with additional information on final surface conditions provided by RCC (as discussed in Section 7.1.2)
- The soils have been assessed against the health-based investigation levels for the use as low density residential with garden and accessible soils (NEPM (2013) HIL A/HSL A/B), which includes children's day care centres, preschools and primary schools. The Auditor is satisfied that suitable risk based assessment was conducted regarding residual soil and potential migration of contamination from soils to groundwater has been considered. The potential for this to occur was deemed to be low.
- No buildings or structures were present at the site.
- Hazardous ground gases and potential for vapour intrusion do not apply to the site as no volatile impacts were identified.
- Any issues relating to local area background soil concentrations that exceed appropriate site soil criteria have been addressed in the site assessment reports.
- To the extent practicable, human health impacts of chemical mixtures have been assessed.
- No ongoing environmental management plan is required as no residual contamination was identified.
- There is no evidence of migration of contaminants either onto or off the site.



12 Auditor's Assessment of Risk

12.1 Risk to human health, structures and the environment arising from the actual or potential contamination of the land

The Auditor concludes that no unacceptable risk to human health, structures and the environment have been identified in respect of actual or potential contamination of the site, based on the findings and results of the assessment works conducted and reviewed by the Auditor.

12.2 Potential for off-site migration of contamination and duty to report guidelines

Whilst no groundwater assessment was conducted, the site has been assessed in terms of extensive review of geology, hydrogeology and site history, contaminant type and behaviour, and available knowledge of surrounding sites.

Section 7.3.2 in Greencap (14 August 2019) states that 'available site data did not indicate the presence of any specific groundwater contamination source on site. This is based on the site desktop review, fieldwork conducted in 2018 and July 2019, and laboratory analytical results of site soils. Results of this investigation indicated that the site predominantly consisted natural soil landscape. Consequently, Greencap is of the opinion that this provides sufficient evidence that groundwater contamination is unlikely and therefore groundwater investigation works are not warranted'.

The factors above provide evidence that groundwater is not at risk from soil conditions. Given the low contamination profile for the site the potential for migration of contamination is considered to be low.

12.3 Requirement for any ongoing management of residual contamination

No contamination was identified and therefore no ongoing management is required.



13 Site Audit Conclusions

The investigation and validation works reviewed are generally considered to have met the requirements of EPA (2017), other relevant guidelines endorsed under s.105 of the CLM Act and the objectives of the Site Audit. Where the consultant's work deviated from the guidelines, the Auditor has discussed this within this SAR and is satisfied that these omissions do not affect the conclusions of the Audit.

Based on the reports provided to the Auditor and their evaluation as discussed in this SAR, the Auditor will issue a Section A Site Audit Statement (SAS) certifying that, in the opinion of the Auditor, the site is suitable for primary school use.

As earthworks are currently underway and construction activities still to commence, the following comments will be added to the SAS:

- Any material surplus to site requirements must be classified in accordance with NSW EPA Waste Classification Guidelines (2014) for offsite disposal and transported to an appropriately licensed waste receiving facility.
- Any material imported to site to achieve final design and landscaping levels must be certified as VENM (or ENM / other suitable material as defined in the waste exemptions).



14 Other Relevant Information

This Audit relates only to those matters relevant to the CLM Act 1997 and CLM Amendment Act 2008, which describes that “The general object of this Act is to establish a process for investigating and (where appropriate) remediating land that the EPA considers to be contaminated significantly enough to require regulation under Division 2 of Part 3”. The SAS and SAR do not seek to provide an opinion regarding other aspects of the environment not related to site contamination, to the suitability of the site in regard to the occupational health and safety legislation, or in regards to the suitability of the engineering design.

By definition, auditing involves the review and critique of Consultants’ work, including site histories, site surveys, subsurface investigations, chemical and physical analyses, risk assessments and modelling. Accordingly, the Auditor relies on the experience, expertise and integrity of the relevant organisations. The information sources referenced have been used to determine site history and local subsurface conditions. While the Auditor has used reasonable care to avoid reliance on data and information that is inaccurate or unsuitable, the Auditor is not able to verify the accuracy or completeness of all information and data made available.

Sampling and chemical analysis of environmental media is based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate based on the regulatory requirements and site history, not on sampling and analysis of all media at all locations for all potential contaminants.

Environmental sampling and laboratory analyses were undertaken as part of the investigations reviewed by the Auditor, as described herein. Ground conditions between sampling locations may vary, and this should be considered when extrapolating between sampling points. Chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the site which was not identified in the site history.

Changes to the subsurface conditions may occur subsequent to the investigations described herein, through natural processes or through the intentional or accidental addition of contaminants. The conclusions and recommendations reached in this site audit are based on the information provided at the time of the investigations.



Appendix A Figures



AERIAL IMAGE SOURCE: GOOGLE EARTH PRO 7.1.5.1557
AERIAL IMAGE ©: 2015 GOOGLE INC.

Title:

SITE LOCATION PLAN

Location:

34-38 SCHOFIELDS ROAD
SCHOFIELDS, NSW

Report No:

E30598KP

Figure No:

1

ENVIRONMENTAL INVESTIGATION SERVICES



This plan should be read in conjunction with the EIS report.



SCHEDULE OF LINES

No.	BEARING	DISTANCE
51	167°53'50"	7.34
52	177°26'40"	20.705

SCHEDULE OF CURVED BOUNDARIES

No.	BEARING	CHORD	ARC	RADIUS
1	94°26'05"	24.31	24.315	358
2	92°42'50"	2.415	2.415	295
3	85°11'20"	52.79	52.93	208
10	92°33'00"	0.695	0.695	279
11	82°03'00"	27.795	27.82	192
12	78°54'00"	7.27	7.27	208
13	81°05'35"	21.4	21.41	192
14	66°25'25"	5.08	5.08	258
15	80°35'30"	5	5	208
16	82°47'00"	10.92	10.92	208
17	89°20'25"	21.03	21.04	192

REFERENCE MARKS

No.	BEARING	DISTANCE	DESCRIPTION
D	98°37'00"	1.465	R.M. G.I.P. FD D.P.1203646
E	342°29'30"	3.415 & 13.195	R.M. D.H. & W. FD D.P.1208330
F	330°46'25"	1.25 & 14.45	R.M. D.H. & W. FD & D.P.1208330
			R.M. S.S.M.193158 FD
G	296°14'00"	5.24 & 20.035	R.M. D.H. & W. FD D.P.1208330
H	317°23'05"	1.16 & 14.47	R.M. D.H. & W. FD & D.P.1208330
			R.M. S.S.M.193159 FD
I	323°47'40"	1.45 & 14.225	R.M. D.H. & W. FD & D.P.1208330
			R.M. S.S.M.193183 FD
J	342°22'20"	3.485 & 12.825	R.M. D.H. & W. FD D.P.1208332
K	182°08'25"	4.04 & 14.2	R.M. D.H. & W. FD D.P.1208330
L	48°07'00"	8.98	R.M. D.H. & W. FD D.P.1208330
M	113°43'20"	4.29 & 17.19	R.M. S.S.M.193166 FD & D.P.1208330
			R.M. D.H. & W. FD
N	223°32'00"	0.925	R.M. G.I.P. FD D.P.1189372
Q	159°26'45"	3.525	R.M. D.H. & W. FD D.P.1231233
R	356°04'05"	4.585	R.M. G.I.P. FD D.P.1231233
S	254°38'25"	6.525	R.M. G.I.P. FD D.P.1231233
U	318°49'40"	6.235	R.M. G.I.P. FD D.P.1231233
V	222°07'50"	4.545	R.M. D.H. & W. FD D.P.1231233
X	228°43'40"	3.305	R.M. G.I.P. PLACED

'A' - PROPOSED RIGHT OF ACCESS & EASEMENT FOR SERVICES 6 WIDE
'B' - PROPOSED RIGHT OF ACCESS & EASEMENT FOR SERVICES 10 WIDE

Boundary of Site covered by Site Audit Statement SAS155 dated 10 September 2019, prepared by R Hall of Zoic Environmental Pty Ltd

SURVEYOR
Name: ANDREW RICHARD THOMAS
Date: 10 JULY 2018
Reference: 023-17

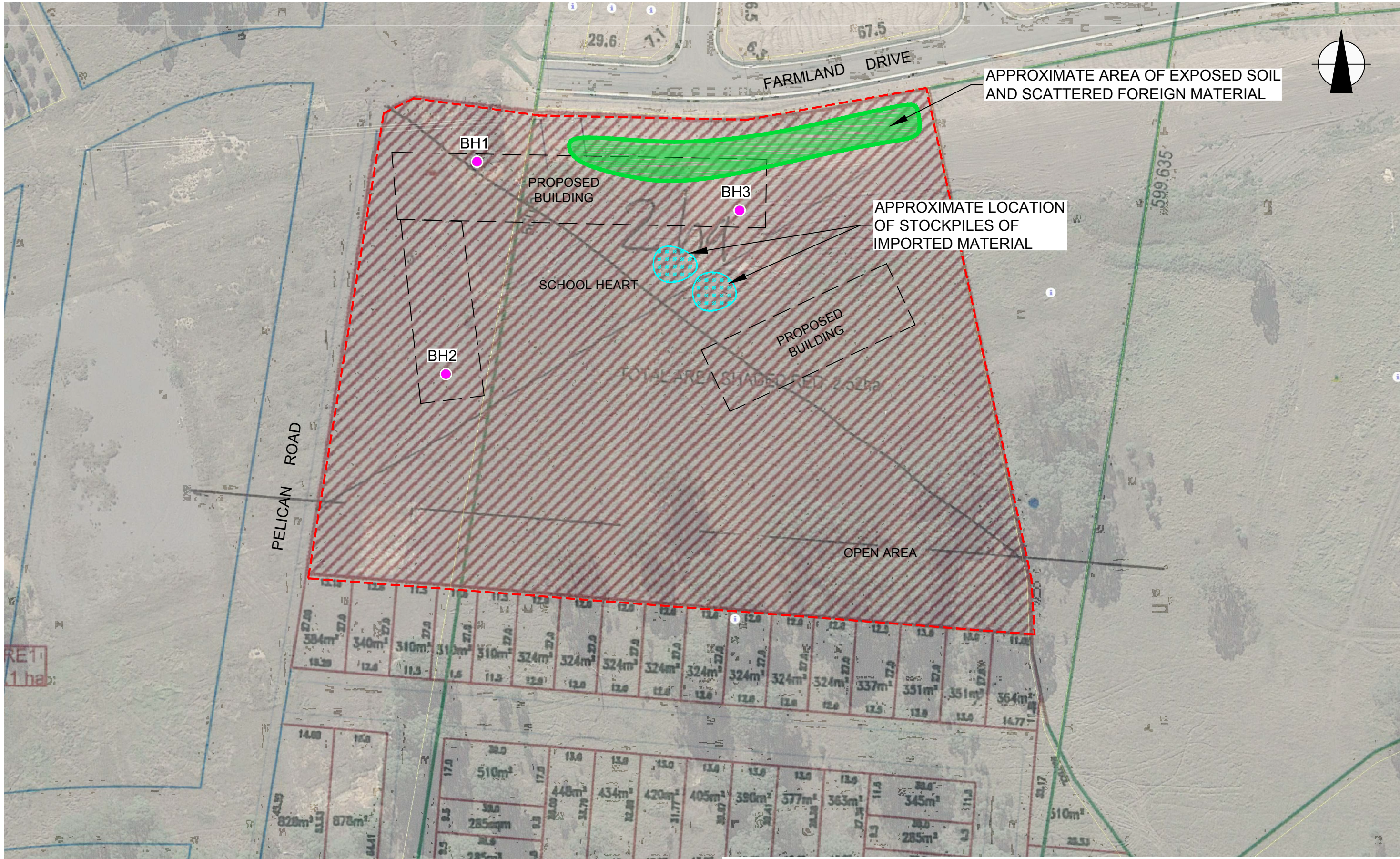
PLAN OF
LAND PROPOSED TO BE ACQUIRED WITHIN
LOT 4 D.P.1208329 & LOT 121 D.P.1203646

LGA: BLACKTOWN
Locality: SCHOFIELDS
Reduction Ratio: 1: 800
Lengths are in metres

Registered
20.07.2018

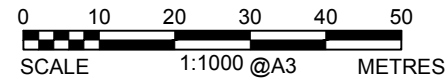
DP1244925

PLOT DATE: 28/07/2017 1:19:06 PM DWG FILE: S:\5 EIS\5C EIS JOBS\30000\5E30598KP SCHOFIELDS\CAD\E30598KP.DWG



LEGEND

- APPROXIMATE SITE BOUNDARY
- BH BOREHOLE LOCATION AND NUMBER

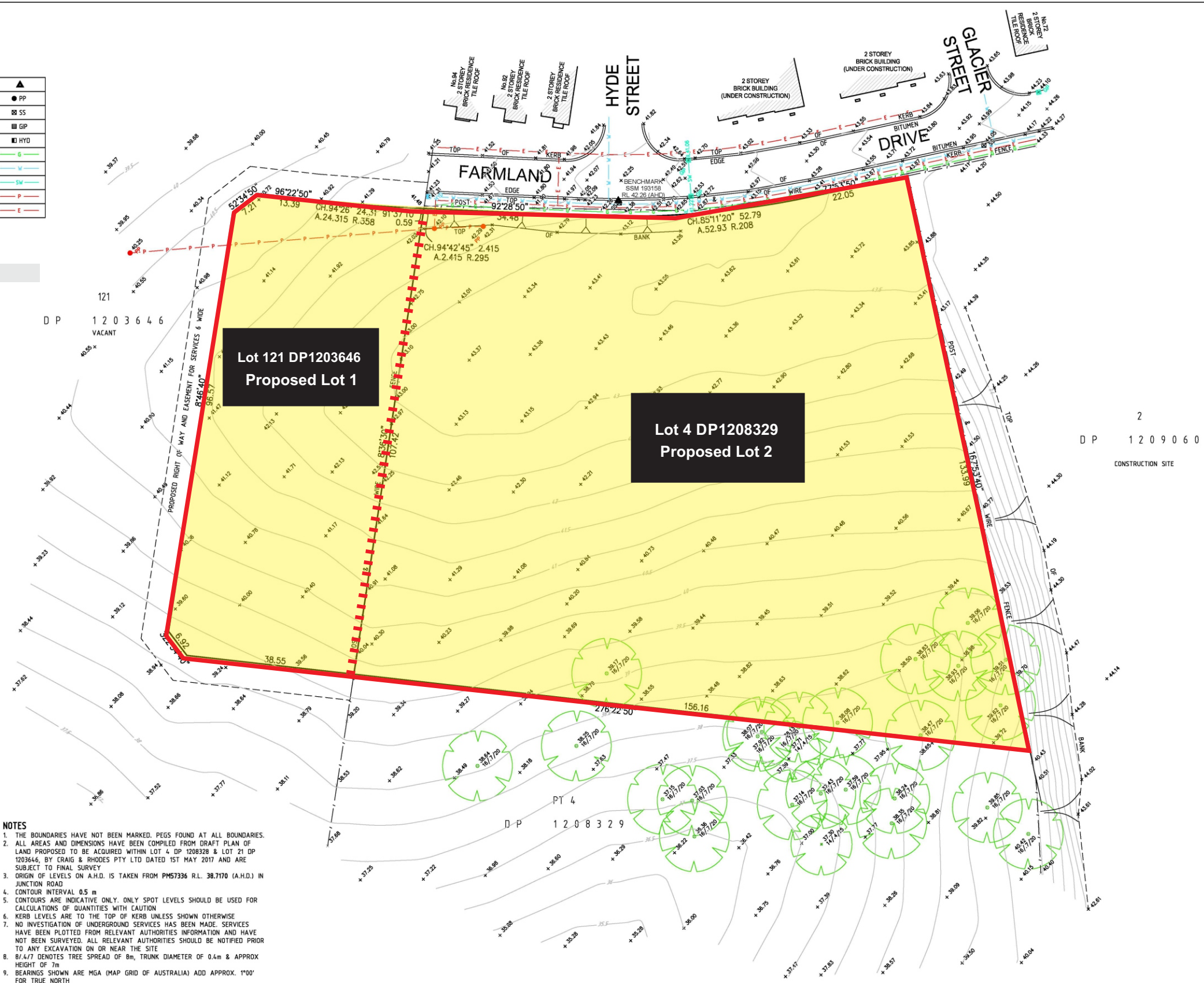


This plan should be read in conjunction with the EIS report.

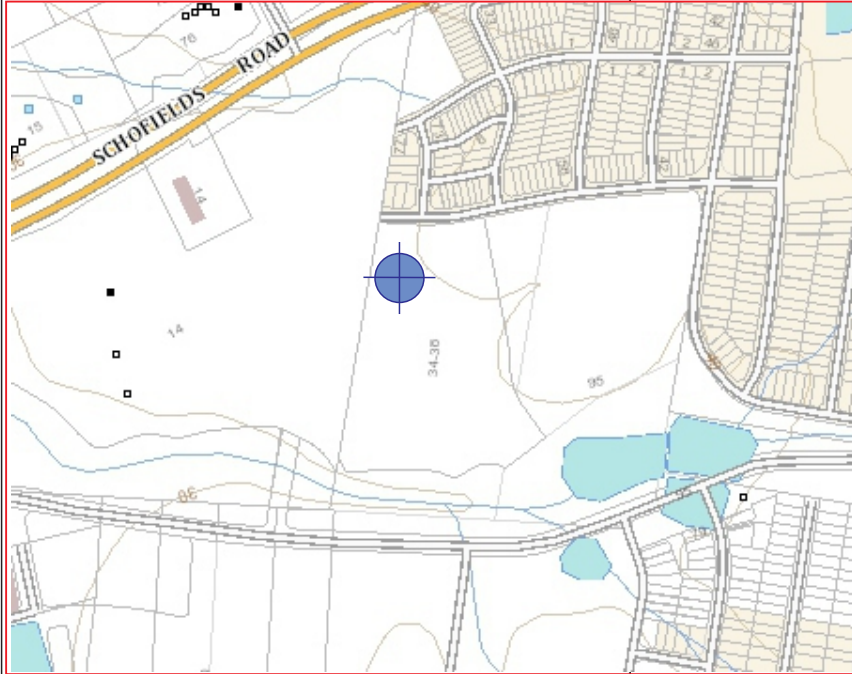
Title: SITE FEATURES PLAN		
Location: 34-38 SCHOFIELDS ROAD SCHOFIELDS, NSW		
Report No: E30598KP	Figure No: 2	
ENVIRONMENTAL INVESTIGATION SERVICES		



LEGEND	
BENCH MARK	▲
POWER POLE	● PP
STREET SIGN	⊠ SS
GRATED INLET PIT	⊠ GP
HYDRANT	■ HYD
GAS (DBYD)	— G
WATER (DBYD)	— W
STORMWATER (DBYD)	— SW
ELECTRICITY (OVERHEAD)	— P
ELECTRICITY (U/GROUND) (DBYD)	— E



- NOTES**
1. THE BOUNDARIES HAVE NOT BEEN MARKED. PEGS FOUND AT ALL BOUNDARIES.
 2. ALL AREAS AND DIMENSIONS HAVE BEEN COMPILED FROM DRAFT PLAN OF LAND PROPOSED TO BE ACQUIRED WITHIN LOT 4 DP 1208329 & LOT 21 DP 1203646, BY CRAIG & RHODES PTY LTD DATED 1ST MAY 2017 AND ARE SUBJECT TO FINAL SURVEY
 3. ORIGIN OF LEVELS ON A.H.D. IS TAKEN FROM PM57336 R.L. 38.7170 (A.H.D.) IN JUNCTION ROAD
 4. CONTOUR INTERVAL 0.5 m
 5. CONTOURS ARE INDICATIVE ONLY. ONLY SPOT LEVELS SHOULD BE USED FOR CALCULATIONS OF QUANTITIES WITH CAUTION
 6. KERB LEVELS ARE TO THE TOP OF KERB UNLESS SHOWN OTHERWISE
 7. NO INVESTIGATION OF UNDERGROUND SERVICES HAS BEEN MADE. SERVICES HAVE BEEN PLOTTED FROM RELEVANT AUTHORITIES INFORMATION AND HAVE NOT BEEN SURVEYED. ALL RELEVANT AUTHORITIES SHOULD BE NOTIFIED PRIOR TO ANY EXCAVATION ON OR NEAR THE SITE
 8. B/A/T DENOTES TREE SPREAD OF 8m, TRUNK DIAMETER OF 0.4m & APPROX HEIGHT OF 7m
 9. BEARINGS SHOWN ARE MGA (MAP GRID OF AUSTRALIA) ADD APPROX. 1°00' FOR TRUE NORTH



Legend:

Site Boundary



Level 2, 11-17 Khartoum Road
North Ryde, NSW 2113
Ph: 02-9889-1800
Fx: 02-9889-1811

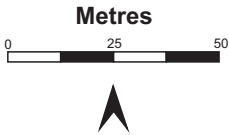
Client Name:		Group GSA	
Client Number:		C122140	Project Number: J157372
Project Description:		Detailed Site Assessment	
Address:		Cnr Farmland Dr & future realignment of Pelican Rd, Schofields NSW 2762	
Prepared:	NXB	Reviewed:	MB
Figure 1		Date:	21/01/2019
Site Location and Regional Context			

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Legend:

- Site Boundary
- Test-pit Sample Locations



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Fx: 02-9889-1811

Client Name:		Group GSA			
Client Number:		C122140		Project Number: J157372	
Project Description:		Detailed Site Assessment			
Address:		Cnr Farmland Dr & future realignment of Pelican Rd, Schofields NSW 2762			
Prepared:	NXB	Reviewed:	MB	Date:	21/01/2019
Figure 1	Sample Locations				

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Legend:

Site Boundary

Test-pit Sample Locations

Locations of Salinity Tested Samples



Test-pit Locations Containing Fill Material

Metres
0 25 50



GRENCAP
Going Further in Managing Risk

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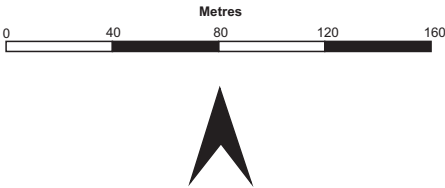
Client Name:		Group GSA			
Client Number:		C122140		Project Number: J157372	
Project Description:		Detailed Site Assessment			
Address:		Cnr Farmland Dr & future realignment of Pelican Rd, Schofields NSW 2762			
Prepared:	NXB	Reviewed:	MB	Date:	21/01/2019
Figure 1	Locations Samples Tested for Salinity & Encountered Fill Material				

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Legend:

- Site Boundary
- Site Location



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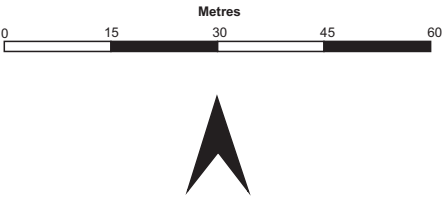
Client Name:		Richard Crookes Constructions Pty Ltd			
Client Number:		C107881		Project Number: J163717	
Project Description:		Detailed Walkover and Additional Soil Investigation			
Address:		34-38 Schofields Road, Schofields NSW 2762			
Prepared:	JG	Reviewed:	MB	Date:	2/08/2019
Figure 1	Site Location and Regional Context				

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Legend:

- Site Boundary
- Excavated Topsoil Stockpile
- Unexpected Find Location
- Test Pit Location - "ATP" Series
- Fill Stockpile Location



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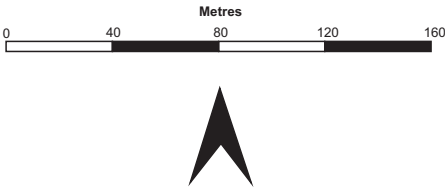
Client Name:		Richard Crookes Constructions Pty Ltd			
Client Number:		C107881		Project Number: J163717	
Project Description:		Detailed Walkover and Additional Soil Investigation			
Address:		34-38 Schofields Road, Schofields NSW 2762			
Prepared:	JG	Reviewed:	MB	Date:	2/08/2019
Figure 2	Site Boundary & Stockpile Locations				

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Legend:

- Site Boundary
- Site Location



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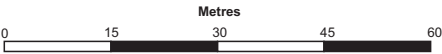
Client Name:		Richard Crookes Constructions Pty Ltd			
Client Number:		C107881		Project Number: J163717	
Project Description:		Waste Classification			
Address:		34-38 Schofields Road, Schofields NSW 2762			
Prepared:	JG	Reviewed:	MB	Date:	2/08/2019
Figure 1	Site Location and Regional Context				

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Legend:

-  Site Boundary
-  Stockpile Location



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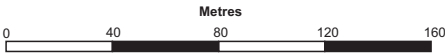
Client Name:		Richard Crookes Constructions Pty Ltd			
Client Number:		C107881		Project Number: J163717	
Project Description:		Waste Classification			
Address:		34-38 Schofields Road, Schofields NSW 2762			
Prepared:	JG	Reviewed:	MB	Date:	2/08/2019
Figure 2	Site Boundary & Stockpile Locations				

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Legend:

- Site Boundary
- Site Location



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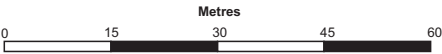
Client Name:		Richard Crookes Constructions Pty Ltd			
Client Number:		C107881		Project Number: J163717	
Project Description:		Waste Classification			
Address:		34-38 Schofields Road, Schofields NSW 2762			
Prepared:	JG	Reviewed:	MB	Date:	30/07/2019
Figure 1	Site Location and Regional Context				

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Legend:

-  Site Boundary
-  Stockpile Location



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Fx: 02-9889-1811

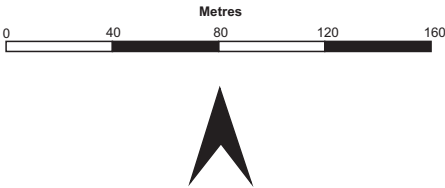
Client Name:		Richard Crookes Constructions Pty Ltd			
Client Number:		C107881		Project Number: J163717	
Project Description:		Waste Classification			
Address:		34-38 Schofields Road, Schofields NSW 2762			
Prepared:	JG	Reviewed:	MB	Date:	30/07/2019
Figure 2	Site Boundary & Stockpile Locations				

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Legend:

- Site Boundary
- Site Location



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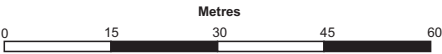
Client Name:		Richard Crookes Constructions Pty Ltd			
Client Number:		C107881		Project Number: J163717	
Project Description:		ENM Classification			
Address:		34-38 Schofields Road, Schofields NSW 2762			
Prepared:	JG	Reviewed:	IM	Date:	23/08/2019
Figure 1	Site Location and Regional Context				

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Legend:

-  Site Boundary
-  ENM Stockpile Boundary



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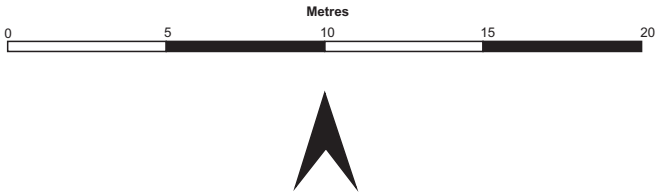
Client Name:		Richard Crookes Constructions Pty Ltd			
Client Number:		C107881		Project Number: J163717	
Project Description:		ENM Classification			
Address:		34-38 Schofields Road, Schofields NSW 2762			
Prepared:	JG	Reviewed:	IM	Date:	23/08/2019
Figure 2	Site Boundary & Stockpile Locations				

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Legend:

-  ENM Composite Sample Location
-  ENM Discrete Sample Location
-  Stockpile Boundary



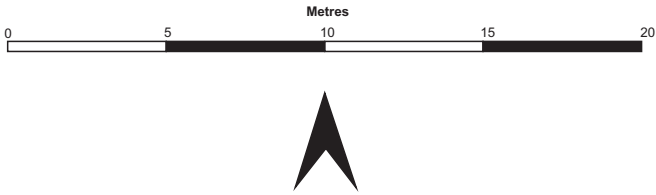
Level 2, 11-17 Khartoum Road
North Ryde, NSW 2113
Ph: 02-9889-1800
Fx: 02-9889-1811

Client Name:		Richard Crookes Constructions Pty Ltd			
Client Number:		C107881		Project Number: J163717	
Project Description:		ENM Classification			
Address:		34-38 Schofields Road, Schofields NSW 2762			
Prepared:	JG	Reviewed:	IM	Date:	23/08/2019
Figure 3	Stockpile One - Sample Locations				



Legend:

- ENM Composite Sample Location
- ENM Discrete Sample Location
- Stockpile Boundary



Level 2, 11-17 Khartoum Road
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Fx: 02-9889-1811

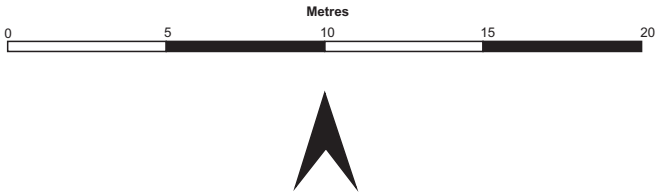
Client Name:		Richard Crookes Constructions Pty Ltd			
Client Number:		C107881		Project Number: J163717	
Project Description:		ENM Classification			
Address:		34-38 Schofields Road, Schofields NSW 2762			
Prepared:	JG	Reviewed:	IM	Date:	23/08/2019
Figure 4	Stockpile Two - Sample Locations				

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Legend:

- Stockpiled Material
- Material Excluded From ENM Classification



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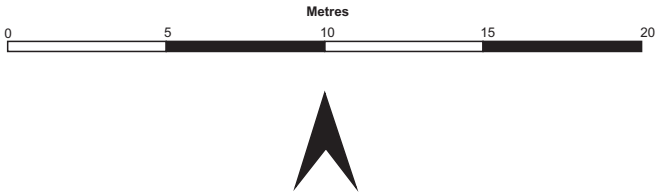
Client Name:		Richard Crookes Constructions Pty Ltd			
Client Number:		C107881		Project Number: J163717	
Project Description:		ENM Classification			
Address:		34-38 Schofields Road, Schofields NSW 2762			
Prepared:	JG	Reviewed:	IM	Date:	23/08/2019
Figure 5	Material Excluded From ENM Classification				

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Legend:

Stockpiled Material - ENM Classified



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Client Name:		Richard Crookes Constructions Pty Ltd			
Client Number:		C107881		Project Number: J163717	
Project Description:		ENM Classification			
Address:		34-38 Schofields Road, Schofields NSW 2762			
Prepared:	JG	Reviewed:	IM	Date:	23/08/2019
Figure 6	Material Covered Under This ENM Classification				

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Appendix B Audit Correspondence

ZOIC Environmental Pty Ltd
ABN 23 154 745 525
Suite 1, Level 9
189 Kent Street Sydney 2000
Phone: +61 2 9251 8070
www.zoic.com.au

19175 IA01 12July19 final.docx

12 July 2019

Issac Pinkerton
Richard Crooks Constructions Pty Ltd
Level 3, 4 Broadcast Way
Artarmon NSW 2064

Via email: PinkertonI@richardcrookes.com.au
cc: VozzoD@richardcrookes.com.au; HemmettT@richardcrookes.com.au

Dear Issac,

**Re: Interim Advice 01 – Review of Existing Information, Proposed Alex Avenue Public School,
28 Farmland Drive, Schofields NSW**

1 Introduction

Richard Crooks Constructions Pty Ltd (RCC) has appointed Rebeka Hall of Zoic Environmental Pty Ltd (Zoic), a NSW EPA Auditor accredited (No. 0802) under the Contaminated Land Management (CLM) Act 1997, to conduct an Audit for the proposed Alex Avenue Public School, located at 28 Farmland Drive, Schofields, NSW ("the site").

The proposed school development will involve:

- Construction of a two storey library, administration and staff building (Block A), comprising school administrative spaces, library, staff rooms and offices, special programs rooms, amenities, canteen, interview rooms and presentation spaces;
- Construction of four two-storey classroom buildings containing 40 home bases (Block B), comprising learning spaces and studios, covered outdoor learning spaces, practical activity areas and amenities;
- Construction of a single storey assembly hall (Block C) with a performance stage and integrated covered outdoor learning area;
- Associated site landscaping and open space;
- Pedestrian access points along both Farmland Drive and the future Pelican Road;
- Substation on the north-east corner of the site.

The aim of the engagement is to enable a site audit statement (SAS) and associated site audit report (SAR) to be prepared that confirms the suitability of the site for the proposed redevelopment into a primary school. The Audit is being conducted in accordance with the requirements outlined in the NSW EPA (2017) Contaminated Land Management Guidelines for the NSW Site Auditor Scheme (3rd edition).



2 Scope of Audit and Nature of Interim Advice

NSW EPA (2017) describes the site assessment and audit process as:

1. *Consultant is commissioned to assess contamination.* The contaminated site consultant designs and undertakes the site assessment and, where required, all remediation and validation activities to achieve the objectives specified by the owner or developer; and
2. *Site auditor reviews the consultant's work.* The site owner or developer commissions the Auditor to review the consultant's work. The Auditor then prepares a SAR and SAS at the conclusion of the review, which are given to the owner or developer.

Therefore, the contaminated land consultant and other relevant parties should be satisfied that the work to be conducted conforms to all appropriate regulations, standards and guidelines and is suitable based on the site history and the proposed land use.

It is understood that the Audit is currently non statutory in nature. Based on the information provided by RCC, we note that a development application has been submitted to Blacktown City Council and is pending for approval (DA no: 19-00283). The following conditions are related to land contamination:

3.3.1 The recommendations provided in the Preliminary Environmental Site Assessment (prepared by Environmental Investigation Services dated 23 January 2019) and the Detailed Site Investigation (prepared by Greencap dated January 2019) shall be implemented.

3.4.1 Any asbestos material is to be handled and treated in accordance with the SafeWork NSW document "Your Guide to Working With Asbestos - Safety guidelines and requirements for work involving asbestos" dated March 2008.

3.4.2 Recommendations outlined in Detailed Site Investigation, prepared by Greencap Pty Ltd, project no. J157372, dated 21 January 2019 must be carried out.

3.4.3 Any new information during remediation or construction works which has the potential to alter previous conclusions about site contamination must be immediately notified to Blacktown City Council.

3.4.4 Any materials requiring off-site disposal will need to be classified, managed and disposed of in accordance with the Protection of the Environment Operations Act 1997 and the NSW Environment Protection Authority's Waste Classification Guidelines (2014)

3.4.5 All areas that are suspected to be contaminated must be remediated. Upon completion of remediation an appropriately qualified environmental consultant must prepare a validation report in accordance with;

- NSW Environment Protection Authority's "Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites" (2011)
- NSW Environment Protection Authority's Contaminated Sites Sampling Design Guidelines (1995)
- NSW Environment Protection Authority's "Contaminated Sites: Guidelines for NSW Site Auditor Scheme" (2006)
- National Environment Protection Council "National Environment Protection (Assessment of Site Contamination) Measure" (2011).



3.4.6 A Site Audit Statement is to be obtained from a NSW Environment Protection Authority accredited Site Auditor. The Site Audit Statement must confirm that the site is suitable for the proposed use.

5.1.3 Should any contaminated material be unearthed or fly-tipped rubbish be encountered during construction, all works are to cease immediately. In this situation, a Remediation Action Plan (RAP) is to be submitted to Council for further consideration and all potentially contaminated material is to be tested, removed or undergo remediation. In this regard, the environmental consultant engaged for this project is to be on site for regular monitoring of the approved site works.

If Development Conditions are issued by Council, the Audit may become statutory in nature and require notification to NSW EPA.

3 Current Interim Advice

In preparing this interim audit advice, the Auditor has reviewed the following reports related to land contamination assessment:

- Environmental Investigation Services (EIS, 23 January 2019) Preliminary Environmental Site Assessment, 34-38 Schofields Road, Schofields NSW (Ref: E3.598KPrpt-rev1), referred to as the EIS (23 January 2019) PSI in this interim advice;
- Greencap (21 January 2019) Detailed Site Investigation, Corner of Farmland Drive and future realignment of Pelican Road, Schofields NSW (Ref: C122140 : NB), referred to as the Greencap (21 January 2019) DSI in this interim advice.;
- Greencap (21 January 2019) Salinity Report, Corner of Farmland Drive and future realignment of Pelican Road, Schofields NSW (Ref: C107881: NXB).

In addition to the above the following were also provided:

- JK Geotechnics (30 June 2017) Geotechnical Investigation, 34-38 Schofields Road, Schofields NSW (Ref: 30598Zrpt).
- JK Geotechnics (8 April 2019) Additional Geotechnical Investigation, 34-38 Schofields Road, Schofields NSW (Ref: 30598PH3rpt).

A brief review of the JK Geotechnics reports indicates that these were not related to land contamination. Therefore, a detailed review of the JK Geotechnics reports was not conducted as part of the preparation of this interim advice.

The purpose of the current IA is to document Auditor findings following the review of existing information related to site conditions and contamination status. This advice also outlines any data gaps identified in the existing information which should be addressed by the appointed consultant as either part of any further investigation works, or as part of any remedial or validation works that may be required at the site.

4 Summary of Greencap (21 January 2019) DSI

The objective of the report was to identify potential sources of contamination and contaminants of concern, evaluate the presence of contamination in the identified areas of concern, close out any data gaps identified in the Preliminary Site Investigation (PSI) (EIS, January 2019) report and assess site suitability for its intended use as a Primary School.

The scope of work included:



- Review of the PSI by Environmental Investigation Services (EIS, August 2017 [which was re-badged in 2019]).
- Review of available references relating to the local topography, geology, hydrogeology, acid sulfate soils risks, and salinity risks
- A site walkover
- Test pitting, soil logging and soil sampling at 35 locations across the site extending 0.5m into the underlying natural soils
- Analysis of soil samples
- Reporting.

The adopted soil investigation criteria were:

- Health investigation / screening levels (HIL/HSL-A) - Residential with garden/accessible soil (home grown produce <10% fruit and vegetable intake, (no poultry), also includes children's day care centres, preschools and primary schools
- Ecological investigation / screening levels for urban residential and public open space for coarse textured soils
- Management limits for fine grained soils.

The findings of the investigation were as follows:

- Analytical results indicated no elevated concentrations of the chemicals of potential concern (COPCs) in soil samples.
- The DSI did not identify any unacceptable human health or ecological risks associated with the surface soil quality. Greencap concluded that the surface soil within the site boundary is suitable for its intended use as a primary school.
- Any material to be taken off-site must be classified in accordance with the NSW EPA Waste Classification Guidelines (2014).

5 Auditor Comments

The Auditor has reviewed the EIS (23 January 2019) PSI and Greencap (21 January 2019) DSI against relevant guidelines made or approved by NSW EPA. The reports largely meets the guideline requirements, however, the Auditor provides the following comments:

EIS (23 January 2019) PSI

1. General (site boundary): It is noted that the site boundary covered by the Lotsearch report did not cover the entire site. A summary of site history should be provided for the 'entire' site or justification on whether the historical information is sufficiently represents the entire audit boundary.
2. Section 1 (introduction): The Auditor notes that the site's physical and legal address has been changed since the report was issued in January 2019.
3. Section 2.4.3 (presence of drums/chemicals, waste and fill material): Figure 2 shows that foreign material was observed within the exposed soils in the northern portion of the site. Whilst noting that three of the Greencap's test pits (TP1, TP2 and TP5) were located within this area, the Greencap report did not mention or record the presence of foreign materials within exposed soil in the northern portion of the site. Greencap to confirm whether or not foreign materials are located in that portion of the site and whether or not this is acceptable aesthetically on a primary school site.



4. Section 3 (geology and hydrogeology): Soil landscape maps were not reviewed.
5. Section 4.1 (review of historical aerial photographs): The site boundary as shown in the historical aerals prepared by Lotsearch has been changed since the completion of the PSI. Are the sheds originally noted to be located approximately 150m west of the site are now part of the site? Are these a potential source of contamination?
6. Section 4.2 (NSW EPA records): EIS states that 'a former licence was listed of the site for sewage treatment and processing by small plants'. No structures were observed on site at the time of the Lotsearch report. Please confirm whether the site was previously occupied by sewage treatment works.
7. Section 5.1 (AECs): If the sheds were located within the site (which have since been demolished), consideration of potential presence of hazardous materials should be included in the AEC table (for example, lead paints and asbestos). It is unclear to the Auditor why PCBs were included as COPC given the site was used historically for agricultural purposes. Is there a PCB risk at the site?
8. Table 5-3 (CSM): It is unclear to the Auditor why soil vapour was identified as potentially affected media, given the site was largely used for rural purposes. Is there a potential soil vapour risk at the site?

