NSW Public Works - Government Architect's Office

Site Audit for Proposed Primary School

Burroway Road, Wentworth Point NSW

17 June 2015

In a
turbulent
world
we provide
clear thinking

This page has been left intentionally blank

Site Audit for Proposed Primary School

Prepared for
NSW Public Works - Government Architect's Office

Prepared by
Coffey Environments Australia Pty Ltd
Level 19, Tower B, 799 Pacific Highway
Chatswood NSW 2067 Australia
t: +61 2 9406 1206 f: +61 2 9406 1004
ABN: 65 140 765 902

Accredited Site Auditor	Dr Michael Dunbavan NSW EPA Accreditation No. 0804

17 June 2015

ENAURHOD01055AA-R01 SAR

Quality information

Revision history

Revision	Description	Date	Originator
Final	R01 Site Audit Report	17/06/2015	M Dunbavan

Distribution

Report Status	No. of copies	Format	Distributed to	Date
Final	1	PDF	NSW Public Works Michael Mossman & Peter Hogan	17/06/2015

Table of contents

Site Audit Statement NSW-0804-020

Tables

Appendices

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 31st October 2012. For more information about completing this form, go to Part IV.

PART I: Site audit identification

Site audit statement no. .....NSW-0804-020.....

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 .....Michael Dunbavan..... Company ...Coffey Environments Australia Pty Ltd

Address .....Level 19, Tower B, 799 Pacific Highway.....

.....Chatswood NSW..... Postcode ...2067.....

Phone .....02 9406 1206..... Fax .....02 9406 1002.....

Site details

Address .....Part of 3 Burroway Road.....

.....Wentworth Point NSW..... Postcode ...2127...

Property description *(attach a list if several properties are included in the site audit)*

.....*Part Lot 2 in DP 859608*.....

.....

.....

Local Government Area .....Auburn City Council.....

Area of site (e.g. hectares) ...1.460 hectares... Current zoning ...R4 High Density Residential.

To the best of my knowledge, the site ~~**is/**~~**is not*** the subject of a declaration, order, agreement, proposal or notice under the *Contaminated Land Management Act 1997* or the *Environmentally Hazardous Chemicals Act 1985.*

Declaration/Order/Agreement/Proposal/Notice* no(s)

.....

****Strike out as appropriate***

Site audit commissioned by

Name .....Michael Mossman..... Company ...NSW Public Works....

Address .....Government Architect's Office, Level 19, McKell Building.....

.....2-24 Rawson Place, Sydney NSW..... Postcode ...2000...

Phone .....02 9372 8396..... Fax .....02 9372 8399.....

Name and phone number of contact person (if different from above)

.....as above.....

Purpose of site audit

☐ ~~A. To determine land use suitability *(please specify intended use[s])*~~

.....

OR

☑ B(i) To determine the nature and extent of contamination, and/or

☑ B(ii) To determine the appropriateness of an **investigation/~~remedial action/management plan~~***, and/or

☑ B(iii) To determine if the land can be made suitable for a particular use or uses ~~by implementation of a specified **remedial action plan/management plan***~~ *(please specify intended use[s])*

.....*Primary School*.....

Information sources for site audit

Consultancy(ies) which conducted the site investigation(s) and/or remediation

.....GHD Pty Ltd (2009 to 2013) and Environmental Investigation Services (2014 and 2015)

Title(s) of report(s) reviewed .....

- Environmental Investigation Services: Report to NSW Public Works – Government Architects Office on Sampling, Analysis and Quality Plan for Proposed Primary School Development at Part of 3 Burroway Road, Wentworth Point, NSW (Part of Lot 2 in DP859608). Reference E27299Krpt-SAQP, dated 18 August 2014.
- Environmental Investigation Services: Report to NSW Public Works – Government Architects Office on Additional Detailed Environmental Site Assessment for Proposed Primary School Development at Part of 3 Burroway Road, Wentworth Point, NSW (Part of Lot 2 in DP859608). Reference E27299Krpt-SAQP, dated 22 May 2015.

Other information reviewed (including previous site audit reports and statements relating to the site) ...

- GHD: Report for Homebush Bay West Contamination Assessment, Preliminary Site Investigation. Revision 0, dated November 2009 (GHD 2009).
- AECOM Australia Pty Ltd: Geotechnical Assessment, Wentworth Point. Dated 28 November 2012 (AECOM 2012)
- GHD: Additional Contamination Assessment, Homebush Bay West, Stage 1 Area. Revision 2, dated November 2012 (GHD 2012).
- GHD: Report for Roads and Maritime Services, Wentworth Point, Homebush Bay West, Ground Gas Monitoring, Final, dated 22 March 2013 (GHD 2013a).

Strike out as appropriate

- GHD: Report for Roads and Maritime Services, Wentworth Point, Homebush Bay West, Ground Gas Monitoring, Rev. No. 1, dated 12 September 2013 (GHD 2013b).
- GHD: Report for Roads and Maritime Services, Wentworth Point, Homebush Bay West, Interim Site Management Plan, Rev. No. 5, dated 12 September 2013 (GHD 2013c).
- GHD: Report for Roads and Maritime Services, Wentworth Point Burroway Road Site, Homebush Bay West, Conceptual Remediation Action Plan, Rev. No. 2, dated 12 September 2013 (GHD 2013d).

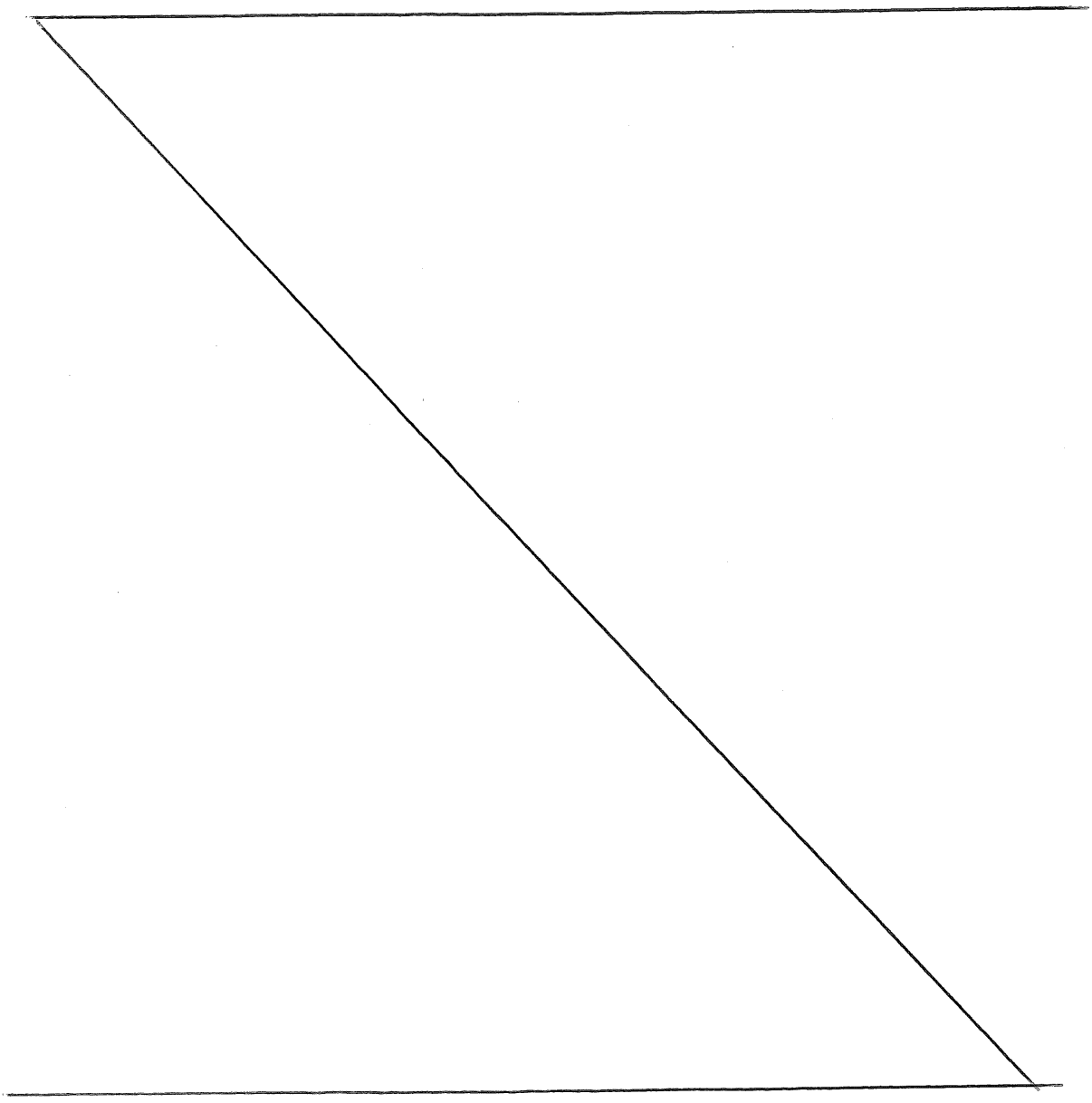
Site Audit Statement (No. 0503-0912, Andrew Lau) issued on 9 July 2010 relevant to the Stage 1 and Stage 2 areas on Wentworth Point (associated Site Audit Report was not available).....

.....

Site audit report

Title Site Audit Report for Proposed Primary School, Burroway Road, Wentworth Point NSW

Report no. ...ENAURHOD01055AA-R01.. Date .....17 June 2015.....



Strike out as appropriate

PART II: Auditor's findings

Please complete either Section A or Section B, **not** both. *(Strike out the irrelevant section.)*

Use Section A where site investigation and/or remediation has been completed and a conclusion can be drawn on the suitability of land use(s).

Use Section B where the audit is to determine the nature and extent of contamination and/or the appropriateness of an investigation or remedial action or management plan and/or whether the site can be made suitable for a specified land use or uses subject to the successful implementation of a remedial action or management plan.

~~Section A~~

❑ **I certify that, in my opinion, the site is SUITABLE for the following use(s)** *(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)* .....

subject to compliance with the following environmental management plan *(insert title, date and author of plan)* **in light of contamination remaining on the site:**

.....

.....

.....

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

.....

.....

.....

.....

Section B

Purpose of the plan[1] which is the subject of the audit … The purpose of this audit is to provide an independent expert opinion regarding contamination in the context of redevelopment of the site to provide a primary school and associated playing fields.

……

I certify that, in my opinion:

☑ **the nature and extent of the contamination HAS/~~HAS NOT~~* been appropriately determined**

AND/~~OR~~

☑ **the investigation/remedial action plan/management plan* IS/~~IS NOT~~* appropriate for the purpose stated above**

AND/~~OR~~

☑ **the site CAN BE MADE 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)*~~

  ……

~~if the site is remediated/managed* in accordance with the following remedial action plan/management plan* *(insert title, date and author of plan)~~

subject to compliance with the following condition(s):

1. The primary school approved for construction is consistent with the concept design which includes raising site surface levels by at least 0.5m through placement of construction fill, support of main school buildings on piled foundations and design and installation of gas protection measures as part of school buildings.
2. A Construction Environment Management Plan (CEMP) must be prepared and implemented prior to demolition. An Asbestos Management Plan (AMP) and an Unexpected Finds Procedure must be incorporated into the CEMP.
3. The stockpile of waste soil identified by EIS samples SP01, SP02 and SP03 must be disposed off-site to an appropriately licensed landfill.
4. Imported fill material used to raise the surface level across the site must be validated as consistent with future use of the site as a primary school.

---

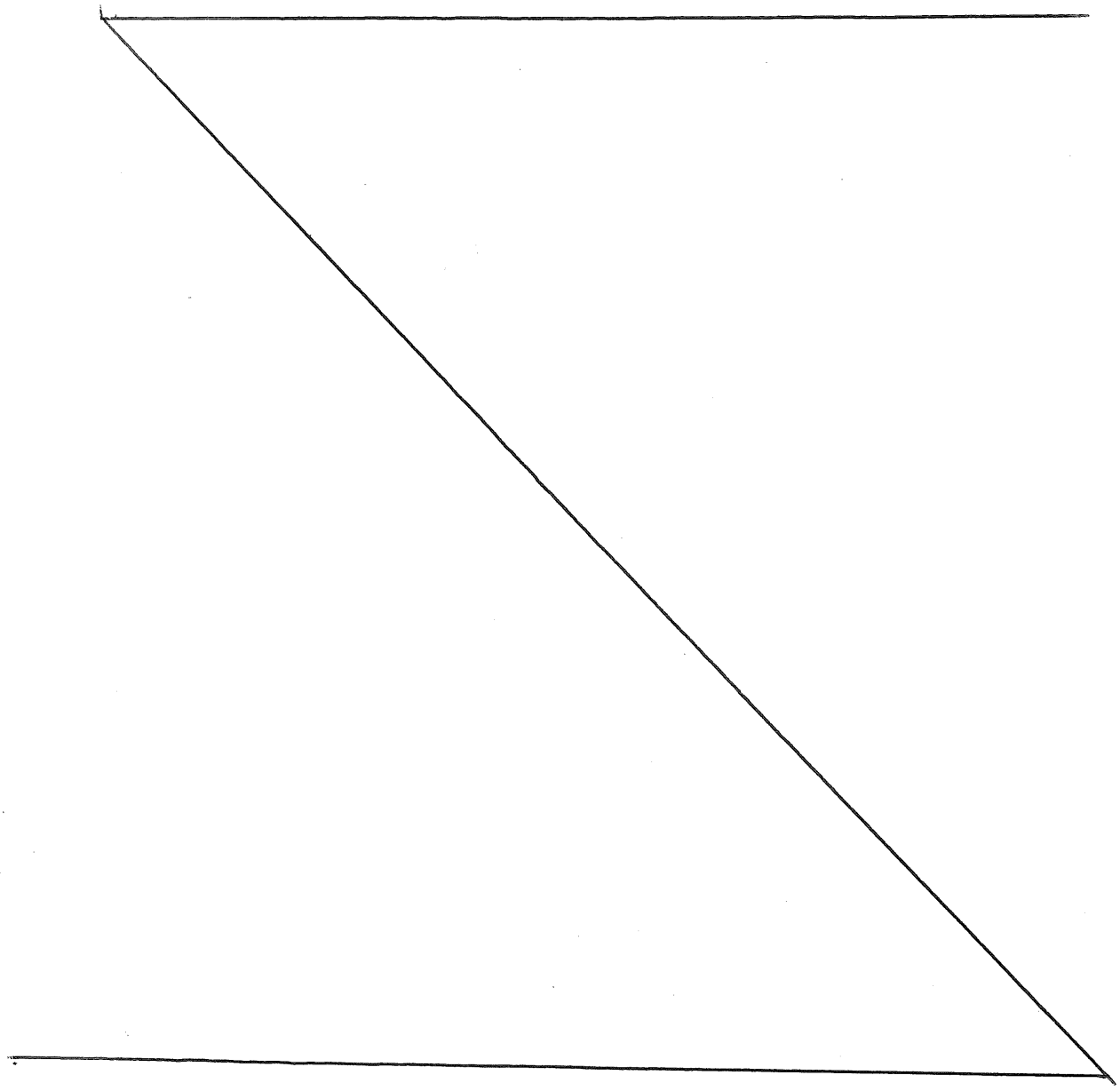
[1] For simplicity, this statement uses the term 'plan' to refer to both plans and reports.