Greencap (21 January 2019) DSI

9. General – please confirm current ownership; the flood potential of the site; key summary of lands title searches and council records review;
10. Section 4.1 (desktop review): Greencap states that 'review of Council records and aerial photographs helped identify landfilling, including potential asbestos landfill'. Was such a use identified? Please clarify.
11. Section 7 (sampling density rationale): Whilst noting that 35 test pits were excavated during investigation works, only 32 soil samples were analysed as part of the analytical program (no soil samples analysed from TP16, TP20 and TP22). Please justify the discrepancy as this does not meet the minimum sampling density requirement as described in NSW EPA (1995).
12. Section 8.1 (site inspection):
 - a. Greencap states that 'the two stockpiles of fill material identified in the PSI report were located as described. Refer to Figure 3 for stockpile locations'. A review of Figure 3 notes that the two stockpiles were identified by Greencap were located further north and east from the two stockpiles observed by EIS during the PSI. Based on the EIS and Greencap figures, it appears that the two stockpile locations identified by EIS were closer to the Greencap's test pits TP6 and TP7 and the area to the immediate south of these two test pits. Please confirm if this interpretation is correct and that the area has been suitably characterised.
 - b. As discussed in Comment 3, foreign materials were previously observed in the northern portion of the site. Please confirm whether this was observed onsite and actual nature of foreign materials across the site and whether aesthetically this is acceptable for a primary school site.
13. Section 8.2.1 (fill material encountered onsite): Based on the information provided in borehole logs (Appendix D of report), fill material was also observed in TP13, TP15, TP17, TP18 and TP20. Please clarify.
14. Section 8.2.2 (natural soils):
 - a. It is noted that 'natural black coal inclusions noted (2%) at 0.5m' within the natural residual clay. Please clarify. It is considered uncommon to observe black coal inclusions



within residual clay encountered in the western Sydney area. Would this material be reworked natural? Please confirm source. Is this of concern?

- b. If the material is confirmed to be reworked natural soils, not natural soils, this test pit did not extend into the underlying natural soils. Please confirm whether this will have a material impact to the outcome of the investigation.

15. Section 10.1 (analytical schedule):

- a. Given the site was previously used for agricultural purposes (in particular the northern portion), please justify why only five soil samples were analysed for OC and OP pesticides.
- b. It is noted that all not fill samples were analysed for PAHs. Please justify.
- c. Please confirm whether the above missions will have a material impact to the outcome of the investigation.

16. Section 10.4 (asbestos in soils):

- a. It is noted that all not all fill samples were analysed for asbestos and some natural soils were selected for asbestos analysis. Whilst noting that ACM was not observed by Greencap during test pitting and the site walkover, please clarify how samples were selected for asbestos assessment.
- b. In addition to the above, please justify why asbestos assessment was not conducted in accordance with NEPM 2013 quantitative method (10L sample for ACM and 500mL sample for FA/AF).
- c. It is noted that the reporting limit of 0.01%w/w was reported. Whilst it may be suitable for the presence/absence method, it does not meet the FA/AF criteria of 0.001%w/w. Has testing completed to date characterised the site for all forms of asbestos? What other lines of evidence are there to confirm that asbestos does not pose an unacceptable risk for the site particularly the proposed sensitive use.
- d. Please confirm whether the above will have a material impact to the outcome of the investigation or whether confirmatory testing is required.

17. Section 11.1.1 (CoPCs): Greencap states that 'sample analysis results indicated no elevated levels of any of the chemical analytes listed in Section 9.1. However, there is always a possibility (for any site) to encounter contamination outside of the investigation points'. Please clarify this statement. This implies the site has not been robustly investigated.

18. Section 12 (conclusions -aesthetic issues):

- a. Given the site is proposed for a primary school development, foreign materials that were identified within the fill materials are not suitable to remain onsite due to aesthetics issues. The Auditor requires these materials to be removed as part of the development or discussion provided given the final layout that these do not pose a concern for the future use of site (i.e. location of proposed site structures, finished ground surfaces relative to the location where foreign material was identified).
- b. During the project meeting held on 4 July 2019 with RCC and TSA, the Auditor was informed that anecdotally fly tipping may have occurred whilst the site was unsecured/unfenced. The extent of fly tipped material should be confirmed by a detailed site walkover following removal of site vegetation and/or site preparation works. The outcome of the site walkover should be reported to the Auditor. During the site walkover conducted by the Audit Assistant on 11 July 2019, two flytipped stockpiles were present in the northwest portion of the site, with demolition waste, including timber and sandstone bricks, observed in one of the stockpiles. It is understood that RCC will



request the appointed environmental consultant to conduct a waste classification of the stockpiles for offsite disposal.

- c. Due to the limited presence and nature of the flytipping observed during the site visit, it is considered that this can be managed as part of unexpected finds in the Construction Environmental Management Plan (CEMP). The Auditor is to be informed as soon as practical possible when unexpected finds being encountered onsite. Affected area should be restricted for access and no works should be resumed until the area has been cleared by the environmental consultant and the Auditor.

19. Appendix F (Lab Documentation):

- a. Please provide a copy of the chain of custody and sample receipt advice for review.
- b. Triplicate laboratory reports were not provided for review.

20. Appendix G (QA/QC):

- a. Section 3.12.2 in Appendix G discusses sampling methods adopted for drilling, not test pitting.
- b. Please outline QA/QC sample splitting techniques adopted.
- c. Please provide decontamination procedures for review.
- d. Was the PID calibrated prior to screening? Please provide calibration procedures and certificate.

General comments

- 21. Proposed temporary easement along eastern site boundary: The Auditor understands that a temporary easement will be constructed along the eastern site boundary to allow neighbouring properties accessing the main road. The easement will return to the school once the construction of the new road located on the adjacent property is complete. Please include the easement in the site survey plan which is required to be included as part of the Site Audit Statement. It is understood that the easement is approx. 6m wide and that no previous sampling locations were located within the easement. The Auditor requires additional sampling to be conducted within the easement, or provide justification as to why this is not required.
- 22. PFAS compounds: Please confirm whether PFAS compounds may have been potentially used onsite.
- 23. Groundwater assessment: EIS has identified groundwater sampling as one of the data gaps. This has not been addressed by Greencap in the DSI. Assessment of groundwater is required to be completed to close this data gap.

We request that the appointed environmental consultant provide responses to the above comments, together with an amended copy of the above reports, as appropriate.



6 Closure

This interim advice does not constitute a SAS or a SAR, but rather is provided to assist the Client in the assessment and management of contamination issues at the site. The information provided herein should not be considered pre-emptive of the final Audit conclusions. It represents the Auditor's opinion based on the review of currently available information.

Should you have any queries or wish to discuss any points, please do not hesitate to contact the undersigned.

Yours sincerely,

Rebeka Hall
Site Auditor
Zoic Environmental Pty Ltd

Fiona Wong
Senior Audit Assistant
Zoic Environmental Pty Ltd

Reference	Greencap Response
<u>Greencap (21 January 2019) DSI</u>	
1. General – please confirm current ownership; the flood potential of the site; key summary of lands title searches and council records review;	Updated DSI will include a subsection called PSI Addendum, where all additional desktop investigations will be incorporated. Additional desktop searches will cover proposed Lot 1 and Lot 2 (parts of Lot 4 DP1208329 and Lot 121 DP1203646 respectively) indicated in the layout. * Current and historical title searches are ordered for above lots and will be incorporated to the PSI Addendum under title "land titles summary". * Flood potential of the site is being assessed with an additional desktop study. * Section 149 (2) and (5) Council certificates are ordered for both lots and will be incorporated into the PSI Addendum under title "council records review".
2. Section 4.1 (desktop review): Greencap states that 'review of Council records and aerial photographs helped identify landfilling, including potential asbestos landfill'. Was such a use identified? Please clarify.	This item has been amended as follows: * "Review of Council records and aerial photograph to help identifying landfilling, including potential asbestos landfill" investigations did not identify any evidence of legacy landfilling on site. Although fill material was observed on the northern/ north eastern section of the site, no asbestos was identified within the test pits or on the surface. Therefore, Greencap deems an Unexpected Finds Protocol (UFP) would be an appropriate practice to manage the residual risk due to potential unexpected finds.
3. Section 7 (sampling density rationale): Whilst noting that 35 test pits were excavated during investigation works, only 32 soil samples were analysed as part of the analytical program (no soil samples analysed from TP16, TP20 and TP22). Please justify the discrepancy as this does not meet the minimum sampling density requirement as described in NSW EPA (1995).	35 test pits were advanced during the DSI and the material was visually observed, field screened with PID, and logged at each location. Absence of chemical data at TP16, TP20, and TP22 is not considered a data gap due to the following lines of evidence: * TP16 and TP22 - natural soil profile, no fill material was encountered, PID did not indicate potential HC contamination (refer to borehole logs in Appendix D); * TP20 - no visual or olfactory evidence of contamination was noted, PID did not indicate potential HC contamination. * An additional field investigation has been undertaken on 26 July 2019 and samples were collected from stockpiled topsoil and fill materials for waste classification purposes (inc. SPA and SPB) this provides additional confidence for the chemical status of the soils originated from the site.
4. Section 8.1 (site inspection):	

Reference	Greencap Response
a. Greencap states that ‘the two stockpiles of fill material identified in the PSI report were located as described. Refer to Figure 3 for stockpile locations’. A review of Figure 3 notes that the two stockpiles were identified by Greencap were located further north and east from the two stockpiles observed by EIS during the PSI. Based on the EIS and Greencap figures, it appears that the two stockpile locations identified by EIS were closer to the Greencap’s test pits TP6 and TP7 and the area to the immediate south of these two test pits. Please confirm if this interpretation is correct and that the area has been suitably characterised.	These stockpiles have been classified as GSW and are scheduled to be taken off-site. Greencap confirms this area has been suitably characterised.

Reference	Greencap Response
b. As discussed in Comment 3, foreign materials were previously observed in the northern portion of the site. Please confirm whether this was observed onsite and actual nature of foreign materials across the site and whether aesthetically this is acceptable for a primary school site.	Foreign materials (e.g. terracotta pieces) that do not pose a contamination risk, may remain in-situ underneath sealed surfaces on site (e.g. Building footprints, pavements or asphalt roadways). Garden accessible soils (top 100 mm in particular), on the other hand, are recommended to be cleared from foreign objects. <u>Updated site condition:</u> On 26 July 2019, Greencap conducted a detailed site walkover and observed fill material containing foreign materials were stockpiled towards the eastern section of the site (referred to as SP3, waste classification report is pending). Including SP3, on this day Greencap sampled six (6) different stockpiles and investigated an unexpected find (UF) of relatively small volume of (< 3m³) buried waste material (referred to as UF1, which consisted an old potential paint cannister ~ 10L volume, plastic sheeting, and terracotta—refer to Greencap's email dated 26 July 2019. We observed that the stockpiles on site were generally well managed and neatly separated from natural soils on site. We also noted that the soils on-site (predominantly natural) have been moved towards the west of the site as part of a cut & fill plan, which was understood to be the source of the re-worked natural soil surface towards the west. After the inspection and clearance of UF1, 3 validation samples were collected from the footprint of UF1 and sent to the NATA laboratory to be placed on hold. Should the chemical testing results of the excavated UF1 material (SP4) indicate presence of contamination, these samples will need to be scheduled for relevant chemical testing. Furthermore, after UF1, 9 test pits were advanced in the western section of the site (Proposed Lot 1) to cover the re-worked natural soils nearby. Greencap observed re-worked natural material was consistent with the natural soils found on site and did not include any visual or olfactory evidences of contamination. At all 9 test pits, natural soils were encountered at depths ranging between 0.1-1.2 mBGL. The findings of this investigation are to be documented in a letter report with photographic evidences and borehole logs. No chemical testing of this material was deemed necessary at this stage.

Reference	Greencap Response
5. Section 8.2.1 (fill material encountered onsite): Based on the information provided in borehole logs (Appendix D of report), fill material was also observed in TP13, TP15, TP17, TP18 and TP20. Please clarify.	Observations on 26 July indicated fill material has been successfully separated from natural soils, to be documented in a letter report. Therefore, former figure is no longer applicable. Plus referred borehole logs did not note any artificial inclusions or indicators of contamination. Therefore this would not have a material impact on the conclusion of our report.
6. Section 8.2.2 (natural soils):	
a. It is noted that 'natural black coal inclusions noted (2%) at 0.5m' within the natural residual clay. Please clarify. It is considered uncommon to observe black coal inclusions within residual clay encountered in the western Sydney area. Would this material be reworked natural? Please confirm source. Is this of concern?	Greencap confirms these soils were natural (site was observed to be predominantly virgin landscape in the initial investigation), to be demonstrated with photographs of test pits in the updated report. Mottling and colours observed in this material did not indicate any potential former re-work at these locations. <u>Updated site condition (after RCC conducted cut and fill):</u> Greencap also noted coal inclusions in the re-work natural soils towards the west of the site, these are thought to be originated from the site it-self. Coal was also observed in natural soil profiles during the recent inspection. Coal is also noted in Lot-search report as part of the geological unit; therefore, it is likely that these inclusions are originated from the weathered bedrock (clay).
b. If the material is confirmed to be reworked natural soils, not natural soils, this test pit did not extend into the underlying natural soils. Please confirm whether this will have a material impact to the outcome of the investigation.	Greencap confirms natural profile has been encountered at all test pits undertaken during the DSI and additional test pitting exercise on 26 July 2019. Re-worked natural soils observed on the site surface was originated from recent Cut-Fill exercise undertaken by RCC (after the DSI). Therefore, presence of recently re-worked natural soils on-site would not pose a material impact to the outcome of the DSI.
7. Section 10.1 (analytical schedule):	
a. Given the site was previously used for agricultural purposes (in particular the northern portion), please justify why only five soil samples were analysed for OC and OP pesticides.A23:A31A23:A32	Aerial photographs do not indicate intense agricultural activity on site. The majority of the site is noted as greenfield with virgin soils (to be incorporated into PSI Addendum). 5 samples collected were tested for OCP and OPP to close out these contaminants of potential concern. The results of the analysis on these samples were all non-detect. Furthermore, recent waste classification results also indicated non-detect for OCP and OPP. Therefore, there are multiple lines of evidence to conclude the OCP and OPP contamination risk on site is low (no further investigation required).

Reference	Greencap Response
b. It is noted that all not fill samples were analysed for PAHs. Please justify.	Allowance for PAH analysis is made for cases (if encountered) where ash, tar or similar inclusions are observed within fill material. Site soils did not contain these inclusions, therefore PAH was scheduled for a number of fill samples for general coverage. Minor bitumen inclusion was noted in TP1 (0.1-0.2), which returned non detect for PAH. Based on these, Greencap deems, the existing lines of evidence is sufficient to conclude PAH contamination on site is low. This is also supported by the recent waste classification testing.
c. Please confirm whether the above missions will have a material impact to the outcome of the investigation.	Greencap confirms above missions would not have an impact on the conclusion of the assessment.
8. Section 10.4 (asbestos in soils):	
a. It is noted that all not all fill samples were analysed for asbestos and some natural soils were selected for asbestos analysis. Whilst noting that ACM was not observed by Greencap during test pitting and the site walkover, please clarify how samples were selected for asbestos assessment.	As no potentially asbestos containing materials (PACM) was observed during the walkover and test pitting exercise, asbestos testing was scheduled targeting the fill material and topsoil for general coverage. Greencap agrees with Auditor's comment that asbestos testing in natural soils is not necessary.
b. In addition to the above, please justify why asbestos assessment was not conducted in accordance with NEPM 2013 quantitative method (10L sample for ACM and 500mL sample for FA/AF).	Greencap field consultants were on site with the necessary sieve equipment (7x7 mm sieve and scale). As test pitting exercise did not reveal any ACM fragments on site, quantitative test was not undertaken. Sieve testing has been undertaken in the scope of the recent waste classification sampling and no ACM was observed.
c. It is noted that the reporting limit of 0.01%w/w was reported. Whilst it may be suitable for the presence/absence method, it does not meet the FA/AF criteria of 0.001%w/w. Has testing completed to date characterised the site for all forms of asbestos? What other lines of evidence are there to confirm that asbestos does not pose an unacceptable risk for the site particularly the proposed sensitive use.	AF/FA testing was recently undertaken for the fill material stockpiled on-site--results to be reported in the updated DSI report. Additional lines of evidence confirming an Unexpected Finds Protocol would be sufficient for the proposed development: - No evidence of building demolition was apparent on aerial photographs; - Field observations, photographic evidences, and borehole logs did not indicate presence of ACM; and - Recent surface inspection did not identify any ACM on the cleared ground surface.
d. Please confirm whether the above will have a material impact to the outcome of the investigation or whether confirmatory testing is required.	Greencap deems any residual ACM risk can be managed in the scope of the Unexpected Finds Protocol. Waste classification AF/FA testing can be considered as confirmatory testing. Greencap confirms above items would not have an impact on the conclusion of the assessment.

Reference	Greencap Response
9. Section 11.1.1 (CoPCs): Greencap states that ‘sample analysis results indicated no elevated levels of any of the chemical analytes listed in Section 9.1. However, there is always a possibility (for any site) to encounter contamination outside of the investigation points’. Please clarify this statement. This implies the site has not been robustly investigated.	Our results and conclusions are based on multiple lines of evidence approach and statistical confidence limits (where relevant), in line with NEPM 2013 and limited to the investigation locations and available data. Wording to be amended in the Updated DSI.
10. Section 12 (conclusions -aesthetic issues):	
a. Given the site is proposed for a primary school development, foreign materials that were identified within the fill materials are not suitable to remain onsite due to aesthetics issues. The Auditor requires these materials to be removed as part of the development or discussion provided given the final layout that these do not pose a concern for the future use of site (i.e. location of proposed site structures, finished ground surfaces relative to the location where foreign material was identified).	Foreign material inclusions (e.g. terracotta pieces) that do not pose a contamination risk, may remain in-situ underneath sealed surfaces on site (e.g. Building footprints, pavements or asphalt roadways). Garden accessible soils (top 100 mm in particular), on the other hand, are recommended to be cleared from foreign objects.

Reference	Greencap Response
b. During the project meeting held on 4 July 2019 with RCC and TSA, the Auditor was informed that anecdotally fly tipping may have occurred whilst the site was unsecured/unfence. The extent of fly tipped material should be confirmed by a detailed site walkover following removal of site vegetation and/or site preparation works. The outcome of the site walkover should be reported to the Auditor. During the site walkover conducted by the Audit Assistant on 11 July 2019, two fly tipped stockpiles were present in the northwest portion of the site, with demolition waste, including timber and sandstone bricks, observed in one of the stockpiles. It is understood that RCC will request the appointed environmental consultant to conduct a waste classification of the stockpiles for offsite disposal.	On 26 July 2019, Greencap conducted a detailed site walkover and observed fill material, containing foreign materials, stockpiled towards the eastern section of the site (referred to as SP3, waste classification report is pending). Including SP3, on this day Greencap sampled six (6) different stockpiles and investigated an unexpected find (UF) of relatively small volume of (< 3m³) buried waste material (referred to as UF1, which consisted an old potential paint cannister ~ 10L volume, plastic sheeting, and terracotta—refer to Greencap's email dated 26 July 2019. We observed that the stockpiles on site were generally well managed and neatly separated from natural soils on site. We also noted that the soils on-site (predominantly natural) have been moved towards the west of the site as part of a cut & fill plan, which was understood to be the source of the re-worked natural soil surface towards the west. After the inspection and clearance of UF1, 3 validation samples were collected from the footprint of UF1 and sent to the NATA laboratory to be placed on hold. Should the chemical testing results of the excavated UF1 material (SP4) indicate presence of contamination, these samples will need to be scheduled for relevant chemical testing. Furthermore, after UF1, 9 test pits were advanced in the western section of the site (Proposed Lot 1) to cover the re-work natural soils nearby. Greencap observed re-worked natural material was consistent with the natural soils found on site and did not include any visual or olfactory evidences of contamination. At all 9 test pits, natural soils were encountered at depths ranging between 0.1-1.2 mBGL depths. The findings of this investigation are to be documented in a letter report with photographic evidences and borehole logs. No chemical testing of this material was deemed necessary at this stage.
c. Due to the limited presence and nature of the flytipping observed during the site visit, it is considered that this can be managed as part of unexpected finds in the Construction Environmental Management Plan (CEMP). The Auditor is to be informed as soon as practical possible when unexpected finds being encountered onsite. Affected area should be restricted for access and no works should be resumed until the area has been cleared by the environmental consultant and the Auditor.	An Unexpected Finds Protocol has been prepared by Greencap and presented to RCC.
11. Appendix F (Lab Documentation):	

Reference	Greencap Response
a. Please provide a copy of the chain of custody and sample receipt advice for review.	Refer to IA Action List Attachments - To be attached to the updated DSI
b. Triplicate laboratory reports were not provided for review.	Triplicate result to be removed from the QA/QC as its primary sample belongs to an off-site location
12. Appendix G (QA/QC):	
a. Section 3.12.2 in Appendix G discusses sampling methods adopted for drilling, not test pitting.	To be amended in the updated DSI
b. Please outline QA/QC sample splitting techniques adopted.	Duplicate samples were split from the primary samples on the field on the exact time and sampling location. To be incorporated into the updated DSI
c. Please provide decontamination procedures for review.	Samples were collected from centre of the excavation bucket and disposable nitrile gloves were replaced between the collection of each sample. To be incorporated into the Updated DSI.
d. Was the PID calibrated prior to screening? Please provide calibration procedures and certificate.	Refer to IA Action List Attachments - To be attached to the updated DSI
General comments	
1. Proposed temporary easement along eastern site boundary: The Auditor understands that a temporary easement will be constructed along the eastern site boundary to allow neighbouring properties accessing the main road. The easement will return to the school once the construction of the new road located on the adjacent property is complete. Please include the easement in the site survey plan which is required to be included as part of the Site Audit Statement. It is understood that the easement is approx. 6m wide and that no previous sampling locations were located within the easement. The Auditor requires additional sampling to be conducted within the easement, or provide justification as to why this is not required.	Total surface area of the site including this easement area is still less than 2.5 ha; therefore, 35 previously investigated locations as well as recently collected waste classification samples of the fill material is deemed to provide sufficient coverage for this area. Therefore, Greencap deems appropriate implementation of the Unexpected Finds Protocol would cover the contamination risk at this area.
2. PFAS compounds: Please confirm whether PFAS compounds may have been potentially used onsite.	An additional desktop search of PFAS sources (on and off-site) will be incorporated into the PSI Addendum.
3. Groundwater assessment: EIS has identified groundwater sampling as one of the data gaps. This has not been addressed by	Resolved with email correspondence with the Auditor (dated: 1 August 2019). Greencap will include a comment in the Updated DSI report commenting the groundwater data gap mentioned in the EIS Report does not require further investigation at this stage.

Reference	Greencap Response
Greencap in the DSI. Assessment of groundwater is required to be completed to close this data gap.	
Reference	
<u>EIS (23 January 2019) PSI</u>	
1. General (site boundary): It is noted that the site boundary covered by the Lotsearch report did not cover the entire site. A summary of site history should be provided for the 'entire' site or justification on whether the historical information is sufficiently represents the entire audit boundary.	To be addressed in the PSI Addendum
2. Section 1 (introduction): The Auditor notes that the site's physical and legal address has been changed since the report was issued in January 2019.	Final address to be incorporated into the Updated DSI.
3. Section 2.4.3 (presence of drums/chemicals, waste and fill material): Figure 2 shows that foreign material was observed within the exposed soils in the northern portion of the site. Whilst noting that three of the Greencap's test pits (TP1, TP2 and TP5) were located within this area, the Greencap report did not mention or record the presence of foreign materials within exposed soil in the northern portion of the site. Greencap to confirm whether or not foreign materials are located in that portion of the site and whether or not this is acceptable aesthetically on a primary school site.	On 26 July 2019, Greencap conducted a detailed site walkover and observed fill material containing foreign materials were stockpiled towards the eastern section of the site (referred to as SP3, waste classification report is pending). Including SP3, on this day Greencap sampled six (6) different stockpiles and investigated an unexpected find (UF) of relatively small volume of (< 3m3) buried waste material (referred to as UF1, which consisted an old potential paint cannister ~ 10L volume, plastic sheeting, and terracotta—refer to Greencap's email dated 26 July 2019. We observed that the stockpiles on site were generally well managed and neatly separated from natural soils on site; therefore, we deem the Unexpected Finds Protocol would be a sufficient measure to manage any potential foreign material finds during construction.
4. Section 3 (geology and hydrogeology): Soil landscape maps were not reviewed.	To be addressed in the PSI Addendum
5. Section 4.1 (review of historical aerial photographs): The site boundary as shown in the historical aerials prepared by Lotsearch has been changed since the completion of the PSI. Are the sheds originally noted to be located approximately 150m west of the	To be discussed in the PSI Addendum

Reference	Greencap Response
site are now part of the site? Are these a potential source of contamination?	
6. Section 4.2 (NSW EPA records): EIS states that 'a former licence was listed of the site for sewage treatment and processing by small plants'. No structures were observed on site at the time of the Lotsearch report. Please confirm whether the site was previously occupied by sewage treatment works.	To be reassessed with the available data discussed in the PSI Addendum. Note: field observations did not indicate such use.
7. Section 5.1 (AECs): If the sheds were located within the site (which have since been demolished), consideration of potential presence of hazardous materials should be included in the AEC table (for example, lead paints and asbestos). It is unclear to the Auditor why PCBs were included as COPC given the site was used historically for agricultural purposes. Is there a PCB risk at the site?	To be evaluated in the PSI Addendum and Updated DSI Report. Available field and chemical data indicated risks associated with asbestos, lead paint , and PCB contamination on site were low.
8. Table 5-3 (CSM): It is unclear to the Auditor why soil vapour was identified as potentially affected media, given the site was largely used for rural purposes. Is there a potential soil vapour risk at the site?	Upon review of the available site data, Greencap deems soil vapour contamination risk on-site is low--no further soil vapor investigation is required at this stage.

Reference Interim Auditor Advice No. 1 12 July 2019	Greencap Response 2 August 2019	Auditor's Review Comments IA2 (6 August 2019)
Greencap (21 January 2019) DSI		
1. General – please confirm current ownership; the flood potential of the site; key summary of lands title searches and council records review;	Updated DSI will include a subsection called PSI Addendum, where all additional desktop investigations will be incorporated. Additional desktop searches will cover proposed Lot 1 and Lot 2 (parts of Lot 4 DP1208329 and Lot 121 DP1203646 respectively) indicated in the layout. * Current and historical title searches are ordered for above lots and will be incorporated to the PSI Addendum under title "land titles summary". * Flood potential of the site is being assessed with an additional desktop study. * Section 149 (2) and (5) Council certificates are ordered for both lots and will be incorporated into the PSI Addendum under title "council records review".	Noted. Findings to be reported by Greencap
2. Section 4.1 (desktop review): Greencap states that 'review of Council records and aerial photographs helped identify landfilling, including potential asbestos landfill'. Was such a use identified? Please clarify.	This item has been amended as follows: * "Review of Council records and aerial photograph to help identifying landfilling, including potential asbestos landfill " Investigations did not identify any evidence of legacy landfilling on site. Although fill material was observed on the northern/ north eastern section of the site, no asbestos was identified within the test pits or on the surface. Therefore, Greencap deems an Unexpected Finds Protocol (UFP) would be an appropriate practice to manage the residual risk due to potential unexpected finds.	Response Noted.
3. Section 7 (sampling density rationale): Whilst noting that 35 test pits were excavated during investigation works, only 32 soil samples were analysed as part of the analytical program (no soil samples analysed from TP16, TP20 and TP22). Please justify the discrepancy as this does not meet the minimum sampling density requirement as described in NSW EPA (1995).	35 test pits were advanced during the DSI and the material was visually observed, field screened with PID, and logged at each location. Absence of chemical data at TP16, TP20, and TP22 is not considered a data gap due to the following lines of evidence: - TP16 and TP22 - natural soil profile, no fill material was encountered, PID did not indicate potential HC contamination (refer to borehole logs in Appendix D); - TP20 - no visual or olfactory evidence of contamination was noted, PID did not indicate potential HC contamination. * An additional field investigation has been undertaken on 26 July 2019 and samples were collected from stockpiled topsoil and fill materials for waste classification purposes (inc. SPA and SPB) this provides additional confidence for the chemical status of the soils originated from the site.	Response Noted.
4. Section 8.1 (site inspection):		
a. Greencap states that 'the two stockpiles of fill material identified in the PSI report were located as described. Refer to Figure 3 for stockpile locations'. A review of Figure 3 notes that the two stockpiles were identified by Greencap were located further north and east from the two stockpiles observed by EIS during the PSI. Based on the EIS and Greencap figures, it appears that the two stockpile locations identified by EIS were closer to the Greencap's test pits TP6 and TP7 and the area to the immediate south of these two test pits. Please confirm if this interpretation is correct and that the area has been suitably characterised.	These stockpiles have been classified as GSW and are scheduled to be taken off-site. Greencap confirms this area has been suitably characterised.	Please provide a copy of the waste classification for review. Waste disposal dockets are to be provided as part of the audit.
b. As discussed in Comment 3, foreign materials were previously observed in the northern portion of the site. Please confirm whether this was observed onsite and actual nature of foreign materials across the site and whether aesthetically this is acceptable for a primary school site.	Foreign materials (e.g. terracotta pieces) that do not pose a contamination risk, may remain in-situ underneath sealed surfaces on site (e.g. Building footprints, pavements or asphalt roadways). Garden accessible soils (top 100 mm in particular), on the other hand, are recommended to be cleared from foreign objects. Updated site condition: On 26 July 2019, Greencap conducted a detailed site walkover and observed fill material containing foreign materials were stockpiled towards the eastern section of the site (referred to as SP3, waste classification report is pending). Including SP3, on this day Greencap sampled six (6) different stockpiles and investigated an unexpected find (UF) of relatively small volume of (< 3m ³) buried waste material (referred to as UF1, which consisted an old potential paint canister - 10L volume, plastic sheeting, and terracotta—refer to Greencap's email dated 26 July 2019. We observed that the stockpiles on site were generally well managed and neatly separated from natural soils on site. We also noted that the soils on-site (predominantly natural) have been moved towards the west of the site as part of a cut & fill plan, which was understood to be the source of the re-worked natural soil surface towards the west. After the inspection and clearance of UF1, 3 validation samples were collected from the footprint of UF1 and sent to the NATA laboratory to be placed on hold. Should the chemical testing results of the excavated UF1 material (SP4) indicate presence of contamination, these samples will need to be scheduled for relevant chemical testing. Furthermore, after UF1, 9 test pits were advanced in the western section of the site (Proposed Lot 1) to cover the re-worked natural soils nearby. Greencap observed re-worked natural material was consistent with the natural soils found on site and did not include any visual or olfactory evidences of contamination. At all 9 test pits, natural soils were encountered at depths ranging between 0.1-1.2 mBGL. The findings of this investigation are to be documented in a letter report with photographic evidences and borehole logs. No chemical testing of material deemed necessary	<u>Foreign Material</u> The Auditor considers that clearance of foreign material for the top 100mm of soil may not sufficient. Given the sensitivity of proposed intended use as a primary school, foreign material should not be present within the proposed non paved area within the upper 0.5m. See comment item 10 below. Updated site condition and works completed on 26/7/19 – based on the information provided by Greencap, the Auditor understands the following tasks were completed on 26/7: SP3 and SP4/UF1 - Waste classification for SP3, comprising fill material and foreign material. Please confirm volume of this stockpile and provide the waste classification report to the Auditor for review. Waste dockets are also required to be provided as part of the audit. - Assessment of UF1, burial of waste material including potential old paint canister, plastic sheeting and terracotta. The excavated material formed SP4 which was estimated to be <3m3. For all unexpected finds the Auditor should be promptly notified. - 6 stockpile samples were collected from SP3 and SP4. Please confirm how many samples were collected from each stockpile. Is RCC planning to remove SP4 offsite? Please provide waste classification for review. Waste disposal dockets are also required to be provided as part of the audit.
b. continued		In addition to the stockpile samples, 3 validation samples were also collected from the footprint of UF1. Greencap is not proposing to test these samples unless the stockpile sample results indicate presence of contamination. Please confirm the dimensions of the excavation. Also the standard practice is to collect 1 sample per wall and 1 sample from the base of the excavation. Please justify why only 3 samples were collected and from which parts of the excavation. The Auditor requires the validation samples to be analysed and results be provided for review. Has the excavation been backfilled? All unexpected finds results should be forwarded to the Auditor for review and endorsement before the site can be cleared for earthworks. Please provide a plan showing the location of 9 test pits
5. Section 8.2.1 (fill material encountered onsite): Based on the information provided in borehole logs (Appendix D of report), fill material was also observed in TP13, TP15, TP17, TP18 and TP20. Please clarify.	Observations on 26 July indicated fill material has been successfully separated from natural soils, to be documented in a letter report. Therefore, former figure is no longer applicable. Plus referred borehole logs did not note any artificial inclusions or indicators of contamination. Therefore this would not have a material impact on the conclusion of our report.	Response Noted.
6. Section 8.2.2 (natural soils):		
a. It is noted that 'natural black coal inclusions noted (2%) at 0.5m' within the natural residual clay. Please clarify. It is considered uncommon to observe black coal inclusions within residual clay encountered in the western Sydney area. Would this material be reworked natural? Please confirm source. Is this of concern?	Greencap confirms these soils were natural (site was observed to be predominantly virgin landscape in the initial investigation), to be demonstrated with photographs of test pits in the updated report. Mottling and colours observed in this material did not indicate any potential former re-work at these locations. Updated site condition (after RCC conducted cut and fill): Greencap also noted coal inclusions in the re-work natural soils towards the west of the site, these are thought to be originated from the site itself. Coal was also observed in natural soil profiles during the recent inspection. Coal is also noted in Lot-search report as part of the geological unit; therefore, it is likely that these inclusions are originated from the weathered bedrock (clay).	Noted. The Auditor considers that this is likely charcoal associated with bushfire events given its shallow presence.
b. If the material is confirmed to be reworked natural soils, not natural soils, this test pit did not extend into the underlying natural soils. Please confirm whether this will have a material impact to the outcome of the investigation.	Greencap confirms natural profile has been encountered at all test pits undertaken during the DSI and additional test pitting exercise on 26 July 2019. Re-worked natural soils observed on the site surface was originated from recent Cut-Fill exercise undertaken by RCC (after the DSI). Therefore, presence of recently re-worked natural soils on-site would not pose a material impact to the outcome of the DSI.	Noted
7. Section 10.1 (analytical schedule):		
a. Given the site was previously used for agricultural purposes (in particular the northern portion), please justify why only five soil samples were analysed for OC and OP pesticides. A23:A31A23:A32	Aerial photographs do not indicate intense agricultural activity on site. The majority of the site is noted as greenfield with virgin soils (to be incorporated into PSI Addendum). 5 samples collected were tested for OCP and OPP to close out these contaminants of potential concern. The results of the analysis on these samples were all non-detect. Furthermore, recent waste classification results also indicated non-detect for OCP and OPP. Therefore, there are multiple lines of evidence to conclude the OCP and OPP contamination risk on site is low (no further investigation required).	Noted
b. It is noted that all not fill samples were analysed for PAHs. Please justify.	Allowance for PAH analysis is made for cases (if encountered) where ash, tar or similar inclusions are observed within fill material. Site soils did not contain these inclusions, therefore PAH was scheduled for a number of fill samples for general coverage. Minor bitumen inclusion was noted in TP1 (0.1-0.2), which returned non detect for PAH. Based on these, Greencap deems, the existing lines of evidence is sufficient to conclude PAH contamination on site is low. This is also supported by the recent waste classification testing.	Noted
c. Please confirm whether the above omissions will have a material impact to the outcome of the investigation.	Greencap confirms above omissions would not have an impact on the conclusion of the assessment.	Noted
8. Section 10.4 (asbestos in soils):		

a. It is noted that all not all fill samples were analysed for asbestos and some natural soils were selected for asbestos analysis. Whilst noting that ACM was not observed by Greencap during test pitting and the site walkover, please clarify how samples were selected for asbestos assessment.	As no potentially asbestos containing materials (PACM) was observed during the walkover and test pitting exercise, asbestos testing was scheduled targeting the fill material and topsoil for general coverage. Greencap agrees with Auditor's comment that asbestos testing in natural soils is not necessary.	Noted.
b. In addition to the above, please justify why asbestos assessment was not conducted in accordance with NEPM 2013 quantitative method (10L sample for ACM and 500mL sample for FA/AF).	Greencap field consultants were on site with the necessary sieve equipment (7x7 mm sieve and scale). As test pitting exercise did not reveal any ACM fragments on site, quantitative test was not undertaken. Sieve testing has been undertaken in the scope of the recent waste classification sampling and no ACM was observed.	Reponse noted. Common practice is to comply with quantitative testing, however the Auditor considers that based on site history, absence of visual indicators of contamination, limited presence of fill and little debris reported by Greencap, this deviation in sampling technique does not affect the characterisation of soils at the site.
c. It is noted that the reporting limit of 0.01%w/w was reported. Whilst it may be suitable for the presence/absence method, it does not meet the FA/AF criteria of 0.001%w/w. Has testing completed to date characterised the site for all forms of asbestos? What other lines of evidence are there to confirm that asbestos does not pose an unacceptable risk for the site particularly the proposed sensitive use.	AF/FA testing was recently undertaken for the fill material stockpiled on-site—results to be reported in the updated DSI report. Additional lines of evidence confirming an Unexpected Finds Protocol would be sufficient for the proposed development: - No evidence of building demolition was apparent on aerial photographs; - Field observations, photographic evidences, and borehole logs did not indicate presence of ACM; and - Recent surface inspection did not identify any ACM on the cleared ground surface.	
d. Please confirm whether the above will have a material impact to the outcome of the investigation or whether confirmatory testing is required.	Greencap deems any residual ACM risk can be managed in the scope of the Unexpected Finds Protocol. Waste classification AF/FA testing can be considered as confirmatory testing. Greencap confirms above items would not have an impact on the conclusion of the assessment.	
9. Section 11.1.1 (CoPCs): Greencap states that 'sample analysis results indicated no elevated levels of any of the chemical analytes listed in Section 9.1. However, there is always a possibility (for any site) to encounter contamination outside of the investigation points'. Please clarify this statement. This implies the site has not been robustly investigated.	Our results and conclusions are based on multiple lines of evidence approach and statistical confidence limits (where relevant), in line with NEPM 2013 and limited to the investigation locations and available data. Wording to be amended in the Updated DSI.	Noted
10. Section 12 (conclusions -aesthetic issues):		
a. Given the site is proposed for a primary school development, foreign materials that were identified within the fill materials are not suitable to remain onsite due to aesthetics issues. The Auditor requires these materials to be removed as part of the development or discussion provided given the final layout that these do not pose a concern for the future use of site (i.e. location of proposed site structures, finished ground surfaces relative to the location where foreign material was identified).	Foreign material inclusions (e.g. terracotta pieces) that do not pose a contamination risk, may remain in-situ underneath sealed surfaces on site (e.g. Building footprints, pavements or asphalt roadways). Garden accessible soils (top 100 mm in particular), on the other hand, are recommended to be cleared from foreign objects.	Aesthetics are not a concern for areas to be paved/or sealed. The Auditor expects any open space areas, including areas of playgrounds and landscaping to be free of any aesthetic issues (in particular the upper 0.5m). Clearing the upper 100mm may not be sufficient. Greencap to consider if proposed areas of landscaping and play grounds will comprise the import of suitable ground surfaces thereby further reducing aesthetic concerns for future use.
b. During the project meeting held on 4 July 2019 with RCC and TSA, the Auditor was informed that anecdotally fly tipping may have occurred whilst the site was unsecured/unfence. The extent of fly tipped material should be confirmed by a detailed site walkover following removal of site vegetation and/or site preparation works. The outcome of the site walkover should be reported to the Auditor. During the site walkover conducted by the Audit Assistant on 11 July 2019, two fly tipped stockpiles were present in the northwest portion of the site, with demolition waste, including timber and sandstone bricks, observed in one of the stockpiles. It is understood that RCC will request the appointed environmental consultant to conduct a waste classification of the stockpiles for offsite disposal.	On 26 July 2019, Greencap conducted a detailed site walkover and observed fill material, containing foreign materials, stockpiled towards the eastern section of the site (referred to as SP3, waste classification report is pending). Including SP3, on this day Greencap sampled six (6) different stockpiles and investigated an unexpected find (UF) of relatively small volume of (< 3m ³) buried waste material (referred to as UF1, which consisted an old potential paint canister ~ 10L volume, plastic sheeting, and terracotta—refer to Greencap's email dated 26 July 2019. We observed that the stockpiles on site were generally well managed and neatly separated from natural soils on site. We also noted that the soils on-site (predominantly natural) have been moved towards the west of the site as part of a cut & fill plan, which was understood to be the source of the re-worked natural soil surface towards the west. After the inspection and clearance of UF1, 3 validation samples were collected from the footprint of UF1 and sent to the NATA laboratory to be placed on hold. Should the chemical testing results of the excavated UF1 material (SP4) indicate presence of contamination, these samples will need to be scheduled for relevant chemical testing. Furthermore, after UF1, 9 test pits were advanced in the western section of the site (Proposed Lot 1) to cover the re-work natural soils nearby. Greencap observed re-worked natural material was consistent with the natural soils found on site and did not include any visual or olfactory evidences of contamination. At all 9 test pits, natural soils were encountered at depths ranging between 0.1-1.2 mBGL depths. The findings of this investigation are to be documented in a letter report with photographic evidences and borehole logs. No chemical testing of this material was deemed necessary at this stage.	The Auditor requests provision of waste classification for all SP, and UF1, and confirmation on the fate of each SP and UF1. If these stockpiles are to be removed offsite, waste disposal dockets are to be provided. Any future occurrence of flytipping should be managed under an unexpected finds protocol (outlined in a CEMP). Comments on the UFP addressed at the end of this table.
c. Due to the limited presence and nature of the flytipping observed during the site visit, it is considered that this can be managed as part of unexpected finds in the Construction Environmental Management Plan (CEMP). The Auditor is to be informed as soon as practical possible when unexpected finds being encountered onsite. Affected area should be restricted for access and no works should be resumed until the area has been cleared by the environmental consultant and the Auditor.	An Unexpected Finds Protocol has been prepared by Greencap and presented to RCC.	Noted. See comments below on UFP
11. Appendix F (Lab Documentation):		
a. Please provide a copy of the chain of custody and sample receipt advice for review.	Refer to IA Action List Attachments - To be attached to the updated DSI	SRN not provided. Only COCs and summary of analyses were provided.
b. Triplicate laboratory reports were not provided for review.	Triplicate result to be removed from the QA/QC as its primary sample belongs to an off-site location	This error will be noted in the SAR
12. Appendix G (QA/QC):		
a. Section 3.12.2 in Appendix G discusses sampling methods adopted for drilling, not test pitting.	To be amended in the updated DSI	Noted
b. Please outline QA/QC sample splitting techniques adopted.	Duplicate samples were split from the primary samples on the field on the exact time and sampling location. To be incorporated into the updated DSI	Noted
c. Please provide decontamination procedures for review.	Samples were collected from centre of the excavation bucket and disposable nitrile gloves were replaced between the collection of each sample. To be incorporated into the Updated DSI.	Noted
d. Was the PID calibrated prior to screening? Please provide calibration procedures and certificate.	Refer to IA Action List Attachments - To be attached to the updated DSI	Noted
General comments		
1. Proposed temporary easement along eastern site boundary: The Auditor understands that a temporary easement will be constructed along the eastern site boundary to allow neighbouring properties accessing the main road. The easement will return to the school once the construction of the new road located on the adjacent property is complete. Please include the easement in the site survey plan which is required to be included as part of the Site Audit Statement. It is understood that the easement is approx. 6m wide and that no previous sampling locations were located within the easement. The Auditor requires additional sampling to be conducted within the easement, or provide justification as to why this is not required.	Total surface area of the site including this easement area is still less than 2.5 ha; therefore, 35 previously investigated locations as well as recently collected waste classification samples of the fill material is deemed to provide sufficient coverage for this area. Therefore, Greencap deems appropriate implementation of the Unexpected Finds Protocol would cover the contamination risk at this area.	Current data does not indicate that the easement area is impacted. However, it may be prudent to revisit the easement area once it is handed back to DOE and incorporated into the school development. The Auditor can only rely on available data at a point in time. A comment regarding this may be added to the Site Audit Statement.
2. PFAS compounds: Please confirm whether PFAS compounds may have been potentially used onsite.	An additional desktop search of PFAS sources (on and off-site) will be incorporated into the PSI Addendum.	Noted - include a conclusion on the likelihood of its potential presence (or absence).
3. Groundwater assessment: EIS has identified groundwater sampling as one of the data gaps. This has not been addressed by Greencap in the DSI. Assessment of groundwater is required to be completed to close this data gap.	Resolved with email correspondence with the Auditor (dated: 1 August 2019). Greencap will include a comment in the Updated DSI report commenting the groundwater data gap mentioned in the EIS Report does not require further investigation at this stage.	Noted
Reference		
EIS (23 January 2019) PSI		
1. General (site boundary): It is noted that the site boundary covered by the Lotsearch report did not cover the entire site. A summary of site history should be provided for the 'entire' site or justification on whether the historical information is sufficiently represents the entire audit boundary.	To be addressed in the PSI Addendum	Noted
2. Section 1 (introduction): The Auditor notes that the site's physical and legal address has been changed since the report was issued in January 2019.	Final address to be incorporated into the Updated DSI.	Noted
3. Section 2.4.3 (presence of drums/chemicals, waste and fill material): Figure 2 shows that foreign material was observed within the exposed soils in the northern portion of the site. Whilst noting that three of the Greencap's test pits (TP1, TP2 and TP5) were located within this area, the Greencap report did not mention or record the presence of foreign materials within exposed soil in the northern portion of the site. Greencap to confirm whether or not foreign materials are located in that portion of the site and whether or not this is acceptable aesthetically on a primary school site.	On 26 July 2019, Greencap conducted a detailed site walkover and observed fill material containing foreign materials were stockpiled towards the eastern section of the site (referred to as SP3, waste classification report is pending). Including SP3, on this day Greencap sampled six (6) different stockpiles and investigated an unexpected find (UF) of relatively small volume of (< 3m ³) buried waste material (referred to as UF1, which consisted an old potential paint canister ~ 10L volume, plastic sheeting, and terracotta—refer to Greencap's email dated 26 July 2019. We observed that the stockpiles on site were generally well managed and neatly separated from natural soils on site; therefore, we deem the Unexpected Finds Protocol would be a sufficient measure to manage any potential foreign material finds during construction.	Noted - Auditor expectations regarding aesthetics for final site covering outlined in response to comment 10a above.
4. Section 3 (geology and hydrogeology): Soil landscape maps were not reviewed.	To be addressed in the PSI Addendum	Noted

5. Section 4.1 (review of historical aerial photographs): The site boundary as shown in the historical arials prepared by Lotsearch has been changed since the completion of the PSI. Are the sheds originally noted to be located approximately 150m west of the site are now part of the site? Are these a potential source of contamination?	To be discussed in the PSI Addendum	Noted
6. Section 4.2 (NSW EPA records): EIS states that 'a former licence was listed of the site for sewage treatment and processing by small plants'. No structures were observed on site at the time of the Lotsearch report. Please confirm whether the site was previously occupied by sewage treatment works.	To be reassessed with the available data discussed in the PSI Addendum. Note: field observations did not indicate such use.	Noted
7. Section 5.1 (AECs): If the sheds were located within the site (which have since been demolished), consideration of potential presence of hazardous materials should be included in the AEC table (for example, lead paints and asbestos). It is unclear to the Auditor why PCBs were included as COPC given the site was used historically for agricultural purposes. Is there a PCB risk at the site?	To be evaluated in the PSI Addendum and Updated DSI Report. Available field and chemical data indicated risks associated with asbestos, lead paint , and PCB contamination on site were low.	Noted
8. Table 5-3 (CSM): It is unclear to the Auditor why soil vapour was identified as potentially affected media, given the site was largely used for rural purposes. Is there a potential soil vapour risk at the site?	Upon review of the available site data, Greencap deems soil vapour contamination risk on-site is low--no further soil vapor investigation is required at this stage.	Noted
		Greencap (26 July 2019) Unexpected Finds Protocol 1. Paragraph 1, page 1: Site address should be 28 Farmland Drive Schofields. 2. Bullet 2, paragraph 4, page 1: The Auditor is to be notified when unexpected finds is encountered onsite. The following process should be conducted: - Environmental consultant to conduct a visual inspection of the finds. Following the inspection, the consultant should inform the Auditor about the nature of the finds and proposed actions. - Environmental consultant to conduct sampling as agreed with Auditor - Environmental consultant to prepare a letter report detailing the nature of the unexpected finds, activities conducted, testing results and comment on the success on remedial actions. The report should be provided to the Auditor for review and endorsement. 3. Bullet 1, page 2: If the environmental consultant / RCC considers that an unexpected finds is warranted remediation, a Remedial Action Plan is required to be prepared prior to remedial works commencing. The RAP is required to be reviewed by the Auditor as per the draft DA conditions. 4. Bullet 2, page 2: The validation report is required to be prepared in accordance with NSW OEH (2011) Guidelines for Consultants Reporting on Contaminated Sites. The report will need to be forwarded to the Auditor for review and endorsement.
		Greencap (5 August 2019) Photo Attachment 1. Based on the photo ID, it is noted that the following stockpiles are present onsite – SP3 and SP4, SPA and SPB and TS1 and TS2. - Are SPA and SPB the stockpiled identified by EIS? - TS1 and TS2 were observed by the Audit Assistant during the site inspection on 11 July 2019. Have they been removed? 2. As part of the site audit, the Auditor is required to track material movement for material entering and leaving the site. The Auditor requires a register to be prepared by Greencap/RCC containing the following information, at the minimum: - Material leaving the site for offsite disposal (for example SP3)- volume of material; waste classification; vehicle registration for each truck load; final destination; and waste dockets. - Imported material for site use – volume of material; origin of material (quarry, VENM etc); documentation (for example, VENM report) and vehicle registration for each truck load; final destination onsite

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MAIL TYPE	MAIL NUMBER	REFERENCE NUMBER
General Correspondence	Zoic-GCOR-000009	RCC-GCOR-002546

IA2 review of Greencap Draft IA1 Comments Resolution Table - Alex Avenue PS

From Mrs Rebeka Hall - Zoic Environmental Pty Ltd

To (2) Mr Isaac Pinkerton - Richard Crookes Constructions Pty Limited
Fiona Wong - Zoic Environmental Pty Ltd

Cc (3) Mr Darren Vozzo - Richard Crookes Constructions Pty Limited
Mr Tom Hemmett - Richard Crookes Constructions Pty Limited
Mr Joel Coubrough - Richard Crookes Constructions Pty Limited

Sent Tuesday, 6 August 2019

MESSAGE

Isaac, Tom

we have reviewed Greencap's responses to our questions outlined in IA1.

We are generally satisfied with their responses but we note the following:

1. Greencap's responses for many questions would be addressed as part of providing a PSI addendum and and updated DSI - we await their revised reports
2. We seek clarification from Greencap on the waste classification for stockpiles/unexpected finds. The Auditor is required to review waste classification as part of the audit. We request confirmation on the fate of each stockpile (i.e. to be disposed offsite, or suitable to remain onsite)
3. Regarding aesthetics please see our comment under response to item10a. Greencap has provided 'clearance' for the upper 10cm only in areas of no-pavement. This may not be sufficient e. Consideration should be give to final design level and materials to be used in areas of open space, soft landscaping, play grounds etc which would deal with any aesthetic concerns.
4. Greencap are requested to respond to items in **bold** in the attached table, and promptly forward the revised PSI and DSI, and waste letters for us to progress the audit documentation.

Happy to discuss further if required.

Also happy if Greencap contacts either Fiona or myself directly to facilitate the process.

regards
Rebeka Hall
Zoic Environmental Pty Ltd
02 9251 8070

From: I Pinkerton
Sent: 02/08/2019 1:12:09 PM AEST (GMT +10:00)
To: Rebeka Hall, Fiona Wong
Cc: Joel Coubrough, Tom Hemmett, Darren Vozzo
Mail Number: RCC-GCOR-002546
Subject: Greencap Draft Comments Resolution Table - Alex Avenue PS

Hi Rebeka & Fiona,

Please find attached Greencap's Draft Comments Resolution Table with associated attachments in response to the Alex Avenue interim advice.

Can you please review the attached and confirm you are satisfied with Greencap's response in closing out the data gaps?

Regards,

Isaac Pinkerton, Site Engineer

RICHARD CROOKES

CONSTRUCTIONS

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Reference	Greencap Response
IA#2 Comments - 6 August 2019	
Please provide a copy of the waste classification for review. Waste disposal dockets are to be provided as part of the audit.	Both the waste classification letters and disposal dockets have been provided to the Auditor. RCC to forward all future material tracking documents and dockets to the Auditor. ENM Testing Report will also be forwarded to the Auditor.
<u>Foreign Material</u> The Auditor considers that clearance of foreign material for the top 100mm of soil may not sufficient. Given the sensitivity of proposed intended use as a primary school, foreign material should not be present within the proposed non paved area within the upper 0.5m. See comment item 10 below. Greencap to consider if proposed areas of landscaping and play grounds will comprise the import of suitable ground surfaces thereby further reducing aesthetic concerns for future use.	Greencap deems minor inclusions of foreign materials within the reworked natural soils would not cause an aesthetic problem (refer to NEPM 2013 Schedule B(1) Section 3.6.3). Exception to this are sharp objects / scrap metals, which may cause injuries during gardening activities. Therefore, any scrap metal or buried waste encountered during earthworks shall be managed as per the Unexpected Finds Protocol and taken off-site. Based on Auditor's comment RCC provided the below response, which addresses the requirements of the Auditor: <i>"Landscaped <u>non paved</u> areas comprise of the following builds ups;</i> <i>Play Mulch Softfall – 100mm of DGB20 base course then 300mm of play mulch on top of the existing compacted subgrade material.</i> <i>Mass Planting – 300mm of topsoil then 75mm of mulch on top of existing compacted subgrade material.</i> <i>Turfing – 100mm of topsoil then turfing on top of existing compacted subgrade material.</i> <i>Rubber Softfall – 75mm DGB20 base course then 110mm rubber attenuation then 15mm Softfall on top of existing compacted subgrade material.</i> <i>Typical Play Mulch – 100mm drainage layer then 300mm organic mulch on top of existing compacted subgrade material.</i> <i>Please refer to the attached landscaping details and site plans."</i> Greencap deems above landscaping layers would be suitable for the site given that the topsoil used in landscaping is classified as VENM or ENM.
Updated site condition and works completed on 26/7/19 – based on the information provided by Greencap, the Auditor understands the following tasks were completed on 26/7: <u>SP3 and SP4/UF1</u> - Waste classification for SP3, comprising fill material and foreign material. Please confirm volume of this stockpile and provide the waste classification report to the Auditor for review. Waste dockets are also required to be provided as part of the audit. - Assessment of UF1, burial of waste material including potential old paint canister, plastic sheeting and terracotta. The excavated material formed SP4 which was estimated to be <3m³. For all unexpected finds the Auditor should be promptly notified. - 6 stockpile samples were collected from SP3 and SP4. Please confirm how many samples were collected from each stockpile. Is RCC planning to remove SP4 offsite? Please provide waste classification for review. Waste disposal dockets are also required to be provided as part of the audit.	- Waste Classification reports of this material have been provided to the Auditor on 7/8/2019. Volume of UF1 (SP4) was 3 m³ and volume of SP3 was ~ 20 m³. SP3 & SP4 was removed off site by RCC on Monday 12/08. RCC advised Greencap that disposal dockets will be provided to the auditor 16/08 for review and will be captured within the materials tracking registers. - Notification requirement to the Auditor has been incorporated into the updated Unexpected Finds Protocol. - 3 samples were collected from each stockpile to satisfy the minimum stockpile sampling density requirement as per NEPM 2013.
In addition to the stockpile samples, 3 validation samples were also collected from the footprint of UF1. Greencap is not proposing to test these samples unless the stockpile sample results indicate presence of contamination. Please confirm the dimensions of the excavation. Also the standard practice is to collect 1 sample per wall and 1 sample from the base of the excavation. Please justify why only 3 samples were collected and from which parts of the excavation. The Auditor requires the validation samples to be analysed and results be provided for review. Has the excavation been backfilled? All unexpected finds results should be forwarded to the Auditor for review and endorsement before the site can be cleared for earthworks. Please provide a plan showing the location of 9 test pits	The reason only 3 validation samples were collected was because this material was only < 3 m³ and its footprint was a relatively small area (see below):

Reference	Greencap Response
	 Photograph 11: Following excavation of unexpected find. Waste Classification report of SP4, which corresponds to UF1, shows all samples tested in this material returned contaminant results below the health criteria for residential land use criteria (HIL-A and HSL-A)—<i>these results are also provided in our letter report dated 6 August 2019:</i> • natural background levels for metals, • trace level hydrocarbon hits (may be naturally occurring as BTEXN and PAH were non-detect), and • below laboratory limit of detection for all other contaminants analysed. Therefore, it can be concluded that analysis of the validation samples collected from the footprint of the above mentioned material is not necessary. Greencap was advised by RCC that the excavation of the unexpected find footprint was backfilled by natural/ re-work material sourced from the site on 27/07 and 29/07 including the 9 test pits within the vicinity of UF1.
1. Paragraph 1, page 1: Site address should be 28 Farmland Drive Schofields. 2. Bullet 2, paragraph 4, page 1: The Auditor is to be notified when unexpected finds is encountered onsite. The following process should be conducted: - Environmental consultant to conduct a visual inspection of the finds. Following the inspection, the consultant should inform the Auditor about the nature of the finds and proposed actions. - Environmental consultant to conduct sampling as agreed with Auditor - Environmental consultant to prepare a letter report detailing the nature of the unexpected finds, activities conducted, testing results and comment on the success on remedial actions. The report should be provided to the Auditor for review and endorsement. 3. Bullet 1, page 2: If the environmental consultant / RCC considers that an unexpected finds is warranted remediation, a Remedial Action Plan is required to be prepared prior to remedial works commencing. The RAP is required to be reviewed by the Auditor as per the draft DA conditions. 4. Bullet 2, page 2: The validation report is required to be prepared in accordance with NSW OEH (2011) Guidelines for Consultants Reporting on Contaminated Sites. The report will need to be forwarded to the Auditor for review and endorsement.	Addressed in the updated UFP: 1. Address updated 2. “ • RCC is to immediately notify the site Auditor and Environmental Consultant when an Unexpected Find is encountered on site. • The Environmental Consultant will then undertake a preliminary assessment (such as a visual inspection) of the potential contamination. Following the assessment, the consultant should inform the Auditor of the nature of the find including all relevant information relating to any special recommendations to site workers/employees and proposed actions such as further sampling, investigation and remediation that may be required. • The Environmental consultant shall then undertake any additional investigative works as agreed with the site Auditor and prepare a letter report detailing the nature of the unexpected finds, activities conducted, testing results and comment on the success on remedial actions. The report should be provided to the Auditor for review and endorsement.” 3. • “If the environmental consultant/ RCC considers that an unexpected find requires remediation, a Remedial Action Plan (RAP) must be prepared prior to the commencement of remediation works. The RAP must be reviewed by the Auditor as per the draft Development Application (DA) conditions. In addition, RCC must notify their client and relevant regulatory authorities (as required) of the planned commencement and completion dates and details of the remediation strategy to be adopted. Any information/reports relating to assessment, investigation or remediation of the unexpected contamination must be included as part of this notification.” 4.

Reference	Greencap Response
	“RCC have a responsibility to keep regulatory authorities updated throughout the duration of any remediation works. Following remediation works a validation report is required to be prepared by the Environmental Consultant in accordance with NSW OEH (2011) <i>Guidelines for Consultants Reporting on Contaminated Sites</i>. The validation report will need to be forwarded to the Auditor for review and endorsement. Copies of any validation results and clearance reporting must be provided by Error! Reference source not found. to all relevant parties.”
1. Based on the photo ID, it is noted that the following stockpiles are present onsite – SP3 and SP4, SPA and SPB and TS1 and TS2. - Are SPA and SPB the stockpiled identified by EIS? - TS1 and TS2 were observed by the Audit Assistant during the site inspection on 11 July 2019. Have they been removed? 2. As part of the site audit, the Auditor is required to track material movement for material entering and leaving the site. The Auditor requires a register to be prepared by Greencap/RCC containing the following information, at the minimum: - Material leaving the site for offsite disposal (for example SP3)- volume of material; waste classification; vehicle registration for each truck load; final destination; and waste dockets. - Imported material for site use – volume of material; origin of material (quarry, VENM etc); documentation (for example, VENM report) and vehicle registration for each truck load; final destination onsite	1. - SPA and SPB are deemed to be the stockpiles identified by EIS - TS1 and TS2 are to be removed after the ENM Classification is completed 2. Greencap was advised imported and exported material tracking registers are currently being prepared by Richard Crookes in accordance with the auditors requirements. RCC to provide the finalised registers once all material movements are completed and all disposal dockets are received. Progress disposal dockets to be provided to the auditor by RCC for reference and records.

LEGEND

- SITE BOUNDARY
- BUILDING AWNING LINE

SOFTWORKS

- + EXISTING TREE TO BE RETAINED AND PROTECTED
- PROPOSED TREE
- MP MASS PLANTING
- TRF TURF
- ML MULCH

PAVING

- P1a CONCRETE PAVING TYPE A
- P1b CONCRETE PAVING TYPE B
- P1c CONCRETE PAVING TYPE C
- P2 CONCRETE PAVING VEHICLE
- P3 ASPHALT
- P4 PLAY MULCH SOFTFALL
- P5a RUBBER SOFTFALL TYPE A
- P5b RUBBER SOFTFALL TYPE B
- P6 UNIT PAVERS
- P7 MULTI PURPOSE COURT
- P8 SAND
- P9 DECK
- P10 ARTIFICIAL TURF

EDGES

- E1 CONCRETE EDGE
- E2 SPADE EDGE
- E3 TIMBER EDGE
- E4 RUBBER SOFTFALL ROLL-OVER EDGE
- E5 CONCRETE HO8

WALLS (Refer to Engineer's Documentation)

- W1 BLOCKWORK WALL
- W2 BLOCKWORK WALL WITH TEMPORARY SHEET PILE

FENCES + GATES (Refer fence and gate plan)

- FN1 SCHOOL FENCE 2100 HIGH
- FN2 PALISADE FENCE 2100 HIGH
- FN3 SPORT FENCE 2400 HIGH

STAIRS AND SEATING STEPS

- S1 CONCRETE STAIRS
- S2 TIMBER STAIRS
- S3 CONCRETE SEATING STEPS

FURNITURE

- F1a SEAT
- F2a BENCH
- F2b BENCH - WALLMOUNT
- F3 PARK PLATFORM
- F4 TABLE SETTING
- F5a BIN - GENERAL WASTE
- F5b BIN - RECYCLING
- F6 BIKE PARKING
- F7 BOLLARD - FIXED / REMOVABLE
- F8 DRINKING FOUNTAIN
- F9 RAISED PLANTERS
- F10 WATER TANK
- F11 POTTING TABLE WITH SINK
- F12 GARDEN SHED
- F13 BALUSTRADE
- F14 HANDRAIL
- F15 TACTILES (TGS)
- F16 STAIRS NOSING
- F18 SHADE SAIL
- F19 UMBRELLA
- F20 VOLLEYBALL NET
- F21 VOLLEYBALL POST
- F22a TENNIS NET
- F22b TENNIS WINDER
- F23 NETBALL RING
- F24 BASKETBALL TOWER AND RING
- F25a SANDSTONE BLOCKS LARGE
- F25b SANDSTONE BLOCKS SMALL
- F25c SANDSTONE BLOCKS CURVED
- F26 MODULAR BLACK SEAT
- F27 TIMBER PLATFORM
- F28
- F29 'CHUCKLE' SEAT

PLAY EQUIPMENT

- PY1 GIANT TUNNEL SYSTEM
- PY2 STREET CLIMBER SYSTEM
- PY3 EMBANKMENT SLIDE
- PY4 CLIMBING ROPES
- PY5 RUBBER CLIMBING MOUNDS
- PY6 TIMBER STEPPING LOGS
- PY7 TIMBER POSTS
- PY8 TIPI
- PY9 SYMPHONY TUBES
- PY10 VOICE TUBES
- PY11 MIRROR
- PY12 GONG DRUMS
- PY13 RAIN WHEEL
- PY14 SAND PIPES
- PY15 COLOURED ACYLIC DISKS
- PY16 BLACKBOARD

SERVICES (Refer to Engineer's Documentation)

- W WATER



Issue	Description	Date
A	FOR COORDINATION	13/05/2019
B	FOR INFORMATION	17/05/2019
C	FOR INFORMATION	29/05/2019
D	FOR INFORMATION	14/06/2019
E	DETAILED DESIGN	21/06/2019

Contractor
RICHARD CROOKES
CONSTRUCTIONS

Client
NSW GOVERNMENT
Education

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nom architect M. Sheldon 3990

Project Title
**ALEX AVENUE
PUBLIC SCHOOL**
Drawing Title
**GENERAL ARRANGEMENT
PLAN**

Scale 1:200 @A1
Drawing created (date) 21/06/2019
By JH
Plotted and checked by JH
Verified FR
Approved FR
Drawing No 180645 L-2001
Issue E
File Plot Date
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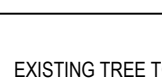
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SOFTWARES

 EXISTING TREE TO BE RETAINED AND PROTECTED

 PROPOSED TREE

 MASS PLANTING

 TURF

 MULCH

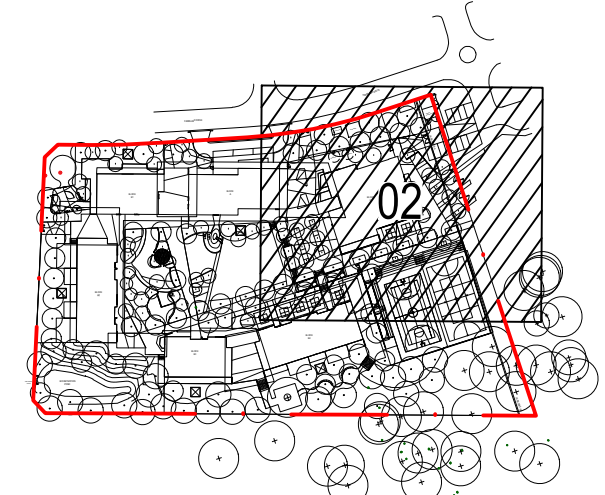
EDGES			
	CONCRETE EDGE		RUBBER SOFTFALL ROLLOVER EDGE
	SPADE EDGE		CONCRETE HOB
	TIMBER EDGE		

FENCES + GATES (Refer fence and gate plan)	
	SCHOOL FENCE 2100 HIGH
	PALISADE FENCE 2100 HIGH
	SPORT FENCE 2400 HIGH

FURNITURE

— W —
GAL WATER

	
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CONSTRUCTIONS	
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architecture interior design urban design landscape nom architect M. Sheldon 3990	
Project Title	
ALEX AVENUE PUBLIC SCHOOL	
Drawing Title	
GENERAL ARRANGEMENT PLAN	
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21/08/2019	
By	
JG	
Plotted and checked by	
JH	
Verified	
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Contractor

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CONSTRUCTIONS

Client

 NSW GOVERNMENT	Education
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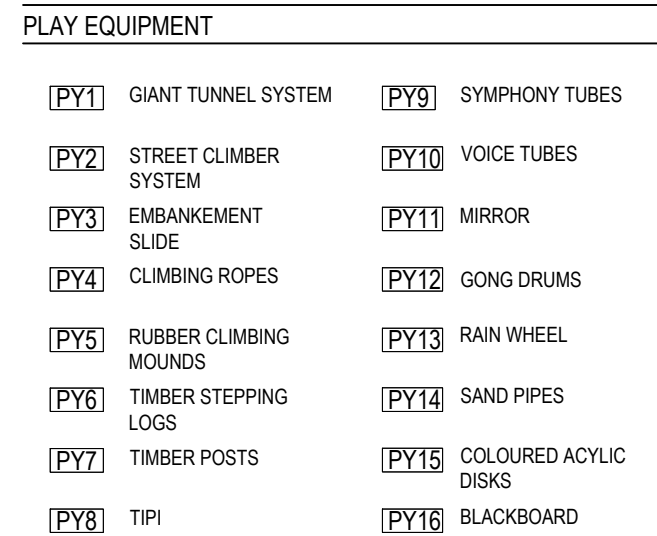
architecture interior design urban design landscape
 nom architect M. Sheldon 3990

Project Title
ALEX AVENUE
PUBLIC SCHOOL

Drawing Title
GENERAL ARRANGEMENT PLAN

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By	JG
Plotted and checked by	JH
Verified	FR
Approved	FR
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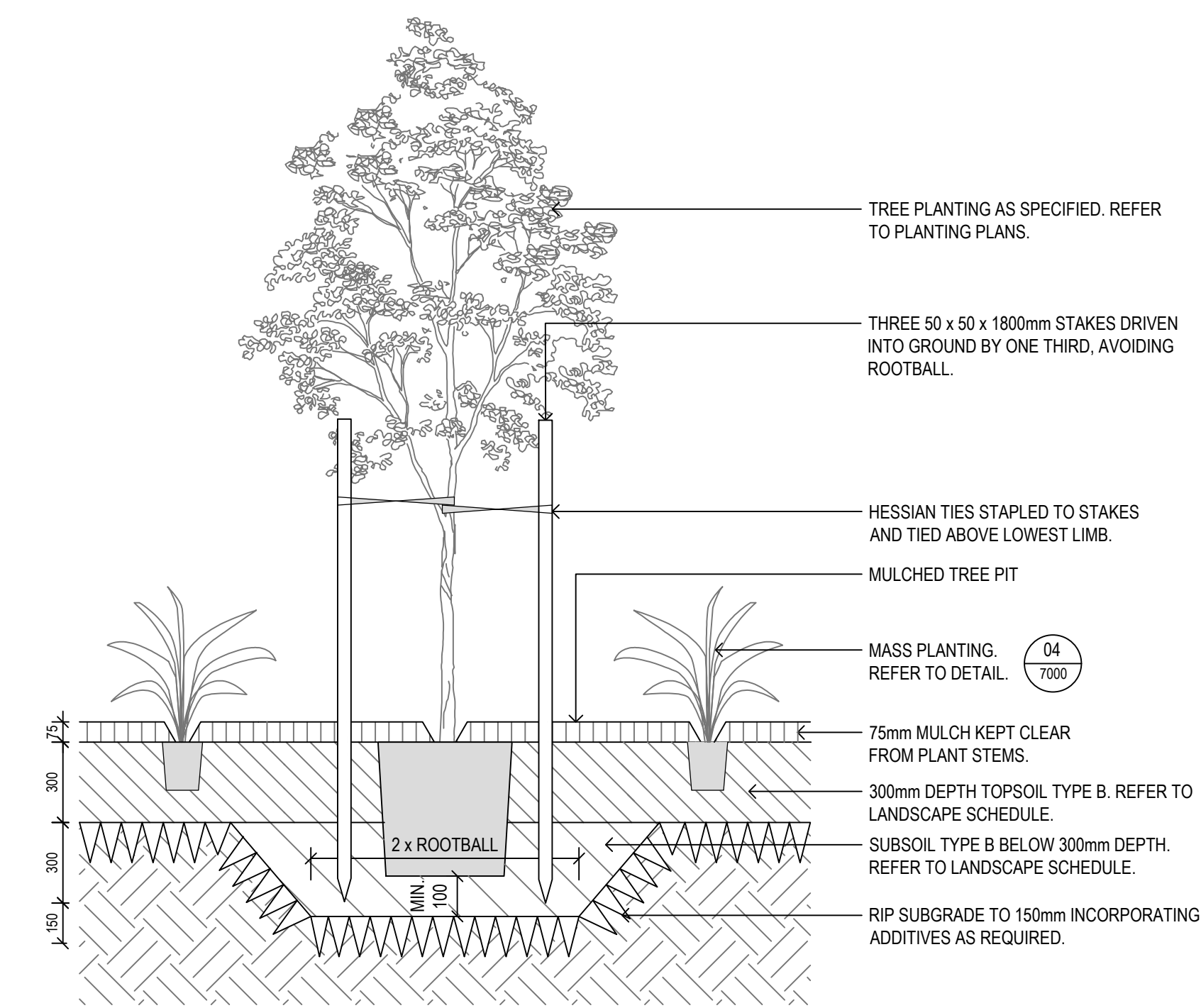
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Project Title

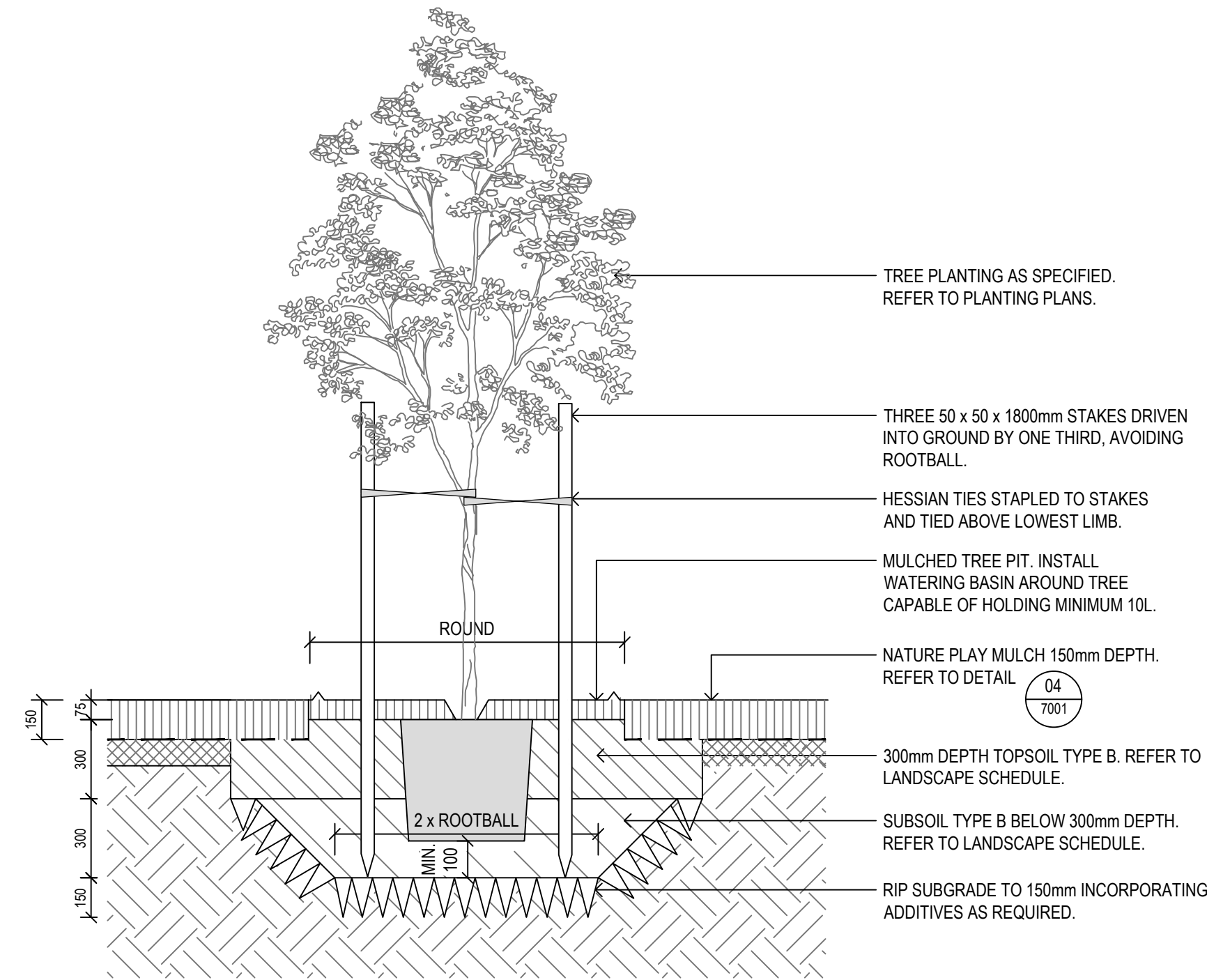
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PUBLIC SCHOOL