5. Potential exposure pathways require on-going control and must be subject to a long-term Environmental Management Plan.
6. Prior to occupation of the Primary School, a Site Audit Statement must be issued regarding the suitability of the site for future use as a Primary School.

Overall comments

Thus, I consider that amendment of the remediation strategy to have no specific Remediation Action Plan for the school site is consistent with meeting the objectives of the GHD Conceptual RAP (GHD 2012d) for the Homebush Bay West area.

I consider that GHD's recommendation for placement of a geotextile marker layer "under the capping layer where hard surface is not built" is not warranted for the site, and would be a very costly item for no substantial reduction in health risk. Placement of a marker layer along a buried services corridor may be appropriate for more reliable management of excavated materials during maintenance or new installation



**** Strike out as appropriate***

PART III: Auditor's declaration

I am accredited as a site auditor by the NSW Environment Protection Authority under the *Contaminated Land Management Act 1997* **(Accreditation No. ...0804.....)**.

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 .....17/6/2015.....

Michael Dunbavan

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

The auditor is to complete either Section A or Section B of Part II, **not** both.

In **Section A** the auditor may conclude that the land is *suitable* for a specified use(s) 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 remediation or investigation of the site was needed to render the site fit for the specified use(s). Any **condition** imposed should be limited to implementation of an environmental management plan to help ensure the site remains safe for the specified use(s). The plan should be legally enforceable: for example a requirement of a notice under the *Contaminated Land Management Act 1997* (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*.

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.

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 whether land can be made suitable for a particular land use or uses upon implementation of a remedial action or management 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.

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.

In **Part III** the auditor certifies his/her 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:

EPA (NSW)
Contaminated Sites Section
PO Box A290, SYDNEY SOUTH NSW 1232
nswauditors@epa.nsw.gov.au

AND

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

1. Introduction

1.1. Background

NSW Public Works – Government Architect's Office (the Principal) proposes to build a primary school on former industrial land known as Part of 3 Burroway Road, Wentworth Point NSW (the site). The site is the western part of Lot 2 in DP 859608 and has an area of 1.46 hectares. Environmental Investigation Services (EIS), a division of Jeffery and Katauskas Pty Limited, was appointed as environmental consultant for the Principal for assessment and remediation planning (as required) at the site.

I visited the site on 4 June 2014 for initial site observations and on 28 April 2015 to observe field activity associated with the additional contamination assessment being conducted by EIS.

I confirm that I have not existing or potential conflict of interest regarding the conduct of this site audit.

1.2. Purpose of Audit

The purpose of this audit is to provide a Site Audit Statement to provide an independent expert opinion regarding contamination in the context of redevelopment of the site to provide a primary school and associated playing fields. This development application is being coordinated by the Principal. This is a non-statutory site audit.

1.3. Design concept for proposed primary school

The design concept for the proposed primary school which was used to provide context for EIS' contamination assessment included:

- Two main 3 storey school buildings in the middle of the western side of the site;
- A car parking area in the southwest quarter of the site;
- Playing fields along the eastern side of the site; and
- Raising the surface level of the site by at least 0.5m prior to building construction and supporting the two main buildings on piled foundations.

This design concept is illustrated on drawings included in Appendix A.

1.4. Consultant's reports reviewed

I have reviewed:

- Environmental Investigation Services: Report to NSW Public Works – Government Architects Office on Sampling, Analysis and Quality Plan for Proposed Primary School Development at Part of 3 Burroway Road, Wentworth Point, NSW (Part of Lot 2 in DP859608). Reference E27299Krpt-SAQP, dated 18 August 2014.
- Environmental Investigation Services: Report to NSW Public Works – Government Architects Office on Additional Detailed Environmental Site Assessment for Proposed Primary School Development at Part of 3 Burroway Road, Wentworth Point, NSW (Part of Lot 2 in DP859608). Reference E27299Krpt-SAQP, dated 22 May 2015.

The above documents are referred to as the SAQP and EIS Report (respectively) in this report. My correspondence with the Principal and EIS as a part of reviewing these reports is included in Appendix B.

I have referred to the following reports:

- GHD: Report for Homebush Bay West Contamination Assessment, Preliminary Site Investigation. Revision 0, dated November 2009 (GHD 2009).
- AECOM Australia Pty Ltd: Geotechnical Assessment, Wentworth Point. Dated 28 November 2012 (AECOM 2012)
- GHD: Additional Contamination Assessment, Homebush Bay West, Stage 1 Area. Revision 2, dated November 2012 (GHD 2012).
- GHD: Report for Roads and Maritime Services, Wentworth Point, Homebush Bay West, Ground Gas Monitoring, Final, dated 22 March 2013 (GHD 2013a).
- GHD: Report for Roads and Maritime Services, Wentworth Point, Homebush Bay West, Ground Gas Monitoring, Rev. No. 1, dated 12 September 2013 (GHD 2013b).
- GHD: Report for Roads and Maritime Services, Wentworth Point, Homebush Bay West, Interim Site Management Plan, Rev. No. 5, dated 12 September 2013 (GHD 2013c).
- GHD: Report for Roads and Maritime Services, Wentworth Point Burroway Road Site, Homebush Bay West, Conceptual Remediation Action Plan, Rev. No. 2, dated 12 September 2013 (GHD 2013d).

I also referred to an existing Site Audit Statement (No. 0503-0912, Andrew Lau) issued on 9 July 2010 relevant to the Stage 1 and Stage 2 areas on Wentworth Point which concluded that GHD contamination investigations were appropriate for assessment of “gross, widespread contamination” of soil and fill and of “the contamination status of groundwater”.

I visited the site on 4 June 2014 for initial site observations and on 28 April 2015 to observe field activity associated with the additional contamination assessment being conducted by EIS.

2. Site description

2.1. Site location and property title

The site is at the western end of a large parcel of land known as 3 Burroway Road, Wentworth Point. The site forms part of property title Lot 2 in DP 859608. I understand that the current owners of Lot 2 (Roads and Maritime Services) intend to subdivide Lot2 so that the site will be identified as a unique property title.

Appendix C includes a street map showing the locality of the site and survey plan defining the site boundaries.

2.2. Site history

Background information for site history, including property ownership records and selected historical aerial photographs was included in GHD’s 2009 Preliminary Site Investigation report. EIS reviewed this information with a focus on the site and provided a summary in the EIS Report.

A 1930 aerial photograph covering the Sydney metropolitan area is available on the SIX Maps web site. This photograph indicates that the site was a natural area subject to inundation, either by high tides or flooding. The seawall around Wentworth Point appears to have been constructed a short time before this photograph was taken because sand dredged for seawall construction and placed

behind the wall remains light coloured. Subsequent photographs show reclamation of the land in the 1950s using dredged sediments from the Parramatta River to the north.

The site was developed for commercial and light industrial uses during the 1960s and similar use continued until recently. GHD (2009) reported activity on the site in 2009 as including storage of industrial marquees, construction goods and shipping containers, timber, pipes, tankers used for transporting liquid waste (but not containing liquid waste), shipping container repair, steel fabrication and commercial vehicles. One leased lot on the site was occupied by Atlas Abrasives, but GDH was unable to access this area.

GHD (2009) reported that Dangerous Goods Licence records provided by NSW WorkCover indicated no above ground of underground storage of dangerous goods on the site.

Improvements on the site in June 2014 included a large steel framed and clad factory building which housed a heavy lift travelling gantry crane and was typical of a heavy engineering facility; several one and two storey sheds and office buildings; and an electrical transformer which sat on a concrete slab.

2.3. Site surroundings

The Parramatta River is to the north of the site with the Sydney Olympic Park ferry wharf and its associated land facilities located immediately to the west of the site. The Parramatta River is approximately 250m wide to the north of the site.

Burroway Road forms the southern boundary of the site and commercial factory and warehouse buildings occupy the southern side of Burroway Road.

Land to the east of the site was formerly a construction materials recycling facility. Aerial photographs show infrastructure which could be two separate concrete crushing and sorting plants occupying the land immediately to the east of the site. This facility is no longer operational.

2.4. Geology and hydrogeology

The Geological Map of Sydney (Series 9130) (Department of Mineral Resources 1983) shows that the site is underlain by unconsolidated soils from the Holocene period comprising silty to peaty quartz sand, silt and clay, with ferruginous and humic cementation in places, common shell layers. These natural soils are covered by man-made fill materials. Undisturbed natural soils on the site are likely to include potential acid sulphate soil because of the geologic processes and conditions associated with sediment deposition.

The hydrogeology of the site is influenced by low relief above the Parramatta River which means that groundwater level is very shallow. Interpretation of measured groundwater levels has provided no consistent direction of groundwater flow.

2.5. Potentially contaminating activities

Land reclamation

In the 1950s, sediment was dredged from the Parramatta River to the north of the site and was discharged on and around the site to raise the surface level for future development by the land holder, Maritime Services. No details of the depth or extent of dredging was included in any of the environmental assessment reports.

The most recently deposited river sediments, say from 1900 onwards, may have been impacted by urban development and associated industrial activity present upstream along the Parramatta River.

Impacted sediments would be mixed with natural fluvial sediments (sands, silts and clays) which may have been present in greater quantities due to land clearing since European settlement. Cardno Lawson Treloar (2008) presents information on sediment deposition, dredging and land reclamation activity in the Parramatta River, however there is insufficient detail to identify the depth and area of dredging associated with reclamation at the site. This study notes that reclamation works associated with the western side of Homebush Bay occurred during 1893, 1904-17 and 1948-62. The latter period coincides with evidence on aerial photographs of reclamation using dredging spoil.

Clearing of vegetation did not appear to occur before land reclamation using dredging spoil. The gradual decay of this buried vegetation is expected to provide a potential source of hazardous ground gas (as methane, carbon monoxide, carbon dioxide and hydrogen sulfide).

Filling before development

Dredging spoil after drainage is usually not suitable for direct use as construction fill. Thus, it is reasonable to assume that the dredging spoil was covered with a soil fill material which provided a suitable surface for future use of the land. Fill material used for this purpose is from unknown sources and thus presents a potential source of contamination.

Commercial and industrial activity on the site

In 2009, the site was leased as 11 different lots, with two of those lots occupying the northern half of the site. The majority of uses of these lots comprised storage of goods with no associated manufacturing processes. Steel fabrication or similar engineering work is likely to have occurred in the large factory building in the middle of the western side of the site. Several drums (200L capacity), including one filled with waste grease/oil remained on the lot to the south of the factory building and the ground around this drum was oil stained. This lot was occupied by Atlas Abrasives and the area may have been used for “grit blasting” metal items in preparation for painting and/or the supply of abrasive materials for industrial use elsewhere. An electrical transformer sitting on a concrete slab was located in the southeast part of the site, however no oil staining was apparent on the slab or the surrounding ground and surrounding ground did not appear to have been replaced.

Commercial and industrial activity adjacent to the site

The construction materials recycling plants on the adjacent site to the east may have resulted in air-borne dust being deposited on the surface of the site.

2.6. Contaminants of potential concern

The use of fill from unknown sources in preparation of the site for development and future use triggers a broad range of contaminants of potential concern (CoPC), being:

- Heavy metals – arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc;
- Petroleum hydrocarbons – Total Recoverable Hydrocarbons (TRH), benzene, toluene, ethylbenzene, xylenes and naphthalene (BTEXN);
- Polycyclic aromatic hydrocarbons (PAHs);
- Organo-chlorine and organo-phosphorus pesticides (OCP and OPP);
- Polychlorinated biphenyls (PCBs);
- Solvents as volatile organic compounds (VOCs); and
- Asbestos – Bonded asbestos containing material (ACM), Fibrous asbestos (FA), Asbestos fines (AF).

The other potentially contaminating activities describe in the previous section are associated with CoPC which are included in the list above, except for hazardous ground gas which comprises:

- Methane, carbon monoxide, carbon dioxide and hydrogen sulfide.

2.7. Auditor's opinion

I agree with the existing Site Audit Statement (No. 5003-0912, Andrew Lau), issued for two larger areas on Wentworth Point which include the site, that the GHD (2009) Preliminary ESA report provided an adequate study of site history and natural characteristics (geology, hydrogeology, topography) for the identification of potential sources of site contamination up to the date of issue of this Statement (17 July 2010).

Based on my review of the SAQP and the EIS Report, I consider that EIS has provided a similar level of information which is specific to the site and has been updated to the current condition of the site which is adequate for identifying potentially contaminating activities affecting the site and CoPC associated with those activities.

3. Contamination Assessment

3.1. Contamination investigation

Results addressed by previous Site Audit Statement

At the request of NSW Roads and Maritime Services, GHD conducted additional contamination investigations with the Homebush Bay West Stage 1 Area (which includes the site as Area 1C), reported in GHD (2012) and conducted several rounds of hazardous ground gas monitoring which are summarised in GHD (2013b). I note that findings from the initial detailed contamination assessment reported by GHD in 2010 were reviewed by Andrew Lau and were confirmed as being adequate for investigation of potential areas of concern and the nature and extent of contamination across the wider Stage 1 Area, which is from the western boundary of the site to the western shore of Homebush Bay and north of a line along Burroway Road.

EIS review of results available to present for the site

The SAQP provides EIS' findings from a review of available information (effectively GHD reports for the Homebush Bay West Stage 1 Area issued between 2009 and 2013) to identify data gaps for contamination assessment of the site for future use as the proposed primary school. Data gaps identified by EIS were:

- The existing sampling density is less than the minimum recommended in Table A of the NSW EPA Sampling Design Guidelines (EPA 1995);
- Results do not address areas of environmental concern identified from site observations, particularly a localised area of oil stained soil, an area of disturbed soil which may indicate a current or former underground storage tank, and potential impact from deposition of air-borne dust from the construction material recycling operation beyond the eastern boundary of the site;
- Information on groundwater quality is several years old and current groundwater quality should be confirmed because of the reduction in industrial activity on the site and the land to the east;

- The potential for groundwater levels on the site to be influenced by tidal rise and fall in the Parramatta River is uncertain and is important for management of hazardous ground gas (if applicable);
- Information on hazardous ground gas does not specifically address the proposed locations for school buildings and continual monitoring is required to reduce uncertainty about the relevant Gas Screening Value for the site; and
- The definition of petroleum hydrocarbon fractions changed with issue of the ASC NEPM in May 2013 which requires reassessment of existing results with respect to potential risk posed by vapour intrusion from lighter fractions of petroleum hydrocarbons.

EIS additional detailed environmental site assessment

The objective of the SAQP was to address the data gaps identified by EIS through review of readily available information in the context of the concept design for the proposed primary school. The SAQP was prepared as draft for my review, and a record of my comments and EIS' responses is provided in Appendix B. The final SAQP was generally consistent with recommendations in Section 5.3 of Schedule B2 of the ASC NEPM in that the SAQP included:

- a brief background providing context to the investigation and site investigation objectives
- a preliminary Conceptual Site Model
- a review of existing information and a data gap analysis
- DQOs based on the 7 step process, including a quality assurance (QA) plan and details of quality control (QC) samples to be collected
- media to be sampled (soil and soil vapour)
- details of analytes and parameters to be measured
- number, location and depth of sampling points
- frequency and pattern of sampling
- sampling methods and procedures
- field screening methods
- laboratory analysis methods
- reporting

I consider that the investigations completed were consistent with those described in the SAQP and that the works described in the SAQP have been substantially completed. I have reviewed the results presented in the EIS Report and that my quality assurance assessment indicates that results from the additional investigation are suitable for their intended purpose.

I consider that the EIS Report:

- Adequately summarises existing information for assessment with additional information arising from the EIS investigation.
- Adequately describes sample collection, handling and analysis and provides quality assurance that the additional data is suitable for the assessment. I note that the existing Site Audit Statement confirms the suitability of previous soil and groundwater results for contamination assessment.
- Presents an appropriate and representative Conceptual Site Model which is updated based on interpretation of relevant information.

3.2. Quality assurance and quality control

Section 9 of the ESI Report presents an analysis of the investigation performance against Data Quality Indicators which are defined in Section 6.2 of the SAQP. My review of the quality assurance assessment presented in the EIS Report confirmed that the results from the EIS additional

investigation were generally consistent with acceptable levels of DQIs and were suitable for use in this assessment. The findings of my quality assurance review are summarised as:

Field quality assurance and quality control

Sampling team – appropriately trained staff, supervised by a senior practitioner and field work was completed in the same mobilisation where practicable.

Decontamination procedures were adequate.

Logs for samples collected show location and duplicate samples.

Chain-of-custody sheets were complete with signatures.

Duplicate frequency was stated and was above recommended minimum.

Background sample results were available from previous Stage 1 Area assessments.

Results for rinsate sample, trip spike and trip blank were acceptable.

Field instrument calibrations were provided.

Laboratory QA/QC

Report included holding times, analytical methods used, surrogates and spikes used, percent recovery and practical quantification limits.

Report also included results for matrix spike, laboratory duplicates and laboratory blanks.

Report was NATA endorsed

QA/QC data evaluation

The EIS Report stated DQOs and included a discussion of field and laboratory considerations regarding:

Completeness – sampling and analysis completed met the objectives of the SAQP and documents and records were sufficient to support results;

Comparability – field activity and laboratory methods were consistent and the investigation was completed

Representativeness

Precision

Accuracy

for both sampling and analysis for soil and soil vapour (ground gas).

3.3. Auditor's opinion

I consider that the additional detailed environmental site assessment completed by EIS was appropriately planned by completing a data gap analysis and preparing a thorough SAQP which used the available concept design to provide context for the proposed future use of the site as a primary school. The SAQP also considered change of activity on the site and surrounding properties. I consider that the sampling and analytical methods were appropriate for assessment of soil and fill materials and soil vapour. In the context of future use of the site, I consider that omission of groundwater quality assessment does not affect the completeness of the investigation because extraction of groundwater for beneficial use is very unlikely and soil vapour assessment was conducted in the footprints of proposed building.

I consider that the Conceptual Site Model, as described in Section 11 of the EIS Report, is a reasonable representation of conditions on the site during the construction period, which includes placement of construction fill to reduce the risk from flooding, and for the site's intended future use as a primary school.

4. Nature and extent of contamination

4.1. Soil assessment criteria

Contaminants of potential concern are listed in Section 2.6. Activities on the site for the foreseeable future are covered by two broad exposure scenarios which are defined in Schedule B7 of the ASC NEPM:

Activity	Exposure Scenario
Construction works and future building or maintenance works requiring excavation	D – commercial / industrial land use
Routine activity for a primary school	A – residential land use with garden / accessible soil. The description in Section 3.2.1 of Schedule B7 states that Scenario A is applicable to primary schools and their integral playgrounds.

Health investigation and screening levels listed in Schedule B1 of the ASC NEPM and relevant to the CoPC are adopted as soil assessment criteria which are listed in Tables 4.1 and 4.2. Where a Health Screening Level is listed as NL (not limiting) for the vapour intrusion pathway, then the lesser of the relevant Management Limit (Table 1B(7) in Schedule B1) and HSL for Direct Contact (Table B4 in CRC CARE 2011) has been adopted.

Table 4.1 Soil Assessment Criteria – Heavy Metals, PAHs and Asbestos

CoPC	Routine school activity	Construction or maintenance activity involving excavation
Arsenic	100	3,000
Cadmium	20	900
Chromium	100	3,600
Copper	6,000	240,000
Lead	300	1,500
Mercury	40	730
Nickel	400	6,000
Zinc	7,400	400,000
Total PAHs	300	4,000
Carcinogenic PAHs, as B(a)P TEQ	3	40
Asbestos	No visible ACM on the surface during construction No asbestos in imported construction fill	

Notes: SAC values are in mg/kg; SAC for total chromium is conservatively based on hexavalent chromium; B(a)P TEQ is defined in note 6 to Table 1A(1) in Schedule B1 of the ASC NEPM; ACM includes all forms of asbestos described in Table 7 in Schedule B1 of the ASC NEPM.

Table 4.2 Soil Assessment Criteria – Heavy Metals, PAHs and Asbestos

CoPC	Routine school activity		Construction or maintenance activity involving excavation
Depth of impact	0 to 1m	1 to 2m	0 to 2m
TRH F1 (C6-C10)	45	70	700 (m)
TRH F2 (>C10-C16)	110	240	1,000 (m)
TRH F3 (>C16-C34)	2,500 (m)	2,500 (m)	3,500 (m)
TRH F1 (>C34-C40)	6,300 (d)	6,300 (d)	10,000 (m)
Benzene	0.5	0.5	77 (v)
Toluene	160	220	99,000 (d)
Ethylbenzene	55	4,500 (d)	27,000 (d)
Total xylenes	40	60	81,000 (d)
Naphthalene	3	1,400 (d)	11,000 (d)

Notes: SAC values are in mg/kg; SAC are based on vapour intrusion into indoor air from impact in a sandy soil; (d) indicates value based on HSL for direct contact; (m) indicates value based on Management Limit; (v) indicates value based on vapour intrusion into a shallow trench.

CoPC not addressed in Tables 4.1 and 4.2 are PCBs, OCP and OPP which have not been detected on the site to date. Should one or more compounds from these broad chemical groups be detected, then an SAC value will be selected using the process described above or from other relevant screening values if an EPA endorsed HIL is not available.

Because concept design requires the site level to be raised by placement of at least 0.5m of construction fill, I consider that assessment of potential ecological effects of contaminants in the existing soil profile is inappropriate. If gross contamination is identified, then this occurrence would be assessed individually. I note that mature trees are present around the site boundary which indicates that existing ground conditions are unlikely to be ecologically unacceptable in the context of future use of the site as a primary school.

Hazardous ground gases are assessed on a different basis than CoPC addressed through SAC and have been assessed using the recommended procedure in NSW EPA Guidelines for Assessment and Management of Sites Impacted by Hazardous Ground Gases (EPA 2012).

4.2. Soil contamination

Results summary tables and maps showing sampling locations for the site are presented in Appendix D. Results included in these tables are:

Table identity	Source report	Results included
D1	GHD 2012	Heavy metals and asbestos
D2	GHD 2012	Petroleum hydrocarbons
D3	GHD 2012	PAHs, OCPs, Total VOCs, Total SVOCs
A	EIS Report	Heavy metals, PAHs, OCPs, Total PCBs, Asbestos
B	EIS Report	BTEXN, TRH F1, TRH F2
I	EIS Report	TRH F1, F2, F3 and F4

Table 4.3 Exceedances of Soil Acceptance Criteria

CoPC	SAC Exceedance		Table	Sample	Comment
	School activity	Construction			
Arsenic	✓		D1	1C03:0-0.1	Beneath future building
Cadmium	✓		D1	1C03:0-0.1	Beneath future building
Chromium	✓		D1	1CW02:0-0.1	Oxidised as Cr+3
Lead	✓		D1	1C10:0.3	Just off-site
	✓		A	TP5:0-0.1	Beneath future building
Asbestos	✓	✓	D1	1C01:1.2	Just off-site and buried
	✓	✓	D1	1C09:0.9-1	Just off-site and buried
	✓	✓	D1	1C10:0.3	Just off-site
	✓	✓	D1	1C11:0.6-0.8	Buried
TRH F2 (>C10-C16)	✓		D2	1C04:0.1	Beneath future car park
TRH F3 (>C16-C34)	✓	✓	I	TP5:0.2-0.4	Beneath future building
Carcinogenic PAHs	✓		D3	1C02:0.1	
	✓		D3	1C04:1.3	Buried
	✓		D3	1C06:1.7	Buried
	✓		D3	1C06b:0-0.1	
	✓		D3	1CW02:1.6-1.8	Buried
	✓		D3	BH39:0.2-0.3	
	✓		D3	BH40:0.4-0.5	
	✓		D3	BH43:1.1-1.2	Buried
	✓		A	TP2:0.2-0.4	

I note that in Table A, SAC exceedances are also indicated for:

- Samples SP01, SP02 and SP03 for chromium, lead and zinc – these have been excluded because this material is a waste stockpile which is recommended for removal as part of demolition works; and
- Samples S41/F1 and S51/F2 – these were isolated single ACM fragments removed for analysis and thus are no longer present on the site.

I completed a simple statistic assessment of results for PAHs and heavy metals, which included number of detects , maximum and minimum result and an estimate of the 95%ile upper confidence limit of the average concentration (heavy metals only and log-normal distribution). Other CoCPs had an insufficient number of results above the limit of reporting to warrant statistical analysis. Table 4.4 summarises these statistical values and details of the data sets are included in Appendix E.

Table 4.4 Results of Statistical Analysis for Data for Heavy Metals and PAHs

CoPC	Samples	Detects	Minimum	Maximum	95%ucl of Average
Arsenic	62	54	1	140	17
Chromium	62	60	<2	120	25
Copper	62	61	3	1300	200
Lead	62	62	8	540	98
Nickel	62	56	<1	157	34
Zinc	62	62	10	6,600	790
Total PAHs	56	36	<1	55	Not calculated
Carcinogenic PAHs	56	31	Not detected	8.7	Not calculated

4.3. Presence of ground gas

Table K from the EIS Report summarising Hazardous Ground Gas (HGG) results and maps showing sampling locations for the site are presented in Appendix D. I note that results indicating very high methane concentrations obtained from the initial three monitoring rounds in 2012 have not recurred in the subsequent 10 monitoring rounds. I confirmed that many of the latter monitoring rounds occurred under low atmospheric pressure associated with the passage of weather fronts across Sydney.

The EIS Report identified a potential risk from HGG because a source and pathway were considered complete when the concept design for the proposed school was considered. EIS used a semi-quantitative risk assessment approach to assess potential HGG impacts and potential HGG protection measures for the proposed school development. EIS have assumed that available HGG measurements are reliable and representative for the site and in relation to the proposed school building locations.

EIS considers that the early high methane HGG concentrations encountered in monitoring wells 1CW02 and BHW42 (monitoring rounds 1 to 3 (2012)) are inconsistent with the CSM and the subsequent HGG measurements for the site. In particular, the second round of HGG measurement by EIS coincided with a potential worst case weather event which combined passage of a low pressure trough and relatively shallow groundwater levels on the site associated with recent rain.

4.4. Potential for migration of contamination

Based on the results of investigation, no evidence of gross contamination was found on the site. Heavy metals contamination (copper, lead and zinc) and PAH contamination was wide-spread at low concentrations through the fill material. Given the fine-grained (silty) consistency of the fill material, and underlying natural materials, I consider that the potential for migration of metals and/or PAHs within fill materials is very low.

4.5. Risk to human health or the environment

I note that SAC are selected from investigation and screening levels which are conservative values so that presence of contamination at lower concentrations does not warrant further investigation. A contaminant concentration above its investigation or screening level warrants "consideration of an appropriate site-specific risk-based approach or appropriate risk management options" (Section 2.1.2 in Schedule B1 of the ASC NEPM).

Potential health risk to construction workers or maintenance workers involved in excavation

Table 4.3 lists SAC exceedances for construction or maintenance workers involved in excavation activity. Identified CoPC are:

- Asbestos at 4 locations, three of which are just outside the site boundary but were included in assessment as a precaution. Asbestos impact at the fourth location is deeper than 0.3m below the excavated surface which is the recommended buffer depth for excavation activity (Table 5 in WA DoH, 2009).
- TRH F3 (>C16-C34) at one location which will be beneath the footprint of a future proposed building. The SAC for TRH F3 is based on the Management Limit and it is likely that this impacted surface soil will be removed as part of site demolition works. The reported TRH F3 concentration is well be the HSL for direct contact and thus does not pose an unacceptable health risk to construction workers.