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Plotted and checked by	JH
Verified	FR
Approved	FR
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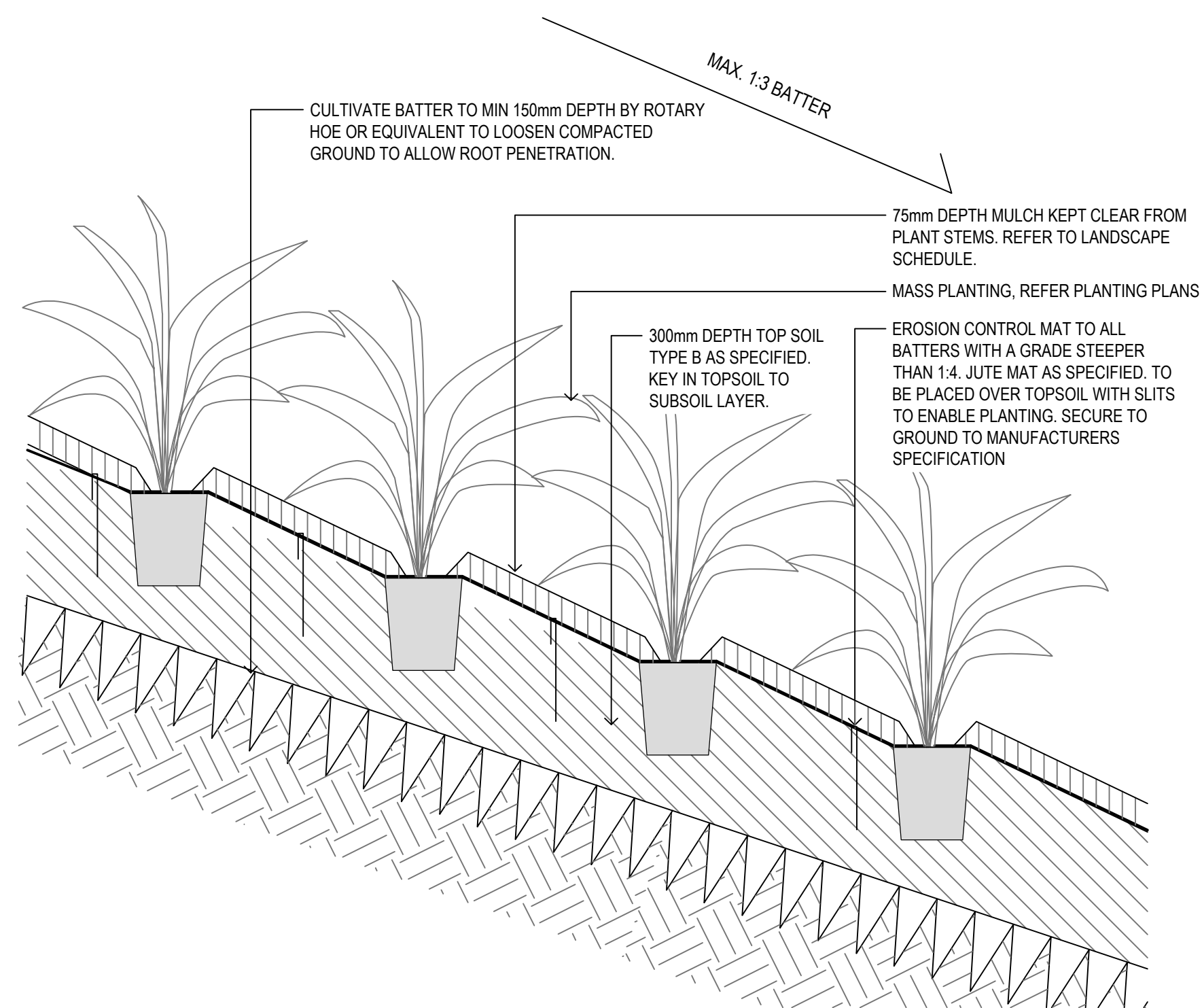
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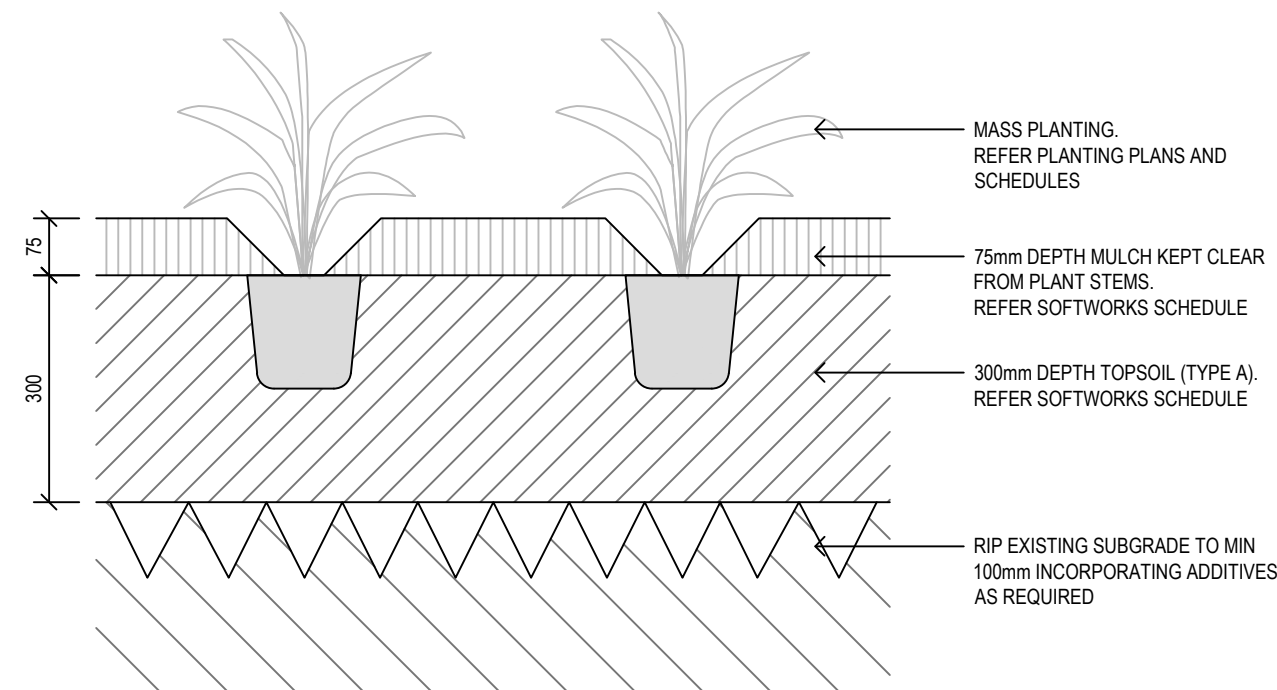
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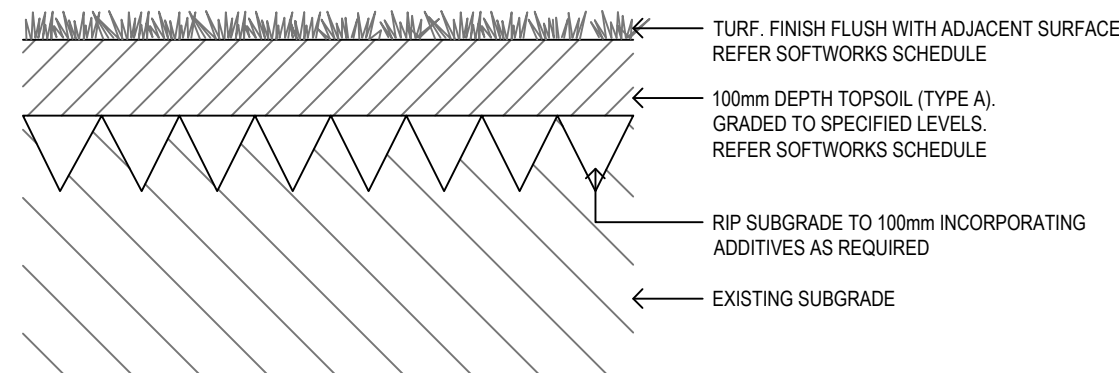
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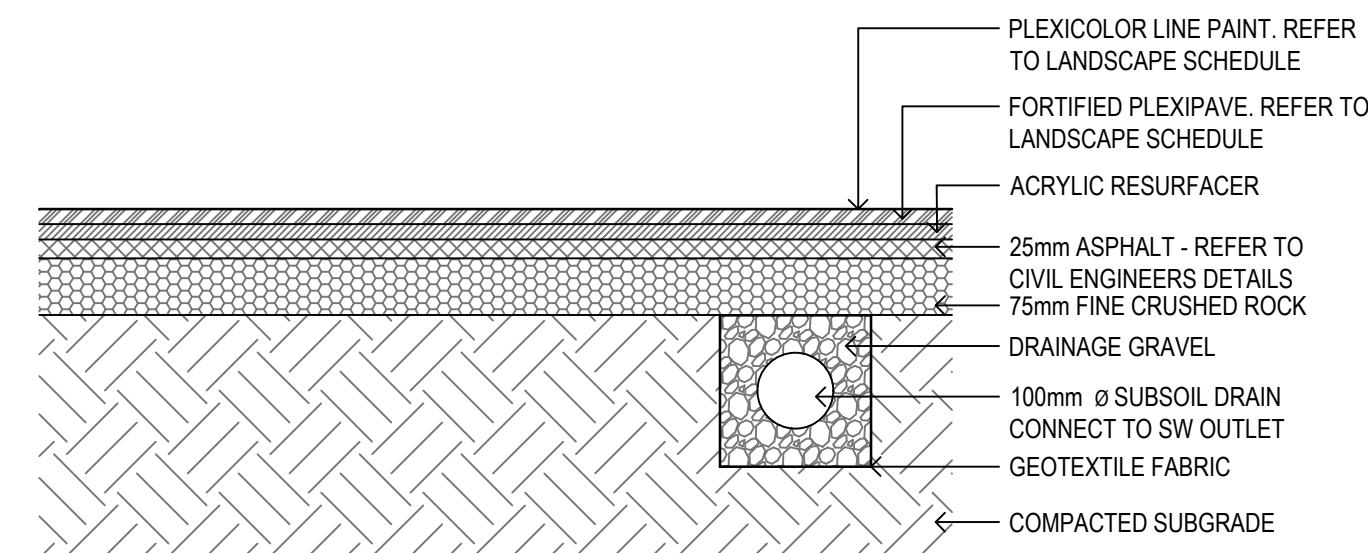
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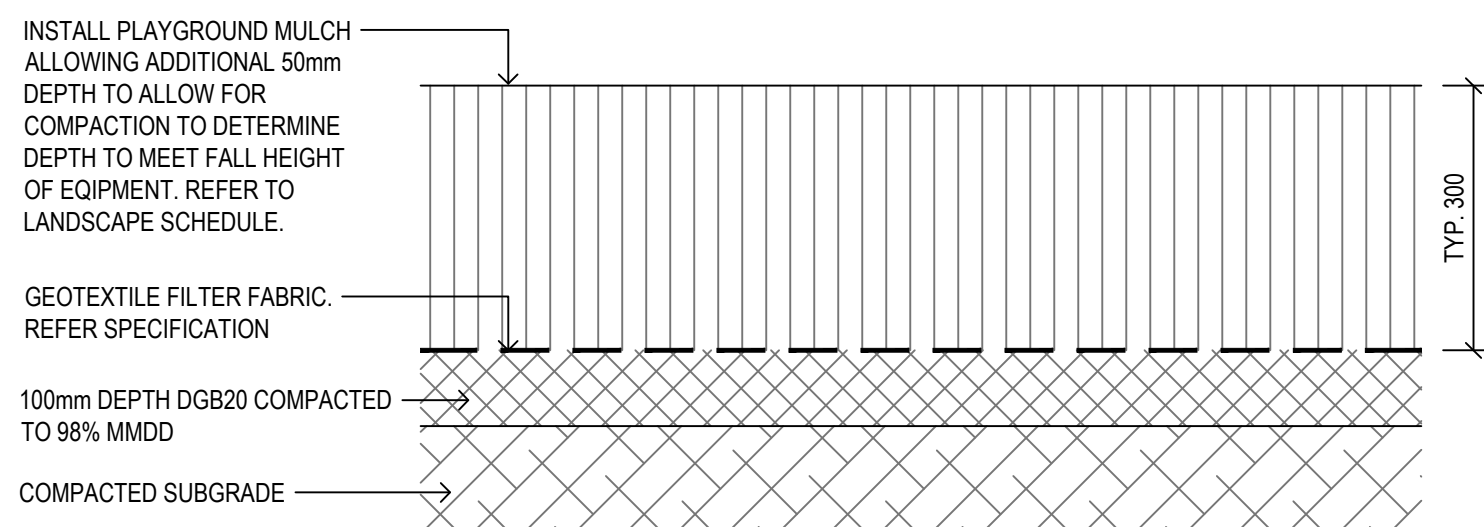
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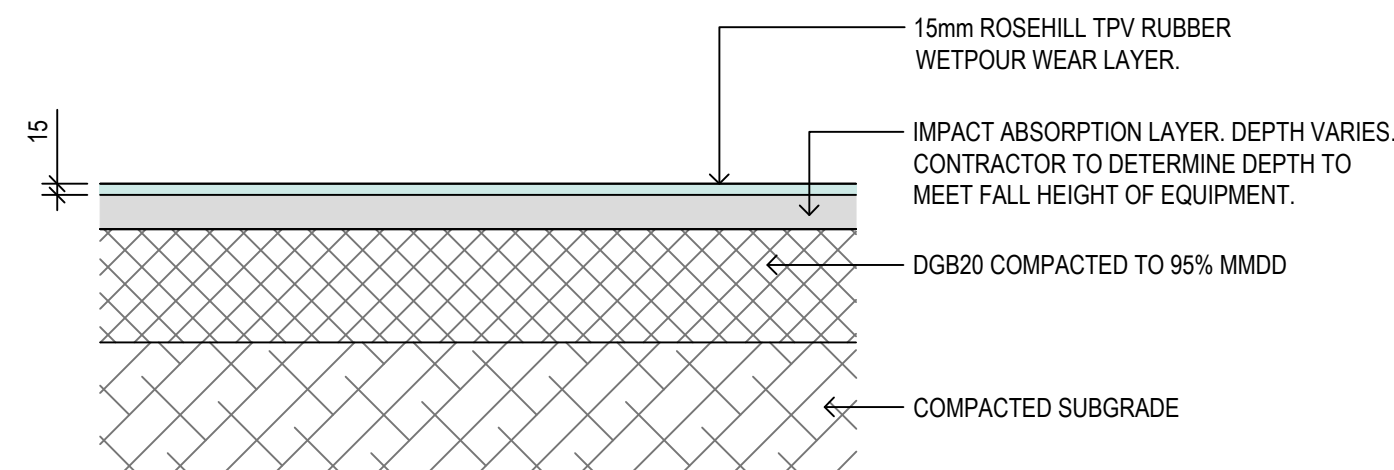
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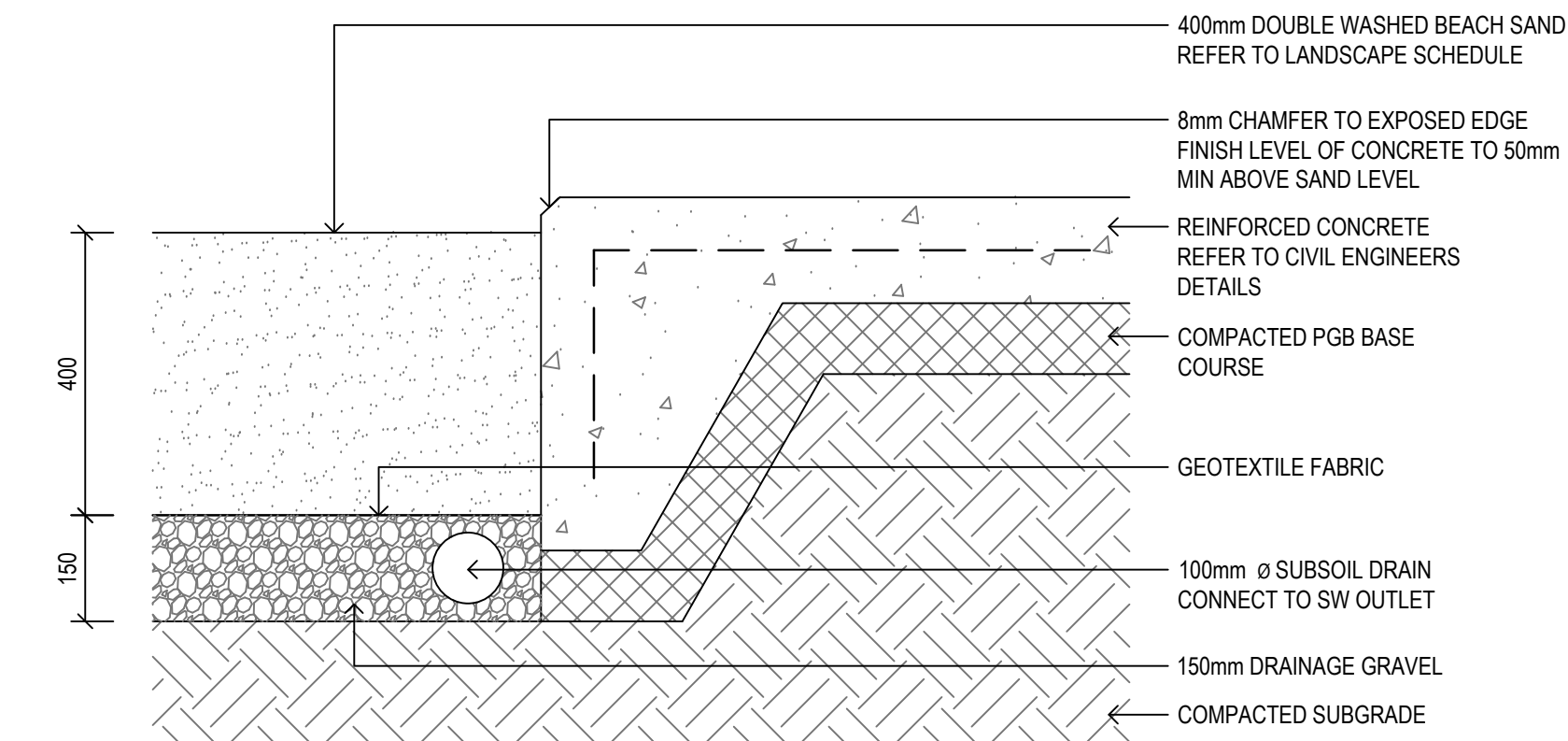
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TYPICAL SECTION



07 PLAY MULCH SOFTFALL
1:10
TYPICAL SECTION

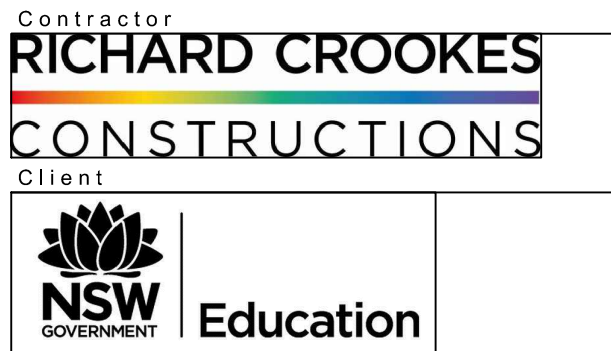


08 RUBBER SOFTFALL
1:10
TYPICAL SECTION



09 SAND
1:10
TYPICAL SECTION

Amendments	Issue	Description	Date
A	FOR INFORMATION	29/05/2019	
B	FOR INFORMATION	14/06/2019	
C	DETAILED DESIGN	21/06/2019	
D	FINAL DETAILED DESIGN	12/07/2019	



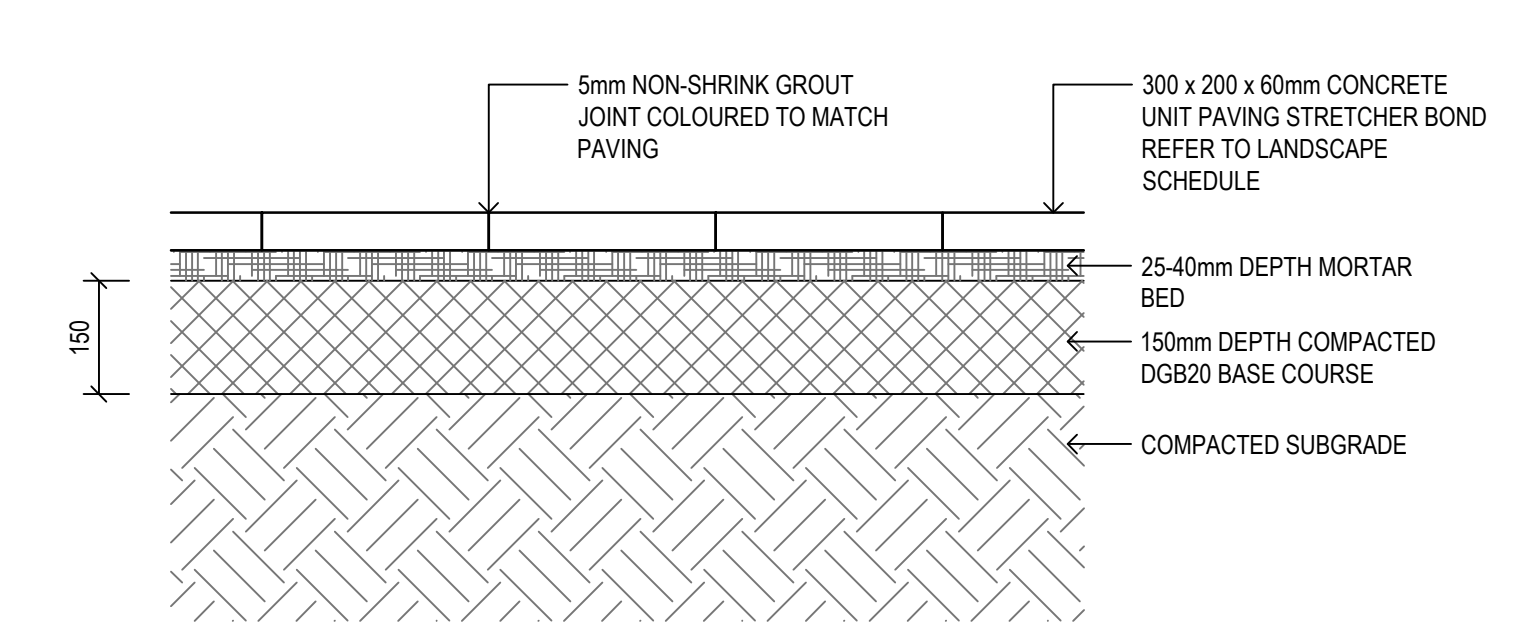
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**ALEX AVENUE
PUBLIC SCHOOL**

Drawing Title
**LANDSCAPE DETAILS
SOFTWARES AND PAVING**

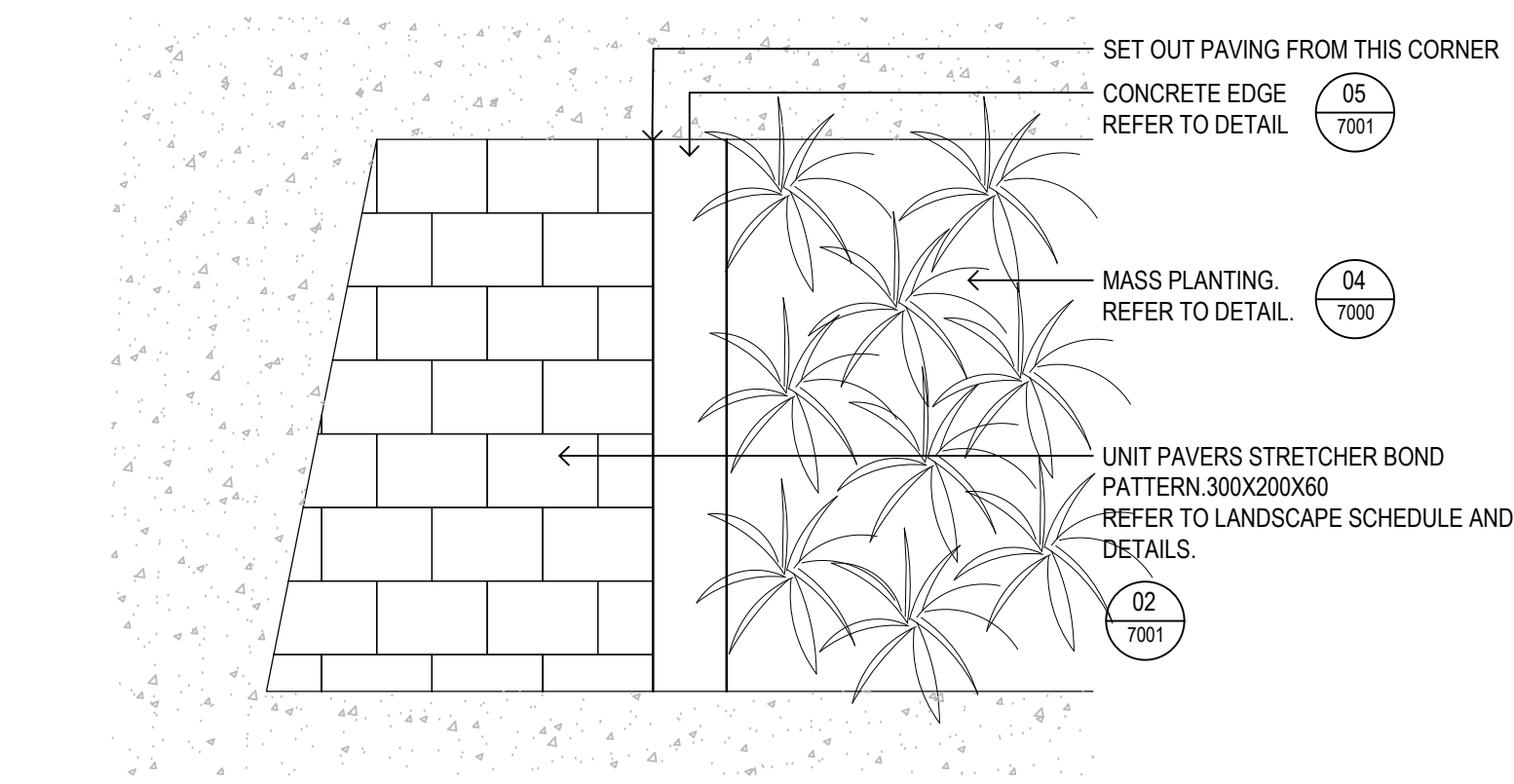
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By	LI
Plotted and checked by	LI
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Approved	FR
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File	Plot Date
\$FILES	\$DATES

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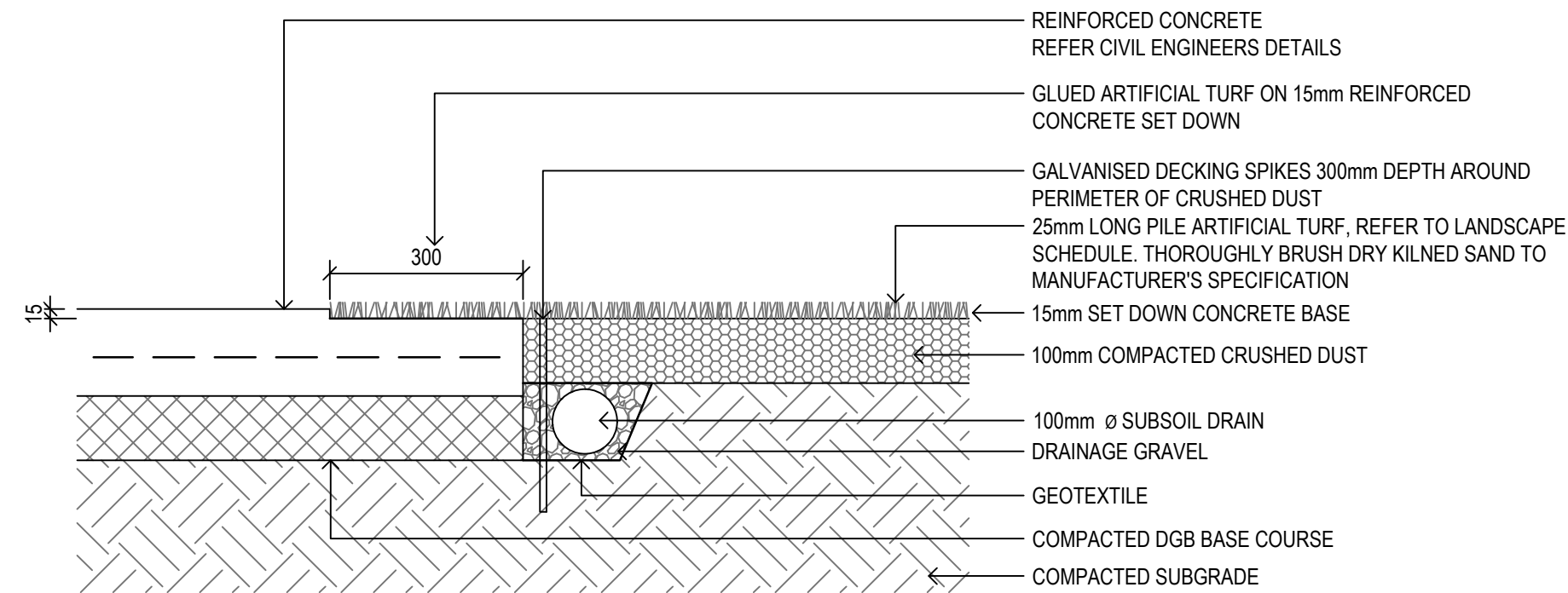
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B	FOR INFORMATION	14/06/2019
C	DETAILED DESIGN	21/06/2019
D	FINAL DETAILED DESIGN	12/07/2019



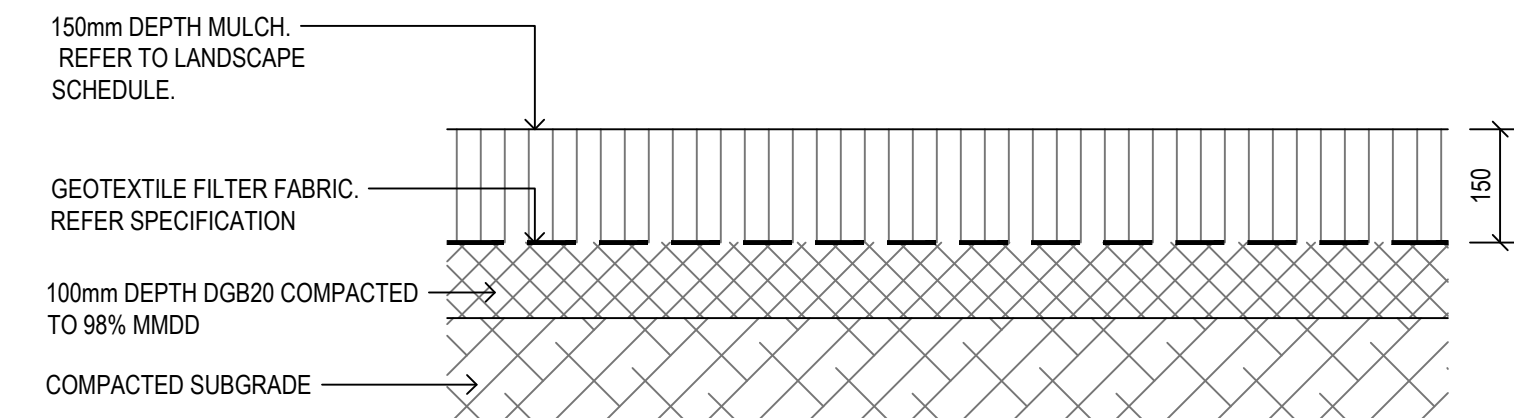
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7001 1:10 TYPICAL SECTION



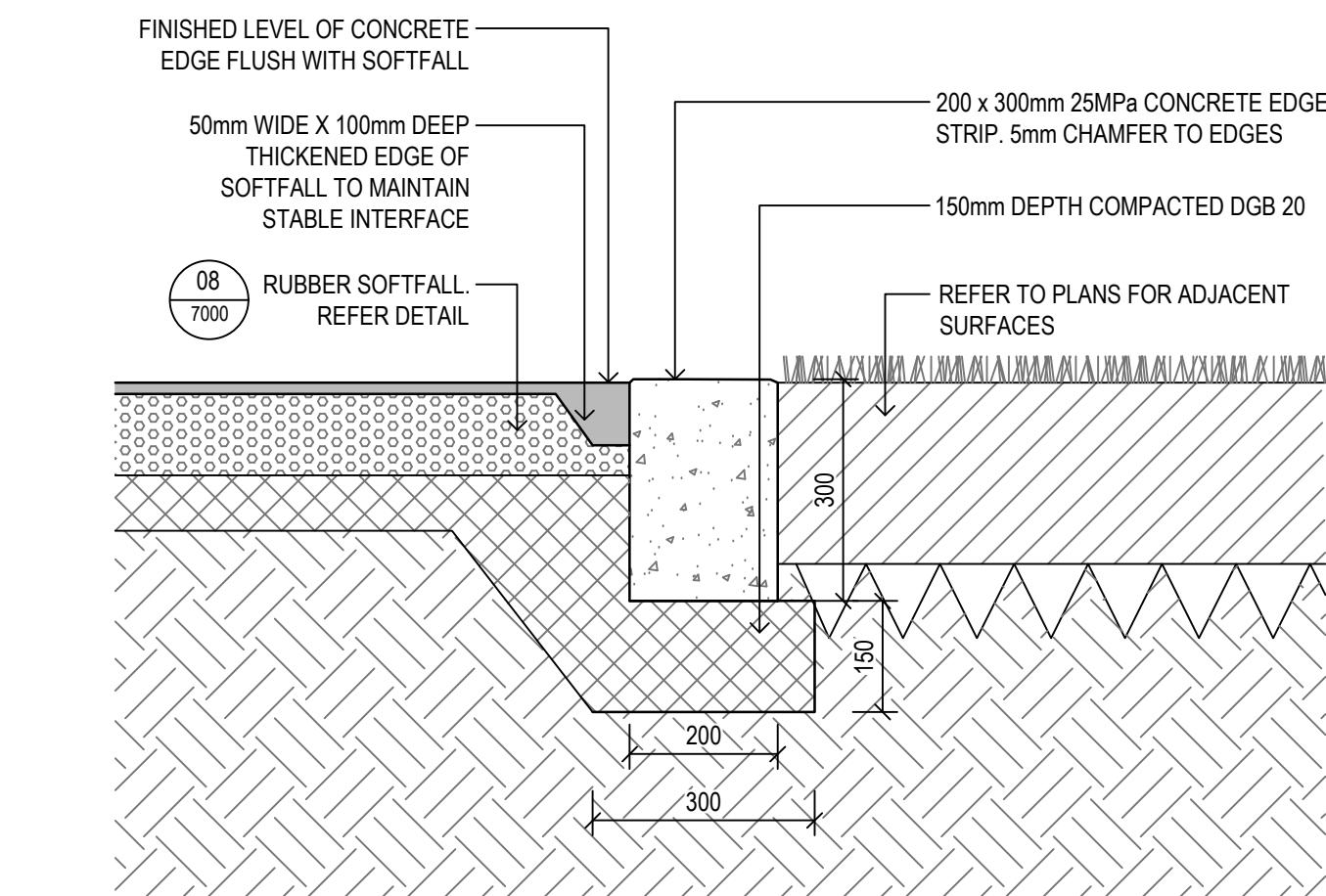
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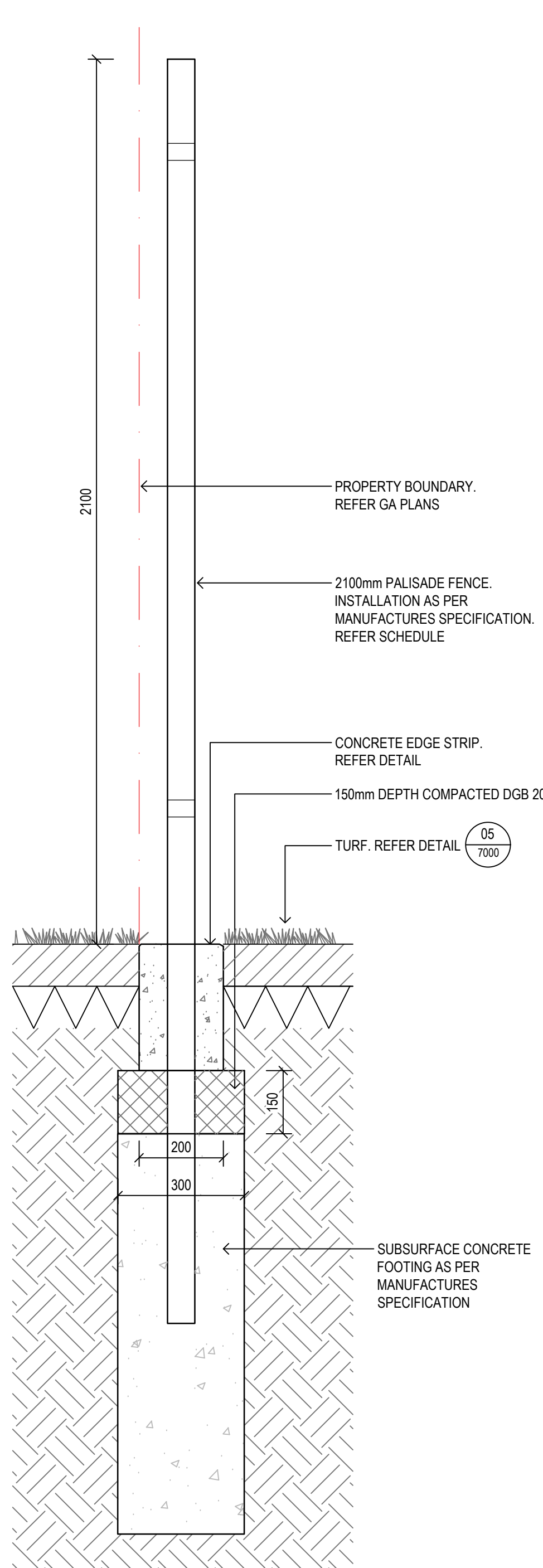
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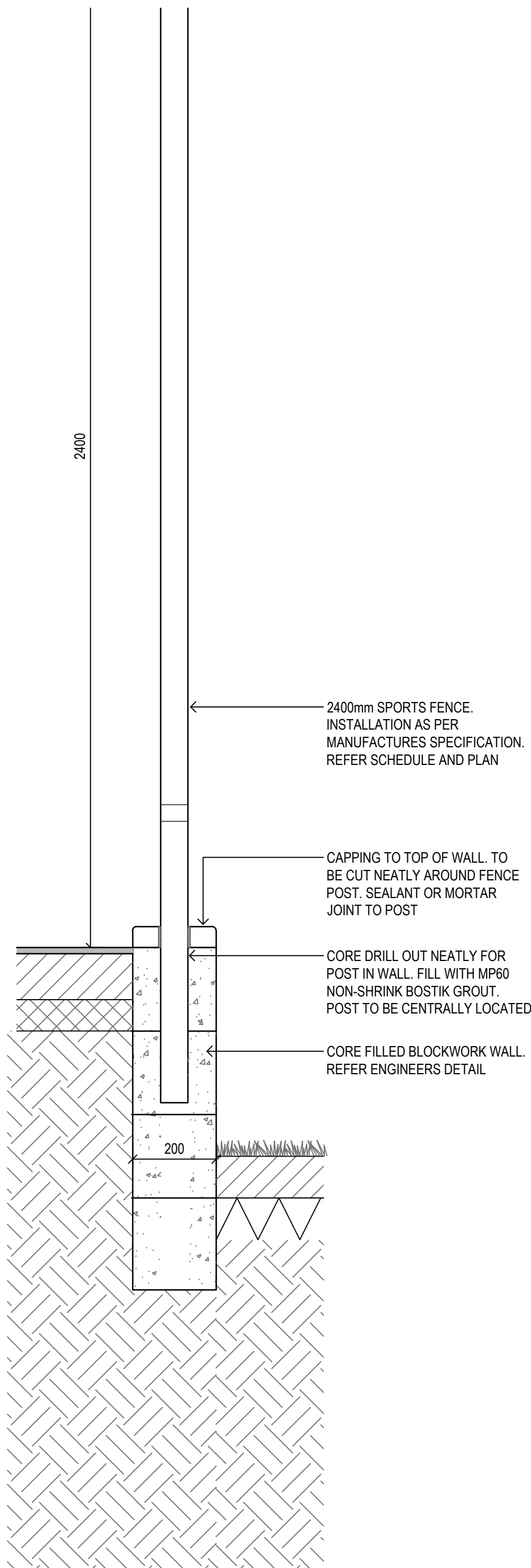
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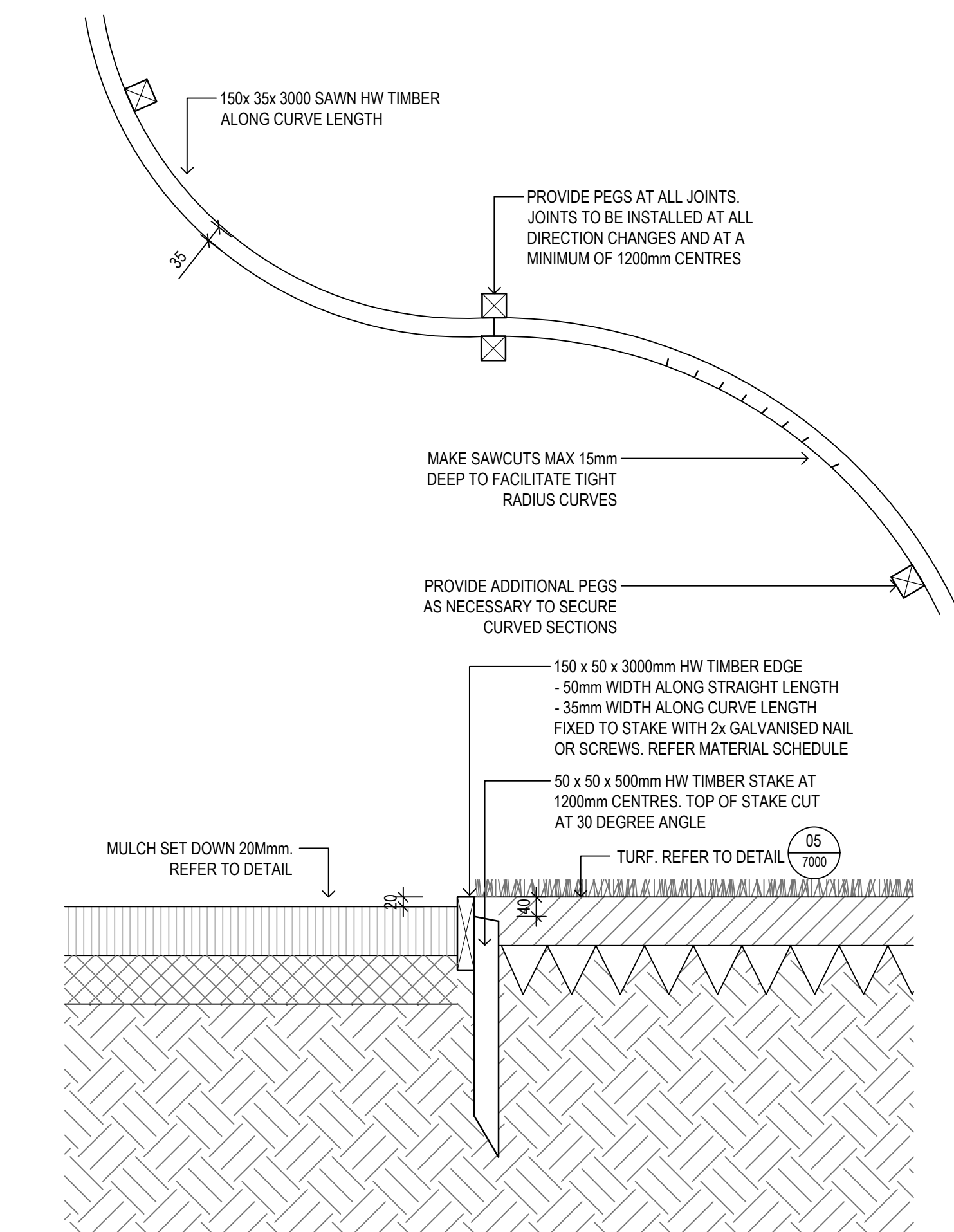
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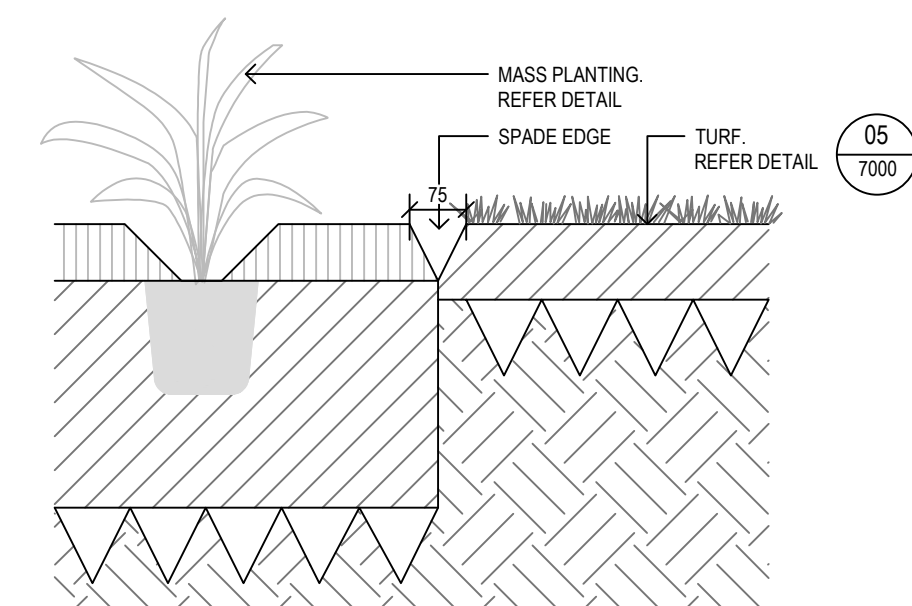
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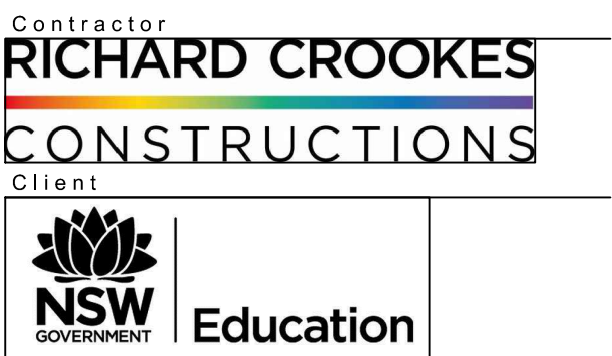
09 FENCE IN WALL
7001 1:10 TYPICAL SECTION