Potential health risk to workers and pupils at the future primary school

Table 4.3 also lists SAC exceedances for workers and pupils involved in routine school activity. Identified CoPC are:

- Arsenic and cadmium which are at a location beneath a future school building.
- Chromium which occurs in near surface soil and is almost certainly in the low toxicity tri-valent form because of the availability of air and oxygenated water at that location.
- Lead at two locations, one which is just outside the site boundary and the other which is beneath a future school building, thus eliminating the potential exposure pathway.
- Asbestos at 4 locations, three of which are just outside the site boundary but were included in assessment as a precaution. Asbestos impact at the fourth location will be beneath the construction fill layer which eliminates the potential exposure pathway.
- TRH F2 (>C10-C16) which will be beneath a future car park with negligible opportunity for vapour intrusion into indoor air. The potential exposure pathway is eliminated.
- TRH F3 (>C16-C34) which will be beneath the footprint of a future proposed building which eliminates the potential exposure pathway.
- Carcinogenic PAHs at 9 locations of which four samples were from more than 1m below the existing ground surface. The other samples are near the surface and will be beneath the construction fill layer which eliminates the potential exposure pathway.

Potential risk posed by hazardous ground gases

The EIS Report provides a preliminary HGG risk assessment which is consistent with NSW EPA Guidelines for the Assessment and Management of Sites Impacted by Hazardous Ground Gases (EPA 2012). EIS presented calculations for Gas Screening Values which led to establishment of a Characteristic Gas Situation (effectively the risk assessment for HGG). The HGG present on the site was assessed to pose a medium risk (CS of 3) which warrants inclusion of gas protection measures with a score of 3 in school buildings planned for the site (Tables 7 and 8 in EPA 2012).

Potential for unacceptable ecological impacts

I have partially addressed this issue in Section 4.4 regarding potential migration of contamination, which should be abated by the placement of the layer of construction fill.

Summary

Given the above site-specific discussion of potential risk to human health and ecological impact, site specific factors have effectively eliminated potential exposure pathways for contamination which was reported with concentrations above the SAC. HGG present on the site was assessed to pose a medium risk which warrants inclusion of gas protection measures with a score of 3 in school buildings planned for the site.

4.6. Conceptual site model

I have referred to Section 4.3 of Schedule B2 in the ASC NEPM for a framework to describe the essential elements for a Conceptual Site Model (CSM). The stratigraphic model of the site is a series of horizontal layers comprising:

- Natural fluvial materials consisting of sands, silts and clays deposited during recent geological time (past 5,000 years) during flood events and as a result of tidal rise and fall. Layers of peat or other similar organic matter may occur and acid sulphate soils may also be present. This layer was partly vegetated and subject to frequent inundation. This layer is expected to be several (5 to 15) metres thick and overlying sandstone bedrock (AECOM 2012).
- Dredged sediments from the Parramatta River to the immediate north of the site used for land reclamation. Dredging spoil consists of sands, silts and clays between 0.5 and 1.5m thick and was almost certainly placed without clearing of natural vegetation. One isolated inclusion of structural timber was found in the northern part of the site.
- Imported gravelly sand / clay fill material generally between 0.5 and 2m thick used to raise the reclaimed surface level to reduce risk of flooding and to provide a practical working surface for development and use of the land. The origin(s) of this fill material is unknown however, inclusion of foreign materials is minor and chemical contamination is low but generally throughout this material.
- Groundwater is generally between 1m and 2m below the existing ground surface and has no distinct flow direction. The site is largely unsealed and groundwater levels were observed to rise in response to rainfall infiltration, especially after heavy rain lasting a few days.

CSM Element	Description
Known and potential sources of contamination	*Natural ground*: potential for acid sulphate soils *Dredging spoil*: very low levels of heavy metals and PAHs Vegetation buried during land reclamation: hazardous ground gases, being methane, carbon monoxide, carbon dioxide and hydrogen sulfide *Imported fill material*: heavy metals (copper, lead and zinc), PAHs, isolated inclusions of asbestos containing material (ACM) *Industrial activity*: surface impact by heavy metals (chromium, copper, lead and zinc), oil and grease and scattered ACM fragments from building materials
Potentially affected media	*Soil*: generally the top 2m of fill material *Soil Vapour*: a regional impact associated with land reclamation *Groundwater*: a regional impact associated with land reclamation and subsequent development
Human and ecological receptors	*Human receptors*: Construction workers and future school maintenance workers involved in excavation activity; Workers and pupils at the future primary school *Ecological receptors*: Deep rooted vegetation around the perimeter of the site, noting that the surface level across the site will be raised by at least 0.5m to reduce potential for future flooding.
Potential and complete exposure pathways	*Construction workers and future school maintenance workers involved in excavation activity*: Potential discovery of unexpected contamination (odours, staining) or incidence of ACM during excavation into historical fill materials *Workers and pupils at the future primary school*: Potential accumulation of hazardous ground gases in enclosed spaces or indoor air resulting in a risk to safety (asphyxiation and/or explosion)

4.7. Auditor's opinion

I consider that:

- the combined results of contamination assessment for the site by GHD (2012 and earlier) and EIS (2014/5) adequately assess the contamination status of the site in the context of the proposed development and operation of a primary school.
- the SAQP and the EIS Report have been prepared to a standard which generally meets recommendations detailed in the NSW EPA Guidelines for Consultants Reporting on Contaminated Sites (2011).
- the investigations completed were consistent with those described in the SAQP and that the works described in the SAQP have been substantially completed. I have reviewed the results presented in the EIS Report and that my quality assurance assessment indicates that results from the additional investigation are suitable for their intended purpose.
- the SAQP:
  - Adequately considered historical activity on and around the site which caused or had the potential to cause land contamination.
  - Presented a sampling and analysis program to provide additional information for assessment of contamination on the site in the context of future use of the site as a primary school.
- the EIS Report:
  - Adequately summarises existing information for assessment with additional information arising from the EIS investigation.
  - Adequately describes sample collection, handling and analysis and provides quality assurance that the additional data is suitable for the assessment. I note that the existing Site

Audit Statement confirms the suitability of previous soil and groundwater results for contamination assessment.

- Presents an appropriate and representative Conceptual Site Model which is updated based on interpretation of relevant information.

5. Remediation and Residual Contamination

5.1. Remediation and Validation

GHD issued a Conceptual Remediation Action Plan (RAP) (GHD 2013d). As part of obtaining supporting information for a Development Application for property subdivision (to create the school site) and also for planning approval for school construction, in mid-2014 NSW Public Works commissioned EIS to undertake additional contamination investigations on the proposed school site and engaged a NSW EPA accredited site auditor (myself) to review these additional works. The Conceptual RAP (GHD 2013d) and associated Interim Site Management Plan (GHD 2013c) were not made available until after the majority of additional investigation field activity was completed in April 2015.

I confirm that in preparing this Site Audit Report, that I made reference to GHD's Conceptual RAP which includes the following items in Section 7, Remedial Strategy:

7.2 Roles and responsibilities - Site Auditor: the appointed Site Auditor will review all the plans / reports prepared by the Environmental Consultant and Contractor and visit the site to verify that remedial works are conducted in accordance with this RAP or amended RAP(s).

7.3 Development of CEMP - comprehensive Construction Environmental Management Plan (CEMP) should be implemented including asbestos management plan (AMP) and piling management plan.

7.5 Capping - For school yard, residential gardens where no slab is planned, a minimum 500 mm capping material is required. Placement of a layer of geotextile marker under the capping material where hard ground surface is not built.

7.9 Ground gas / soil vapour protection measures - The EPA (2012) guidelines derive scores for protection measures for different Characteristic Situations (CS). Based on the calculated CS values from the monitoring data collected to date, and given the property will be developed into medium to high density residential properties, schools, open space and commercial properties, the guidance value for gas protection is considered to be "5" for the residential and school areas.

As the appointed Site Auditor, I have reviewed the plans and reports prepared by EIS (*7.2 in strategy has been implemented*) and have confirmed information through detailed reference to other reports by GHD, AECOM and Douglas Partners.

In the EIS Report, EIS concluded that remediation of soil or groundwater on the school site was not warranted on condition that:

- The site surface level is to be raised by at least 0.5m to mitigate flood risk (*7.5 in strategy is addressed*);
- Gas protection measures will be designed and installed in the school buildings, however additional ground gas monitoring results have identified CS of 3 which allows the gas protection level to be reduced to 3 (*7.9 in strategy is addressed*);
- A Construction Environmental Management Plan is prepared and implemented, including an Unexpected Finds Procedure and associated Asbestos Management Plan (*7.3 in strategy is addressed*); and

- Imported construction fill must be properly validated (*relevant part of 7.5 in strategy is addressed*).

I consider that GHD's recommendation for placement of a geotextile marker layer "under the capping layer where hard surface is not built" is not warranted for the site, and would be a very costly item for no substantial reduction in health risk. Placement of a marker layer along a buried services corridor may be appropriate for more reliable management of excavated materials during maintenance or new installation. I acknowledge that the potential exposure pathway requires on-going control and recommend that this be achieved through a long-term Environmental Management Plan.

Thus, I consider that amendment of the remediation strategy to have no specific Remediation Action Plan for the school site is consistent with meeting the objectives of the GHD Conceptual RAP for the Homebush Bay West area.

5.2. On-going Management of Residual Contamination

I note that:

- The stockpile of impacted soil and any similarly impacted material in the vicinity must be removed as part of demolition activity.
- A Construction Environment Management Plan (CEMP) must be prepared and implemented prior to demolition. An Asbestos Management Plan (AMP) and an Unexpected Finds Procedure must be incorporated into the CEMP.
- Imported fill material must be validated as consistent with future use of the site as a primary school.

I acknowledge that identified potential exposure pathways require on-going control and recommend that this be achieved through a long-term Environmental Management Plan.

6. Conclusions

Given the information and discussion provided in the Site Audit Report, I conclude that:

- The site is suitable for development of a primary school in that the contamination status of the site does not warrant remediation of soil or groundwater, in the context of the concept design which includes raising site surface levels by at least 0.5m through placement of construction fill, support of main school buildings on piled foundations and design and installation of gas protection measures as part of school buildings.
- A Construction Environment Management Plan (CEMP) must be prepared and implemented prior to demolition. An Asbestos Management Plan (AMP) and an Unexpected Finds Procedure must be incorporated into the CEMP.
- Imported fill material must be validated as consistent with future use of the site as a primary school.

I acknowledge that the potential exposure pathway requires on-going control and recommend that this be achieved through a long-term Environmental Management Plan.

7. Limitations

The review for this non-statutory site audit addressed reports listed in Section 1.4. Those reports included limitations and consequently, the findings of this review also are subject to the same limitations. The site auditor, within reason, relied on factual information presented in listed reports.

This review did not include any sampling or chemical analysis by the site auditor. I took reasonable measures to verify the suitability of the data to inform my independent professional assessment of contamination on the site and surroundings.

8. References

ANZECC (2000) Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000. Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand.

AS 4482.1-2005 Guide to the investigation and sampling of sites with potentially contaminated soil. Part 1: Non-volatile and semi-volatile compounds. Standards Australia

CRC CARE (2011) Health screening levels for petroleum hydrocarbons in soil and groundwater, Part 2: Application document. Technical Report no. 10, E Friebel and P Nadebaum.

DEC (2006) Contaminated Sites, Guidelines for the NSW Site Auditor Scheme (2nd edition). Department of Environment and Conservation NSW, DEC 2006/121.

EPA (1994) Contaminated Sites, Guidelines for Assessing Service Station Sites. NSW Environment Protect Authority, EPA 94/119.

EPA (1995) Contaminated Sites, Sampling Design Guidelines. NSW Environment Protect Authority, EPA 95/59.

EPA (2012) Guidelines for Assessment and Management of Sites Impacted by Hazardous Ground Gases. NSW Environment Protect Authority, EPA 2012/0932.

NEPC (1999) National Environment Protection (Assessment of Site Contamination) Measure. National Environment Protection Council 1999, amended May 2013

OEH (2011) Contaminated Sites, Guidelines for Consultants Reporting on Contaminated Sites. Office of Environment and Heritage NSW, OEH 2011/0650.

WA DoH (2009) Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia. WA Department of Health.

Appendix A - Proposed Primary School Concept Design

WENTWORTH POINT PUBLIC SCHOOL

DRAWING SCHEDULE

ARCHITECTURAL

DRG. No.	SCALE @ A1	DESCRIPTION
DA01	AS SHOWN	DRAWING SCHEDULE, SITE PLAN AND LOCATION PLAN
DA02	1:500	SITE DEMOLITION PLAN AND SITE PLAN
DA03	1:200	EXTERNAL WORKS - SITE PLAN 1
DA04	1:200	EXTERNAL WORKS - SITE PLAN 2
DA05	1:200	GROUND FLOOR PLAN & FIRST FLOOR PLAN
DA06	1:200	SECOND FLOOR PLAN & ROOF PLAN
DA07	1:200	ELEVATIONS & SECTIONS
DA08	1:200	LANDSCAPE PLAN - LEVEL 1
DA07	NTS	SHADOW DIAGRAMS
DA08	NTS	3D VIEWS / EXTERNAL FINISHES

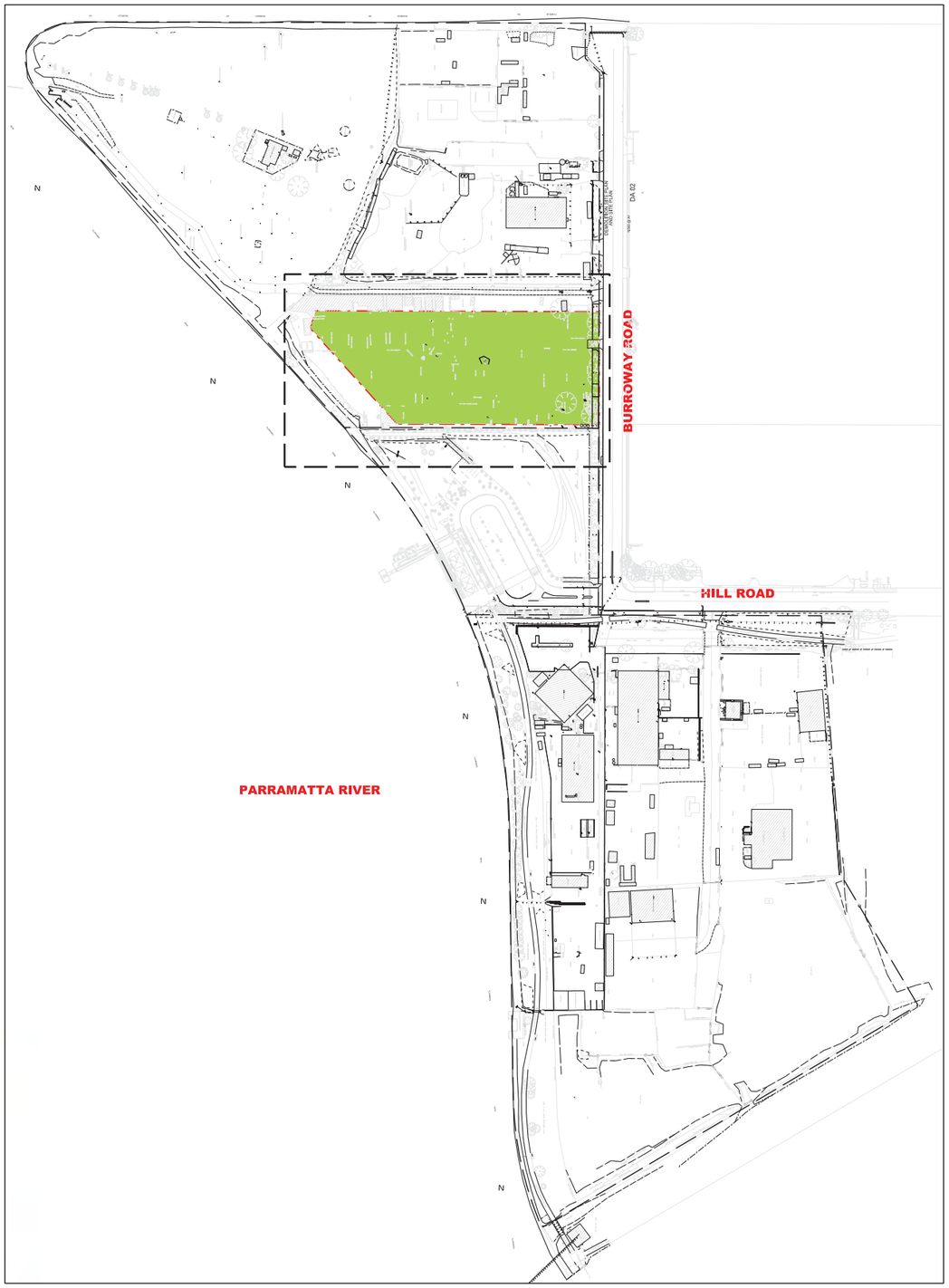
SURVEY

DRG. No.	SCALE @ A1	DESCRIPTION
113925500SH1	1:500	DETAIL AND COUNTOUR SURVEY - SHEET 1
113925500SH2	1:200	DETAIL AND COUNTOUR SURVEY - SHEET 2
113925500SH3	1:200	DETAIL AND COUNTOUR SURVEY - SHEET 3
113925500SH4	1:200	DETAIL AND COUNTOUR SURVEY - SHEET 4
113925500SH5	1:200	DETAIL AND COUNTOUR SURVEY - SHEET 5

STATE LOCATION NTS

LOCALITY PLAN NTS

LOCATION PLAN NTS



SITE PLAN

1:2000

1 The Government Architect's Office, a division of the Office of Finance & Services shall not be liable or responsible for any loss or damage arising out of the conversion of any electronic document, data or program to any other format or medium, or arising out of any modification or changes that occur in the handling or use of the electronic document, data or program.

2 The recipient or user of any electronic document, data or program is solely responsible for ascertaining its accuracy and its suitability for their purposes.

3 The Department uses virus scanning software to prevent file and system virus attacks but gives no warranty. The recipient or user is solely responsible for their own virus protection.

LEGEND

AC	AIR CONDITIONER
ALUM	ALUMINIUM
BAL	BALUSTRADE
BOL	BOLLARD
C	CONCRETE
CB	CONCRETE BLOCK
CBW	CONCRETE BLOCK WALL
CFC	COMPRESSED FIBRE CEMENT
CK	CONCRETE KERB
CM	CORRUGATED METAL
COL	COLUMN
COLA	COVERED OUTDOOR LEARNING AREA
COS	CHECK ON SITE
CP	CONCRETE PAVING
CPA	CONCRETE PAVING - ASPHALTIC
CPC	CONCRETE PAVING - COLOURED
CPD	CUPBOARD
CPW	CONCRETE PAVING – WASHED AGGREGATE
CSW	CONCRETE SEATING WALL
DP	DOWNPIPE
EDB	ELECTRICAL DISTRIBUTION BOARD
EX	EXISTING
FC	FIBRE CEMENT
FCB	FACE CONCRETE BLOCK
FFL	FINISHED FLOOR LEVEL
FHR	FIRE HOSE REEL
FIP	FIRE INDICATOR PANEL
FNC	FENCE
GL	GROUND LINE
OFC	OFF-FORM CONCRETE
MC	METAL CLADDING
MP	MASS PLANTING
MO	MULCH ONLY
PA	PAVER
PAA	PRACTICAL ACTIVITIES AREA
PB	PLASTERBOARD
PBX	PLANTER BOX
PCFC	PREFINISHED COMPRESSED FIBRE CEMENT
PERF	PERFORATED
PP	PERMEABLE PAVING
RL	REDUCED LEVEL
RS	ROOF SHEETING
RW	RETAINING WALL
RWG	RAINWATER GUTTER
SFP	SOFTFALL PAVING
STE	SYNTHETIC TURF EMBANKMENT
STF	SYNTHETIC TURF
TC	TRANSLUCENT CLADDING
TF	TURF
TOW	TOP OF WALL
WS	WHEEL STOP

REVISION

ISS	DATE	COMMENT

STRUCTURAL
GOVERNMENT ARCHITECT'S OFFICE
T 9372 8230 F 9372 8399

ARCHITECTURAL
GOVERNMENT ARCHITECT'S OFFICE
T 9372 8411 F 9372 8399

ELECTRICAL
GOVERNMENT ARCHITECT'S OFFICE
T 9372 8253 F 9372 8133

LANDSCAPE
GOVERNMENT ARCHITECT'S OFFICE
T 9372 8428 F 9372 8444

MECHANICAL
GOVERNMENT ARCHITECT'S OFFICE
T 9372 8253 F 9372 8133

QUANTITY SURVEYOR
GOVERNMENT ARCHITECT'S OFFICE
T 9372 8311 F 9372 8444

HYDRAULIC
GOVERNMENT ARCHITECT'S OFFICE
T 9372 8202 F 9372 8133

PROJECT MANAGEMENT
PROJECT MANAGEMENT GROUP
T 9372 8558 F 9372 8566

NSW GOVERNMENT Public Works
Government Architect's Office

PETER POULET
NSW Government Architect
Nominated Architect: ARN 5754
Level 19 McKell Building, 2-24 Rawson Place
Sydney NSW 2000 AUSTRALIA

A division of the Office of Finance & Services
PHIL GAETJENS
Secretary

WENTWORTH POINT PUBLIC SCHOOL
BURROWAY ROAD

DRAWING SCHEDULE SITE PLAN AND LOCATION PLAN

PLAN RM NO | CONTRACT NUMBER

SCALES: AS SHOWN @ A1

SHEET NO: DA 01

DESIGNED: GAO | PLOT DATE: 2/12/2014

DRAFTED: GAO | VERIFIED: GAO | REVISION: A

2/12/2014 10:43:29 AM G:\Projects\Educ\PPS\Wentworth_Pt\4_ds\arch\WENTPT_DA 01-cover.PLT

mossmorn $NODE$

A1 0 10 20 30 40 50 60 70 80 90 100 | USE FIGURED DIMENSIONS IN PREFERENCE TO SCALING. CHECK ALL DIMENSIONS ON SITE | 200MM | 300MM ON ORIGINAL

01 SITE DEMOLITION PLAN
SCALE 1:500

02 SITE PLAN
SCALE 1:500

1 The Government Architect's Office, a division of the Office of Finance & Services shall not be liable or responsible for any loss or damage arising out of the conversion of any electronic document, data or program to any other format or medium, or arising out of any modification or changes that occur in the handling or use of the electronic document, data or program.

2 The recipient or user of any electronic document, data or program is solely responsible for ascertaining its accuracy and its suitability for their purposes.

3 The Department uses virus scanning software to prevent file and system virus attacks but gives no warranty. The recipient or user is solely responsible for their own virus protection.

LEGEND

AC	AIR CONDITIONER
ALUM	ALUMINIUM
BAL	BALUSTRADE
BOL	BOLLARD
C	CONCRETE
CB	CONCRETE BLOCK
CBW	CONCRETE BLOCK WALL
CFC	COMPRESSED FIBRE CEMENT
CK	CONCRETE KERB
CM	CORRUGATED METAL
COL	COLUMN
COLA	COVERED OUTDOOR LEARNING AREA
COS	CHECK ON SITE
CP	CONCRETE PAVING
CPA	CONCRETE PAVING - ASPHALTIC
CPC	CONCRETE PAVING - COLOURED
CPD	CUPBOARD
CPW	CONCRETE PAVING – WASHED AGGREGATE
CSW	CONCRETE SEATING WALL
DP	DOWNPIPE
EDB	ELECTRICAL DISTRIBUTION BOARD
EX	EXISTING
FC	FIBRE CEMENT
FCB	FACE CONCRETE BLOCK
FFL	FINISHED FLOOR LEVEL
FHR	FIRE HOSE REEL
FIP	FIRE INDICATOR PANEL
FNC	FENCE
GL	GROUND LINE
OFC	OFF-FORM CONCRETE
MC	METAL CLADDING
MP	MASS PLANTING
MO	MULCH ONLY
PA	PAVER
PAA	PRACTICAL ACTIVITIES AREA
PB	PLASTERBOARD
PBX	PLANTER BOX
PCFC	PREFINISHED COMPRESSED FIBRE CEMENT
PERF	PERFORATED
PP	PERMEABLE PAVING
RL	REDUCED LEVEL
RS	ROOF SHEETING
RW	RETAINING WALL
RWG	RAINWATER GUTTER
SFP	SOFTFALL PAVING
STE	SYNTHETIC TURF EMBANKMENT
STF	SYNTHETIC TURF
TC	TRANSLUCENT CLADDING
TF	TURF
TOW	TOP OF WALL
WS	WHEEL STOP

REVISION

ISS	DATE	COMMENT

STRUCTURAL GOVERNMENT ARCHITECT'S OFFICE T 9372 8230 F 9372 8399	ARCHITECTURAL GOVERNMENT ARCHITECT'S OFFICE T 9372 8411 F 9372 8399
ELECTRICAL GOVERNMENT ARCHITECT'S OFFICE T 9372 8253 F 9372 8133	LANDSCAPE GOVERNMENT ARCHITECT'S OFFICE T 9372 8428 F 9372 8444
MECHANICAL GOVERNMENT ARCHITECT'S OFFICE T 9372 8253 F 9372 8133	QUANTITY SURVEYOR GOVERNMENT ARCHITECT'S OFFICE T 9372 8311 F 9372 8444
HYDRAULIC GOVERNMENT ARCHITECT'S OFFICE T 9372 8202 F 9372 8133	PROJECT MANAGEMENT PROJECT MANAGEMENT GROUP T 9372 8558 F 9372 8566

NSW GOVERNMENT
Public Works
Government Architect's Office
PETER POULET
NSW Government Architect
Nominated Architect ARN 5754
Level 19 McKell Building, 2-24 Rawson Place
Sydney NSW 2000 AUSTRALIA
A division of the Office of Finance & Services
PHIL GAETJENS
Secretary

WENTWORTH POINT PUBLIC SCHOOL
BURROWAY ROAD

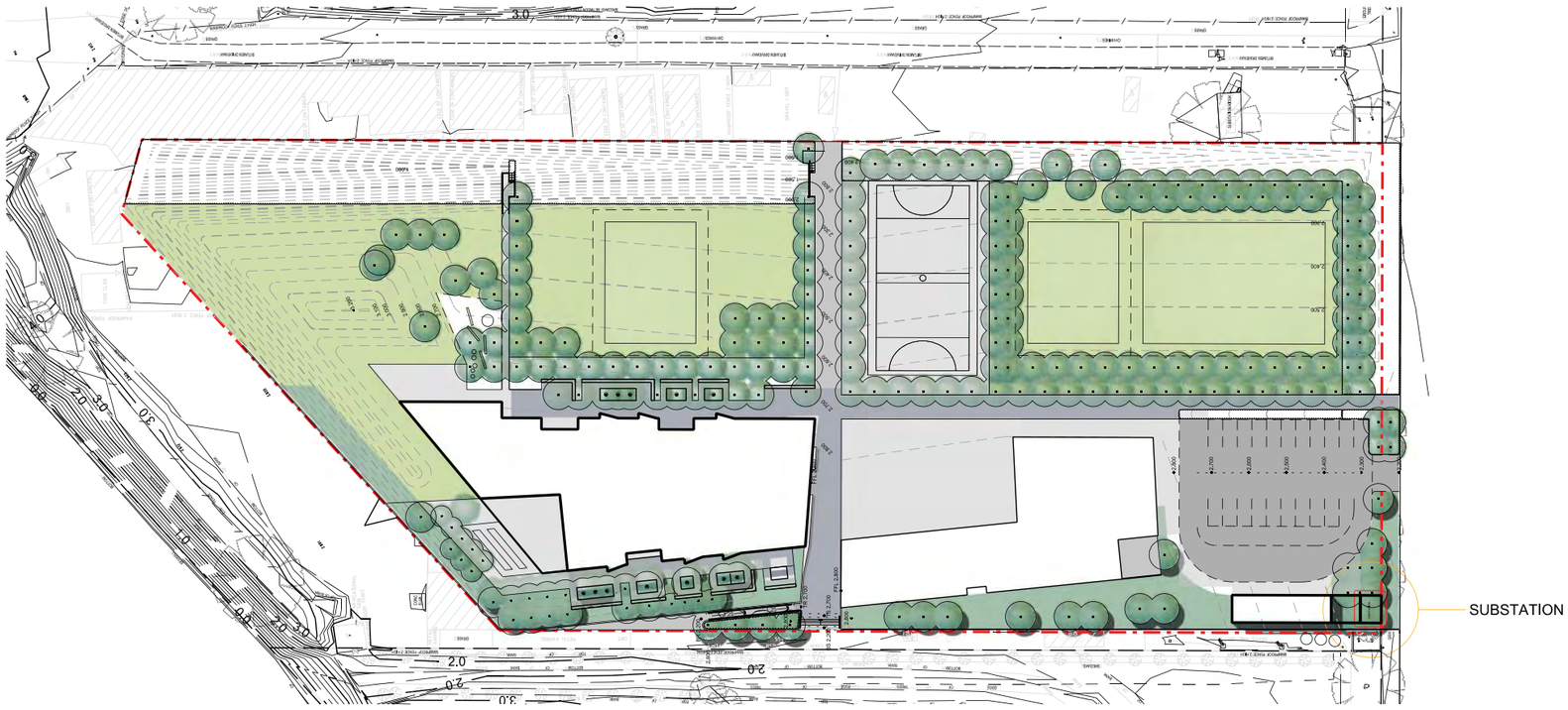
DEMOLITION SITE PLAN AND SITE PLAN

PLAN RM NO	CONTRACT NUMBER
SCALES 1:500 @ A1	SHEET NO DA 02
DESIGNED GAO / PLOT DATE 4/12/2014	
DRAFTED GAO / VERIFIED GAO	REVISION A