07 TIMBER EDGE
7001 1:10 TYPICAL SECTION



08 SPADE EDGE
7001 1:10 TYPICAL SECTION



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nom architect M. Sheldon 3990

Project Title
**ALEX AVENUE
PUBLIC SCHOOL**

Drawing Title
**LANDSCAPE DETAILS
PAVING AND EDGING**

Scale 1:10 @A1
Drawing created (date) 21/06/2019
By LI
Plotted and checked by LI
Verified FR
Approved FR
Drawing No 180645 Issue L-7001 D
File Plot Date
SPLES SDATES

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Reference	Greencap Response	Changes made in the Updated DSI (if required)
Greencap (21 January 2019) DSI		
1. General – please confirm current ownership; the flood potential of the site; key summary of lands title searches and council records review;	The DSI has been amended with a new section: <i>Section 7 – ‘PSI Addendum – Additional Desktop Investigation’</i> which incorporates additional desktop investigations. Additional desktop searches cover proposed Lot 1 and Lot 2 (parts of Lot 4 DP1208329 and Lot 121 DP1203646 respectively) indicated in the layout. <i>Land Title Summary – Section 7.1</i> * Current and historical title searches were ordered, reviewed and the data summarised for the above lots <i>Council Planning Certificate Review – Section 7.2</i> * Section 149 (2) and (5) Council certificates were ordered for both lots and incorporated into the PSI Addendum. Flood potential of the site is was assessed and incorporated into the DSI: <i>Site Flood Hazard Potential - Section 7.3.1</i>	Section 7 – ‘PSI Addendum – Additional Desktop Investigation’ added to DSI. Land Title Summary – Section 7.1 Council Planning Certificate Review – Section 7.2 Site Flood Hazard Potential - Section 7.3.1 ok
2. Section 4.1 (desktop review): Greencap states that ‘review of Council records and aerial photographs helped identify landfilling, including potential asbestos landfill’. Was such a use identified? Please clarify.	This item has been amended as follows: * "Review of Council records and aerial photograph to help identifying landfilling, including potential asbestos landfill" investigations did not identify any evidence of legacy landfilling on site. Although fill material was observed on the northern/ north eastern section of the site, no asbestos was identified within the test pits or on the surface. Therefore, Greencap deems an Unexpected Finds Protocol (UFP) would be an appropriate practice to manage the residual risk due to potential unexpected finds. This item has also been incorporated into <i>Section 5.2 - Site setting</i> and <i>Section 9.2.1 – Fill materials encountered on site</i>.	Incorporated into Section 5.2 - Site setting Incorporated into Section 9.2.1 – Fill materials encountered on site ok
3. Section 7 (sampling density rationale): Whilst noting that 35 test pits were excavated during investigation works, only 32 soil samples were analysed as part of the analytical program (no soil samples analysed from TP16, TP20 and TP22). Please justify the discrepancy as this does not meet the minimum sampling density requirement as described in NSW EPA (1995).	35 test pits were advanced during the DSI and the material was visually observed, field screened with PID, and logged at each location. A total of 35 samples were analysed although this included analysis of two samples from the same test pit and no soil samples analysed for the full suite of chemical analytes for TP16, TP20 and TP22. Absence of chemical data at TP16, TP20, and TP22 is not considered a data gap due to the following lines of evidence: * TP16 and TP22 - natural soil profile, no fill material was encountered, PID did not indicate potential HC contamination (refer to borehole logs in Appendix D). <i>TP16 was however analysed for salinity analytes;</i> * TP20 - no visual or olfactory evidence of contamination was noted, PID did not indicate potential HC contamination. * An additional field investigation has been undertaken on 26 July 2019 and samples were collected from stockpiled topsoil and fill materials for waste classification purposes (inc. SPA and SPB) this provides additional confidence for the chemical status of the soils originated from the site.	Justification included in Section 8 of report - Sampling Density and Rationale. T
4. Section 8.1 (site inspection):		

Reference	Greencap Response	Changes made in the Updated DSI (if required)
a. Greencap states that ‘the two stockpiles of fill material identified in the PSI report were located as described. Refer to Figure 3 for stockpile locations’. A review of Figure 3 notes that the two stockpiles were identified by Greencap were located further north and east from the two stockpiles observed by EIS during the PSI. Based on the EIS and Greencap figures, it appears that the two stockpile locations identified by EIS were closer to the Greencap’s test pits TP6 and TP7 and the area to the immediate south of these two test pits. Please confirm if this interpretation is correct and that the area has been suitably characterised.	These stockpiles have been classified as GSW and have since been removed off-site. Greencap confirms this area has been suitably characterised. This was incorporated into the DSI, <i>Section 9.1 – Site inspection</i>: [The two stockpiles of fill material identified in the PSI report were located as described. Refer to Figure 3 for stockpile locations.] <i>The two stockpiles of fill material identified in the PSI report were located as described. These materials have since been classified as General Solid Waste for offsite disposal (refer to Section 9.3 and Figure 3 of Waste Classification Report: J163717 - Waste Classification - Alex Avenue (SPA & SPB)_V1, issued July 2019);</i>	Incorporated into <i>section 9.1 (site inspection)</i>
b. As discussed in Comment 3, foreign materials were previously observed in the northern portion of the site. Please confirm whether this was observed onsite and actual nature of foreign materials across the site and whether aesthetically this is acceptable for a primary school site.	Foreign materials (e.g. terracotta pieces) that do not pose a contamination risk, may remain in-situ underneath sealed surfaces on site (e.g. Building footprints, pavements or asphalt roadways). Garden accessible soils, on the other hand, are recommended to be cleared from foreign objects. <u>Updated site condition:</u> On 26 July 2019, Greencap conducted a detailed site walkover and observed fill material containing foreign materials were stockpiled towards the eastern section of the site (referred to as SP3, and since classified as General Solid Waste (GSW) with issued waste classification report). Including SP3, on this day Greencap sampled six (6) different stockpiles and investigated an unexpected find (UF) of relatively small volume of (< 3m³) buried waste material (referred to as UF1, which consisted an old potential paint cannister ~ 10L volume, plastic sheeting, and terracotta) —refer to Greencap's email dated 26 July 2019. We observed that the stockpiles on site were generally well- managed and neatly separated from natural soils on site. We also noted that the soils on-site (predominantly natural) have been moved towards the west of the site as part of a cut & fill plan, which was understood to be the source of the re-worked natural soil surface towards the west. After the inspection and clearance of UF1, 3 validation samples were collected from the footprint of UF1 and sent to the NATA laboratory to be placed on hold. As the chemical testing results of the excavated UF1 material (SP4) did not indicate the presence of any chemical contamination (refer to issued letter report and SP4 waste classification certificate), Greencap does not deem it necessary for these validation samples to undergo chemical analysis. Furthermore, after UF1, 9 test pits were advanced in the western section of the site (Proposed Lot 1) to cover the re-worked natural soils nearby. Greencap observed re-worked natural material was consistent with the natural soils found on site and did not include any visual or olfactory evidences of contamination. At all 9 test pits, natural soils were encountered at depths ranging between 0.1-1.2 mBGL. The findings of this investigation have been documented in a letter report with photographic evidence and borehole logs. No chemical testing of this material was deemed necessary at this stage. Reference to these additional site works, and the issued waste classification certificates has been added to the DSI, (<i>Section 9.3 – Additional Site works</i>). Refence to site soil aesthetics has also been added to the DSI in the following added sections: <i>Section 10.3 – Aesthetic Quality of Soils (assessment criteria)</i> <i>Section 11.5 - Aesthetic condition of on-site Soils</i>	<i>Section 9.3 – Additional Site works</i> <i>Section 10.3 – Aesthetic Quality of Soils (assessment criteria)</i> <i>Section 11.5 - Aesthetic condition of on-site Soils</i>

Reference	Greencap Response	Changes made in the Updated DSI (if required)
5. Section 8.2.1 (fill material encountered onsite): Based on the information provided in borehole logs (Appendix D of report), fill material was also observed in TP13, TP15, TP17, TP18 and TP20. Please clarify.	Observations on 26 July indicated fill material has been successfully separated from natural soils, which has been documented in a letter report. Therefore, former figure is no longer applicable. Plus referred borehole logs did not note any artificial inclusions or indicators of contamination. Therefore, this would not have a material impact on the conclusion of our report.	N/A
6. Section 8.2.2 (natural soils):		
a. It is noted that 'natural black coal inclusions noted (2%) at 0.5m' within the natural residual clay. Please clarify. It is considered uncommon to observe black coal inclusions within residual clay encountered in the western Sydney area. Would this material be reworked natural? Please confirm source. Is this of concern?	Greencap confirms these soils were natural (site was observed to be predominantly virgin landscape in the initial investigation), which was demonstrated with photographs of test pits in the aforementioned letter report. Mottling and colours observed in this material did not indicate any potential former re-work at these locations. <u>Updated site condition (after RCC conducted cut and fill):</u> Greencap also noted coal inclusions in the re-work natural soils towards the west of the site, these are thought to be originated from the site it-self. Coal was also observed in natural soil profiles during the recent inspection. Coal is also noted in Lot-search report as part of the geological unit; therefore, it is likely that these inclusions are originated from the weathered bedrock (clay).	N/A
b. If the material is confirmed to be reworked natural soils, not natural soils, this test pit did not extend into the underlying natural soils. Please confirm whether this will have a material impact to the outcome of the investigation.	Greencap confirms natural profile has been encountered at all test pits undertaken during the DSI and additional test pitting exercise on 26 July 2019. Re-worked natural soils observed on the site surface was originated from recent Cut-Fill exercise undertaken by RCC (after the DSI). Therefore, presence of recently re-worked natural soils on-site would not pose a material impact to the outcome of the DSI.	N/A
7. Section 10.1 (analytical schedule):		
a. Given the site was previously used for agricultural purposes (in particular the northern portion), please justify why only five soil samples were analysed for OC and OP pesticides.A23:A31A23:A32	Aerial photographs do not indicate intense agricultural activity on site. The majority of the site is noted as greenfield with virgin soils (to be incorporated into PSI Addendum). 5 samples collected were tested for OCP and OPP to close out these contaminants of potential concern. The results of the analysis on these samples were all non-detect. Furthermore, recent waste classification results also indicated non-detect for OCP and OPP. Therefore, there are multiple lines of evidence to conclude the OCP and OPP contamination risk on site is low (no further investigation required).	N/A
b. It is noted that all not fill samples were analysed for PAHs. Please justify.	Allowance for PAH analysis is made for cases (if encountered) where ash, tar or similar inclusions are observed within fill material. Site soils did not contain these inclusions, therefore PAH was scheduled for a number of fill samples for general coverage. Minor bitumen inclusion was noted in TP1 (0.1-0.2), which returned non detect for PAH. Based on these, Greencap deems, the existing lines of evidence is sufficient to conclude PAH contamination on site is low. This is also supported by the recent waste classification testing.	N/A
c. Please confirm whether the above missions will have a material impact to the outcome of the investigation.	Greencap confirms above missions would not have an impact on the conclusion of the assessment.	N/A
8. Section 10.4 (asbestos in soils):		
a. It is noted that all not all fill samples were analysed for asbestos and some natural soils were selected for asbestos analysis. Whilst noting that ACM was not observed by Greencap during test pitting and the site walkover, please clarify how samples were selected for asbestos assessment.	As no potentially asbestos containing materials (PACM) was observed during the walkover and test pitting exercise, asbestos testing was scheduled targeting the fill material and topsoil for general coverage. Greencap agrees with Auditor's comment that asbestos testing in natural soils is not necessary.	N/A
b. In addition to the above, please justify why asbestos assessment was not conducted in accordance with NEPM 2013	Greencap field consultants were on site with the necessary sieve equipment (7x7 mm sieve and scale). As test pitting exercise did not reveal any ACM fragments on site, quantitative test was not undertaken.	Addition to <i>section 11.4 (asbestos in soils):</i> As part of the additional investigation works conducted in July 2019, further sampling and laboratory analysis for Asbestos Fines / Friable

Reference	Greencap Response	Changes made in the Updated DSI (if required)
quantitative method (10L sample for ACM and 500mL sample for FA/AF).	Sieve testing has been undertaken in the scope of the recent waste classification sampling and no ACM was observed.	Asbestos (AF/FA) was conducted on 18 samples. These samples were collected from stockpiled materials on the site (stockpiles: SPA, SPB, SP3 and SP4) for waste classification purposes, as well as from two additional topsoil stockpiles (TS1, TS2). All soil samples analysed for AF/FA returned negative results for friable asbestos, with no asbestos detected at or above the reporting limit. All samples also contained no detectable respirable asbestos fibres. Refer to the Greencap laboratory analysis report as part of the Walkover & Additional Investigation letter (Appendix J).
c. It is noted that the reporting limit of 0.01%w/w was reported. Whilst it may be suitable for the presence/absence method, it does not meet the FA/AF criteria of 0.001%w/w. Has testing completed to date characterised the site for all forms of asbestos? What other lines of evidence are there to confirm that asbestos does not pose an unacceptable risk for the site particularly the proposed sensitive use.	AF/FA testing was recently undertaken for the fill material stockpiled on-site. The results Have been summarised in Section 11.4 (asbestos in soils) of the DSI report. Additional lines of evidence confirming an Unexpected Finds Protocol would be sufficient for the proposed development: - No evidence of building demolition was apparent on aerial photographs; - Field observations, photographic evidences, and borehole logs did not indicate presence of ACM; and - Recent surface inspection did not identify any ACM on the cleared ground surface.	
d. Please confirm whether the above will have a material impact to the outcome of the investigation or whether confirmatory testing is required.	Greencap deems any residual ACM risk can be managed in the scope of the Unexpected Finds Protocol. Waste classification AF/FA testing can be considered as confirmatory testing. Greencap confirms above items would not have an impact on the conclusion of the assessment.	
9. Section 11.1.1 (CoPCs): Greencap states that ‘sample analysis results indicated no elevated levels of any of the chemical analytes listed in Section 9.1. However, there is always a possibility (for any site) to encounter contamination outside of the investigation points’. Please clarify this statement. This implies the site has not been robustly investigated.	Our results and conclusions are based on multiple lines of evidence approach and statistical confidence limits (where relevant), in line with NEPM 2013 and limited to the investigation locations and available data. Wording has been amended in the Updated DSI (<i>Section 12.1.1 - CoPC</i>)	Sentence removed from <i>Section 12.1.1 - CoPC</i>
10. Section 12 (conclusions -aesthetic issues):		
a. Given the site is proposed for a primary school development, foreign materials that were identified within the fill materials are not suitable to remain onsite due to aesthetics issues. The Auditor requires these materials to be removed as part of the development or discussion provided given the final layout that these do not pose a concern for the future use of site (i.e. location of proposed site structures, finished ground surfaces relative to the location where foreign material was identified).	The sites soil aesthetics has been addressed in the following sections of the amended DSI report: - Section 9.3 – Additional Site works - Section 10.3 – Aesthetic Quality of Soils (assessment criteria) - Section 11.5 - Aesthetic condition of on-site Soils Foreign material inclusions (e.g. terracotta pieces) that do not pose a contamination risk, may remain in-situ underneath sealed surfaces on site (e.g. Building footprints, pavements or asphalt roadways). Garden accessible soils, on the other hand, are recommended to be cleared from foreign objects. This is based on reference to the NEPM: “....sites with large quantities of well-covered known inert materials that present no health hazard such as brick fragments and cement wastes (for example, broken cement blocks) are usually of low concern for both non-sensitive and sensitive land uses.” - NEPM 2013 Schedule B(1) Section 3.6.3	Amended sections of the DSI report: - Section 9.3 – Additional Site works - Section 10.3 – Aesthetic Quality of Soils (assessment criteria) - Section 11.5 - Aesthetic condition of on-site Soils
b. During the project meeting held on 4 July 2019 with RCC and TSA, the Auditor was informed that anecdotally fly tipping may have occurred whilst the site was unsecured/unfence. The extent of fly tipped material should be confirmed by a detailed site walkover following removal of site vegetation and/or site preparation works. The outcome of the site walkover should be reported to the Auditor. During the site walkover conducted by the Audit Assistant on 11 July 2019, two fly tipped stockpiles were present in the northwest portion of the site, with demolition waste, including timber and sandstone bricks, observed in one of the stockpiles. It is understood that RCC will request the appointed	On 26 July 2019, Greencap conducted a detailed site walkover and observed fill material, containing foreign materials, stockpiled towards the eastern section of the site (referred to as SP3, site (referred to as SP3, and since classified as General Solid Waste (GSW) with issued waste classification report). Including SP3, on this day Greencap sampled six (6) different stockpiles and investigated an unexpected find (UF) of relatively small volume of (< 3m ³) buried waste material (referred to as UF1, which consisted an old potential paint cannister ~ 10L volume, plastic sheeting, and terracotta—refer to Greencap's email dated 26 July 2019. We observed that the stockpiles on site were generally well managed and neatly separated from natural soils on site. We also noted that the soils on-site (predominantly natural) have been moved towards the	Reference to issued waste classifications made in section 9.3

Reference	Greencap Response	Changes made in the Updated DSI (if required)
environmental consultant to conduct a waste classification of the stockpiles for offsite disposal.	west of the site as part of a cut & fill plan, which was understood to be the source of the re-worked natural soil surface towards the west. After the inspection and clearance of UF1, 3 validation samples were collected from the footprint of UF1 and sent to the NATA laboratory to be placed on hold. As the chemical testing results of the excavated UF1 material (SP4) did not indicate the presence of any chemical contamination (refer to issued letter report and SP4 waste classification certificate), Greencap does not deem it necessary for these validation samples to undergo chemical analysis. Furthermore, after UF1, 9 test pits were advanced in the western section of the site (Proposed Lot 1) to cover the re-work natural soils nearby. Greencap observed re-worked natural material was consistent with the natural soils found on site and did not include any visual or olfactory evidences of contamination. At all 9 test pits, natural soils were encountered at depths ranging between 0.1-1.2 mBGL depths. The findings of this investigation have been documented in a letter report with photographic evidence and borehole logs. No chemical testing of this material was deemed necessary.	
c. Due to the limited presence and nature of the flytipping observed during the site visit, it is considered that this can be managed as part of unexpected finds in the Construction Environmental Management Plan (CEMP). The Auditor is to be informed as soon as practical possible when unexpected finds being encountered onsite. Affected area should be restricted for access and no works should be resumed until the area has been cleared by the environmental consultant and the Auditor.	An Unexpected Finds Protocol (UFP) has been prepared by Greencap and presented to RCC. Reference to the UFP has been added to <i>Section 9.3 - Additional Site Works Conducted July 2019</i>. UFP has also been amended following auditor comments and is to be re-issued to RCC.	UFP mentioned in section 9.3 with UFP reference
11. Appendix F (Lab Documentation):		
a. Please provide a copy of the chain of custody and sample receipt advice for review.	Refer to IA Action List Attachments	
b. Triplicate laboratory reports were not provided for review.	QA/QC report has been amended accordingly. Triplicate result has been removed from the QA/QC as its primary sample belonged to an off-site location.	QA/QC Report has been amended (Appendix G of DSI report)
12. Appendix G (QA/QC):		
a. Section 3.12.2 in Appendix G discusses sampling methods adopted for drilling, not test pitting.	QA/QC report has been amended accordingly. Word 'borehole' now amended to 'test pit' in section 3.12.2 of the QAQC report, to prevent sampling method confusion.	Section 3.12.2 of the QAQC report amended.
b. Please outline QA/QC sample splitting techniques adopted.	Duplicate samples were split from the primary samples on the field on the exact time and sampling location. This is now detailed in the QAQC report (appendix G of DSI report); <i>Section 3.12.2 – Sampling Controls</i> under heading: 'Sampling of Duplicate samples'	Section 3.12.2 of the QAQC report amended.
c. Please provide decontamination procedures for review.	Samples were collected from centre of the excavation bucket and disposable nitrile gloves were replaced between the collection of each sample. Additional details of the decontamination procedures have been provided in Section 3.12.2 – Sampling Controls under the heading 'sampling methods and decontamination procedures)	Section 3.12.2 of the QAQC report amended.
d. Was the PID calibrated prior to screening? Please provide calibration procedures and certificate.	Refer to IA Action List Attachments	N/A
General comments		
1. Proposed temporary easement along eastern site boundary: The Auditor understands that a temporary easement will be constructed along the eastern site boundary to allow neighbouring properties accessing the main road. The easement will return to the school once the construction of the new road located on the adjacent property is complete. Please include the easement in the site survey plan which is required to be included as part of the Site Audit Statement. It is understood that the easement is approx. 6m	Total surface area of the site including this easement area is still less than 2.5 ha; therefore, 35 previously investigated locations as well as recently collected waste classification samples of the fill material is deemed to provide sufficient coverage for this area. Therefore, Greencap deems appropriate implementation of the Unexpected Finds Protocol would cover the contamination risk at this area.	N/A

Reference	Greencap Response	Changes made in the Updated DSI (if required)
wide and that no previous sampling locations were located within the easement. The Auditor requires additional sampling to be conducted within the easement, or provide justification as to why this is not required.		
2. PFAS compounds: Please confirm whether PFAS compounds may have been potentially used onsite.	An additional desktop search of PFAS sources (on and off-site) has been provided in the DSI report in Section 7 (<i>Section 7.3.2 - PFAS Site Investigations Search</i>)	Section 7 – ‘PSI Addendum – Additional Desktop Investigation’ added to DSI, including PFAS Site Investigations Search – Section 7.3.2
3. Groundwater assessment: EIS has identified groundwater sampling as one of the data gaps. This has not been addressed by Greencap in the DSI. Assessment of groundwater is required to be completed to close this data gap.	Resolved with email correspondence with the Auditor (dated: 1 August 2019). Greencap has amended Table 1 of the updated DSI report and also included a statement addressing the groundwater data gap mentioned in the EIS Report which does not require further investigation at this stage. Refer to <i>section 7.3.2 – Groundwater contamination risk</i>	<i>Table 1</i> of DSI (<i>Section 3 – Response to SEARs</i>) <i>Section 7.3.2 – Groundwater contamination risk</i>
EIS (23 January 2019) PSI		
1. General (site boundary): It is noted that the site boundary covered by the Lotsearch report did not cover the entire site. A summary of site history should be provided for the ‘entire’ site or justification on whether the historical information is sufficiently represents the entire audit boundary.	The DSI has been amended with a new section: <i>Section 7 – ‘PSI Addendum – Additional Desktop Investigation’</i> which incorporates additional desktop investigations. Additional desktop searches cover proposed Lot 1 and Lot 2 (parts of Lot 4 DP1208329 and Lot 121 DP1203646 respectively) indicated in the layout. <i>Land Title Summary – Section 7.1</i> * Current and historical title searches were ordered, reviewed and the data summarised for the above lots <i>Council Planning Certificate Review – Section 7.2</i> * Section 149 (2) and (5) Council certificates were ordered for both lots	<i>Section 7 – ‘PSI Addendum – Additional Desktop Investigation</i> including: <i>Land Title Summary – Section 7.1</i> <i>Council Planning Certificate Review – Section 7.2</i>
2. Section 1 (introduction): The Auditor notes that the site’s physical and legal address has been changed since the report was issued in January 2019.	DSI updated with final address.	
3. Section 2.4.3 (presence of drums/chemicals, waste and fill material): Figure 2 shows that foreign material was observed within the exposed soils in the northern portion of the site. Whilst noting that three of the Greencap’s test pits (TP1, TP2 and TP5) were located within this area, the Greencap report did not mention or record the presence of foreign materials within exposed soil in the northern portion of the site. Greencap to confirm whether or not foreign materials are located in that portion of the site and whether or not this is acceptable aesthetically on a primary school site.	On 26 July 2019, Greencap conducted a detailed site walkover and observed fill material containing foreign materials were stockpiled towards the eastern section of the site (referred to as SP3, site (referred to as SP3, and since classified as General Solid Waste (GSW) with issued waste classification report). Including SP3, on this day Greencap sampled six (6) different stockpiles and investigated an unexpected find (UF) of relatively small volume of (< 3m3) buried waste material (referred to as UF1, which consisted an old potential paint cannister ~ 10L volume, plastic sheeting, and terracotta—refer to Greencap's email dated 26 July 2019. We observed that the stockpiles on site were generally well managed and neatly separated from natural soils on site; therefore, we deem the Unexpected Finds Protocol would be a sufficient measure to manage any potential foreign material finds during construction.	
4. Section 3 (geology and hydrogeology): Soil landscape maps were not reviewed.	Following review of soil landscape mapping by Greencap, the site is confirmed to be underlain by Blacktown, residual (bt) soil landscape. Soils comprise of friable brownish black loam, hard-setting brown clay loam, strongly pedal, mottled brown light clay and light grey plastic mottled clays. Greencap does not consider this information to conflict with or change the findings of the PSI report.	
5. Section 4.1 (review of historical aerial photographs): The site boundary as shown in the historical aerials prepared by Lotsearch has been changed since the completion of the PSI. Are the sheds originally noted to be located approximately 150m west of the site are now part of the site? Are these a potential source of contamination?	The sheds located 150m west of the original site boundary of the PSI, are not within the corrected site boundary. Therefore, Greencap does not consider this information to conflict with or change the findings of the PSI report. Greencap does not consider the updated site boundary to warrant any further investigation.	
6. Section 4.2 (NSW EPA records): EIS states that ‘a former licence was listed of the site for sewage treatment and processing	Historical aerials did not indicate any structures on the site and land historical title searches also did not suggest such use based on historical ownership of the site. In addition, the	

Reference	Greencap Response	Changes made in the Updated DSI (if required)
by small plants'. No structures were observed on site at the time of the Lotsearch report. Please confirm whether the site was previously occupied by sewage treatment works.	Enviro-screen conducted by Land Insight Resources on behalf of Greencap (Appendix J of amended DSI report) indicates no historical waste management facilities or wastewater treatment facilities within 200m of the site - refer to Section 2. ('Current and Historical commercial and trade directory data) of <i>Appendix J</i> report - <i>Environmental Risk information report</i> . Furthermore, field observations did not indicate such use.	
7. Section 5.1 (AECs): If the sheds were located within the site (which have since been demolished), consideration of potential presence of hazardous materials should be included in the AEC table (for example, lead paints and asbestos). It is unclear to the Auditor why PCBs were included as COPC given the site was used historically for agricultural purposes. Is there a PCB risk at the site?	The sheds located 150m west of the original site boundary of the PSI, are not within the corrected site boundary. Therefore, Greencap does not consider this information to conflict with or change the findings of the PSI report. In addition to this, available field and chemical data indicated risks associated with asbestos, lead paint , and PCB contamination on site were low.	
8. Table 5-3 (CSM): It is unclear to the Auditor why soil vapour was identified as potentially affected media, given the site was largely used for rural purposes. Is there a potential soil vapour risk at the site?	Upon review of the available site data, Greencap deems soil vapour contamination risk on-site is low--no further soil vapor investigation is required at this stage.	

Fiona Wong

From: Fiona Wong
Sent: Tuesday, 27 August 2019 10:21 AM
To: 'Isaac Pinkerton'; Rebeka Hall
Cc: 'Tom Hemmett'; 'Darren Vozzo'; 'Joel Coubrough'
Subject: RE: J163717: Alex Avenue - ENM Report Review

Hi Isaac,

We have reviewed the following report provided in your below email:

- Greencap (23 August 2019) Excavated Natural Material Classification, 28 Farmland Drive, Schofields NSW 2762 (Ref: C107881:JG)

Based on the information provided in the report, we generally concur with Greencap's classifications for the following stockpiles onsite:

- Material from E1, E2, E4, E7, E8, E9 and E10 in Stockpile 1, can be classified as Excavated Natural Material (ENM). We note that the estimated volume of this stockpile will be approx. 1785m3 (2700 tonnes).
- Stockpile 2, consisting of E11 to E13, as well as the material from E3, E5 and E6 of Stockpile 1, can be classified as General Solid Waste (GSW) non putrescible. We note that the estimated volume will be 1150 tonnes (around 770m3).

Material from E3, E5 and E6 in Stockpile 1 should be segregated from Stockpile 1 before taking it offsite as ENM. Material segregation should be conducted in accordance with procedure as described in Section 8 of the above listed report.

Any questions please let us know.

Regards
Fiona

Fiona Wong
Senior Environmental Consultant



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From: Isaac Pinkerton <PinkertonI@richardcrookes.com.au>
Sent: Friday, 23 August 2019 12:46 PM
To: Fiona Wong <fiona.wong@zoic.com.au>; Rebeka Hall <rebeka.hall@zoic.com.au>

Cc: Tom Hemmett <HemmettT@richardcrookes.com.au>; Darren Vozzo <VozzoD@richardcrookes.com.au>; Joel Coubrough <CoubroughJ@richardcrookes.com.au>

Subject: RE: J163717: Alex Avenue - ENM Classification Suitability

Hi Fiona,

Please find attached ENM classification letter for stockpile 1 & 2.

The report also documents the requirements for the segregation of stockpiled material, which will be classified under a separate classification.

Can you please review and confirm and advise if you are happy for RCC to undertake segregation of the stockpile as per Greencaps advice?

Regards,

Isaac Pinkerton, Site Engineer

RICHARD CROOKES

CONSTRUCTIONS

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From: Fiona Wong <fiona.wong@zoic.com.au>

Sent: Wednesday, 21 August 2019 3:08 PM

To: Isaac Pinkerton <PinkertonI@richardcrookes.com.au>; Rebeka Hall <rebeka.hall@zoic.com.au>

Cc: Tom Hemmett <HemmettT@richardcrookes.com.au>; Darren Vozzo <VozzoD@richardcrookes.com.au>; Joel Coubrough <CoubroughJ@richardcrookes.com.au>

Subject: RE: J163717: Alex Avenue - ENM Classification Suitability

Hi Isaac,

As discussed in our telephone conversation earlier we have not received the ENM assessment report from Greencap. All we have received so far are the laboratory reports and the sampling locations attached in your email below.

James has indicated that the ENM report should be ready for issue by tomorrow afternoon. In this instance, it would be easier for us to review the ENM report. James will include a discussion on the proposed segregation method in this report.

Thanks
Fiona

Fiona Wong
Senior Environmental Consultant



ZOIC Environmental Pty Ltd

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From: Isaac Pinkerton <PinkertonI@richardcrookes.com.au>
Sent: Wednesday, 21 August 2019 12:27 PM
To: Fiona Wong <fiona.wong@zoic.com.au>; Rebeka Hall <rebeka.hall@zoic.com.au>
Cc: Tom Hemmett <HemmettT@richardcrookes.com.au>; Darren Vozzo <VozzoD@richardcrookes.com.au>; Joel Coubrough <CoubroughJ@richardcrookes.com.au>
Subject: FW: J163717: Alex Avenue - ENM Classification Suitability

Hi Fiona,

We have received the results for stockpiles TS1 & TS2 which are outlined within the attached and below.

In summary, TS1 will require 3 sections of the stockpile to be segregated and consolidated with TS2 which will all be classified as GSW and potentially removed off site.

The remaining sections of TS1 will then meet the ENM criteria once the 3 sections have been segregated.

Can you please review the below and advise on the best course of action and how you propose segregation on TS1 to be managed?

Regards,

Isaac Pinkerton, Site Engineer

RICHARD CROOKES

CONSTRUCTIONS

Direct 02 9902 4700 | Fax 02 9439 1114 | Mobile 0432 565 814
Level 3, 4 Broadcast Way, Artarmon NSW 2064
www.richardcrookes.com.au



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From: James Green <James.Green@greencap.com.au>
Sent: Wednesday, 21 August 2019 11:25 AM
To: Isaac Pinkerton <PinkertonI@richardcrookes.com.au>
Cc: Eustace Vance <Eustace.Vance@greencap.com.au>; Nicole Boukarim <Nicole.Boukarim@greencap.com.au>; Steve MacDonald <MacdonaldS@richardcrookes.com.au>; Joel Coubrough <CoubroughJ@richardcrookes.com.au>; Darren Vozzo <VozzoD@richardcrookes.com.au>; Tom Hemmett <HemmettT@richardcrookes.com.au>
Subject: J163717: Alex Avenue - ENM Classification Suitability

Morning Isaac,

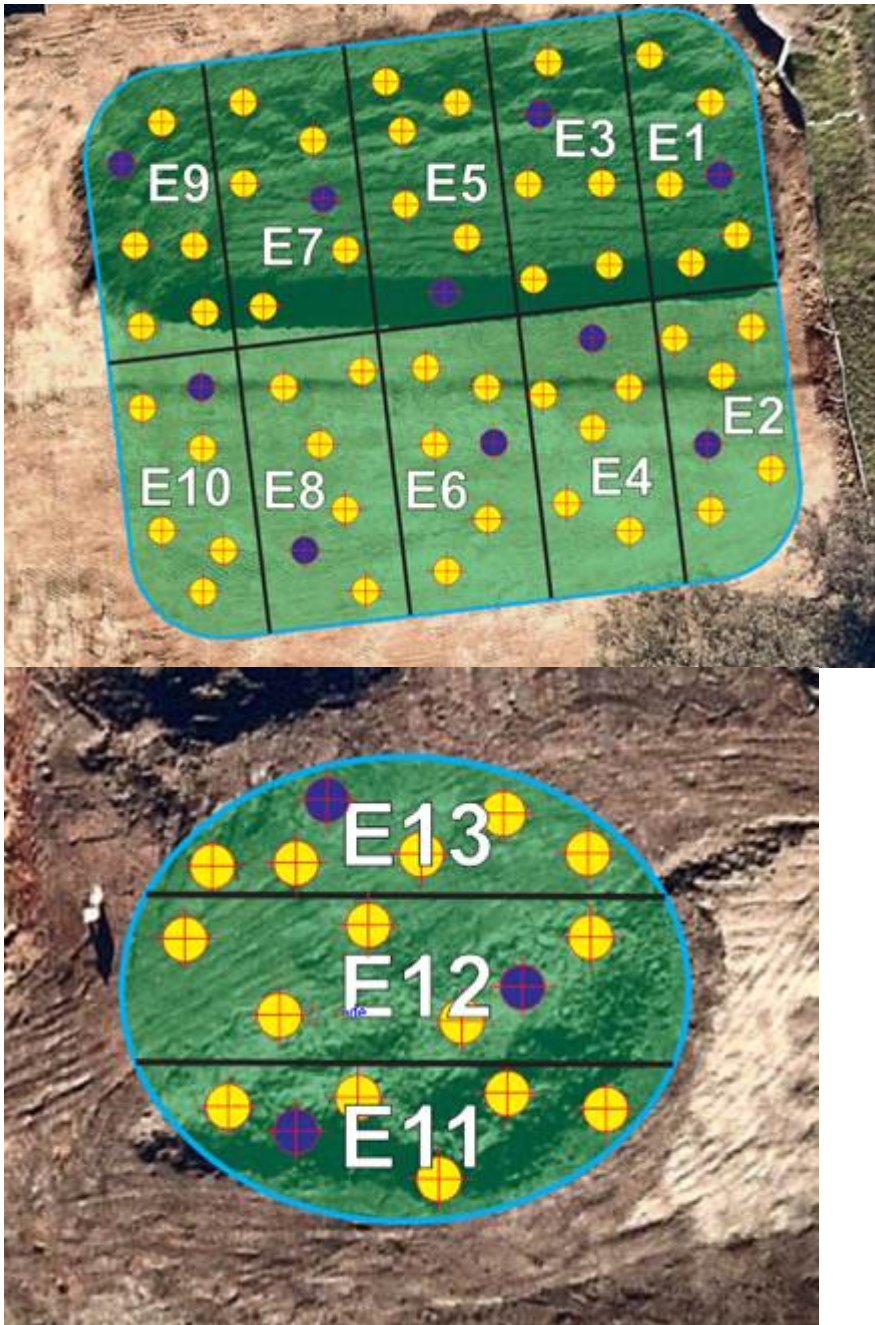
We have received the laboratory results for the ENM classification (attached). Foreign materials in the form of “wood” were identified to exceed the ENM criteria at four sample locations:

- E3;
- E5;
- E6; and
- E12.

Please see below the sampling locations of the two stockpiles.

Stockpile 1

Stockpile 2



As a result, the four above-mentioned quadrants will be required to be separated and stockpiled separately. However, as a minimum of three valid ENM samples are required for stockpile 2, this stockpile cannot be classified as ENM. Therefore, we recommend that E3, E5 & E6 are removed from stockpile 1 and combined with stockpile 2. Stockpile 2 (now consisting of E3, E5, E6, E11, E12 and E13) may be classified as GSW with the laboratory analysis which has already been undertaken. We can provide a separate waste classification for the new “Stockpile 2” at our standard rate of \$850 excl.GST (if this material will be required to be exported from the site).

The ENM classification will cover up to a maximum of 3,000 tonnes.

Please feel free to give me a call if you have any questions.

Kind Regards,

James Green

BSc, Geology

Consultant - Environment (NSW) | Greencap

Level 2 / 11 Khartoum Road North Ryde, NSW 2113

D: 02 8879 8297 | M: 0437 646 386 | E: James.Green@greencap.com.au | in: [LinkedIn](#)



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Fiona Wong

From: Fiona Wong
Sent: Tuesday, 27 August 2019 2:12 PM
To: Warren Russell - Hi-Quality Group
Cc: Isaac Pinkerton; Rebeka Hall
Subject: RE: Alex Avenue Public School Stockpiles

Hi Warren

Nice to speak to you earlier this morning.

As discussed, Rebeka Hall of Zoic has been engaged to conduct a site audit for the Alex Ave Public School site. As part of the audit, we are required to review the waste documentation as described in the NSW EPA (2017) Guidelines for the Site Auditor Scheme (third edition). I am assisting Rebeka on this audit.

Much appreciated if you can send us a copy of the EPL for the St Marys facility to confirm that the facility can accept GSW.

Any questions please let us know.

Kind regards
Fiona

Fiona Wong
Senior Environmental Consultant



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From: Warren Russell - Hi-Quality Group <wrussell@hiquality.com.au>
Sent: Monday, 26 August 2019 5:34 PM
To: Isaac Pinkerton <PinkertonI@richardcrookes.com.au>
Subject: FW: Alex Avenue Public School Stockpiles

Hi Isaac

Sorry for the delay

I can confirm that Hi Quality reviewed and approved the 2 attached reports prior to accepting the material. The combined total disposed was 102.34t, thanks.

Warren Russell
Sales Executive
Hi Quality
Waste Treatment Services
0490.293.356

Begin forwarded message:

From: "Isaac Pinkerton" <PinkertonI@richardcrookes.com.au>
To: "Warren Russell - Hi-Quality Group" <wrussell@hiquality.com.au>
Cc: "Tom Hemmett" <HemmettT@richardcrookes.com.au>, "Joe Mullarkey" <joe@clydeexcavations.com>
Subject: Alex Avenue Public School Stockpiles

Hi Warren,

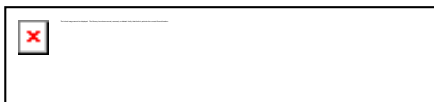
As discussed, Clyde Excavations are our civil contractor on the Alex Avenue Public School project.

They have recently removed and disposed of the attached stockpiles outlined in the attached waste classification report.

Further to the above, can you please confirm that Hi-quality reviewed and accepted the attached waste classification prior to accepting the material?

Regards,

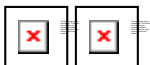
Isaac Pinkerton, Site Engineer



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Level 3, 4 Broadcast Way, Artarmon NSW 2064
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Fiona Wong

From: Fiona Wong
Sent: Friday, 23 August 2019 10:38 AM
To: Isaac Pinkerton
Cc: Tom Hemmett; Rebeka Hall
Subject: RE: 19175 Alex Ave PS - Queries on DA condition and waste dockets

Hi Isaac

We are currently working on the Site Audit Report – can you please clarify the following:

- Blacktown City Council DA condition – we have only received a set of draft conditions at the time of project inception. Has DoE / RCC received the final conditions?
- Waste dockets – we note that the dockets issued by Hi Quality states that the material was disposed of as 'General Solid Waste'. We have reviewed their Environment Protection Licence No 5857 (publicly available on NSW EPA website) and notes that the facility only accept material that needs to meet the GSW classification (assessed against the CT1 thresholds, Table 1). See below

Code	Waste	Description	Activity	Other Limits
NA	Soils	Soil that meets the General Solid Waste Classification (assessed against the CT1 thresholds, Table 1) of the Waste Classification Guidelines as in force from time to time with the exception of the maximum threshold values for contaminants specified in the 'Other Limits' column.	Resource recovery Waste storage	Arsenic: 40mg/kg; Cadmium: 2mg/kg; Copper:200mg/kg; Mercury: 1.5mg/kg; Zinc: 600mg/kg; Total Petroleum Hydrocarbons C6 to C9: 150mg/kg; Total Petroleum Hydrocarbons C10 to C36: 1600mg/kg; Polycyclic aromatic hydrocarbons: 80mg/kg;

Can you please confirm whether the Hi-Quality facility in St Marys can receive General Solid Waste above CT1 thresholds?

Any questions please let us know.