4/12/2014 12:35:20 PM G:\Projects\Educ\PS\Wentworth_Pt\4_do\arch\WENTPT_DA 02-SITE-HOR.PLT
mssmarm $NODE$

A1 0 10 20 30 40 50 60 70 80 90 100 USE FIGURED DIMENSIONS IN PREFERENCE TO SCALING CHECK ALL DIMENSIONS ON SITE 200MM 300MM ON ORIGINAL

01 SITE DEMOLITION PLAN
SCALE 1:500



02 SITE PLAN
SCALE 1:500

LEGEND

AC	AIR CONDITIONER
ALUM	ALUMINIUM
BAL	BALUSTRADE
BOL	BOLLARD
C	CONCRETE
CB	CONCRETE BLOCK
CBW	CONCRETE BLOCK WALL
CFC	COMPRESSED FIBRE CEMENT
CK	CONCRETE KERB
CM	CORRUGATED METAL
COL	COLUMN
COLA	COVERED OUTDOOR LEARNING AREA
COS	CHECK ON SITE
CP	CONCRETE PAVING
CPA	CONCRETE PAVING - ASPHALTIC
CPC	CONCRETE PAVING - COLOURED
CPD	CUPBOARD
CPW	CONCRETE PAVING – WASHED AGGREGATE
CSW	CONCRETE SEATING WALL
DP	DOWNPIPE
EDB	ELECTRICAL DISTRIBUTION BOARD
EX	EXISTING
FC	FIBRE CEMENT
FCB	FACE CONCRETE BLOCK
FFL	FINISHED FLOOR LEVEL
FHR	FIRE HOSE REEL
FIP	FIRE INDICATOR PANEL
FNC	FENCE
GL	GROUND LINE
OFC	OFF-FORM CONCRETE
MC	METAL CLADDING
MP	MASS PLANTING
MO	MULCH ONLY
PA	PAVER
PAA	PRACTICAL ACTIVITIES AREA
PB	PLASTERBOARD
PBX	PLANTER BOX
PCFC	PREFINISHED COMPRESSED FIBRE CEMENT
PERF	PERFORATED
PP	PERMEABLE PAVING
RL	REDUCED LEVEL
RS	ROOF SHEETING
RW	RETAINING WALL
RWG	RAINWATER GUTTER
SFP	SOFTFALL PAVING
STE	SYNTHETIC TURF EMBANKMENT
STF	SYNTHETIC TURF
TC	TRANSLUCENT CLADDING
TF	TURF
TOW	TOP OF WALL
WS	WHEEL STOP

REVISION

ISS	DATE	COMMENT

STRUCTURAL GOVERNMENT ARCHITECT'S OFFICE T 9372 8230 F 9372 8399	ARCHITECTURAL GOVERNMENT ARCHITECT'S OFFICE T 9372 8411 F 9372 8399
ELECTRICAL GOVERNMENT ARCHITECT'S OFFICE T 9372 8253 F 9372 8133	LANDSCAPE GOVERNMENT ARCHITECT'S OFFICE T 9372 8428 F 9372 8444
MECHANICAL GOVERNMENT ARCHITECT'S OFFICE T 9372 8253 F 9372 8133	QUANTITY SURVEYOR GOVERNMENT ARCHITECT'S OFFICE T 9372 8311 F 9372 8444
HYDRAULIC GOVERNMENT ARCHITECT'S OFFICE T 9372 8202 F 9372 8133	PROJECT MANAGEMENT PROJECT MANAGEMENT GROUP T 9372 8558 F 9372 8566

NSW GOVERNMENT
Public Works
Government Architect's Office
PETER POULET
NSW Government Architect
Nominated Architect AIRN 5754
Level 19 McKell Building 2-24 Rawson Place
Sydney NSW 2000 AUSTRALIA
A division of the Office of Finance & Services
PHIL GAETJENS
Secretary

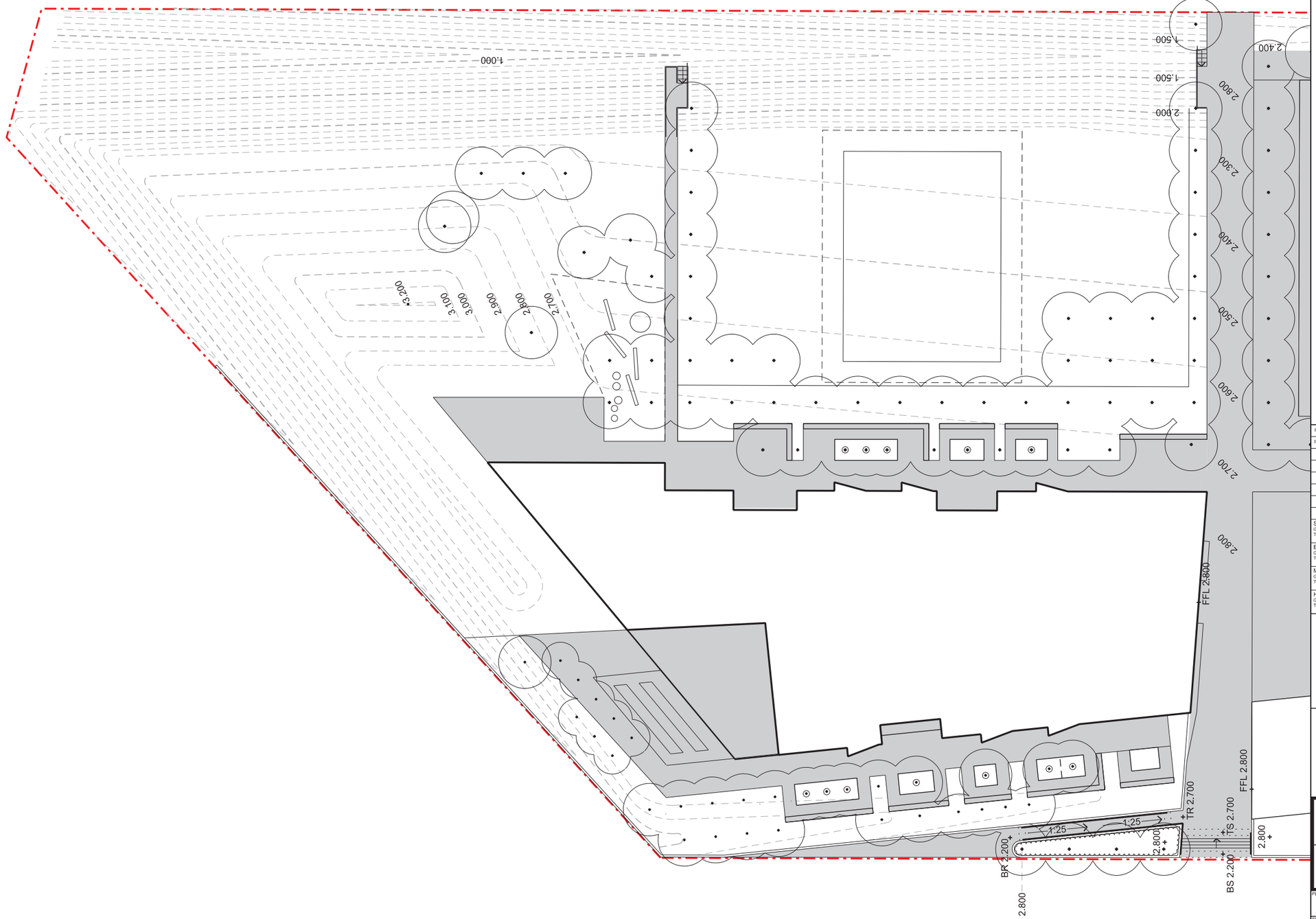
WENTWORTH POINT PUBLIC SCHOOL
BURROWAY ROAD

DEMOLITION SITE PLAN AND SITE PLAN

PLAN RM NO	CONTRACT NUMBER
SCALES: 1:500 @ A1	SHEET NO: DA 02
DESIGNED: GAO	PLOT DATE: 8/12/2014
DRAFTED: GAO	VERIFIED: GAO
	REVISION: A

8/12/2014 10:24:12 AM G:\Projects\Edu\PS\Wentworth_Pt\14-dd\arch\WENTPT_DA 02-SITE-HOR.PLT

A1 0 10 20 30 40 50 60 70 80 90 100
USE FIGURED DIMENSIONS IN PREFERENCE TO SCALING
CHECK ALL DIMENSIONS ON SITE
200MM
300MM ON ORIGINAL



1 The Government Architect's Office, a division of the Office of Finance & Services shall not be liable or responsible for any loss or damage arising out of the conversion of any electronic document, data or program to any other format or medium, or arising out of any modification or changes that occur in the handling or use of the electronic document, data or program.

2 The recipient or user of any electronic document, data or program is solely responsible for ascertaining its accuracy and its suitability for their purposes.

3 The Department uses virus scanning software to prevent file and system virus attacks but gives no warranty. The recipient or user is solely responsible for their own virus protection.

LEGEND

AC	AIR CONDITIONER
ALUM	ALUMINIUM
BAL	BALUSTRADE
BOL	BOLLARD
C	CONCRETE
CB	CONCRETE BLOCK
CBW	CONCRETE BLOCK WALL
CFC	COMPRESSED FIBRE CEMENT
CK	CONCRETE KERB
CM	CORRUGATED METAL
COL	COLUMN
COLA	COVERED OUTDOOR LEARNING AREA
COS	CHECK ON SITE
CP	CONCRETE PAVING
CPA	CONCRETE PAVING - ASPHALTIC
CPC	CONCRETE PAVING - COLOURED
CPD	CUPBOARD
CPW	CONCRETE PAVING – WASHED AGGREGATE
CSW	CONCRETE SEATING WALL
DP	DOWNPIPE
EDB	ELECTRICAL DISTRIBUTION BOARD
EX	EXISTING
FC	FIBRE CEMENT
FCB	FACE CONCRETE BLOCK
FFL	FINISHED FLOOR LEVEL
FHR	FIRE HOSE REEL
FIP	FIRE INDICATOR PANEL
FNC	FENCE
GL	GROUND LINE
OFC	OFF-FORM CONCRETE
MC	METAL CLADDING
MP	MASS PLANTING
MO	MULCH ONLY
PA	PAVER
PAA	PRACTICAL ACTIVITIES AREA
PB	PLASTERBOARD
PBX	PLANTER BOX
PCFC	PREFINISHED COMPRESSED FIBRE CEMENT
PERF	PERFORATED
PP	PERMEABLE PAVING
RL	REDUCED LEVEL
RS	ROOF SHEETING
RW	RETAINING WALL
RWG	RAINWATER GUTTER
SFP	SOFTFALL PAVING
STE	SYNTHETIC TURF EMBANKMENT
STF	SYNTHETIC TURF
TC	TRANSLUCENT CLADDING
TF	TURF
TOW	TOP OF WALL
WS	WHEEL STOP

REVISION

ISS	DATE	COMMENT

STRUCTURAL GOVERNMENT ARCHITECT'S OFFICE T 9372 8230 F 9372 8399	ARCHITECTURAL GOVERNMENT ARCHITECT'S OFFICE T 9372 8411 F 9372 8399
ELECTRICAL GOVERNMENT ARCHITECT'S OFFICE T 9372 8253 F 9372 8133	LANDSCAPE GOVERNMENT ARCHITECT'S OFFICE T 9372 8428 F 9372 8444
MECHANICAL GOVERNMENT ARCHITECT'S OFFICE T 9372 8253 F 9372 8133	QUANTITY SURVEYOR GOVERNMENT ARCHITECT'S OFFICE T 9372 8311 F 9372 8444
HYDRAULIC GOVERNMENT ARCHITECT'S OFFICE T 9372 8202 F 9372 8133	PROJECT MANAGEMENT PROJECT MANAGEMENT GROUP T 9372 8558 F 9372 8566

NSW GOVERNMENT

Public Works
Government Architect's Office

PETER POULET
NSW Government Architect
Registration Number - ABN 5754
Level 19 McKell Building - 2-24 Rawson Place
Sydney NSW 2000 AUSTRALIA
A division of the Office of Finance & Services
PHIL GAETJENS
Secretary

WENTWORTH POINT PUBLIC SCHOOL
BURROWAY ROAD

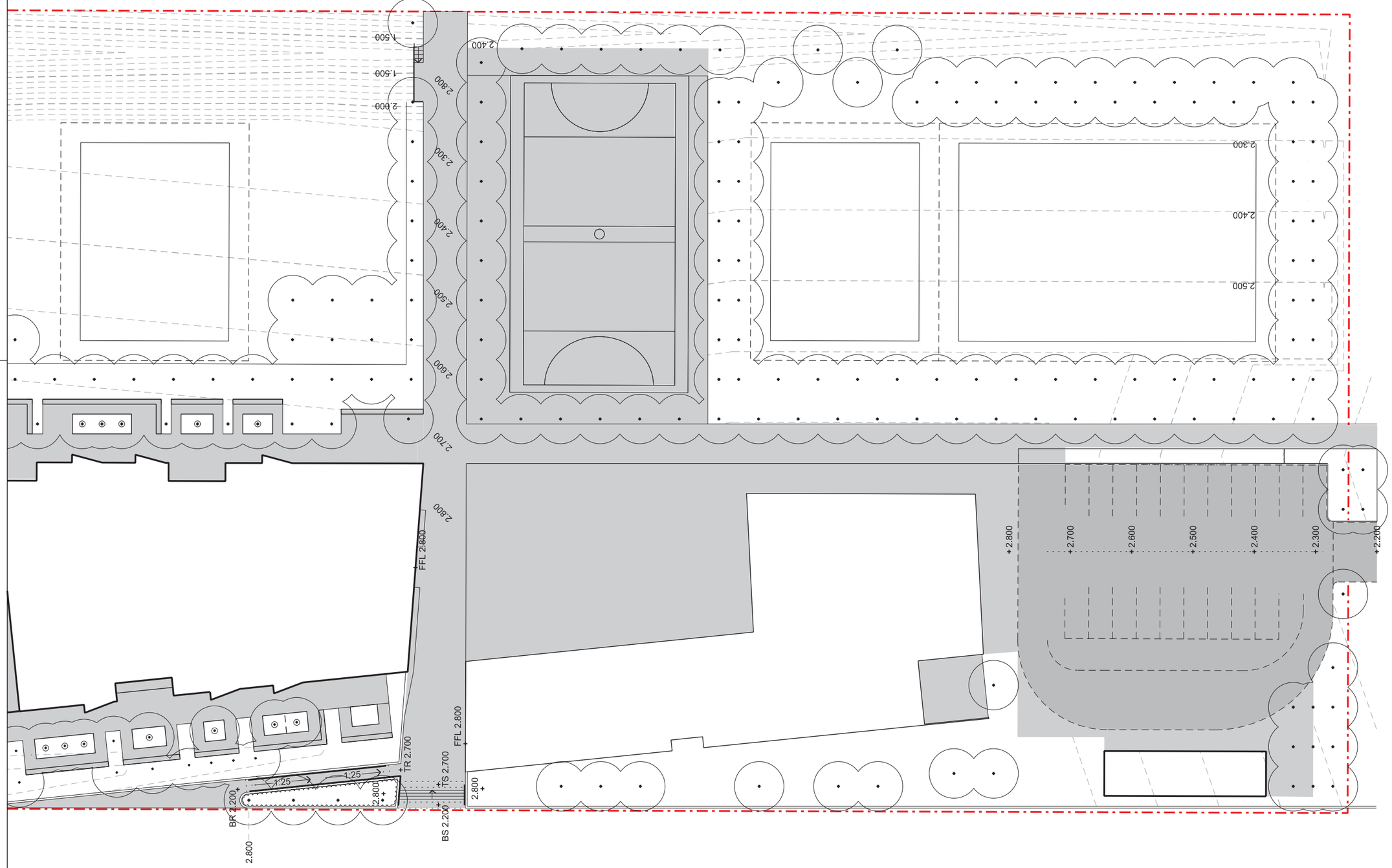
EXTERNAL WORKS SITE PLAN 1

PLAN RM NO	CONTRACT NUMBER
SCALES 1:200 @ A1	SHEET NO DA 03
DESIGNED GAO / PLOT DATE 5/12/2014	
DRAFTED GAO / VERIFIED GAO	REVISION

A1 0 10 20 30 40 50 60 70 80 90 100 | USE FIGURED DIMENSIONS IN PREFERENCE TO SCALING. CHECK ALL DIMENSIONS ON SITE | 200MM | 300MM ON ORIGINAL

G:\Projects\Educ\PS\Wentworth_Pt\4_dev\arch\WENTPT_DA 03-SITE 200-1.PLT 3:21:39 PM 5/12/2014

mossmorris $NODE$



1 The Government Architect's Office, a division of the Office of Finance & Services shall not be liable or responsible for any loss or damage arising out of the conversion of any electronic document, data or program to any other format or medium, or arising out of any modification or changes that occur in the handling or use of the electronic document, data or program.

2 The recipient or user of any electronic document, data or program is solely responsible for ascertaining its accuracy and its suitability for their purposes.

3 The Department uses virus scanning software to prevent file and system virus attacks but gives no warranty. The recipient or user is solely responsible for their own virus protection.

LEGEND

AC	AIR CONDITIONER
ALUM	ALUMINIUM
BAL	BALUSTRADE
BOL	BOLLARD
C	CONCRETE
CB	CONCRETE BLOCK
CBW	CONCRETE BLOCK WALL
CFC	COMPRESSED FIBRE CEMENT
CK	CONCRETE KERB
CM	CORRUGATED METAL
COL	COLUMN
COLA	COVERED OUTDOOR LEARNING AREA
COS	CHECK ON SITE
CP	CONCRETE PAVING
CPA	CONCRETE PAVING - ASPHALTIC
CPC	CONCRETE PAVING - COLOURED
CPD	CUPBOARD
CPW	CONCRETE PAVING – WASHED AGGREGATE
CSW	CONCRETE SEATING WALL
DP	DOWNPIPE
EDB	ELECTRICAL DISTRIBUTION BOARD
EX	EXISTING
FC	FIBRE CEMENT
FCB	FACE CONCRETE BLOCK
FFL	FINISHED FLOOR LEVEL
FHR	FIRE HOSE REEL
FIP	FIRE INDICATOR PANEL
FNC	FENCE
GL	GROUND LINE
OFC	OFF-FORM CONCRETE
MC	METAL CLADDING
MP	MASS PLANTING
MO	MULCH ONLY
PA	PAVER
PAA	PRACTICAL ACTIVITIES AREA
PB	PLASTERBOARD
PBX	PLANTER BOX
PCFC	PREFINISHED COMPRESSED FIBRE CEMENT
PERF	PERFORATED
PP	PERMEABLE PAVING
RL	REDUCED LEVEL
RS	ROOF SHEETING
RW	RETAINING WALL
RWG	RAINWATER GUTTER
SFP	SOFTFALL PAVING
STE	SYNTHETIC TURF EMBANKMENT
STF	SYNTHETIC TURF
TC	TRANSLUCENT CLADDING
TF	TURF
TOW	TOP OF WALL
WS	WHEEL STOP

REVISION

ISS	DATE	COMMENT

STRUCTURAL GOVERNMENT ARCHITECT'S OFFICE T 9372 8230 F 9372 8399	ARCHITECTURAL GOVERNMENT ARCHITECT'S OFFICE T 9372 8411 F 9372 8399
ELECTRICAL GOVERNMENT ARCHITECT'S OFFICE T 9372 8253 F 9372 8133	LANDSCAPE GOVERNMENT ARCHITECT'S OFFICE T 9372 8428 F 9372 8444
MECHANICAL GOVERNMENT ARCHITECT'S OFFICE T 9372 8253 F 9372 8133	QUANTITY SURVEYOR GOVERNMENT ARCHITECT'S OFFICE T 9372 8311 F 9372 8444
HYDRAULIC GOVERNMENT ARCHITECT'S OFFICE T 9372 8202 F 9372 8133	PROJECT MANAGEMENT PROJECT MANAGEMENT GROUP T 9372 8558 F 9372 8566

NSW GOVERNMENT
Public Works
Government Architect's Office
PETER POULET
NSW Government Architect
Nominated Architect: ARN 5754
Level 19 McKell Building, 2-24 Rawson Place
Sydney NSW 2000 AUSTRALIA
A division of the Office of Finance & Services
PHIL GAETJENS
Secretary

WENTWORTH POINT PUBLIC SCHOOL
BURROWAY ROAD

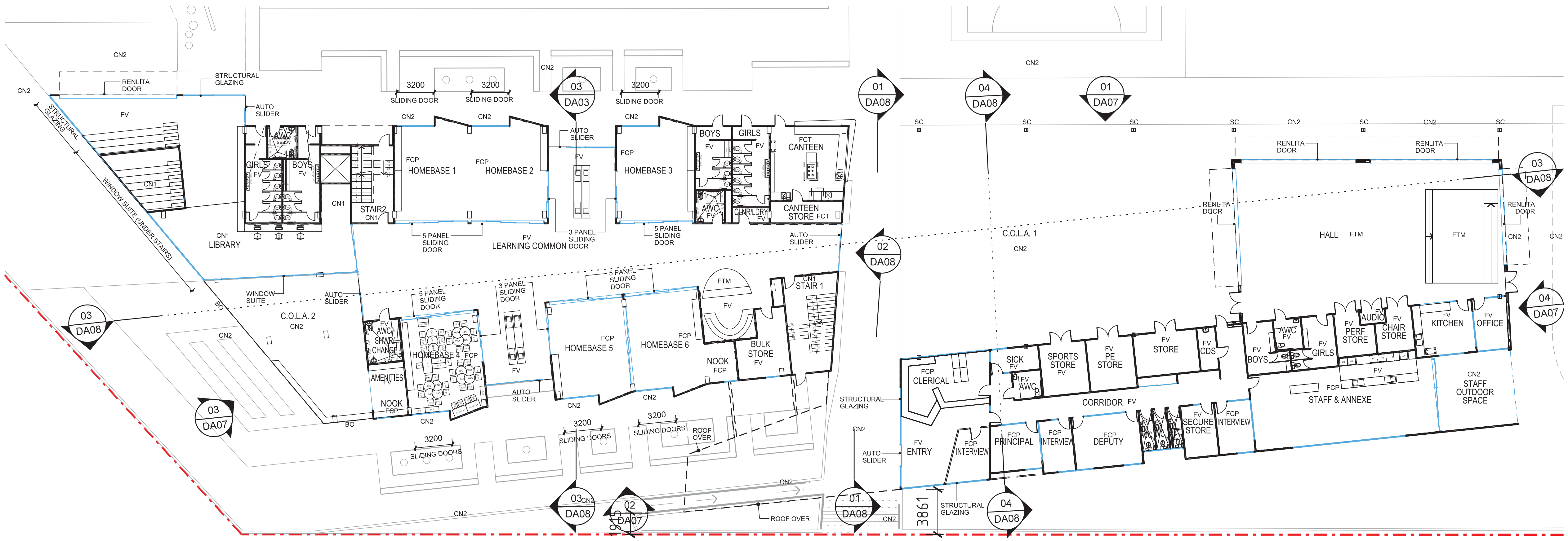
EXTERNAL WORKS SITE PLAN 2

PLAN RM NO	CONTRACT NUMBER
SCALES: 1:200 @ A1	SHEET NO: DA 04
DESIGNED: GAO / PLOT DATE: 5/12/2014	
DRAFTED: GAO / VERIFIED: GAO	REVISION

5/12/2014 3:23:55 PM G:\Projects\Educ\PS\Wentworth_Pt\4_dgs\arch\WENTPT_DA 04-SITE 200-2.PLT

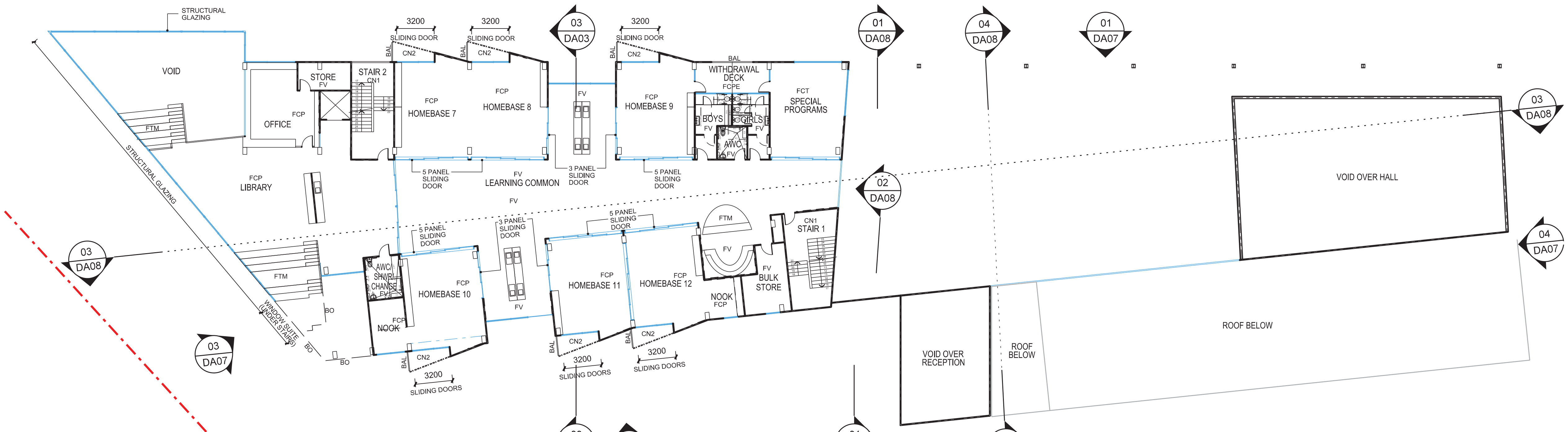
NODES mossmorris

A1 0 10 20 30 40 50 60 70 80 90 100 USE FIGURED DIMENSIONS IN PREFERENCE TO SCALING. CHECK ALL DIMENSIONS ON SITE 200MM 300MM ON ORIGINAL



CN1 - CONCRETE INDOOR
CN2 - CONCRETE OUTDOOR
FCP - FLOOR CARPET
FV - FLOOR VINYL
FTM - FLOOR TIMBER

01 GROUND FLOOR PLAN
SCALE 1:200



CN1 - CONCRETE INDOOR
CN2 - CONCRETE OUTDOOR
FCP - FLOOR CARPET
FV - FLOOR VINYL
FTM - FLOOR TIMBER
FCPE - FLOOR CARPET EXTERNAL