Kind regards
Fiona

Fiona Wong
Senior Environmental Consultant



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From: Isaac Pinkerton <PinkertonI@richardcrookes.com.au>
Sent: Friday, 16 August 2019 12:27 PM
To: 'Matthew Barberson' <Matthew.Barberson@greencap.com.au>; Rebeka Hall <rebeka.hall@zoic.com.au>
Cc: James Green <James.Green@greencap.com.au>; Nicole Boukarim <Nicole.Boukarim@greencap.com.au>; Fiona Wong <fiona.wong@zoic.com.au>; Tom Hemmett <HemmettT@richardcrookes.com.au>; Darren Vozzo <VozzoD@richardcrookes.com.au>
Subject: RE: 19175 IA3 on review of RE: J163717 - Additional Investigation and Waste Classification Reports

Hi Rebeka/Fiona,

Further to the below, please find attached disposal dockets for stockpiles SP3 & SP4 which were removed and disposed off site on 12/08.

Finalised registers will follow next week.

Regards,

Isaac Pinkerton, Site Engineer

RICHARD CROOKES

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From: Matthew Barberson <Matthew.Barberson@greencap.com.au>
Sent: Wednesday, 14 August 2019 3:57 PM
To: Rebeka Hall <rebeka.hall@zoic.com.au>; Isaac Pinkerton <PinkertonI@richardcrookes.com.au>
Cc: James Green <James.Green@greencap.com.au>; Nicole Boukarim <Nicole.Boukarim@greencap.com.au>; Fiona Wong <fiona.wong@zoic.com.au>; Tom Hemmett <HemmettT@richardcrookes.com.au>; Darren Vozzo <VozzoD@richardcrookes.com.au>
Subject: RE: 19175 IA3 on review of RE: J163717 - Additional Investigation and Waste Classification Reports

Dear Rebecca,

Please find the Updated DSI Report in the below link and our responses to Interim Advice #1 and #2 attached. I have also left our responses to the items specified in your email below. I hope our justification regarding validation samples will suffice, if not please let us know and we will schedule the samples for analysis for the analytical suite you deem necessary.

https://drive.google.com/file/d/1V3j2PO7vcET1xrp0lq5d_DN4bxMyf-Vc/view?usp=sharing

From this Friday, I will be going on leave until 9th of September. In my absence feel free to reach out to my colleagues James and Nicole regarding any additional queries or questions. James will prepare the ENM Report of the TS1 and TS2 once we get the laboratory results.

Best regards,
Matt

Matthew Barberson

MEng Engineering Management | BSc Environmental Engineering | CENVP (GP): 1227

Team Manager – Contaminated Land Management | Greencap

Level 2, 11 Khartoum Road North Ryde, NSW 2113

D: 02 8879 8276 | **M:** 0438 862 838 | **E:** Matthew.Barberson@greencap.com.au | **in:** [LinkedIn](#)



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From: Rebeka Hall <rebeka.hall@zoic.com.au>

Sent: Friday, 9 August 2019 10:19 AM

To: Matthew Barberson <Matthew.Barberson@greencap.com.au>; Isaac Pinkerton <PinkertonI@richardcrookes.com.au>

Cc: James Green <James.Green@greencap.com.au>; Nicole Boukarim <Nicole.Boukarim@greencap.com.au>; Fiona Wong <fiona.wong@zoic.com.au>; Tom Hemmett <HemmettT@richardcrookes.com.au>; Darren Vozzo

Hi Matthew

Thank you for your email. We confirm we have reviewed the following:

1. Greencap (30 July 2019) Waste Classification Report for SP3 and SP4 (Unexpected Finds 1 (UF1) material) (Ref: C107881:J163171 JG)
2. Greencap (30 July 2019) Waste Classification Report for SPA and SPB (Ref: C107881:J163171 JG)
3. Greencap (6 August 2019) Letter report explaining the detailed site walkover and additional soil investigation undertaken at 34-38 Schofields Road, Schofields NSW 2762 (Ref: C107881:J163171 JG)

The Auditor confirms that the waste classification of material in SP3, SP4, SPA and SPB has been conducted in accordance with NSW EPA (2014) Waste Classification Guideline. We have no comments on the 30 July 2019 documents. If the material has already been disposed offsite, please provide waste dockets to the Auditor for verification.

We have the following comments on the **Greencap (6 August 2019) Letter Report:**

1. Section 2.1 (topsoil stockpiles): Based on the information provided by RCC (Isaac Pinkerton, pers comm 8/8/19), topsoil was scraped and stockpiled as TS1 and TS2. Whilst the Auditor acknowledges that a separate ENM report is being prepared please address the following:
 - a. 3 samples have been scheduled for analysis from both stockpiles. Please confirm the volume of each stockpile, and that the sampling density meets the NSW EPA 2014 Excavated Natural Material (ENM) Order. 3 samples are acceptable for volumes <500 tonnes.

Yesterday (13/8/2019) my colleague James conducted the actual ENM Sampling Round (*previous samples were an initial check to assess the likely hood of success for ENM classification*). A precise estimate was undertaken by measuring out the stockpiles. The estimated approximate tonnages and required sampling requirements as follows:

- TS1:
 - o Approximately 3,850 tonnes
 - o minimum 10 samples required as per ENM Order
 - TS2:
 - o Approximately 450 tonnes
 - o minimum 3 samples required per ENM Order
- (13 Samples total)

- b. Table 4 in the ENM Order lists the analytical suite for ENM confirmation. It is noted that pH, EC and rubber, plastic, bitumen, paper, cloth, paint and wood have not been included in the testing regime – this does not comply with the Order..

Above mentioned 13 samples have been scheduled for the ENM Order (2014) suite, which includes the mentioned foreign material testing.

2. Section 2.5 (unexpected finds): Validation samples are required to close out the UF as outlined in IA2 (issued 6 August 2019). Please provide results for review (or include in the pending DSI).

Waste Classification report of SP4, which corresponds to the material excavated in the scope of UF1, indicates all samples tested in this material had contaminant concentrations below the health criteria for residential land use criteria (HIL-A and HSL-A)—*these results are also provided in our letter report dated 6 August 2019*. All three samples taken from this < 3m³ material returned results:

- natural background levels for metals,
- trace level hydrocarbon hits (may be naturally occurring as BTEXN and PAH were non-detect), and
- below laboratory limit of detection for all other contaminants analysed.

Consequently, Greencap deems analysis of the validation samples collected from the footprint of the above mentioned material is not necessary/ required.

Should you have any questions please do not hesitate to contact either Fiona or myself

Regards

Rebeka Hall

NSW EPA Accredited Site Auditor/Principal Environmental Scientist
Certified Environmental Practitioner (CEnvP) Contaminated Land Specialist



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From: Matthew Barberson [<mailto:Matthew.Barberson@greencap.com.au>]

Sent: Tuesday, 6 August 2019 6:57 PM

To: Rebeka Hall <rebeka.hall@zoic.com.au>; Fiona Wong <fiona.wong@zoic.com.au>; Isaac Pinkerton <PinkertonI@richardcrookes.com.au>

Cc: James Green <James.Green@greencap.com.au>; Nicole Boukarim <Nicole.Boukarim@greencap.com.au>; Tom Hemmett <HemmettT@richardcrookes.com.au>; Darren Vozzo <VozzoD@richardcrookes.com.au>

Subject: J163717 - Additional Investigation and Waste Classification Reports

Dear Rebeka, Fiona, and Isaac,

Thank you for providing us with the Interim Advice #2. Attached are the following reports for the Alex Avenue Public School Site as requested:

- Letter report explaining the detailed site walkover and additional soil investigation undertaken at 34-38 Schofields Road, Schofields NSW 2762;
- Waste Classification Report for SP3 and SP4—*SP4 consists the material identified as Unexpected Finds 1 (UF1)*; and
- Waste Classification Report for SPA and SPB.

Please be advised we are expecting to deliver the Updated DSI Report by the end of this week or early next week.

Kind regards,
Matt

Matthew Barberson

MEng Engineering Management | BSc Environmental Engineering | CENVP (GP): 1227

Team Manager – Contaminated Land Management | Greencap

Level 2, 11 Khartoum Road North Ryde, NSW 2113

D: 02 8879 8276 | M: 0438 862 838 | E: Matthew.Barberson@greencap.com.au | in: [LinkedIn](#)

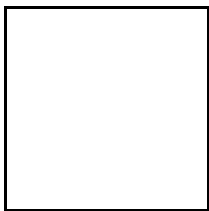


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Fiona Wong

From: Rebeka Hall
Sent: Friday, 9 August 2019 10:19 AM
To: Matthew Barberson; Isaac Pinkerton
Cc: James Green; Nicole Boukarim; Fiona Wong; Tom Hemmett; Darren Vozzo
Subject: 19175 IA3 on review of RE: J163717 - Additional Investigation and Waste Classification Reports

Hi Matthew

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The Auditor confirms that the waste classification of material in SP3, SP4, SPA and SPB has been conducted in accordance with NSW EPA (2014) Waste Classification Guideline. We have no comments on the 30 July 2019 documents. If the material has already been disposed offsite, please provide waste dockets to the Auditor for verification.

We have the following comments on the **Grencap (6 August 2019) Letter Report:**

1. Section 2.1 (topsoil stockpiles): Based on the information provided by RCC (Isaac Pinkerton, pers comm 8/8/19), topsoil was scraped and stockpiled as TS1 and TS2. Whilst the Auditor acknowledges that a separate ENM report is being prepared please address the following:
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 - b. Table 4 in the ENM Order lists the analytical suite for ENM confirmation. It is noted that pH, EC and rubber, plastic, bitumen, paper, cloth, paint and wood have not been included in the testing regime – this does not comply with the Order..
2. Section 2.5 (unexpected finds): Validation samples are required to close out the UF as outlined in IA2 (issued 6 August 2019). Please provide results for review (or include in the pending DSI).

Should you have any questions please do not hesitate to contact either Fiona or myself

Regards

Rebeka Hall

NSW EPA Accredited Site Auditor/Principal Environmental Scientist
Certified Environmental Practitioner (CEnvP) Contaminated Land Specialist



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Cc: James Green <James.Green@greencap.com.au>; Nicole Boukarim <Nicole.Boukarim@greencap.com.au>; Tom Hemmett <HemmettT@richardcrookes.com.au>; Darren Vozzo <VozzoD@richardcrookes.com.au>
Subject: J163717 - Additional Investigation and Waste Classification Reports

Dear Rebeka, Fiona, and Isaac,

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- Letter report explaining the detailed site walkover and additional soil investigation undertaken at 34-38 Schofields Road, Schofields NSW 2762;
- Waste Classification Report for SP3 and SP4—*SP4 consists the material identified as Unexpected Finds 1 (UF1)*; and
- Waste Classification Report for SPA and SPB.

Please be advised we are expecting to deliver the Updated DSI Report by the end of this week or early next week.

Kind regards,
Matt

Matthew Barberson

MEng Engineering Management | BSc Environmental Engineering | CENVP (GP): 1227

Team Manager – Contaminated Land Management | Greencap

Level 2, 11 Khartoum Road North Ryde, NSW 2113

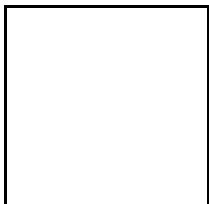
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Fiona Wong

From: Warren Russell - Hi-Quality Group <wrussell@hiquality.com.au>
Sent: Tuesday, 27 August 2019 2:40 PM
To: Fiona Wong
Cc: Isaac Pinkerton; Rebeka Hall
Subject: RE: Alex Avenue Public School Stockpiles
Attachments: St Marys EPL.pdf

Hi Fiona

Please see the attached we are fully licenced to take this waste, please read the levels of exception of the various levels of contamination ,

Regards,

Warren Russell

NSW Sales Executive

T: (02) 9826 1666 **F:** (02) 9826 1416 **M:** 0490 293 356

E: wrussell@hiquality.com.au www.hiquality.com.au

Corner of Mamre Road & Elizabeth Drive
(PO Box 42), Kemps Creek NSW 2178



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From: Fiona Wong <fiona.wong@zoic.com.au>
Sent: Tuesday, 27 August 2019 2:12 PM
To: Warren Russell - Hi-Quality Group <wrussell@hiquality.com.au>
Cc: Isaac Pinkerton <PinkertonI@richardcrookes.com.au>; Rebeka Hall <rebeka.hall@zoic.com.au>
Subject: RE: Alex Avenue Public School Stockpiles

Hi Warren

Nice to speak to you earlier this morning.

As discussed, Rebeka Hall of Zoic has been engaged to conduct a site audit for the Alex Ave Public School site. As part of the audit, we are required to review the waste documentation as described in the NSW EPA (2017) Guidelines for the Site Auditor Scheme (third edition). I am assisting Rebeka on this audit.

Much appreciated if you can send us a copy of the EPL for the St Marys facility to confirm that the facility can accept GSW.

Any questions please let us know.

Kind regards
Fiona

Fiona Wong

ZOIC Environmental Pty Ltd

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www.zoic.com.au

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From: Warren Russell - Hi-Quality Group <wrussell@hiquality.com.au>

Sent: Monday, 26 August 2019 5:34 PM

To: Isaac Pinkerton <PinkertonI@richardcrookes.com.au>

Subject: FW: Alex Avenue Public School Stockpiles

Hi Isaac

Sorry for the delay

I can confirm that Hi Quality reviewed and approved the 2 attached reports prior to accepting the material. The combined total disposed was 102.34t, thanks.

Warren Russell
Sales Executive
Hi Quality
Waste Treatment Services
0490.293.356

Begin forwarded message:

From: "Isaac Pinkerton" <PinkertonI@richardcrookes.com.au>
To: "Warren Russell - Hi-Quality Group" <wrussell@hiquality.com.au>
Cc: "Tom Hemmett" <HemmettT@richardcrookes.com.au>, "Joe Mullarkey" <joe@clydeexcavations.com>
Subject: Alex Avenue Public School Stockpiles

Hi Warren,

As discussed, Clyde Excavations are our civil contractor on the Alex Avenue Public School project.

They have recently removed and disposed of the attached stockpiles outlined in the attached waste classification report.

Further to the above, can you please confirm that Hi-quality reviewed and accepted the attached waste classification prior to accepting the material?

Regards,

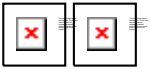
Isaac Pinkerton, Site Engineer



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Fiona Wong

From: Rebeka Hall
Sent: Thursday, 1 August 2019 9:57 AM
To: Isaac Pinkerton; Fiona Wong
Cc: Tom Hemmett; Darren Vozzo; Joel Coubrough; Joshua Lloyd
Subject: RE: J163717 - Groundwater Investigation

Hi Isaac

Thank you for providing Greencap's email.

With reference to comment No.23 of Site Auditor IA1 (12 July 2019), the Auditor was seeking further clarification and discussion on potential for groundwater contamination to be present at the site, as the DSI report did not close out the data gap identified by the previous consultant (EIS).

Based on Zoic's knowledge of site history, surrounding landuses, environmental setting and subsequent site inspection observations made on 11 July 2019, combined with Greencap's discussion presented below "Please note available site data did not indicate the presence of any specific groundwater contamination source on site. Friday's surface walkover and additional test pitting exercise (results to be reported officially in a letter report and updated DSI) indicated the site predominantly consisted natural soil landscape—*Greencap understood that the re-work natural material towards the west of the site consisted the material carried from the eastern section of the site in the scope of RCC's cut&fill plan (to be provided by RCC)*. Previously noted unverified fill material, on the other hand, was noted to be stockpiled and scheduled to be taken off-site—*waste classification results of this material did not indicate the presence of contamination*" we are of the opinion this provides sufficient evidence that groundwater contamination is unlikely and does not warrant further field investigation.

If groundwater investigation was still proposed by Greencap, the depth of drilling would need to be deeper than 8m below ground level to obtain representative data for the area.

We trust this feedback meets your current requirements. Please pass this onto Greencap – we would be happy to discuss further with them if required

Regards

Rebeka Hall

NSW EPA Accredited Site Auditor/Principal Environmental Scientist
Certified Environmental Practitioner (CEnvP) Contaminated Land Specialist



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From: Isaac Pinkerton [mailto:PinkertonI@richardcrookes.com.au]
Sent: Wednesday, 31 July 2019 1:17 PM
To: Fiona Wong <fiona.wong@zoic.com.au>; Rebeka Hall <rebeka.hall@zoic.com.au>
Cc: Tom Hemmett <HemmettT@richardcrookes.com.au>; Darren Vozzo <VozzoD@richardcrookes.com.au>; Joel Coubrough <CoubroughJ@richardcrookes.com.au>
Subject: FW: J163717 - Groundwater Investigation

Hi Fiona,

Greencap have sent their groundwater monitoring scope which is outlined in the below email. Greencap would like to commence these works next Thursday 8/08.

Would it be possible to gain your comments and/or approval for the below groundwater monitoring scope by the end of this week to enable them to pencil in the works?

Regards,

Isaac Pinkerton, Site Engineer

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Level 3, 4 Broadcast Way, Artarmon NSW 2064
www.richardcrookes.com.au



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From: Matthew Barberson <Matthew.Barberson@greencap.com.au>
Sent: Tuesday, 30 July 2019 6:18 PM
To: Isaac Pinkerton <PinkertonI@richardcrookes.com.au>; Tom Hemmett <HemmettT@richardcrookes.com.au>
Cc: Steve MacDonald <MacdonaldS@richardcrookes.com.au>; Joel Coubrough <CoubroughJ@richardcrookes.com.au>; Darren Vozzo <VozzoD@richardcrookes.com.au>; James Green <James.Green@greencap.com.au>; Nicole Boukarim <Nicole.Boukarim@greencap.com.au>
Subject: J163717 - Groundwater Investigation

Hi Isaac and Tom,

Just to give you an update, I contacted our drillers and service locator to plan the date of the groundwater well installations. I will let you know once I get their available dates.

In the meantime, if possible we would like to get Auditor's comments/ approval for the below groundwater monitoring scope, particularly the chemical screening suite we suggested, which is selected as a general screening suite to cover some common contaminants.

Please note available site data did not indicate the presence of any specific groundwater contamination source on site. Friday's surface walkover and additional test pitting exercise (results to be reported officially in a letter report and updated DSI) indicated the site predominantly consisted natural soil landscape—*Greencap understood that the re-work natural material towards the west of the site consisted the material carried from the eastern section of the site in the scope of RCC's cut&fill plan (to be provided by RCC)*. Previously noted unverified fill material, on the other hand, was noted to be stockpiled and scheduled to be taken off-site—*waste classification results of this material did not indicate the presence of contamination*. Therefore, the primary objective of this investigation will be to undertake confirmatory screening to close out the data gap mentioned in the PSI.

Groundwater investigation scope will include the following:

- Initial clearance of proposed investigation locations using a Telstra approved services clearance subcontractor;
- Installation of 3 groundwater wells (2 downstream and 1 upstream). At this stage it is proposed that groundwater wells be installed to maximum depth of 8m below ground level (BGL) and screened to target the shallow water bearing aquifer (if encountered)—*no data was identified in the nearby locations shown in Water NSW data base to provide an indication for the anticipated depth of groundwater on-site*;
- Gauging of wells and recording of groundwater field parameters;
- Sampling of wells and analysis at NATA accredited laboratory for likely contaminants of concern: **TRH, BTEXN, Metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn, Al, Fe, and Mn), polycyclic aromatic hydrocarbons (PAHs), phenols, ammonia, VOCs, organochlorine pesticides (OCP), and anion/ cations**;
- Installed wells will be surveyed by a qualified surveyor;
- Development of the wells will be done by purging water equivalent to 10 times the volume of the standing water column of each well;
- Wells will be inspected for well integrity and the Standing Water Levels in each well will be gauged prior to the groundwater sampling (within one day) to establish more accurate direction of groundwater flow beneath the site;
- Purging and sampling of monitoring wells will be done by using a peristaltic pump where the groundwater is shallower than 8 mBGL. Where the ground water is found to be deeper, dedicated foot valves and waterra tubing will be used to avoid cross contamination;
- Water quality parameters (pH, temperature, conductivity, oxidation reduction potential and dissolved oxygen) will be monitored during purging, using a calibrated water quality meter and a flow cell;
- Samples will be collected after water quality parameters are stabilised or water equivalent to three times the volume of measured standing water is purged;
- If a well is purged dry, samples will be collected from the recharged water;
- Field logs for each sampling location will be recorded showing the volume of purged water, field readings of the physical parameters, and details of the colour and turbidity and potential contamination indicators (odours and sheens);
- The sampler will wear a clean pair of latex disposable gloves during sampling and replace the gloves with a new pair between each sampling location;
- All groundwater samples collected will be placed in containers provided by the analytical laboratory;
- Samples will be placed and kept in iced containers until they are delivered to the laboratory;
- QA/QC sampling and analysis will comprise collecting and analysing both intra and inter-laboratory duplicate groundwater samples at the recommended testing rate of 1 sample per 20 primary samples analysed. Trip blank samples are proposed to be collected at a rate of 1 per day and will be tested for a similar suite of analytes as per the primary samples tested. In addition, laboratory trip spikes samples will be included at a rate of one per batch of samples sent to the laboratory and analysed for Volatile Organic Compounds (VOCs);
- When a non-dedicated pump is used for purging and sampling (e.g. peristaltic pump) rinsate blank samples will be collected at a rate of 1 per day and will be tested for a similar suite of analytes as per the primary samples tested;
- Rinsate blanks will not be required if dedicated foot valves and waterra tubing will be used in sampling;
- Groundwater samples will be analysed at NATA accredited Eurofins; and

- The results of groundwater sampling will be compared to the adopted environmental criteria and presented in the updated DSI Report.

Best regards,

Matthew Barberson

Team Manager – CLM East | Greencap

Level 2 / 11 Khartoum Road, North Ryde NSW 2113

T: +61 2 9889 1800 M: 0438 862 838 | E: matthew.barberson@greencap.com.au |



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Fiona Wong

From: Rebeka Hall
Sent: Thursday, 1 August 2019 9:25 AM
To: Isaac Pinkerton; Fiona Wong
Cc: Tom Hemmett; Joel Coubrough; Darren Vozzo
Subject: RE: Incoming Material - AAPS

Hi Isaac

This material is considered to be suitable for import to site for the intended use as described below.
I will just require confirmation of the volume imported to site, with some confirmatory photos to assist with the audit.

Thanks and regards
Rebeka

From: Isaac Pinkerton [mailto:PinkertonI@richardcrookes.com.au]
Sent: Tuesday, 30 July 2019 5:06 PM
To: Fiona Wong <fiona.wong@zoic.com.au>
Cc: Tom Hemmett <HemmettT@richardcrookes.com.au>; Joel Coubrough <CoubroughJ@richardcrookes.com.au>; Darren Vozzo <VozzoD@richardcrookes.com.au>
Subject: Incoming Material - AAPS

Hi Fiona,

I just wanted to quickly run something past you.

Our plumber on the Alex Avenue site would like to import the attached materials for use as pipe bedding.

Can you please confirm the attached certificates is sufficient verification of material?

Greencap have provided their initial advice on the matter and have indicated as the site is not being remediated it may not be necessary, unless the auditor prefers Greencap to visually observe the imported material and take confirmatory samples.

Regards,

Isaac Pinkerton, Site Engineer

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www.richardcrookes.com.au



Fiona Wong

From: Isaac Pinkerton <PinkertonI@richardcrookes.com.au>
Sent: Thursday, 5 September 2019 9:36 AM
To: Fiona Wong
Cc: Rebeka Hall; Tom Hemmett; Darren Vozzo
Subject: RE: 19175 Alex Ave Public School Site Audit -outstanding information - imported material volume

Hi Fiona/Rebeka,

Apologies on the delay in getting back to you.

The total volume of bedding sand that was imported to site was 433.16 tonnes.

Can you please confirm when we should expect to receive the SAS & SAR for Alex Avenue Site noting now you have all the required information.

Let me know if you need anything else from us.

Thanks.

Regards,

Isaac Pinkerton, Site Engineer

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From: Fiona Wong <fiona.wong@zoic.com.au>
Sent: Friday, 30 August 2019 10:32 AM
To: Isaac Pinkerton <PinkertonI@richardcrookes.com.au>
Cc: Rebeka Hall <rebeka.hall@zoic.com.au>
Subject: RE: 19175 Alex Ave Public School Site Audit -outstanding information - imported material volume

Hi Isaac



Appendix C Result Summary Tables

J163717
 Field Duplicate RPD
 Material Classification - Alex Avenue



								FD2	FD3	FT1
Our Label			TS2-S2	FD2	TS1-S7	FD3	FT1	RPD Primary vs Duplicate	RPD Primary vs Duplicate	RPD Primary vs Triplicate
Laboratory Label			M19-JI44071	M19-JI44079	M19-JI44069	M19-JI44080	222563			
Sample Date			26/07/2019	26/07/2019	26/07/2019	26/07/2019	26/07/2019			
Sample Type			PS	FD	PS	FD	IL			
Analyte		Units	LOR	Result						
Heavy Metals										
Arsenic	mg/kg	2	14	7.5	11	10	10	60%	10%	10%
Cadmium	mg/kg	0.4	< 0.4	< 0.4	< 0.4	< 0.4	<0.4	N/A	N/A	N/A
Chromium	mg/kg	5	17	9.7	15	13	15	55%	14%	0%
Copper	mg/kg	5	15	15	16	15	11	0%	6%	37%
Lead	mg/kg	5	21	19	20	17	17	10%	16%	16%
Mercury	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	<0.1	N/A	N/A	N/A
Nickel	mg/kg	5	6.9	6.5	8	6.5	5	6%	21%	46%
Zinc	mg/kg	5	33	33	39	39	29	0%	0%	29%

-: Not analysed

PS: Primary Sample

FD: Field Duplicate

IL: Inter-Laboratory Duplicate

N/A: Not Applicable (RPDs not calculated where one or more result <PQL)

Acceptable RPDs:	<5 x LOR	Any RPD acceptable
	<10 x LOR	<80% RPD acceptable
	>10 x LOR	<50% RPD acceptable

Acceptable RPD limits reached

Report Name:	Waste Classification Report		
Site Address:	34-38 Schofields Road, Schofields NSW 2762		
Client Name:	Richard Crookes Constructions Pty Ltd		
Client Number:	C107881	Job Number:	J163171

Waste Classification	Heavy Metals (mg/kg)								Total PCB	PAH (mg/kg)	
	Arsenic As	Cadmium Cd	Chromium Cr**	Copper Cu	Lead Pb	Mercury Hg	Nickel Ni	Zinc Zn	mg/kg	Benzo (a) Pyrene	Total PAH
General Solid Waste	100	20	100	-	100	4	40	-	50	0.8	200
Restricted Solid Waste	400	80	400	-	400	16	160	-	50	3.2	800
Hazardous Waste	>400	>80	>400	-	>400	>16	>160	-	>50	>3.2	>800
Soil Sample ID											
SPA-1	4.6	< 0.4	15	19	140	< 0.1	9.2	74	N/A	< 0.5	1.6
SPA-2	< 2	< 0.4	7.3	< 5	5.3	< 0.1	< 5	15	N/A	< 0.5	< 0.5
SPA-3	4	< 0.4	7.8	6.1	9	< 0.1	< 5	27	N/A	< 0.5	< 0.5
SPB-1	10	< 0.4	13	21	23	< 0.1	13	66	N/A	< 0.5	< 0.5
SPB-2	12	< 0.4	14	22	23	< 0.1	14	63	N/A	< 0.5	< 0.5
SPB-3	12	< 0.4	15	28	29	< 0.1	13	220	N/A	< 0.5	< 0.5

Waste Classification	Petroleum Hydrocarbons (mg/kg)			BTEXN (mg/kg)					Asbestos (g/kg)	Lead (Pb) TCLP (mg/L)	
	C10-C14	C15-C28	C29-C36	C6-C9	Benzene	Toluene	Ethyl Benzene	Xylene	AF/FA	TCLP1	SCC1
General Solid Waste	-			650	10	288	600	1000	-	5	1,500
Restricted Solid Waste	-			2600	40	1152	2400	4000	-	20	6,000
Hazardous Waste	-			>2600	>40	>1152	>2400	>4000	-	>20	>6,000
Soil Sample ID											
SPA-1	< 20	51	100	< 20	< 0.1	< 0.1	< 0.1	< 0.3	ND	< 0.01	140
SPA-2	< 20	< 50	< 50	< 20	< 0.1	< 0.1	< 0.1	< 0.3	ND	0.01	5.3
SPA-3	< 20	< 50	< 50	< 20	< 0.1	< 0.1	< 0.1	< 0.3	ND	< 0.01	9
SPB-1	< 20	< 50	< 50	< 20	< 0.1	< 0.1	< 0.1	< 0.3	ND	0.01	23
SPB-2	< 20	< 50	< 50	< 20	< 0.1	< 0.1	< 0.1	< 0.3	ND	0.01	23
SPB-3	< 20	< 50	58	< 20	< 0.1	< 0.1	< 0.1	< 0.3	ND	< 0.01	29

Indicates General Solid Waste	
Indicates Restricted Solid Waste	
Indicates Hazardous Waste	

Criteria adopted from NSW EPA Waste Classification Guidelines , 2014
N/A - Not Analysed , ND - non-detect

Report Name:	Waste Classification Report		
Site Address:	34-38 Schofields Road, Schofields NSW 2762		
Client Name:	Richard Crookes Constructions Pty Ltd		
Client Number:	C107881	Job Number:	J163171

Waste Classification	Heavy Metals (mg/kg)								PAH (mg/kg)	
	Arsenic As	Cadmium Cd	Chromium Cr**	Copper Cu	Lead Pb	Mercury Hg	Nickel Ni	Zinc Zn	Benzo (a) Pyrene	Total PAH
General Solid Waste	100	20	100	-	100	4	40	-	0.8	200
Restricted Solid Waste	400	80	400	-	400	16	160	-	3.2	800
Hazardous Waste	>400	>80	>400	-	>400	>16	>160	-	>3.2	>800
Soil Sample ID										
SP3-S1	8.7	< 0.4	9.7	47	14	< 0.1	21	90	< 0.5	< 0.5
SP3-S2	11	< 0.4	14	71	17	< 0.1	17	76	< 0.5	< 0.5
SP3-S3	11	< 0.4	10	34	16	< 0.1	21	93	< 0.5	< 0.5
SP4-S1	19	< 0.4	17	37	23	< 0.1	21	160	< 0.5	< 0.5
SP4-S2	11	< 0.4	15	25	17	< 0.1	19	86	< 0.5	< 0.5
SP4-S3	22	< 0.4	28	37	23	< 0.1	21	480	< 0.5	< 0.5

Waste Classification	Petroleum Hydrocarbons (mg/kg)			BTEXN (mg/kg)					Asbestos (g/kg)
	C10-C14	C15-C28	C29-C36	C6-C9	Benzene	Toluene	Ethyl Benzene	Xylene	AF/FA
General Solid Waste	-			650	10	288	600	1000	-
Restricted Solid Waste	-			2600	40	1152	2400	4000	-
Hazardous Waste	-			>2600	>40	>1152	>2400	>4000	-
Soil Sample ID									
SP3-S1	< 20	< 50	< 50	< 20	< 0.1	< 0.1	< 0.1	< 0.2	ND
SP3-S2	< 20	< 50	< 50	< 20	< 0.1	< 0.1	< 0.1	< 0.2	ND
SP3-S3	< 20	< 50	< 50	< 20	< 0.1	< 0.1	< 0.1	< 0.2	ND
SP4-S1	< 20	98	70	< 20	< 0.1	< 0.1	< 0.1	< 0.2	ND
SP4-S2	< 20	< 50	< 50	< 20	< 0.1	< 0.1	< 0.1	< 0.2	ND
SP4-S3	< 20	< 50	< 50	< 20	< 0.1	< 0.1	< 0.1	< 0.2	ND

Indicates General Solid Waste	
Indicates Restricted Solid Waste	
Indicates Hazardous Waste	

Criteria adopted from NSW EPA Waste Classification Guidelines , 2014
N/A - Not Analysed , ND - non-detect

Table 2: Laboratory Results - Stockpile 1															
Soil Samples (stockpiled soils)			E1	E2	E3	E4	E5	E6	E7	E8	E9	E10	Average Portion Conc. ⁽¹⁾	Maximum average Conc.	Absolute Maximum Conc.
Analyte	Units	LOR													
Arsenic	mg/kg	< 2	11	11	11	11	9.3	9.3	9.4	19	14	10	12.2	20	40
Cadmium	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	0.5	1
Chromium (total)	mg/kg	< 5	13	14	14	14	11	14	12	23	18	15	15.6	75	150
Copper	mg/kg	< 5	17	16	15	20	18	15	16	19	21	18	18.1	100	200
Lead	mg/kg	< 5	31	20	25	20	22	19	20	26	23	23	23.3	50	100
Mercury	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	0.5	1
Nickel	mg/kg	< 5	9.5	7	5.8	8	9.9	8.2	8.4	8.5	14	8.4	9.1	30	60
Zinc	mg/kg	< 5	48	37	36	45	55	41	51	45	80	48	50.6	150	300
Electrical Conductivity	µS/cm	< 10	86	54	150	52	75	54	88	42	88	58	66.9	1,500	3,000
pH	pH units	< 0.1	6.1	6.2	6.7	6.6	6.7	6.2	7.1	6.3	7.2	7	6.6	5 to 9	4.5 to 10
Total PAH	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	20	40
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	1
Benzene	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	N/A	0.5
Toluene	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	N/A	65
Ethyl-benzene	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	N/A	25
Xylene	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	N/A	15
Total Petroleum Hydrocarbons (C ₁₀ -C ₃₆)	mg/kg	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	250	500
Foreign Materials: Rubber, Plastic, Bitumen, Paper, Cloth, Paint & Wood	%	< 0.05	< 0.05	< 0.05	1.3	< 0.05	0.2	0.3	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	0.10

Note:

LOR = limit of reporting (laboratory detection limit)

1 = Average concentrations are based on samples suitable for classification as ENM and excludes E3, E5 and E7. **Bold/Highlight** = ENM Criteria Exceedance

Table 3: Laboratory Results - Stockpile 2

Soil Samples (stockpiled soils)			E11	E12	E13	Average Portion Conc.	Maximum Average Conc.	Absolute Maximum Conc.
Analyte	Units	LOR						
Arsenic	mg/kg	< 2	14	14	9.2	N/A ⁽¹⁾	20	40
Cadmium	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4	N/A	0.5	1
Chromium (total)	mg/kg	< 5	20	21	13	N/A	75	150
Copper	mg/kg	< 5	24	23	14	N/A	100	200
Lead	mg/kg	< 5	40	26	18	N/A	50	100
Mercury	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	N/A	0.5	1
Nickel	mg/kg	< 5	16	11	6.8	N/A	30	60
Zinc	mg/kg	< 5	57	60	32	N/A	150	300
Electrical Conductivity	µS/cm	< 10	34	210	58	N/A	1,500	3,000
pH	pH units	<0.1	6.7	6.7	6.3	N/A	5 to 9	4.5 to 10
Total PAH	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	N/A	20	40
Benzo(a)pyrene	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	N/A	0.5	1
Benzene	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	N/A	N/A	0.5
Toluene	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	N/A	N/A	65
Ethyl-benzene	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	N/A	N/A	25
Xylene	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3	N/A	N/A	15
Total Petroleum Hydrocarbons (C ₁₀ -C ₃₆)	mg/kg	< 50	< 50	< 50	< 50	N/A	250	500
Foreign Materials: Rubber, Plastic, Bitumen, Paper, Cloth, Paint & Wood	%	< 0.05	0.1	0.81	<0.05	N/A	0.05	0.10

Note:

LOR = limit of reporting (laboratory detection limit)

1 = Average not calculated as Stockpile 2 is not suitable for classification as ENM

Bold/Highlight = ENM Criteria Exceedance

Analyte		Sample ID						TP1	TP2	TP2	TP3	TP4	TP5	TP6	TP7	TP8	TP9	TP10	TP11	TP12	TP13				
		Sample Depth (m)						0.1-0.2	0.01-0.2	0.6-0.7	0.1-0.2	0.1-0.2	0.1-0.2	0.0-0.2	0.1-0.2	0.1-0.2	0.1-0.3	0.2-0.3	0.1-0.3	0.3-0.5	0.01-0.1				
		Sample Date						16/11/18	16/11/18	16/11/18	16/11/18	16/11/18	16/11/18	16/11/18	16/11/18	16/11/18	16/11/18	16/11/18	16/11/18	16/11/18					
Units	LOR	(HIL-A)	HSL - A/B 0 - <1m	EIL	ESL - R (coarse)	ML (coarse)																			
BTEX																									
Benzene	mg/kg	0.1		0.6		50		<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				
Ethylbenzene	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				
m&p-Xylenes	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				
o-Xylene	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				
Toluene	mg/kg	0.1		390		85		<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				
Xylenes - Total	mg/kg	0.3		-		105		<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				
Heavy Metals																									
Arsenic	mg/kg	2	100		113			12	14	-	7.8	8.6	9.8	10	8.7	5.2	8.5	7.3	10	4.5	8.4				
Cadmium	mg/kg	0.4	20					<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				
Chromium	mg/kg	5	100		417			18	12	-	9.3	9.1	13	13	11	7.7	12	7.9	13	15	12				
Copper	mg/kg	5	6000		199			11	11	-	15	17	15	15	11	7.2	12	15	16	17	14				
Lead	mg/kg	5	300		1,119			27	18	-	24	21	15	18	29	10	26	20	31	36	22				
Mercury	mg/kg	0.1	40		-			<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				
Nickel	mg/kg	5	400		170			7.2	5.9	-	6.6	7.7	<5	8.7	6.9	<5	5.8	8.3	7.1	9.4	6.4				
Zinc	mg/kg	5	7400		281			31	25	-	38	43	29	44	31	21	30	42	43	99	26				
Organochlorine Pesticides																									
4,4'-DDD	mg/kg	0.05						-	<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-	-	-	-				
4,4'-DDE	mg/kg	0.05						-	<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-	-	-	-				
4,4'-DDT	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 and Dieldrin (Total)	mg/kg	0.05						-	<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-	-	-	-				
b-BHC	mg/kg	0.1						-	<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-	-	-	-				
Chlordanes - Total	mg/kg	0.05						-	<0.1	-	-	<0.1	-	-	<0.1	-	<0.1	-	-	-	-				
d-BHC	mg/kg	0.05						-	<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-	-	-	-				
DDT + DDE + DDD (Total)	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						-	<0.05	-	-	<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	0.05						-	<0.05	-	-	<0.05	-	-	<0.05	-	<0.05	-	-	-	-				
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	-	-	-	-				
Physical Properties																									
Moisture	%	1						7.8	9	12	11	10	14	9.1	8	20	11	9.7	10	8.7	11				
Organophosphorus Pesticides																									
Azinphos-methyl	mg/kg	0.2						-	<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	-	-	-				
Bolstar	mg/kg	0.2						-	<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	-	-	-				
Chlorfenvinphos	mg/kg	0.2						-	<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	-	-	-				
Chlorpyrifos	mg/kg	0.2						-	<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	-	-	-				
Chlorpyrifos-methyl	mg/kg	0.2						-	<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	-	-	-				
Coumaphos	mg/kg	2						-	<2	-	-	<2	-	-	<2	-	<2	-	-	-	-				
Demeton-O	mg/kg	0.2						-	<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	-	-	-				
Demeton-S	mg/kg	0.2						-	<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	-	-	-				
Diazinon	mg/kg	0.2						-	<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	-	-	-				
Dichlorvos	mg/kg	0.2						-	<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	-	-	-				
Dimethoate	mg/kg	0.2						-	<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	-	-	-				
Disulfoton	mg/kg	0.2						-	<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	-	-	-				
EPN	mg/kg	0.2						-	<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	-	-	-				
Ethion	mg/kg	0.2						-	<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	-	-	-				
Ethoprop	mg/kg	0.2						-	<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	-	-	-				
Ethyl parathion	mg/kg	0.2						-	<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	-	-	-				
Fenitrothion	mg/kg	0.2						-	<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	-	-	-				
Fensulfotthion	mg/kg	0.2						-	<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	-	-	-				
Fenthion	mg/kg	0.2						-	<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	-	-	-				
Malathion	mg/kg	0.2						-	<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	-	-	-				
Merphos	mg/kg	0.2						-	<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	-	-	-				
Methyl parathion	mg/kg	0.2						-	<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	-	-	-				
Mevinphos	mg/kg	0.2						-	<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	-	-	-				
Monocrotophos	mg/kg	2						-	<2	-	-	<2	-	-	<2	-	<2	-	-	-	-				
Naled	mg/kg	0.2						-	<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	-	-	-				
Omethoate	mg/kg	2						-	<2	-	-	<2	-	-	<2	-	<2	-	-	-	-				
Phorate	mg/kg	0.2						-	<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	-	-	-				
Pirimiphos-methyl	mg/kg	0.2						-	<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	-	-	-				
Pyrazophos	mg/kg	0.2						-	<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	-	-	-				
Ronnel	mg/kg	0.2						-	<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	-	-	-				
Terbufos	mg/kg	0.2						-	<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-	-	-	-				
Tetrachlorvinphos	mg/kg	0.2						-	<0.2	-	-	<0.2	-	-											