02 FIRST FLOOR PLAN
SCALE 1:200

LEGEND

AC	AIR CONDITIONER
ALUM	ALUMINIUM
BAL	BALUSTRADE
BOL	BOLLARD
C	CONCRETE
CB	CONCRETE BLOCK
CBW	CONCRETE BLOCK WALL
CFC	COMPRESSED FIBRE CEMENT
CK	CONCRETE KERB
CM	CORRUGATED METAL
COL	COLUMN
COLA	COVERED OUTDOOR LEARNING AREA
COS	CHECK ON SITE
CP	CONCRETE PAVING
CPA	CONCRETE PAVING - ASPHALTIC
CPC	CONCRETE PAVING - COLOURED
CPD	CUPBOARD
CPW	CONCRETE PAVING – WASHED AGGREGATE
CSW	CONCRETE SEATING WALL
DP	DOWNPIPE
EDB	ELECTRICAL DISTRIBUTION BOARD
EX	EXISTING
FC	FIBRE CEMENT
FCB	FACE CONCRETE BLOCK
FFL	FINISHED FLOOR LEVEL
FHR	FIRE HOSE REEL
FIP	FIRE INDICATOR PANEL
FNC	FENCE
GL	GROUND LINE
OFC	OFF-FORM CONCRETE
MC	METAL CLADDING
MP	MASS PLANTING
MO	MULCH ONLY
PA	PAVER
PAA	PRACTICAL ACTIVITIES AREA
PB	PLASTERBOARD
PBX	PLANTER BOX
PCFC	PREFINISHED COMPRESSED FIBRE CEMENT
PERF	PERFORATED
PP	PERMEABLE PAVING
RL	REDUCED LEVEL
RS	ROOF SHEETING
RW	RETAINING WALL
RWG	RAINWATER GUTTER
SFP	SOFTFALL PAVING
STE	SYNTHETIC TURF EMBANKMENT
STF	SYNTHETIC TURF
TC	TRANSLUCENT CLADDING
TF	TURF
TOW	TOP OF WALL
WS	WHEEL STOP

REVISION

ISS	DATE	COMMENT

STRUCTURAL
GOVERNMENT ARCHITECT'S OFFICE
T 9372 8230 F 9372 8399

ARCHITECTURAL
GOVERNMENT ARCHITECT'S OFFICE
T 9372 8411 F 9372 8399

ELECTRICAL
GOVERNMENT ARCHITECT'S OFFICE
T 9372 8253 F 9372 8133

LANDSCAPE
GOVERNMENT ARCHITECT'S OFFICE
T 9372 8428 F 9372 8444

MECHANICAL
GOVERNMENT ARCHITECT'S OFFICE
T 9372 8253 F 9372 8133

QUANTITY SURVEYOR
GOVERNMENT ARCHITECT'S OFFICE
T 9372 8311 F 9372 8444

HYDRAULIC
GOVERNMENT ARCHITECT'S OFFICE
T 9372 8202 F 9372 8133

PROJECT MANAGEMENT
PROJECT MANAGEMENT GROUP
T 9372 8558 F 9372 8566

NSW GOVERNMENT
Public Works
Government Architect's Office
PETER POULET
NSW Government Architect
Nominated Architect ARN 5754
Level 19 McKell Building, 2-24 Rawson Place
Sydney NSW 2000 AUSTRALIA
A division of the Office of Finance & Services
PHIL GAETJENS
Secretary

WENTWORTH POINT PUBLIC SCHOOL
BURROWAY ROAD

GROUND FLOOR PLAN & FIRST FLOOR PLAN

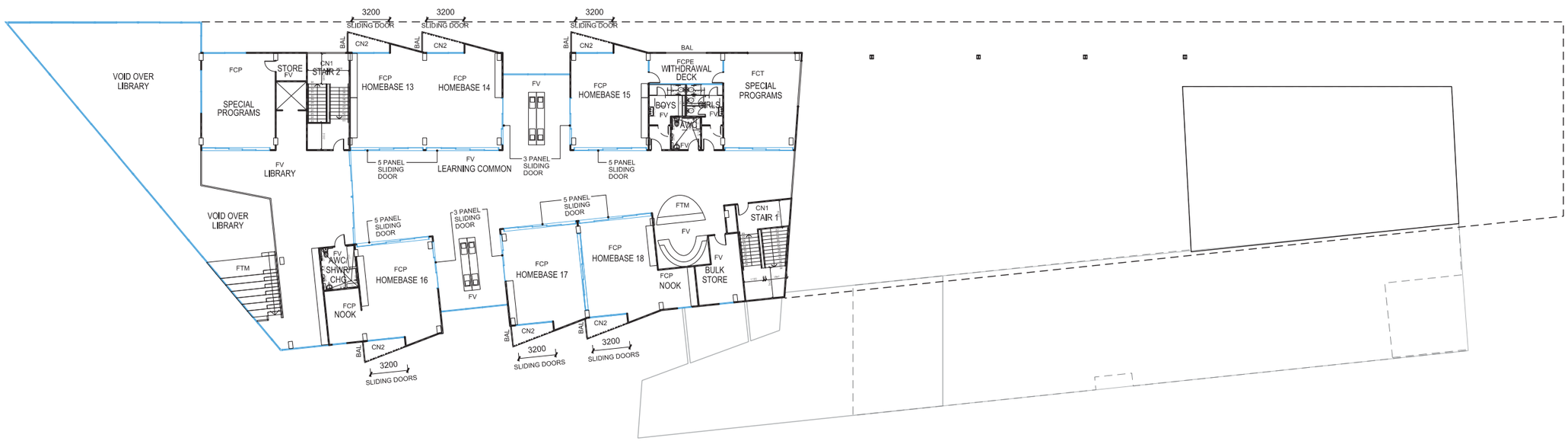
PLAN RM NO	CONTRACT NUMBER

SCALES	SHEET NO
1:200 @ A1	DA 05

DESIGNED	PLOT DATE	DRAFTED	VERIFIED	REVISION
GAO	11/12/2014	GAO	GAO	A

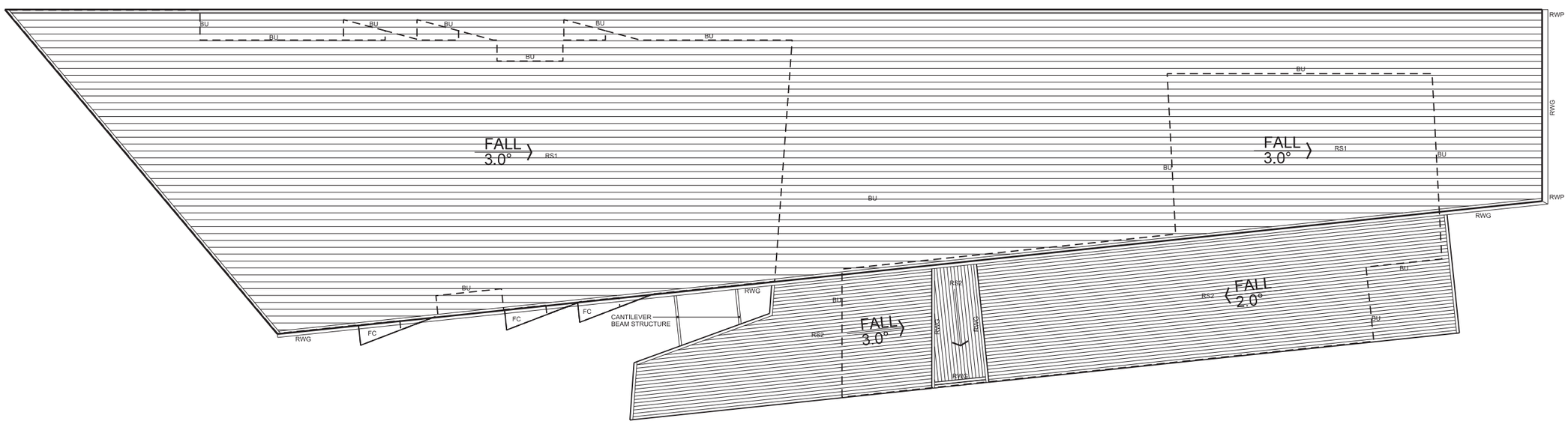
mossmanm $NODE$ 11/12/2014 10:43:09 AM G:\Projects\Educ\PS\Wentworth_Pt\4_da\arch\WENTPT_DA 05-Gfp and Ffp.PLT

A1 0 10 20 30 40 50 60 70 80 90 100 USE FIGURED DIMENSIONS IN PREFERENCE TO SCALING CHECK ALL DIMENSIONS ON SITE 200MM 300MM ON ORIGINAL



01 SECOND FLOOR PLAN
SCALE 1:200

CN1	-	CONCRETE INDOOR
CN2	-	CONCRETE OUTDOOR
FCP	-	FLOOR CARPET
FV	-	FLOOR VINYL
FTM	-	FLOOR TIMBER
FCPE	-	FLOOR CARPET EXTERNAL



02 ROOF PLAN
SCALE 1:200

RS1	-	ROOF SHEET 1 - KLIP-LOK
RS2	-	ROOF SHEET 2 - KLIP-LOK

1 The Government Architect's Office, a division of the Office of Finance & Services shall not be liable or responsible for any loss or damage arising out of the conversion of any electronic document, data or program to any other format or medium, or arising out of any modification or changes that occur in the handling or use of the electronic document, data or program.

2 The recipient or user of any electronic document, data or program is solely responsible for ascertaining its accuracy and its suitability for their purposes.

3 The Department uses virus scanning software to prevent file and system virus attacks but gives no warranty. The recipient or user is solely responsible for their own virus protection.

LEGEND

AC	AIR CONDITIONER
ALUM	ALUMINIUM
BAL	BALUSTRADE
BOL	BOLLARD
C	CONCRETE
CB	CONCRETE BLOCK
CBW	CONCRETE BLOCK WALL
CFC	COMPRESSED FIBRE CEMENT
CK	CONCRETE KERB
CM	CORRUGATED METAL
COL	COLUMN
COLA	COVERED OUTDOOR LEARNING AREA
COS	CHECK ON SITE
CP	CONCRETE PAVING
CPA	CONCRETE PAVING - ASPHALTIC
CPC	CONCRETE PAVING - COLOURED
CPD	CUPBOARD
CPW	CONCRETE PAVING – WASHED AGGREGATE
CSW	CONCRETE SEATING WALL
DP	DOWNPIPE
EDB	ELECTRICAL DISTRIBUTION BOARD
EX	EXISTING
FC	FIBRE CEMENT
FCB	FACE CONCRETE BLOCK
FFL	FINISHED FLOOR LEVEL
FHR	FIRE HOSE REEL
FIP	FIRE INDICATOR PANEL
FNC	FENCE
GL	GROUND LINE
OFC	OFF-FORM CONCRETE
MC	METAL CLADDING
MP	MASS PLANTING
MO	MULCH ONLY
PA	PAVER
PAA	PRACTICAL ACTIVITIES AREA
PB	PLASTERBOARD
PBX	PLANTER BOX
PCFC	PREFINISHED COMPRESSED FIBRE CEMENT
PERF	PERFORATED
PP	PERMEABLE PAVING
RL	REDUCED LEVEL
RS	ROOF SHEETING
RW	RETAINING WALL
RWG	RAINWATER GUTTER
SFP	SOFTFALL PAVING
STE	SYNTHETIC TURF EMBANKMENT
STF	SYNTHETIC TURF
TC	TRANSLUCENT CLADDING
TF	TURF
TOW	TOP OF WALL
WS	WHEEL STOP

REVISION

ISS	DATE	COMMENT

STRUCTURAL
GOVERNMENT ARCHITECT'S OFFICE
T 9372 8230 F 9372 8399

ARCHITECTURAL
GOVERNMENT ARCHITECT'S OFFICE
T 9372 8411 F 9372 8399

ELECTRICAL
GOVERNMENT ARCHITECT'S OFFICE
T 9372 8253 F 9372 8133

LANDSCAPE
GOVERNMENT ARCHITECT'S OFFICE
T 9372 8428 F 9372 8444

MECHANICAL
GOVERNMENT ARCHITECT'S OFFICE
T 9372 8253 F 9372 8133

QUANTITY SURVEYOR
GOVERNMENT ARCHITECT'S OFFICE
T 9372 8311 F 9372 8444

HYDRAULIC
GOVERNMENT ARCHITECT'S OFFICE
T 9372 8202 F 9372 8133

PROJECT MANAGEMENT
PROJECT MANAGEMENT GROUP
T 9372 8558 F 9372 8566

NSW GOVERNMENT
Public Works
Government Architect's Office
PETER POULET
NSW Government Architect
Nominated Architect ARN 5754
Level 19 McKell Building, 2-24 Rawson Place
Sydney NSW 2000 AUSTRALIA
A division of the Office of Finance & Services
PHIL GAETJENS
Secretary

WENTWORTH POINT PUBLIC SCHOOL
BURROWAY ROAD

SECOND FLOOR PLAN & ROOF PLAN

PLAN RM NO
CONTRACT NUMBER
SCALES 1:200 @ A1
SHEET NO DA 06
DESIGNED GAO
PLOT DATE 2/12/2014
DRAFTED GAO
VERIFIED GAO
REVISION A

2/12/2014 10:48:33 AM G:\Projects\Educ\PS\Wentworth_Pt\4_do\arch\WENTPT_DA 06-Sip and Roof.PLT
mssmarm $NODE$

A1 0 10 20 30 40 50 60 70 80 90 100
USE FIGURED DIMENSIONS IN PREFERENCE TO SCALING
CHECK ALL DIMENSIONS ON SITE
200MM
300MM ON ORIGINAL

Appendix B - Auditor Correspondence

Level 19, Tower B, 799 Pacific Highway
Chatswood
NSW 2067 Australia

t: +61 2 9406 1119
f: +61 2 9911 10032

coffey.com

30 July 2014

Our ref: ENAURHOD01055AA-IA01

Absolute Environmental
Level 18, McKell Building
2 - 24 Rawson Place
Sydney NSW 2000

Attention: Michael Mossman

Dear Michael

Interim Audit Advice 01 - Comment EIS SAQP for Proposed School Development, Burroway Road, Wentworth Point NSW

The advice presented in this document represents interim advice only, and does not constitute a Site Contamination Audit Report or Site Contamination Audit Statement. This advice provides the opinion of the Auditor based on the knowledge that is available at the time of this advice. A Site Contamination Audit Report and Site Contamination Audit Statement will be issued at the end of the