Total Recoverable Hydrocarbons - 2013 NEPM Fractions																	
Naphthalene	mg/kg	0.5				170	-	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16	mg/kg	50				120	1,000	< 50	< 50	-	< 50	< 50	< 50	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)	mg/kg	50				-	-	< 50	< 50	-	< 50	< 50	< 50	< 50	< 50	< 50	< 50
TRH >C10-C40 (total)*	mg/kg	100				-	-	< 100	< 100	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100
TRH >C16-C34	mg/kg	100				300	2,500	< 100	< 100	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100
TRH >C34-C40	mg/kg	100				2,800	10,000	< 100	< 100	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100
TRH C6-C10	mg/kg	20				180	700	< 20	< 20	-	< 20	< 20	< 20	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)	mg/kg	20				-	-	< 20	< 20	-	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Asbestos																	
Asbestos	g/g	0.01% w/w						<0.01%	-	-	<0.01%	-	<0.01%	<0.01%	-	<0.01%	-
Respirable fibres		ND						ND*	-	-	ND*	-	ND*	-	-	ND*	-
Salinity																	
Chloride	mg/kg	5						-	-	24	-	-	-	-	-	-	-
Conductivity (1:5 aqueous extract at 25°C)	uS/cm	10						-	-	47	-	-	-	-	-	-	-
Exchangeable Sodium Percentage (ESP)	%	0.1						-	-	7.9	-	-	-	-	-	-	-
Magnesium (exchangeable)	meq/100g	0.1						-	-	5.7	-	-	-	-	-	-	-
pH (1:5 Aqueous extract at 25°C)	pH units	0.1						-	-	5.7	-	-	-	-	-	-	-
Potassium (exchangeable)	meq/100g	0.1						-	-	0.4	-	-	-	-	-	-	-
Resistivity	ohm.m	0.5						-	-	210	-	-	-	-	-	-	-
Sodium (exchangeable)	meq/100g	0.1						-	-	0.8	-	-	-	-	-	-	-
Sulphate (as SO4)	mg/kg	30						-	-	140	-	-	-	-	-	-	-
Cation Exchange Capacity																	
Calcium (exchangeable)	meq/100g	0.1						-	-	3.5	-	-	-	-	-	-	-
Cation Exchange Capacity	meq/100g	0.05						-	-	10	-	-	-	-	-	-	-

Analyte		Sample ID						TP14	TP15	TP15	TP16	TP17	TP18	TP19	TP21	TP23	TP24	FD01	FD02
		Sample Depth (m)						0.0-0.1	0.1-0.2	0.8-0.9	0.1-0.3	0.25-0.35	0.1-0.2	0.2-0.3	0.2-0.3	0.1-0.2	FD01	FD02	
		Sample Date						16/11/18	16/11/18	16/11/18	16/11/18	16/11/18	16/11/18	16/11/18	16/11/18	16/11/18	16/11/18	16/11/18	
Units	LOR	(HIL-A)	HSL - A/B 0 - <1m	EL	ESL - R (coarse)	ML (coarse)													
BTEX																			
Benzene	mg/kg	0.1		0.6		50	<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	-	-	-	-	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
m&p-Xylenes	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
o-Xylene	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
Toluene	mg/kg	0.1		390		85	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Xylenes - Total	mg/kg	0.3	-	-	-	105	<0.3	<0.3	-	-	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Heavy Metals																			
Arsenic	mg/kg	2	100		113		8.9	28	-	-	40	19	28	12	13	19	4.2	7.6	
Cadmium	mg/kg	0.4	20	-	-		<0.4	<0.4	-	-	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	5	100		417		13	17	-	-	11	17	31	9.2	17	15	17	7.8	
Copper	mg/kg	5	6000		199		15	21	-	-	28	18	25	33	9.4	34	27	12	
Lead	mg/kg	5	300		1,119		26	27	-	-	33	23	31	13	19	17	43	22	
Mercury	mg/kg	0.1	40		-		<0.1	<0.1	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	5	400		170		6	7.8	-	-	17	9	12	11	<5	9.2	8.8	5.5	
Zinc	mg/kg	5	7400		281		28	51	-	-	77	25	37	67	11	66	140	35	
Organochlorine Pesticides																			
4,4'-DDD	mg/kg	0.05					-	-	-	-	<0.05	-	-	-	-	-	-	-	-
4,4'-DDE	mg/kg	0.05					-	-	-	-	<0.05	-	-	-	-	-	-	-	-
4,4'-DDT	mg/kg	0.05					-	-	-	-	<0.05	-	-	-	-	-	-	-	-
α-BHC	mg/kg	0.05					-	-	-	-	<0.05	-	-	-	-	-	-	-	-
Aldrin	mg/kg	0.05					-	-	-	-	<0.05	-	-	-	-	-	-	-	-
Aldrin and Dieldrin (Total)	mg/kg	0.05					-	-	-	-	<0.05	-	-	-	-	-	-	-	-
β-BHC	mg/kg	0.1					-	-	-	-	<0.05	-	-	-	-	-	-	-	-
Chlordanes - Total	mg/kg	0.05					-	-	-	-	<0.1	-	-	-	-	-	-	-	-
δ-BHC	mg/kg	0.05					-	-	-	-	<0.05	-	-	-	-	-	-	-	-
DDT + DDE + DDD (Total)	mg/kg	0.05					-	-	-	-	<0.05	-	-	-	-	-	-	-	-
Dieldrin	mg/kg	0.05					-	-	-	-	<0.05	-	-	-	-	-	-	-	-
Endosulfan I	mg/kg	0.05					-	-	-	-	<0.05	-	-	-	-	-	-	-	-
Endosulfan II	mg/kg	0.05					-	-	-	-	<0.05	-	-	-	-	-	-	-	-
Endosulfan sulphate	mg/kg	0.05					-	-	-	-	<0.05	-	-	-	-	-	-	-	-
Endrin	mg/kg	0.05					-	-	-	-	<0.05	-	-	-	-	-	-	-	-
Endrin aldehyde	mg/kg	0.05					-	-	-	-	<0.05	-	-	-	-	-	-	-	-
Endrin ketone	mg/kg	0.05					-	-	-	-	<0.05	-	-	-	-	-	-	-	-
γ-BHC (Lindane)	mg/kg	0.05					-	-	-	-	<0.05	-	-	-	-	-	-	-	-
Heptachlor	mg/kg	0.05					-	-	-	-	<0.05	-	-	-	-	-	-	-	-
Heptachlor epoxide	mg/kg	0.05					-	-	-	-	<0.05	-	-	-	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.05					-	-	-	-	<0.05	-	-	-	-	-	-	-	-
Methoxychlor	mg/kg	0.05					-	-	-	-	<0.05	-	-	-	-	-	-	-	-
Toxaphene	mg/kg	1					-	-	-	-	<1	-	-	-	-	-	-	-	-
Vic EPA IWRG 621 OCP (Total)	mg/kg	0.1					-	-	-	-	<0.1	-	-	-	-	-	-	-	-
Vic EPA IWRG 621 Other OCP (Total)	mg/kg	0.1					-	-	-	-	<0.1	-	-	-	-	-	-	-	-
Physical Properties																			
Moisture	%	1					14	15	18	11	12	11	15	19	6.9	14	8.9	9.8	
Organophosphorus Pesticides																			
Azinphos-methyl	mg/kg	0.2					-	-	-	-	<0.2	-	-	-	-	-	-	-	-
Bolstar	mg/kg	0.2					-	-	-	-	<0.2	-	-	-	-	-	-	-	-
Chlorfenvinphos	mg/kg	0.2					-	-	-	-	<0.2	-	-	-	-	-	-	-	-
Chlorpyrifos	mg/kg	0.2					-	-	-	-	<0.2	-	-	-	-	-	-	-	-
Chlorpyrifos-methyl	mg/kg	0.2					-	-	-	-	<0.2	-	-	-	-	-	-	-	-
Coumaphos	mg/kg	2					-	-	-	-	<2	-	-	-	-	-	-	-	-
Demeton-O	mg/kg	0.2					-	-	-	-	<0.2	-	-	-	-	-	-	-	-
Demeton-S	mg/kg	0.2					-	-	-	-	<0.2	-	-	-	-	-	-	-	-
Diazinon	mg/kg	0.2					-	-	-	-	<0.2	-	-	-	-	-	-	-	-
Dichlorvos	mg/kg	0.2					-	-	-	-	<0.2	-	-	-	-	-	-	-	-
Dimethoate	mg/kg	0.2					-	-	-	-	<0.2	-	-	-	-	-	-	-	-
Disulfoton	mg/kg	0.2					-	-	-	-	<0.2	-	-	-	-	-	-	-	-
EPN	mg/kg	0.2					-	-	-	-	<0.2	-	-	-	-	-	-	-	-
Ethion	mg/kg	0.2					-	-	-	-	<0.2	-	-	-	-	-	-	-	-
Ethoprop	mg/kg	0.2					-	-	-	-	<0.2	-	-	-	-	-	-	-	-
Ethyl parathion	mg/kg	0.2					-	-	-	-	<0.2	-	-	-	-	-	-	-	-
Fenitrothion	mg/kg	0.2					-	-	-	-	<0.2	-	-	-	-	-	-	-	-
Fensulfothion	mg/kg	0.2					-	-	-	-	<0.2	-	-	-	-	-	-	-	-
Fenthion	mg/kg	0.2					-	-	-	-	<0.2	-	-	-	-	-	-	-	-
Malathion	mg/kg	0.2					-	-	-	-	<0.2	-	-	-	-	-	-	-	-
Merphos	mg/kg	0.2					-	-	-	-	<0.2	-	-	-	-	-	-	-	-
Methyl parathion	mg/kg	0.2					-	-	-	-	<0.2	-	-	-	-	-	-	-	-
Mevinphos	mg/kg	0.2					-	-	-	-	<0.2	-	-	-	-	-	-	-	-
Monocrotophos	mg/kg	2					-	-	-	-	<2	-	-	-	-	-	-	-	-
Naled	mg/kg	0.2					-	-	-	-	<0.2	-	-	-	-	-	-	-	-
Omethoate	mg/kg	2					-	-	-	-	<2	-	-	-	-	-	-	-	-
Phorate	mg/kg	0.2					-	-	-	-	<0.2	-	-	-	-	-	-	-	-
Pirimiphos-methyl	mg/kg	0.2					-	-	-	-	<0.2	-	-	-	-	-	-	-	-
Pyrazophos	mg/kg	0.2					-	-	-	-	<0.2	-	-	-	-	-	-	-	-
Ronnel	mg/kg	0.2					-	-	-	-	<0.2	-	-	-	-	-	-	-	-
Terbufos	mg/kg	0.2					-	-	-	-	<0.2	-	-	-	-	-	-	-	-
Tetrachlorvinphos	mg/kg	0.2					-	-	-	-	<0.2	-	-	-	-	-	-	-	-
Tokuthion	mg/kg	0.2					-	-	-	-	<0.2	-	-	-	-	-	-	-	-
Trichloronate	mg/kg	0.2					-	-	-	-	<0.2	-	-	-	-	-	-	-	-
Polychlorinated Biphenyls																			
Aroclor-1016	mg/kg	0.1					-	-	-	-	<0.1	-	-	-	-	-	-	-	-
Aroclor-1221	mg/kg	0.1					-	-	-	-	<0.1	-	-	-	-	-	-	-	-
Aroclor-1232	mg/kg	0.1					-	-	-	-	<0.1	-	-	-	-	-	-	-	-
Aroclor-1242	mg/kg	0.1					-	-	-	-	<0.1	-	-	-	-	-	-	-	-
Aroclor-1248	mg/kg	0.1					-	-	-	-	<0.1	-	-	-	-	-	-	-	-
Aroclor-1254	mg/kg	0.1					-	-	-	-	<0.1	-	-	-	-	-	-	-	-
Aroclor-1260	mg/kg	0.1					-	-	-	-	<0.1	-	-	-	-	-	-	-	-
Total PCB	mg/kg	0.1					-	-	-	-	<0.1	-	-	-	-	-	-	-	-
Polycyclic Aromatic Hydrocarbons																			
Acenaphthene	mg/kg	0.5	-		-		-	-	-	-	<0.5	-	-	-	-	-	-	-	-
Acenaphthylene	mg/kg	0.5	-		-		-	-	-	-	<0.5	-	-	-	-	-	-	-	-
Anthracene	mg/kg	0.5	-		-		-	-	-	-	<0.5	-	-	-	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.5	3		-		-	-	-	-	<0.5	-	-	-	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.5	-		-	0.7	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
Benzo(a)pyrene TEQ (lower bound)	mg/kg	0.5	-		-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
Benzo(a)pyrene TEQ (upper bound)	mg/kg	0.6	-		-	-	-	-	-	-	1.2	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.5																	

Total Recoverable Hydrocarbons - 2013 NEPM Fractions															
Naphthalene	mg/kg	0.5				170	-	< 0.5	< 0.5	-	-	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16	mg/kg	50				120	1,000	< 50	< 50	-	-	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)	mg/kg	50				-	-	< 50	< 50	-	-	< 50	< 50	< 50	< 50
TRH >C10-C40 (total)*	mg/kg	100				-	-	< 100	< 100	-	-	< 100	< 100	< 100	< 100
TRH >C16-C34	mg/kg	100				300	2,500	< 100	< 100	-	-	< 100	< 100	< 100	< 100
TRH >C34-C40	mg/kg	100				2,800	10,000	< 100	< 100	-	-	< 100	< 100	< 100	< 100
TRH C6-C10	mg/kg	20				180	700	< 20	< 20	-	-	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)	mg/kg	20				-	-	< 20	< 20	-	-	< 20	< 20	< 20	< 20
Asbestos															
Asbestos	g/g	0.01% w/w						-	<0.01%	-	-	-	-	<0.01%	-
Respirable fibres		ND						-	ND*	-	-	-	-	ND*	-
Salinity															
Chloride	mg/kg	5						-	-	46	< 5	-	-	-	100
Conductivity (1:5 aqueous extract at 25°C)	uS/cm	10						-	-	87	11	-	-	-	110
Exchangeable Sodium Percentage (ESP)	%	0.1						-	-	21	2	-	-	-	5.8
Magnesium (exchangeable)	meq/100g	0.1						-	-	9.2	3.2	-	-	-	7.1
pH (1:5 Aqueous extract at 25°C)	pH units	0.1						-	-	5.2	6.1	-	-	-	5.4
Potassium (exchangeable)	meq/100g	0.1						-	-	0.6	0.2	-	-	-	0.3
Resistivity	ohm.m	0.5						-	-	110	940	-	-	-	93
Sodium (exchangeable)	meq/100g	0.1						-	-	2.8	0.2	-	-	-	1
Sulphate (as SO4)	mg/kg	30						-	-	82	< 30	-	-	-	52
Cation Exchange Capacity															
Calcium (exchangeable)	meq/100g	0.1						-	-	1	5.3	-	-	-	8.2
Cation Exchange Capacity	meq/100g	0.05						-	-	14	8.8	-	-	-	16

		Sample ID						TP25A	TP26A	TP27A	TP28A	TP29A	TP30A	TP31A	TP32A	TP33A	TP34A	TP35A	FO01A	
								0.2-0.3	0.1-0.3	0.2-0.3	0.2-0.4	0.1-0.3	0.2-0.3	0.1-0.2	0.2-0.3	0.2-0.25	0.1-0.2	0.15-0.25	(TP34A)	
		Sample Date						10/12/18	10/12/18	10/12/18	10/12/18	10/12/18	10/12/18	10/12/18	10/12/18	10/12/18	10/12/18	10/12/18	10/12/18	
Analyte	Units	LOR	(HL-A)	HSL - A/B 0 - <1m	EIL	ESL - R (coarse)	ML (coarse)													
BTEx																				
Benzene	mg/kg	0.1		0.6		50		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	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
m&p-Xylenes	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
o-Xylene	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
Toluene	mg/kg	0.1		390		85		< 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
Xylenes - Total	mg/kg	0.3		-	-	105		< 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
Heavy Metals																				
Arsenic	mg/kg	2	100		113			7.6	9.7	14	28	19	12	20	9.3	8.2	7.7	5.8	13	
Cadmium	mg/kg	0.4	20	-	-			< 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
Chromium	mg/kg	5	100		417			10	11	19	9	17	14	18	11	10	12	9.8	13	
Copper	mg/kg	5	6000		199			14	16	17	22	41	27	20	16	18	15	13	20	
Lead	mg/kg	5	300		1,119			22	21	19	22	22	19	39	21	23	23	17	14	
Mercury	mg/kg	0.1	40					< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	mg/kg	5	400		170			8.1	9.1	9.6	23	7.9	12	14	12	13	8.6	5.7	6.3	
Zinc	mg/kg	5	7400		281			49	180	87	74	41	58	59	51	63	52	32	28	
Organochlorine Pesticides																				
4,4'-DDD	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-
4,4'-DDE	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-
4,4'-DDT	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-
a-BHC	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-
Aldrin	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-
Aldrin and Dieldrin (Total)	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-
b-BHC	mg/kg	0.1						-	-	-	-	-	-	-	-	-	-	-	-	-
Chlordanes - Total	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-
d-BHC	mg/kg	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-
DDT + DDE + DDD (Total)	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	0.05						-	-	-	-	-	-	-	-	-	-	-	-	-
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						-	-	-	-	-	-	-	-	-	-	-	-	-
Physical Properties																				
Moisture	%	1						8.2	7.8	9.7	8.6	6.4	12	9.4	9.7	10	12	6	6.3	
Organophosphorus Pesticides																				
Azinphos-methyl	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-
Bolstar	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorfenvinphos	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorpyrifos	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorpyrifos-methyl	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-
Coumaphos	mg/kg	2						-	-	-	-	-	-	-	-	-	-	-	-	-
Demeton-O	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-
Demeton-S	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-
Diazinon	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-
Dichlorvos	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-
Dimethoate	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-
Disulfoton	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-
EPN	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-
Ethion	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-
Ethoprop	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-
Ethyl parathion	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-
Fenitrothion	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-
Fensulfothion	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-
Fenthion	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-
Malathion	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-
Merphos	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl parathion	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-
Mevinphos	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-
Monocrotophos	mg/kg	2						-	-	-	-	-	-	-	-	-	-	-	-	-
Naled	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-
Omethoate	mg/kg	2						-	-	-	-	-	-	-	-	-	-	-	-	-
Phorate	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-
Pirimiphos-methyl	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrazophos	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-
Ronnel	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-
Terbufos	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachlorvinphos	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-
Tokuthion	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloronate	mg/kg	0.2						-	-	-	-	-	-	-	-	-	-	-	-	-
Polychlorinated Biphenyls																				
Aroclor-1016	mg/kg	0.1						-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1221	mg/kg	0.1						-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1232	mg/kg	0.1						-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1242	mg/kg	0.1						-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1248	mg/kg	0.1						-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1254	mg/kg	0.1						-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1260	mg/kg	0.1						-	-	-	-	-	-	-	-	-	-	-	-	-
Total PCB	mg/kg	0.1						-	-	-	-	-	-	-	-	-	-	-	-	-
Polycyclic Aromatic Hydrocarbons																				
Acenaphthene	mg/kg	0.5	-			-		-	-	-	< 0.5	-	-	-	-	-	-	-	-	-
Acenaphthylene	mg/kg	0.5	-			-		-	-	-	< 0.5	-	-	-	-	-	-	-	-	-
Anthracene	mg/kg	0.5	-			-		-	-	-	< 0.5	-	-	-	-	-	-	-	-	-
Benz(a)anthracene	mg/kg	0.5	3			-		-	-	-	< 0.5	-	-	-	-	-	-	-	-	-
Benz(a)pyrene	mg/kg	0.5	3			0.7		-	-	-	< 0.5	-	-	-	-	-	-	-	-	-
Benz(a)pyrene TEQ (lower bound)	mg/kg	0.5	-			-		-	-	-	< 0.5	-	-	-	-	-	-	-	-	-
Benz(a)pyrene TEQ (medium bound)	mg/kg	0.6	-			-		-	-	-	1.2	-	-	-	-	-	-	-	-	-
Benz(a)pyrene TEQ (upper bound)	mg/kg	1.2	-			-		-	-	-	-	-	-	-	-	-	-	-	-	-
Benz(b)fluoranthene	mg/kg	0.5	3			-		-	-	-	< 0.5	-	-	-	-	-	-	-	-	-
Benz(k)fluoranthene	mg/kg	0.5	-			-		-	-	-	< 0.5	-	-	-	-	-	-	-	-	-
Benz(k)fluoranthene	mg/kg	0.5	3			-		-	-	-	< 0.5	-	-	-	-	-	-	-	-	-
Chrysene	mg/kg	0.5	-			-		-	-	-	< 0.5	-	-	-	-	-	-	-	-	-
Dibenz(a,h																				

Total Recoverable Hydrocarbons - 2013 NEPM Fractions															
Naphthalene	mg/kg	0.5				170	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16	mg/kg	50				120	1,000	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)	mg/kg	50				-	-	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
TRH >C10-C40 (total)*	mg/kg	100				-	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
TRH >C16-C34	mg/kg	100				300	2,500	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
TRH >C34-C40	mg/kg	100				2,800	10,000	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
TRH C6-C10	mg/kg	20				180	700	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)	mg/kg	20				-	-	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Asbestos															
Asbestos	g/g	0.01% w/w						-	-	-	-	-	-	-	-
Respirable fibres								-	-	-	-	-	-	-	-
Salinity															
Chloride	mg/kg	5						-	-	-	-	170	-	-	-
Conductivity (1:5 aqueous extract at 25°C)	uS/cm	10						-	-	-	-	97	-	-	-
Exchangeable Sodium Percentage (ESP)	%	0.1						-	-	-	-	9.1	-	-	-
Magnesium (exchangeable)	meq/100g	0.1						-	-	-	-	6.7	-	-	-
pH (1:5 Aqueous extract at 25°C)	pH units	0.1						-	-	-	-	6.8	-	-	-
Potassium (exchangeable)	meq/100g	0.1						-	-	-	-	0.5	-	-	-
Resistivity	ohm.m	0.5						-	-	-	-	100	-	-	-
Sodium (exchangeable)	meq/100g	0.1						-	-	-	-	1.4	-	-	-
Sulphate (as SO4)	mg/kg	30						-	-	-	-	< 30	-	-	-
Cation Exchange Capacity															
Calcium (exchangeable)	meq/100g	0.1						-	-	-	-	6.3	-	-	-
Cation Exchange Capacity	meq/100g	0.05						-	-	-	-	15	-	-	-



Appendix D Borelogs

TEST PIT NUMBER TP1

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CLIENT C107881 - Richard Crookes Construction	PROJECT NAME Detailed Site Investigation
PROJECT NUMBER J160656	PROJECT LOCATION 34-38 Schofields Road, Schofields NSW
DATE STARTED 16/11/18	COMPLETED 16/11/18
EXCAVATION CONTRACTOR McMahon's	SLOPE ---
EQUIPMENT Excavator	TEST PIT LOCATION
TEST PIT SIZE ~1m	LOGGED BY NXB/JG
CHECKED BY MB	

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
E	None Observed					Grass FILL: Firm, brown, clayey SILT, rootlets, bitumen fragments 1cm diameter ~ <0.5%	TP1 (0.1-0.2)	No olfactory evidence of contamination Moisture (D) PID (0.1)
			0.5			NATURAL: Firm, orange/red, silty CLAY, yellow mottling, high plasticity, increases in grey mottling with depth	TP2 (0.5-0.6)	Moisture (DM) PID (0.1)
			1.0			Borehole TP1 terminated at 1m (Target depth reached)		
			1.5					
			2.0					
			2.5					

TEST PIT NUMBER TP2

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CLIENT C107881 - Richard Crookes Construction	PROJECT NAME Detailed Site Investigation
PROJECT NUMBER J160656	PROJECT LOCATION 34-38 Schofields Road, Schofields NSW
DATE STARTED 16/11/18	COMPLETED 16/11/18
EXCAVATION CONTRACTOR McMahon's	SLOPE ---
EQUIPMENT Excavator	TEST PIT LOCATION
TEST PIT SIZE ~1m	LOGGED BY NXB/JG
	CHECKED BY MB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
E	None Observed					Grass FILL: Firm, light brown, clayey silty SAND, low plasticity, rock fragments approximately 1cm diameter, rootlets	TP2 (0.01-0.2)	No olfactory evidence of contamination Moisture (D) PID (0.0)
			0.5			NATURAL: Firm, orange/red sandy CLAY, red mottling, high plasticity, grey mottling with depth		
			1.0				TP2 (0.6-0.7)	Moisture (DM) PID (0.0)
			1.5					
			2.0					
			2.5			Borehole TP2 terminated at 1m (Target depth reached)		

TEST PIT NUMBER TP3

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CLIENT C107881 - Richard Crookes Construction	PROJECT NAME Detailed Site Investigation
PROJECT NUMBER J160656	PROJECT LOCATION 34-38 Schofields Road, Schofields NSW
DATE STARTED 16/11/18	COMPLETED 16/11/18
EXCAVATION CONTRACTOR McMahon's	SLOPE ---
EQUIPMENT Excavator	TEST PIT LOCATION
TEST PIT SIZE ~1m	LOGGED BY NXB/JG
	CHECKED BY MB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
E	None Observed		0.5			Grass NATURAL: Firm, high density, clayey SILT, with rootlets and other organic matter	TP3 (0.1-0.2)	No olfactory evidence of contamination Moisture (D) PID (0.1)
			1.0			NATURAL: Red/orange, CLAY, medium density, high plasticity, increase in grey and yellow mottling with depth	TP3 (0.7-0.8)	Moisture (DM) PID (0.2)
			1.5			Borehole TP3 terminated at 1m (Target depth reached)		
			2.0					
			2.5					



CLIENT C107881 - Richard Crookes Construction

PROJECT NAME Detailed Site Investigation

PROJECT NUMBER J160656

PROJECT LOCATION 34-38 Schofields Road, Schofields NSW

DATE STARTED 16/11/18

COMPLETED 16/11/18

R.L. SURFACE

DATUM

EXCAVATION CONTRACTOR McMahons

SLOPE ---

BEARING -

EQUIPMENT Excavator

TEST PIT LOCATION

TEST PIT SIZE ~1m

LOGGED BY NXB/JG

CHECKED BY MB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
E						Grass FILL: Firm, light brown, clayey silty SAND, low plasticity, wood chips and roots ~3%		No olfactory evidence of contamination
	None Observed		0.5				TP4 (0.1-0.2)	Moisture (D) PID (0.1)
			1.0			Borehole TP4 terminated at 1m (Target depth reached)	TP4 (0.8-0.9)	Moisture (DM) PID (0.0)
			1.5					
			2.0					
			2.5					

TEST PIT NUMBER TP5

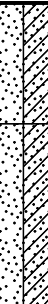
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CLIENT C107881 - Richard Crookes Construction PROJECT NAME Detailed Site Investigation
PROJECT NUMBER J160656 PROJECT LOCATION 34-38 Schofields Road, Schofields NSW

DATE STARTED 16/11/18 COMPLETED 16/11/18 R.L. SURFACE _____ DATUM _____
EXCAVATION CONTRACTOR McMahons SLOPE --- BEARING -
EQUIPMENT Excavator TEST PIT LOCATION _____
TEST PIT SIZE ~1m LOGGED BY NXB/JG CHECKED BY MB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
E	None Observed					NATURAL: Loose, brown, gravelly sandy SILT, gravel is ~ 2cm diameter subrounded sandstone	TP5 (0.1-0.2)	No olfactory evidence of contamination Moisture (DM) PID (0.0)
			0.5			NATURAL: Stiff, red, CLAY	TP5 (0.5-0.6)	Moisture (M) PID (0.0)
						Borehole TP5 terminated at 0.5m (Target depth reached)		
			1.0					
			1.5					
			2.0					
			2.5					

CLIENT C107881 - Richard Crookes Construction

PROJECT NAME Detailed Site Investigation

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PROJECT LOCATION 34-38 Schofields Road, Schofields NSW

DATE STARTED 16/11/18

COMPLETED 16/11/18

R.L. SURFACE

DATUM

EXCAVATION CONTRACTOR McMahon's

SLOPE ---

BEARING -

EQUIPMENT Excavator

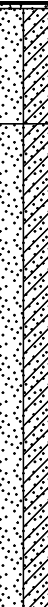
TEST PIT LOCATION

TEST PIT SIZE ~1m

LOGGED BY NXB/JG

CHECKED BY MB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
E	None Observed		0.5			Grass NATURAL: Still, brown clayey SILT with grass roots (no observed rocks)	TP6 (0.0-0.2)	No olfactory evidence of contamination Moisture (DM) PID (0.2)
			1.0			NATURAL: Firm, red and yellow mottled CLAY, medium plasticity, yellow mottling increases with depth	TP6 (0.5-0.6)	Moisture (M) PID (0.1)
			1.5			Borehole TP6 terminated at 1m (Target depth reached)		
			2.0					
			2.5					

TEST PIT NUMBER TP7



CLIENT C107881 - Richard Crookes Construction

PROJECT NAME Detailed Site Investigation

PROJECT NUMBER J160656

PROJECT LOCATION 34-38 Schofields Road, Schofields NSW

DATE STARTED 16/11/18

COMPLETED 16/11/18

R.L. SURFACE

DATUM

EXCAVATION CONTRACTOR McMahon's

SLOPE ---

BEARING -

EQUIPMENT Excavator

TEST PIT LOCATION

TEST PIT SIZE ~1m

LOGGED BY NXB/JG

CHECKED BY MB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
E	None Observed					Grass NATURAL: Soft to firm CLAY with organic matter (roots)	TP7 (0.1-0.2)	No olfactory evidence of contamination Moisture (D) PID (0.1)
			0.5			NATURAL: Firm, red, CLAY, low plasticity, roots	TP7 (0.3-0.4)	Moisture (DM) PID (0.0)
			1.0			Yellow mottling & high plasticity with depth		
			1.5			Borehole TP7 terminated at 1m (Target depth reached)		
			2.0					
			2.5					

TEST PIT NUMBER TP8



CLIENT C107881 - Richard Crookes Construction

PROJECT NAME Detailed Site Investigation

PROJECT NUMBER J160656

PROJECT LOCATION 34-38 Schofields Road, Schofields NSW

DATE STARTED 16/11/18

COMPLETED 16/11/18

R.L. SURFACE

DATUM

EXCAVATION CONTRACTOR McMahon's

SLOPE ---

BEARING -

EQUIPMENT Excavator

TEST PIT LOCATION

TEST PIT SIZE ~1m

LOGGED BY NXB/JG

CHECKED BY MB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
E	None Observed					FILL: Loose, brown, sandy SILT with pieces of wood (15%)	TP8 (0.1-0.2)	No olfactory evidence of contamination
			0.5			NATURAL: Firm, red, CLAY	TP8 (0.7-0.8)	Moisture (DM) PID (0.0)
			1.0			Borehole TP8 terminated at 1m (Target depth reached)		Moisture (M) PID (0.1)
			1.5					
			2.0					
			2.5					

TEST PIT NUMBER TP9



CLIENT C107881 - Richard Crookes Construction

PROJECT NAME Detailed Site Investigation

PROJECT NUMBER J160656

PROJECT LOCATION 34-38 Schofields Road, Schofields NSW

DATE STARTED 16/11/18

COMPLETED 16/11/18

R.L. SURFACE

DATUM

EXCAVATION CONTRACTOR McMahons

SLOPE ---

BEARING -

EQUIPMENT Excavator

TEST PIT LOCATION

TEST PIT SIZE ~1m

LOGGED BY NXB/JG

CHECKED BY MB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
E	None Observed					FILL: Soft, brown, silty SILT with rootlets and wood pieces	TP9 (0.1-0.3)	No olfactory evidence of contamination
			0.5			NATURAL: Firm, red, CLAY	TP9 (0.4-0.6)	Metal spool noted @0.3m
			1.0					
			1.5					
			2.0					
			2.5			Borehole TP9 terminated at 0.6m (Target depth reached)		



CLIENT C107881 - Richard Crookes Construction

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R.L. SURFACE

DATUM

EXCAVATION CONTRACTOR McMahon's

SLOPE ---

BEARING -

EQUIPMENT Excavator

TEST PIT LOCATION

TEST PIT SIZE ~1m

LOGGED BY NXB/JG

CHECKED BY MB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
E	None Observed					Grass NATURAL: Firm, dark brown silty SAND, organis matter (grass roots)		No olfactory evidence of contamination
			0.5			NATURAL: Firm, red CLAY, grey/yellow mottling which increases with depth, low plasticity, @ 0.5-0.5 large light grey boulder encountered - flat, angular fine grained sandstone	TP10 (0.2-0.3)	Moisture (D) PID (0.2)
			1.0				TP10 (0.6-0.7)	Moisture (M) PID (0.3)
			1.5			Borehole TP10 terminated at 1m (Target depth reached)		
			2.0					
			2.5					

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
E						Grass		No olfactory evidence of contamination
						NATURAL: Loose, light brown, clayey silty SAND, low plasticity	TP11 (0.1-0.3)	Moisture (D) PID (0.1) FD2 taken @ 0.1-0.3
	None Observed		0.5			NATURAL: Firm, red/brown CLAY, clay grades to yellow/orange @ 0.7m	TP11 (0.6-0.7)	Moisture (DM) PID (0.3)
			1.0			Borehole TP11 terminated at 1m (Target depth reached)		
			1.5					
			2.0					
			2.5					



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R.L. SURFACE

DATUM

EXCAVATION CONTRACTOR McMahons

SLOPE ---

BEARING -

EQUIPMENT Excavator

TEST PIT LOCATION

TEST PIT SIZE ~1m

LOGGED BY NXB/JG

CHECKED BY MB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
E	None Observed		0.5			FILL: Loose, light brown, gravelly SAND. Gravel is ~1-5cm diameter sub rounded rock, plastic pipe and golf ball noted ~0.5m	TP12 (0.3-0.5)	2m3 soil mound No odour Moisture (D) PID (0.4) FD1 taken @ 0.3-0.5
			1.0			NATURAL: Firm, red, CLAY with white mottling	TP12 (1.3-1.4)	Moisture (DM) PID (0.1)
			1.5			Borehole TP12 terminated at 1.5m (Target depth reached)		
			2.0					
			2.5					



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R.L. SURFACE

DATUM

EXCAVATION CONTRACTOR McMahon's

SLOPE ---

BEARING -

EQUIPMENT Excavator

TEST PIT LOCATION

TEST PIT SIZE ~1m

LOGGED BY NXB/JG

CHECKED BY MB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
E	None Observed					Grass FILL: Loose, light brown clayey silty SAND, low plasticity, rock fragments 3cm diameter ~5%	TP13 (0.01-0.1)	No olfactory evidence of contamination Moisture (D) PID (0.0)
			0.5			NATURAL: Firm, red CLAY, high plasticity, orange mottling increases with depth, minor natural coal lens 0.5%, grey mottling at 0.8m	TP13 (0.3-0.5)	Moisture (DM) PID (0.0)
			1.0			Borehole TP13 terminated at 1m (Target depth reached)		
			1.5					
			2.0					
			2.5					



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R.L. SURFACE

DATUM

EXCAVATION CONTRACTOR McMahon's

SLOPE ---

BEARING -

EQUIPMENT Excavator

TEST PIT LOCATION

TEST PIT SIZE ~1m

LOGGED BY NXB/JG

CHECKED BY MB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
E	None Observed		0.5			NATURAL: Loose, brown, SILT with rootlets	TP14 (0-0.1)	No olfactory evidence of contamination
						NATURAL: Stiff, red CLAY	TP14 (0.4-0.6)	Moisture (DM) PID (0.0)
			1.0					
			1.5					
			2.0					
			2.5			Borehole TP14 terminated at 0.6m (Target depth reached)		



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R.L. SURFACE

DATUM

EXCAVATION CONTRACTOR McMahons

SLOPE ---

BEARING -

EQUIPMENT Excavator

TEST PIT LOCATION

TEST PIT SIZE ~1m

LOGGED BY NXB/JG

CHECKED BY MB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
E	None Observed					Grass		No olfactory evidence of contamination
						FILL: Stiff, dark brown clayey SILT with roots, no rocks	TP15 (0.1-0.2)	
			0.5			NATURAL: Stiff, red CLAY with grey and yellow mottling, medium plasticity, rootlets		Moisture (D) PID (0.0)
			1.0			NATURAL: Grey CLAY with yellow mottling, firm, high plasticity, rootlets	TP15 (0.8-0.9)	Moisture (DM) PID (0.0)
			1.5			Borehole TP15 terminated at 1m (Target depth reached)		
			2.0					
			2.5					



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R.L. SURFACE

DATUM

EXCAVATION CONTRACTOR McMahon's

SLOPE ---

BEARING -

EQUIPMENT Excavator

TEST PIT LOCATION

TEST PIT SIZE ~1m

LOGGED BY NXB/JG

CHECKED BY MB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
E	None Observed					Grass NATURAL: Firm, light brown, sandy clayey SILT, low plasticity NATURAL: Firm, red/orange CLAY, orange increases with depth	TP16 (0.1-0.3)	No olfactory evidence of contamination Moisture (DM) PID (0.2)
			1.0			Borehole TP16 terminated at 1m (Target depth reached)		
			1.5					
			2.0					
			2.5					



CLIENT C107881 - Richard Crookes Construction

PROJECT NAME Detailed Site Investigation

PROJECT NUMBER J160656

PROJECT LOCATION 34-38 Schofields Road, Schofields NSW

DATE STARTED 16/11/18

COMPLETED 16/11/18

R.L. SURFACE

DATUM

EXCAVATION CONTRACTOR McMahon's

SLOPE ---

BEARING -

EQUIPMENT Excavator

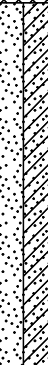
TEST PIT LOCATION

TEST PIT SIZE ~1m

LOGGED BY NXB/JG

CHECKED BY MB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
E	None Observed					Grass		No olfactory evidence of contamination
						FILL: Firm, brown, clayey SILT with rootlets	TP17 (0.25-0.35)	
			0.5			NATURAL: Stiff, orange-gold CLAY with black mottling (minor), low plasticity, some white/cream mottling (minor)	TP17 (0.85-0.95)	Moisture (D) PID (0.0)
			1.0			Borehole TP17 terminated at 1m (Target depth reached)		
			1.5					
			2.0					
			2.5					



CLIENT C107881 - Richard Crookes Construction

PROJECT NAME Detailed Site Investigation

PROJECT NUMBER J160656

PROJECT LOCATION 34-38 Schofields Road, Schofields NSW

DATE STARTED 16/11/18

COMPLETED 16/11/18

R.L. SURFACE

DATUM

EXCAVATION CONTRACTOR McMahon's

SLOPE ---

BEARING -

EQUIPMENT Excavator

TEST PIT LOCATION

TEST PIT SIZE ~1m

LOGGED BY NXB/JG

CHECKED BY MB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
E	None Observed					REWORKED NATURAL: Brown, SILT, medium density, tree and grass roots		No olfactory evidence of contamination
			0.5			NATURAL: Stiff red/orange and grey mottled CLAY, low plasticity	TP18 (0.1-0.2)	Moisture (DM) PID (0.0)
			1.0			Borehole TP18 terminated at 1m (Target depth reached)		
			1.5					
			2.0					
			2.5					



CLIENT C107881 - Richard Crookes Construction

PROJECT NAME Detailed Site Investigation

PROJECT NUMBER J160656

PROJECT LOCATION 34-38 Schofields Road, Schofields NSW

DATE STARTED 16/11/18

COMPLETED 16/11/18

R.L. SURFACE

DATUM

EXCAVATION CONTRACTOR McMahons

SLOPE ---

BEARING -

EQUIPMENT Excavator

TEST PIT LOCATION

TEST PIT SIZE ~1m

LOGGED BY NXB/JG

CHECKED BY MB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
E	None Observed					NATURAL: Loose, brown, clayey SILT with rootlets		No olfactory evidence of contamination
						NATURAL: Stiff, red, CLAY	TP19 (0.3-0.3)	Moisture (M) PID (0.0)
			0.5			Borehole TP19 terminated at 0.5m (Target depth reached)		
			1.0					
			1.5					
			2.0					
			2.5					

CLIENT <u>C107881 - Richard Crookes Construction</u>	PROJECT NAME <u>Detailed Site Investigation</u>
PROJECT NUMBER <u>J160656</u>	PROJECT LOCATION <u>34-38 Schofields Road, Schofields NSW</u>
DATE STARTED <u>16/11/18</u> COMPLETED <u>16/11/18</u>	R.L. SURFACE _____ DATUM _____
EXCAVATION CONTRACTOR <u>McMahons</u>	SLOPE <u>---</u> BEARING <u>-</u>
EQUIPMENT <u>Excavator</u>	TEST PIT LOCATION _____
TEST PIT SIZE <u>~1m</u>	LOGGED BY <u>NXB/JG</u> CHECKED BY <u>MB</u>

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
E	None Observed		0.5 1.0			Grass FILL: Loose light brown, clayey SILT, low plasticity NATURAL: Red/orange CLAY, orange mottling increases with depth	TP20 (0.01-0.1)	No olfactory evidence of contamination Moisture (DM) PID (0.1)
			1.5 2.0 2.5			Borehole TP20 terminated at 1m (Target depth reached)		



CLIENT C107881 - Richard Crookes Construction

PROJECT NAME Detailed Site Investigation

PROJECT NUMBER J160656

PROJECT LOCATION 34-38 Schofields Road, Schofields NSW

DATE STARTED 16/11/18

COMPLETED 16/11/18

R.L. SURFACE

DATUM

EXCAVATION CONTRACTOR McMahon's

SLOPE ---

BEARING -

EQUIPMENT Excavator

TEST PIT LOCATION

TEST PIT SIZE ~1m

LOGGED BY NXB/JG

CHECKED BY MB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
E	None Observed					Grass NATURAL: Loose light brown sandy clayey SILT		No olfactory evidence of contamination
						NATURAL: Firm yellow/orange CLAY, yellow mottling, yellow content increase with depth	TP21 (0.2-0.3)	Moisture (M) PID (0.0)
			0.5					
						NATURAL: Grey weathered shale, minor natural coal inclusions		
			1.0			Borehole TP21 terminated at 1m (Target depth reached)		
			1.5					
			2.0					
			2.5					

PROJECT LOCATION 34-38 Schofields Road, Schofields NSW

CHECKED BY MB

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
E						Grass		No olfactory evidence of contamination
						NATURAL: Loose light brown, clayey SILT, minor rock fragments, diameter 0.5cm ~0.1%, rootlets		
						NATURAL: Firm red/orange CLAY, clay grades lighter with depth, grey mottling increases with depth	TP22 (0.1-0.2)	Moisture (D) PID (0.0)
	None Observed		0.5					
			1.0					
						Borehole TP22 terminated at 1m (Target depth reached)		
			1.5					
			2.0					
			2.5					



CLIENT C107881 - Richard Crookes Construction

PROJECT NAME Detailed Site Investigation

PROJECT NUMBER J160656

PROJECT LOCATION 34-38 Schofields Road, Schofields NSW

DATE STARTED 16/11/18

COMPLETED 16/11/18

R.L. SURFACE

DATUM

EXCAVATION CONTRACTOR McMahon's

SLOPE ---

BEARING -

EQUIPMENT Excavator

TEST PIT LOCATION

TEST PIT SIZE ~1m

LOGGED BY NXB/JG

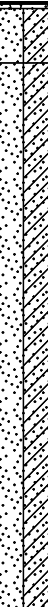
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NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
E	None Observed		0.5			Grass		No olfactory evidence of contamination
						NATURAL: Loose yellow/light brown clayey SILT	TP23 (0.1-0.2)	Moisture (D)
						NATURAL: Firm orange/red CLAY, grades to red with depth		PID (0.1)
			1.0			Borehole TP23 terminated at 1m (Target depth reached)		
			1.5					
			2.0					
			2.5					

CLIENT C107881 - Richard Crookes Construction	PROJECT NAME Detailed Site Investigation
PROJECT NUMBER J160656	PROJECT LOCATION 34-38 Schofields Road, Schofields NSW
DATE STARTED 16/11/18	COMPLETED 16/11/18
EXCAVATION CONTRACTOR McMahon's	R.L. SURFACE _____
EQUIPMENT Excavator	DATUM _____
TEST PIT SIZE ~1m	SLOPE ---
	BEARING -
	TEST PIT LOCATION _____
	LOGGED BY NXB/JG
	CHECKED BY MB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
E	None Observed		0.5			Grass NATURAL: Firm brown clayey SILT, low plasticity NATURAL: Firm red CLAY, high plasticity, orange mottling increasing with depth	TP24 (0.1-0.2)	No olfactory evidence of contamination Moisture (DM) PID (0.2)
			1.0			Borehole TP24 terminated at 1m (Target depth reached)		
			1.5					
			2.0					
			2.5					

CLIENT C107881 - Richard Crookes Construction	PROJECT NAME Detailed Site Investigation		
PROJECT NUMBER J160656	PROJECT LOCATION 34-38 Schofields Road, Schofields NSW		
DATE STARTED 10/12/18	COMPLETED 10/12/18	R.L. SURFACE	DATUM
EXCAVATION CONTRACTOR	SLOPE ---	BEARING ---	
EQUIPMENT Manual	TEST PIT LOCATION Proposed Lot 1 of site		
TEST PIT SIZE	LOGGED BY MB	CHECKED BY GB	

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
						NATURAL: Brown silty clay with rootlets		No olfactory evidence of contamination
						NATURAL: Red, stiff clay		
							TP25A(0.2-0.3)	
						Borehole TP25A terminated at 0.3m (Target depth reached)		
			0.5					
			1.0					
			1.5					

TEST PIT NUMBER TP26A



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CLIENT C107881 - Richard Crookes Construction	PROJECT NAME Detailed Site Investigation
PROJECT NUMBER J160656	PROJECT LOCATION 34-38 Schofields Road, Schofields NSW
DATE STARTED 10/12/18	COMPLETED 10/12/18
EXCAVATION CONTRACTOR	R.L. SURFACE
EQUIPMENT Manual	DATUM
TEST PIT SIZE	SLOPE ---
	BEARING ---
	TEST PIT LOCATION Proposed Lot 1 of site
	LOGGED BY MB
	CHECKED BY GB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
						NATURAL: Brown silty clay with rootlets		No olfactory evidence of contamination
						NATURAL: Red/brown, stiff clay		
							TP26A(0.1-0.3)	
						Borehole TP26A terminated at 0.3m (Target depth reached)		
			0.5					
			1.0					
			1.5					

CLIENT <u>C107881 - Richard Crookes Construction</u>	PROJECT NAME <u>Detailed Site Investigation</u>
PROJECT NUMBER <u>J160656</u>	PROJECT LOCATION <u>34-38 Schofields Road, Schofields NSW</u>
DATE STARTED <u>10/12/18</u> COMPLETED <u>10/12/18</u>	R.L. SURFACE _____ DATUM _____
EXCAVATION CONTRACTOR _____	SLOPE <u>---</u> BEARING <u>---</u>
EQUIPMENT <u>Manual</u>	TEST PIT LOCATION <u>Proposed Lot 1 of site</u>
TEST PIT SIZE _____	LOGGED BY <u>MB</u> CHECKED BY <u>GB</u>

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
						NATURAL: Brown silty clay with rootlets		No olfactory evidence of contamination
						NATURAL: Red/brown, stiff clay		
							TP27A(0.2-0.3)	
						Borehole TP27A terminated at 0.3m (Target depth reached)		

BOREHOLE / TEST PIT J160656 - SCHOFIELDS DSI (TEST PITTING 2ND VISIT TP25-35).GPJ TESTING TEMPLATE.GDT 23/1/19



CLIENT C107881 - Richard Crookes Construction

PROJECT NAME Detailed Site Investigation

PROJECT NUMBER J160656

PROJECT LOCATION 34-38 Schofields Road, Schofields NSW

DATE STARTED 10/12/18

COMPLETED 10/12/18

R.L. SURFACE

DATUM

EXCAVATION CONTRACTOR

SLOPE ---

BEARING ---

EQUIPMENT Manual

TEST PIT LOCATION Proposed Lot 1 of site

TEST PIT SIZE

LOGGED BY MB

CHECKED BY GB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
						NATURAL: Brown, firm gravelly clay-silt. Gravel is shale: 1-3cm diameter, flat (15%)		No olfactory evidence of contamination
							TP28A(0.2-0.4)	
			0.5			Borehole TP28A terminated at 0.4m (Target depth reached)		
			1.0					
			1.5					

CLIENT C107881 - Richard Crookes Construction

PROJECT NAME Detailed Site Investigation

PROJECT NUMBER J160656

PROJECT LOCATION 34-38 Schofields Road, Schofields NSW

DATE STARTED 10/12/18

COMPLETED 10/12/18

R.L. SURFACE

DATUM

EXCAVATION CONTRACTOR

SLOPE ---

BEARING ---

EQUIPMENT Manual

TEST PIT LOCATION Proposed Lot 1 of site

TEST PIT SIZE

LOGGED BY MB

CHECKED BY GB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
						NATURAL: Red and grey stiff clay		No olfactory evidence of contamination
							TP29A(0.15-0.3)	
						Borehole TP29A terminated at 0.3m (Target depth reached)		
			0.5					
			1.0					
			1.5					

CLIENT <u>C107881 - Richard Crookes Construction</u>	PROJECT NAME <u>Detailed Site Investigation</u>
PROJECT NUMBER <u>J160656</u>	PROJECT LOCATION <u>34-38 Schofields Road, Schofields NSW</u>
DATE STARTED <u>10/12/18</u> COMPLETED <u>10/12/18</u>	R.L. SURFACE _____ DATUM _____
EXCAVATION CONTRACTOR _____	SLOPE <u>---</u> BEARING <u>---</u>
EQUIPMENT <u>Manual</u>	TEST PIT LOCATION <u>Proposed Lot 1 of site</u>
TEST PIT SIZE _____	LOGGED BY <u>MB</u> CHECKED BY <u>GB</u>

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
						NATURAL: Brown silty clay with rootlets		No olfactory evidence of contamination
						NATURAL: Brown/red, stiff clay		
							TP30A(0.2-0.3)	
						Borehole TP30A terminated at 0.3m (Target depth reached)		

BOREHOLE / TEST PIT J160656 - SCHOFIELDS DSI (TEST PITTING 2ND VISIT TP25-35).GPJ TESTING TEMPLATE.GDT 23/1/19

TEST PIT NUMBER TP31A



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CLIENT C107881 - Richard Crookes Construction	PROJECT NAME Detailed Site Investigation
PROJECT NUMBER J160656	PROJECT LOCATION 34-38 Schofields Road, Schofields NSW
DATE STARTED 10/12/18	COMPLETED 10/12/18
EXCAVATION CONTRACTOR	R.L. SURFACE
EQUIPMENT Manual	DATUM
TEST PIT SIZE	SLOPE ---
	BEARING ---
	TEST PIT LOCATION Proposed Lot 1 of site
	LOGGED BY MB
	CHECKED BY GB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
						NATURAL: Brown-red stiff clay		No olfactory evidence of contamination
							TP31A(0.1-0.2)	
						Borehole TP31A terminated at 0.3m (Target depth reached)		
			0.5					
			1.0					
			1.5					

TEST PIT NUMBER TP32A



PAGE 1 OF 1

CLIENT C107881 - Richard Crookes Construction	PROJECT NAME Detailed Site Investigation
PROJECT NUMBER J160656	PROJECT LOCATION 34-38 Schofields Road, Schofields NSW
DATE STARTED 10/12/18	COMPLETED 10/12/18
R.L. SURFACE	DATUM
EXCAVATION CONTRACTOR	SLOPE --- BEARING ---
EQUIPMENT Manual	TEST PIT LOCATION Proposed Lot 1 of site
TEST PIT SIZE	LOGGED BY MB CHECKED BY GB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
						NATURAL: Red stuff clay		No olfactory evidence of contamination
							TP32A(0.2-0.3)	
						Borehole TP32A terminated at 0.3m (Target depth reached)		
			0.5					
			1.0					
			1.5					

BOREHOLE / TEST PIT J160656 - SCHOFIELDS DSI (TEST PITTING 2ND VISIT TP25-35).GPJ TESTING TEMPLATE.GDT 23/1/19

TEST PIT NUMBER TP33A



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CLIENT C107881 - Richard Crookes Construction	PROJECT NAME Detailed Site Investigation
PROJECT NUMBER J160656	PROJECT LOCATION 34-38 Schofields Road, Schofields NSW
DATE STARTED 10/12/18	COMPLETED 10/12/18
R.L. SURFACE	DATUM
EXCAVATION CONTRACTOR	SLOPE --- BEARING ---
EQUIPMENT Manual	TEST PIT LOCATION Proposed Lot 1 of site
TEST PIT SIZE	LOGGED BY MB CHECKED BY GB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
						NATURAL: Brown firm, silty clay with rootlets		No olfactory evidence of contamination
						NATURAL: Red/brown stiff clay		
							TP33A(0.2-0.25)	
						Borehole TP33A terminated at 0.3m (Target depth reached)		

BOREHOLE / TEST PIT J160656 - SCHOFIELDS DSI (TEST PITTING 2ND VISIT TP25-35).GPJ TESTING TEMPLATE.GDT 23/1/19

TEST PIT NUMBER TP34A



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CLIENT C107881 - Richard Crookes Construction	PROJECT NAME Detailed Site Investigation
PROJECT NUMBER J160656	PROJECT LOCATION 34-38 Schofields Road, Schofields NSW
DATE STARTED 10/12/18	COMPLETED 10/12/18
EXCAVATION CONTRACTOR	R.L. SURFACE
EQUIPMENT Manual	DATUM
TEST PIT SIZE	SLOPE ---
	BEARING ---
	TEST PIT LOCATION Proposed Lot 1 of site
	LOGGED BY MB
	CHECKED BY GB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
						NATURAL: Red stiff clay		No olfactory evidence of contamination
							TP34A(0.1-0.2) & Field Duplicate Sample FD2A	
						Borehole TP34A terminated at 0.3m (Target depth reached)		
			0.5					
			1.0					
			1.5					

TEST PIT NUMBER TP35A



CLIENT C107881 - Richard Crookes Construction

PROJECT NAME Detailed Site Investigation

PROJECT NUMBER J160656

PROJECT LOCATION 34-38 Schofields Road, Schofields NSW

DATE STARTED 10/12/18

COMPLETED 10/12/18

R.L. SURFACE

DATUM

EXCAVATION CONTRACTOR

SLOPE ---

BEARING ---

EQUIPMENT Manual

TEST PIT LOCATION Proposed Lot 1 of site

TEST PIT SIZE

LOGGED BY MB

CHECKED BY GB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
						NATURAL: Brown firm silty clay with rootlets		No olfactory evidence of contamination
						NATURAL: Red stiff clay with yellow/brown mottling		
							TP35A(0.15-0.25)	
						Borehole TP35A terminated at 0.3m (Target depth reached)		
			0.5					
			1.0					
			1.5					

CLIENT C107881 **PROJECT NAME** Richard Crookes Constructions Pty Ltd
PROJECT NUMBER J163171 **PROJECT LOCATION** 34-38 Schofields Road, Schofields NSW 2762

DATE STARTED 26/7/19 **COMPLETED** 26/7/19 **R.L. SURFACE** _____ **DATUM** _____
DRILLING CONTRACTOR Richard Crookes **SLOPE** 90° **BEARING** ---
EQUIPMENT Excavator **HOLE LOCATION** _____
HOLE SIZE - **LOGGED BY** JG **CHECKED BY** MB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
E	None Observed		0.5			Reworked Natural: Grey/orange silty CLAY, loose, low plasticity, with rootlets and minor subangular sandstone fragments (diameter 1cm, 2%) Natural: Red CLAY, firm, medium plasticity, with orange mottling	ATP1 (0.0-0.1)	No olfactory evidence of contamination observed Moisture: M
			1.0			Grades to orange/grey CLAY, firm, medium plasticity		
			1.5					
			2.0					
			2.5			Borehole ATP1 terminated at 0.8m (Target depth reached)		

CLIENT C107881 **PROJECT NAME** Richard Crookes Constructions Pty Ltd
PROJECT NUMBER J163171 **PROJECT LOCATION** 34-38 Schofields Road, Schofields NSW 2762

DATE STARTED 26/7/19 **COMPLETED** 26/7/19 **R.L. SURFACE** _____ **DATUM** _____
DRILLING CONTRACTOR Richard Crookes **SLOPE** 90° **BEARING** ---
EQUIPMENT Excavator **HOLE LOCATION** _____
HOLE SIZE - **LOGGED BY** JG **CHECKED BY** MB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
E	None Observed					Reworked Natural: Grey/orange silty CLAY, loose, low plasticity, with minor subangular sandstone fragments (diameter 1cm, 2%) Natural: Dark brown silty SAND topsoil Natural: Red CLAY, firm, medium plasticity, with orange mottling	ATP2 (0.2-0.25)	No olfactory evidence of contamination observed Moisture: M
			0.5			Borehole ATP2 terminated at 0.6m (Target depth reached)		
			1.0					
			1.5					
			2.0					
			2.5					

CLIENT C107881 **PROJECT NAME** Richard Crookes Constructions Pty Ltd
PROJECT NUMBER J163171 **PROJECT LOCATION** 34-38 Schofields Road, Schofields NSW 2762

DATE STARTED 26/7/19 **COMPLETED** 26/7/19 **R.L. SURFACE** **DATUM**
DRILLING CONTRACTOR Richard Crookes **SLOPE** 90° **BEARING** ---
EQUIPMENT Excavator **HOLE LOCATION**
HOLE SIZE - **LOGGED BY** JG **CHECKED BY** MB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
E	None Observed					Reworked Natural/Fill: Dark and light brown silty CLAY, loose, low plasticity		No olfactory evidence of contamination observed
						Natural: Red CLAY, firm, medium plasticity, with orange mottling	ATP3 (0.15-0.25)	Moisture: M
			0.5			Borehole ATP3 terminated at 0.5m (Target depth reached)		
			1.0					
			1.5					
			2.0					
			2.5					

CLIENT C107881 **PROJECT NAME** Richard Crookes Constructions Pty Ltd
PROJECT NUMBER J163171 **PROJECT LOCATION** 34-38 Schofields Road, Schofields NSW 2762

DATE STARTED 26/7/19 **COMPLETED** 26/7/19 **R.L. SURFACE** _____ **DATUM** _____
DRILLING CONTRACTOR Richard Crookes **SLOPE** 90° **BEARING** ---
EQUIPMENT Excavator **HOLE LOCATION** _____
HOLE SIZE - **LOGGED BY** JG **CHECKED BY** MB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
E	None Observed					Reworked Natural: Light brown silty CLAY, loose, low plasticity Natural: Red CLAY, firm, medium plasticity		No olfactory evidence of contamination observed
			0.5			Borehole ATP4 terminated at 0.4m (Target depth reached)		
			1.0					
			1.5					
			2.0					
			2.5					

CLIENT C107881 **PROJECT NAME** Richard Crookes Constructions Pty Ltd
PROJECT NUMBER J163171 **PROJECT LOCATION** 34-38 Schofields Road, Schofields NSW 2762

DATE STARTED 26/7/19 **COMPLETED** 26/7/19 **R.L. SURFACE** _____ **DATUM** _____
DRILLING CONTRACTOR Richard Crookes **SLOPE** 90° **BEARING** ---
EQUIPMENT Excavator **HOLE LOCATION** _____
HOLE SIZE - **LOGGED BY** JG **CHECKED BY** MB

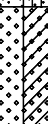
NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
E	None Observed					Reworked Natural: Light brown silty CLAY, loose, low plasticity		No olfactory evidence of contamination observed
						Natural: Red CLAY, firm, medium plasticity	ATP5 (0.1-0.15)	Moisture: M
			0.5			Borehole ATP5 terminated at 0.4m (Target depth reached)		
			1.0					
			1.5					
			2.0					
			2.5					

CLIENT C107881 **PROJECT NAME** Richard Crookes Constructions Pty Ltd
PROJECT NUMBER J163171 **PROJECT LOCATION** 34-38 Schofields Road, Schofields NSW 2762

DATE STARTED 26/7/19 **COMPLETED** 26/7/19 **R.L. SURFACE** **DATUM**
DRILLING CONTRACTOR Richard Crookes **SLOPE** 90° **BEARING** ---
EQUIPMENT Excavator **HOLE LOCATION**
HOLE SIZE - **LOGGED BY** JG **CHECKED BY** MB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
E	None Observed		0.5			Reworked Natural: Light brown silty CLAY, loose, low plasticity with orange clay inclusions	ATP6 (0.0-0.1)	No olfactory evidence of contamination observed Moisture: M
						Natural: Red CLAY, firm, medium plasticity		
			1.0			Borehole ATP6 terminated at 0.8m (Target depth reached)		
			1.5					
			2.0					
			2.5					

CLIENT C107881 **PROJECT NAME** Richard Crookes Constructions Pty Ltd
PROJECT NUMBER J163171 **PROJECT LOCATION** 34-38 Schofields Road, Schofields NSW 2762

DATE STARTED 26/7/19 **COMPLETED** 26/7/19 **R.L. SURFACE** _____ **DATUM** _____
DRILLING CONTRACTOR Richard Crookes **SLOPE** 90° **BEARING** ---
EQUIPMENT Excavator **HOLE LOCATION** _____
HOLE SIZE - **LOGGED BY** JG **CHECKED BY** MB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
E	None Observed		0.5			Reworked Natural: Grey/orange silty CLAY, loose, low plasticity	ATP7 (0.1-0.2)	No olfactory evidence of contamination observed
						Natural: Dark brown silty SAND topsoil		Moisture: M
						Natural: Red CLAY, firm, medium plasticity		
						Borehole ATP7 terminated at 0.65m (Target depth reached)	ATP7 (0.6-0.7)	Moisture: M
			1.0					
			1.5					
			2.0					
			2.5					

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DRILLING CONTRACTOR Richard Crookes **SLOPE** 90° **BEARING** ---
EQUIPMENT Excavator **HOLE LOCATION**
HOLE SIZE - **LOGGED BY** JG **CHECKED BY** MB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
E						Reworked Natural: Grey/orange silty CLAY, loose, low plasticity		No olfactory evidence of contamination observed
			0.5				ATP8 (0.5-0.6)	Moisture: M
			1.0					
			1.5			Natural: Dark brown silty SAND topsoil		
						Natural: Red CLAY, firm, medium plasticity, with orange mottling		
			2.0				ATP8 (1.9-2.0)	Moisture: M
						Borehole ATP8 terminated at 2.1m (Target depth reached)		
			2.5					

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DATE STARTED 26/7/19 **COMPLETED** 26/7/19 **R.L. SURFACE** **DATUM**
DRILLING CONTRACTOR Richard Crookes **SLOPE** 90° **BEARING** ---
EQUIPMENT Excavator **HOLE LOCATION**
HOLE SIZE - **LOGGED BY** JG **CHECKED BY** MB

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Material Description	Samples Tests Remarks	Additional Observations
E	None Observed		0.5			Reworked Natural: Grey/orange silty CLAY, loose, low plasticity		No olfactory evidence of contamination observed
			1.0			Natural: Dark brown silty SAND topsoil		
			1.5			Natural: Red CLAY, firm, medium plasticity, with orange mottling		
			2.0			Natural: Light orange CLAY, firm, medium plasticity, with grey mottling		
			2.5			Borehole ATP9 terminated at 2m (Target depth reached)		



Appendix E QA/QC Summary



Table E1. Sampling and Analysis Plan Methodology

Sampling Item	EPA Guidelines	Greencap (14 August 2019) DSI	Auditor Comment
Data Quality Objectives (DQOs)	"Data Quality Objectives: Outline of the DQO Process" in Schedule B2 of NEPM (2013).	The 7 step DQOs for investigation, as summarised in Section 2 in Appendix G by Greencap (2019), are as follows: • Step 1: There may be a potential for human health and environmental risk associated with the surface soils at the site. • Step 2: Decisions are: is site suitable? Sufficient data to inform the need for further investigations and remedial actions (if required). • Step 3: Inputs are laboratory data; field observations / measurements; assessment criteria. • Step 4: Boundaries are site; vertical boundary restricted to up 1m of surface soils. • Step 5: Decision rules are meeting adopted site criteria; if systematic or judgmental samples fail these decision rules, then further assessment or remediation will be required • Step 6: Decision error limits based on AS4482.1-1995 for number of samples to make a decision. • Step 7: Design for optimising data collection by sampling as per SAQP.	The Auditor considers the DQOs to be appropriate for the purposes of this SAR
Sampling Pattern Rationale	The EPA (1995) Sampling Design Guidelines (Section 2.3) provides details on judgmental, random, systematic and stratified sampling pattern.	Section 8 states that 35 locations were selected in a grid pattern to ensure adequate site coverage.	The Auditor considers the sampling pattern to be appropriate for the purposes of this SAR.
Sampling Density Rationale:	EPA (1995) Sampling Design Guidelines	Section 8 states that 35 investigation locations were required for a site area of 2.5Ha as stated in NSW EPA (1995). Further to the above, Greencap's response to IA01 (14 August 2019) states that 'although this included analysis of two samples from the same test pit and no soil samples analysed for the full suite of chemical analytes for TP16, TP20 and TP22, absence of chemical data at TP16, TP20, and TP22 is not considered a data gap due to the following lines of evidence: • TP16 and TP22 - natural soil profile, no fill material was encountered, PID did not indicate potential HC [hydrocarbon] contamination. • TP20 - no visual or olfactory evidence of contamination was noted, PID did not indicate potential HC contamination. • An additional field investigation has been undertaken on 26 July 2019 and samples were collected from stockpiled topsoil and fill	Whilst noting that the final sampling density did not meet NSW EPA (1995) minimum sampling density, the Auditor generally concurs with the justifications provided by Greencap and considers the sampling density rationale to be appropriate for the CSM and objectives of the audit. The Auditor also notes that the site was predominantly used as rural land in the past and that no visual and/or olfactory signs of contamination were observed in the 35 test pits excavated as part of the DSI.



Sampling Item	EPA Guidelines	Greencap (14 August 2019) DSI	Auditor Comment
		materials for waste classification purposes (inc. SPA and SPB). This provides additional confidence for the chemical status of the soils originated from the site.	
Locations Shown on Site Plan:	The OEH (2011) Guidelines for Consultants reporting on Contaminated Sites requires that sampling locations are shown on a site plan.	The locations are shown on Greencap figures in Appendix 3.	The Auditor considers this requirement to have been met.
Sampling Depths	The OEH (2011) Guidelines for Consultants Reporting on Contaminated Sites requires information on the depths of samples that were collected. NEPM (2013) Schedule B2.	Sample depths are recorded in borehole logs.	The Auditor considers the sampling depths to be appropriate for the objectives of the audit.
Selection of Samples for Analysis:	The OEH (2011) Guidelines for Consultants Reporting on Contaminated Sites. NEPM (2013) Schedule B2	Section 7 states that surface samples were collected and analysed. In response to IA01, Greencap (14 August 2019) provides the following justifications: • Aerial photographs do not indicate intense agricultural activity on site. The majority of the site is noted as greenfield with virgin soils. 5 samples collected were tested for OCP and OPP to close out these contaminants of potential concern. The results of the analysis on these samples were all non-detect. Furthermore, recent waste classification results also indicated non-detect for OCP and OPP. Therefore, there are multiple lines of evidence to conclude the OCP and OPP contamination risk on site is low (no further investigation required). • Allowance for PAH analysis is made for cases (if encountered) where ash, tar or similar inclusions are observed within fill material. Site soils did not contain these inclusions, therefore PAH was scheduled for a number of fill samples for general coverage. Minor bitumen inclusion was noted in TP1 (0.1-0.2), which returned non detect for PAH. Based on these, Greencap deems, the existing lines of evidence is sufficient to conclude PAH contamination on site is low. This is also supported by the recent waste classification testing. • Greencap field consultants were on site with the necessary sieve equipment (7x7 mm sieve and scale). As test pitting exercise did not	The Auditor accepts Greencap's discussion on the selection of samples for analysis and methods adopted, and that samples provided adequate site characterisation to assess soil conditions.



Sampling Item	EPA Guidelines	Greencap (14 August 2019) DSI	Auditor Comment
		reveal any ACM fragments on site, quantitative test was not undertaken. Sieve testing has been undertaken in the scope of the recent waste classification sampling and no ACM was observed. AF/AF testing was also conducted for the fill material stockpiled onsite where friable asbestos was also noted recorded.	
Sample Splitting Techniques and Statement of QA/QC Sample Frequencies	NEPM (2013) Schedule B3 EPA (2017) Contaminated Land Management Guidelines for the NSW Site Auditor Scheme OEH (2011) Guidelines for Consultants Reporting on Contaminated Sites	Section 3.2 in Appendix G states that 'duplicate samples were split from the primary samples on the field at the same time and sampling location. These samples were collected by taking a larger than normal quantity of soil from the sampling point, removed from the ground in a single action. This was then placed into a sterile plastic sample bag to allow the sample to be mixed as thoroughly as practicable, then divided into two replicate samples by transferring the soil to two laboratory-supplied sample containers of appropriate composition'. Section 3.2 in Appendix G states that 'at least 5 percent of samples (1 in 20) per day of sampling from a site are collected in duplicate. It is noted that 3 duplicate samples and 1 triplicate sample were analysed as part of this investigation.	The Auditor considers the sample spitting techniques to be appropriate. The Auditor notes that 1 triplicate sample was analysed for this investigation (but not collected onsite), which is below the NEPM requirement (1 duplicate and 1 triplicate samples per 20 primary samples). However, the Auditor notes that this minor discrepancy does not materially affect the outcome of this SAR.
Analytical Methods:	EPA (2017) Contaminated Land Management Guidelines for the NSW Site Auditor Scheme	Section 3.12.2 in Appendix G states that 'samples were delivered to NATA accredited laboratories (Eurofins and Envirolab) under a completed Chain of Custody (CoC)'.	The Auditor considers the analytical methods to be appropriate for the purposes of this SAR.
Sample Container Selection:	NEPM (2013) Schedule B2 and B3	Section 3.12.2 in Appendix G states that 'all sampling implements were cleaned between sampling locations, and gloves changed between sampling locations. Once collected, the samples were immediately transferred to laboratory-supplied airtight sample containers of appropriate composition. These containers were then promptly stored on ice, to prevent the loss of potential volatile components and transported to a NATA accredited laboratory'.	The Auditor considers the sample container selection to be appropriate for the purposes of this SAR.
Sampling Devices / Techniques	NEPM (2013) Schedule B2 and B3 DEC (2007) Groundwater Guidelines	Section 3.12.2 in Appendix G states that 'test pits were advanced by an excavator, allowing for sample collection using a decontaminated trowel. Fresh nitrile gloves were used when handling samples'.	The Auditor considers the sampling devices / techniques to be appropriate for the purposes of this SAR.
Decontamination Procedures:	Australian Standard AS4482.1 – 2005	Section 3.12.2 in Appendix G states that 'all manual sampling implements were thoroughly decontaminated between sampling locations, and nitrile gloves changed between each sampling location. Manual sampling implements were decontaminated by removing soil adhering to the sampling equipment by scraping, brushing or	The Auditor considers the decontamination procedures to be appropriate for the purposes of this SAR.



Sampling Item	EPA Guidelines	Greencap (14 August 2019) DSI	Auditor Comment
	NEPM (2013) Schedule B2 and B3	wiping with disposable towels, thoroughly cleaning with isopropyl alcohol wipes and air-dried'.	
Sample Handling and Preservation Procedures:	NEPM (2013) Schedule B3 AS4482.1 and AS 4482.2	Section 3.12.2 in Appendix G states that 'all sampling implements were cleaned between sampling locations, and gloves changed between sampling locations. Once collected, the samples were immediately transferred to laboratory-supplied airtight sample containers of appropriate composition. These containers were then promptly stored on ice, to prevent the loss of potential volatile components and transported to a NATA accredited laboratory'.	The Auditor considers these procedures to be appropriate for the purposes of this SAR.
Field Calibration and Screening Protocols	NEPM (2013) B2	Section 4 states that soil samples were field screened with a PID. A calibration certificate was provided in an email dated 6 August 2019.	The Auditor considers field calibration and screening protocols to be appropriate for the purposes of this SAR.
Groundwater Monitoring Well Installation	NEPM (2013) Schedule B2 DEC (2007)	Not conducted	-
Groundwater Monitoring Well Development & Sampling	NEPM (2013) Schedule B2 DEC (2007) AS5667.11 (1998)	Not conducted	-



Table E2. Quality Assessment and Quality Control Summary

Requirement	DQI	Greencap (14 August 2019) DSI	Auditor Comment
Completeness		DQI Range	
Appropriate field sampling, sample documentation & description	AS4482.2 (1997) Parts 1&2	All samples comply	The Auditor considers this requirement to have been met.
Records detailing samples & conditions	Recorded on Borehole logs	All sample records provided	The Auditor considers this requirement to have been met.
All critical samples analysed for COCs and compared to criteria	All Samples.	The following observations have been made: • Whilst noting that 35 test pits were excavated during investigation works, only 32 soil samples were analysed as part of the analytical program (no soil samples being analysed from TP16, TP20 and TP22). • It is noted that all not fill samples were analysed for PAHs. • It is noted that 5 samples were analysed for OCP, OPP and PCB. • It is noted that all not fill samples were analysed for asbestos and some natural soils were selected for asbestos analysis. In Response to IA01, Greencap (14 August 2019) provides the following justifications: • Aerial photographs do not indicate intense agricultural activity on site. The majority of the site is noted as greenfield with virgin soils. 5 samples collected were tested for OCP and OPP to close out these contaminants of potential concern. The results of the analysis on these samples were all non-detect. Furthermore, recent waste classification results also indicated non-detect for OCP and OPP. Therefore, there are multiple lines of evidence to conclude the OCP and OPP contamination risk on site is low (no further investigation required). • Allowance for PAH analysis is made for cases (if encountered) where ash, tar or similar inclusions are observed within fill material. Site soils did not contain these inclusions, therefore PAH was scheduled for a number of fill samples for general coverage. Minor bitumen inclusion was noted in TP1 (0.1-0.2), which returned non detect for PAH. Based on these, Greencap deems, the existing lines of evidence is sufficient to conclude PAH contamination on site is low. This is	The Auditor generally concurs with justifications provided by Greencap and considers this requirement to have been met.



Requirement	DQI	Greencap (14 August 2019) DSI	Auditor Comment
		also supported by the recent waste classification testing. • Greencap field consultants were on site with the necessary sieve equipment (7x7 mm sieve and scale). As test pitting exercise did not reveal any ACM fragments on site, quantitative test was not undertaken. Sieve testing has been undertaken in the scope of the recent waste classification sampling and no ACM was observed.	
Comparability			
Experienced sampling team followed SAQP/SOP	Comment made in report	Appendix G, Section 3.7 noted that sampling was undertaken by trained Greencap field team using Greencap's standard operating procedures.	The Auditor considers this requirement to have been met.
Climatic Conditions Recorded & Discussed	Recorded on Borehole logs or in Report	None provided	The absence of this information does not affect the outcome of this SAR.
Primary Laboratory	NATA Accredited to 17025	Eurofins (NATA 1261)	The Auditor considers this requirement to have been met.
Secondary Laboratory	NATA Accredited to 17025	Not conducted. Greencap response to IA01 (14 August 2019) that the triplicate sample was collected from an offsite location. No triplicate samples were available for this DSI.	Given soil contamination was not detected during the DSI, this discrepancy does not materially affect the outcome of this SAR.
Appropriate Analytical Methods	NEPM	All NEPM, except asbestos	Generally acceptable, noting that asbestos was not observed during DSI and additional works in the western portion of the site after discovery of unexpected finds. Confirmatory ACM and FA/AF samples collected during waste classification works on the foreign material stockpiles did not detect asbestos (which was conducted in accordance with NEPM 2013 quantitative method).
LOR, PQL Appropriate & Consistent	LOR<criteria	LOR< criteria, except asbestos	As above
Representativeness			
Sample Handling Appropriate & Received by Lab in Good Condition under correct Preservation Conditions	Compliant SRN	Yes	Acceptable



Requirement	DQI	Greencap (14 August 2019) DSI	Auditor Comment
Field Screening Method Calibration	Field Instrumentation calibrated in accordance with manufacturer's instruction	Section 4 states that soil samples were field screened with a PID. Calibration certificate was provided in an email dated 6 August 2019.	Acceptable
Primary Lab Holding Times	All samples comply with NEPM (2013)	Laboratory transcripts in Appendix F note that all holding times achieved.	The Auditor considers this requirement to have been met.
Secondary Lab Holding Times	All samples comply with NEPM (2013)	Not conducted	-
Trip Spike	(per sampling event) 70-130%R	Not conducted	Given volatile compound is not a main COPC for the site, this discrepancy does not materially affect the outcome of this SAR.
Trip Blank	70-130%R	Not conducted	Given soil contamination was not detected during the DSI, this discrepancy does not materially affect the outcome of this SAR.
Rinsate Blank	(per sampling event)	Not conducted	Given nitrile gloves were used during sampling and changed between samples, this discrepancy does not materially affect the outcome of this SAR.
Precision			
Primary Lab Duplicates (D)	(1/20 sample batch)	0 - 18%RPD	The Auditor considers this requirement to have been met.
Field Duplicate Samples by Primary (intra-laboratory duplicates)	<5xPQL = any %RPD	0 - 50 %RPD	The Auditor considers this requirement to have been met.
Field Duplicate Samples by Secondary (intra-laboratory duplicates)	>5xPQL = <50% RPD	0 - 61 %RPD	The Auditor considers this requirement to have been met.
Accuracy			
Primary Lab Matrix Spikes (MS)	(1/20 sample batch) 70-130%R Soil	70 - 148 %R Lead 135% and Zinc 145% recoveries, sample S18-No24381 in Lab transcript 628453-S-V2	The Auditor considers this requirement to have been met. The two exceedances are not considered to affect the datasets quality.
Primary Lab Surrogate Spikes (S)	(1/20 sample batch) 70-130%R Soil	53 - 112 %R	The Auditor considers this requirement to have been met.



Requirement	DQI	Greencap (14 August 2019) DSI	Auditor Comment
Primary Lab Control Spikes (LCS)	(1/20 sample batch) 70-130%R Soil	71 – 120 %R	The Auditor considers this requirement to have been met.
Primary Lab Method Blanks (MB)	<LOR	<LOR	The Auditor considers this requirement to have been met.
Secondary Laboratory QA/QC Data (Soil and Water)	0-100%R 70-130%R 70-140%R 70-140%R <LOR	Not conducted	-



Appendix F Waste Classification and Imported Fill Review

**Table F1: Waste Classification Review**

Waste Classification Document	Material Source and Description	Volume Specified	Sampling Density & Pattern	COPCs	Summary of Results	Waste Classification	Auditor's Assessment
Greencap 30 July 2019 Waste Classification for two stockpiles located at 34-38 Schofields Road, Schofields NSW 2762 C107881:J163171 JG	The waste classification was prepared for stockpiles SPA and SPB which were generated from the centre and north-western of the site and the north-western site boundary, respectively. Both stockpiles were in their original identified position during inspection and were concluded to have been dumped from an unknown source.	Approx. 30m3	6 stockpile samples	Heavy metals, TRH, PAHs, BTEX, asbestos	All concentrations meet CT1, with the exception of lead in 1 sample exceeding CT1 (SPA-1), but below SCC1 and TCLP1.	GSW	The Auditor considers the waste classification is appropriate.
Greencap 5 August 2019 Additional Waste Classification for two stockpiles (Incl. UFP & Bitumen Stockpiles) located at 34-38 Schofields Road, Schofields NSW 2762 C107881:J163171 JG	The waste classification was prepared for stockpiles SP3 and SP4 which were generated from the bitumen material removed from the eastern portion of the site and unexpected finds in the western portion of the site, respectively.	Approx. 23m3	6 stockpile samples	Heavy metals, TRH, PAHs, BTEX, asbestos	All concentrations meet CT1.	GSW	The Auditor considers the waste classification is appropriate.
Greencap 23 August 2019 ENM Report, 28 Farmland Drive Schofields NSW 2762 C107881 : JG	The ENM assessment was prepared for the scrapped topsoils (Stockpiles 1 and 2) generated from earthworks activities at the site.	Stockpile 1: approx. 1785m3 (2700 tonnes) Stockpile 2: 1150 tonnes (around 770m3)	Stockpile 1: 10 discreet and 10 composite samples as per ENM requirement. Stockpile 2: 3 discreet and 3 composite	Heavy metals, TRH, PAHs, BTEX, pH, EC and foreign material.	All concentrations from E1, E2, E4, E7, E8, E9 and E10 in Stockpile 1, meets Natural Material (ENM) Stockpile 2, consisting of E11 to E13, as well as the material from E3, E5 and E6 of Stockpile 1, meet CT1	Stockpile 1: ENM Stockpile 2: GSW	The Auditor considers the waste classification is appropriate. The material meets criteria for onsite reuse.



Waste Classification Document	Material Source and Description	Volume Specified	Sampling Density & Pattern	COPCs	Summary of Results	Waste Classification	Auditor's Assessment
			samples as per ENM requirement.				

Table F2: Offsite Disposal Works Review

Location / Source	Date	Estimated Volume	Actual Volume of Disposal	Waste Class	Transporter (PoEO Licence)	Final Destination (PoEO Licence)	Dockets Matching Disposal Volume?
SPA and SPB	1 August 2019	30m3	101.6 tonnes	GSW	Not provided	Hi-Quality Waste Management Pty Ltd (POEO licence 5857)	Yes
SP3 and SP4	12 August 2019	23m3	54.62 tonnes	GSW	Not provided	Hi-Quality Waste Management Pty Ltd (POEO licence 5857)	Yes

Table F3: Imported Materials Review

Location / Source	Date	Consultant	Volume	Waste Class	Carrier	Final Destination
Quarried Bedding Sand	Not provided	Boral	433.16 tonnes	VENM	Not provided	Site. Acceptable

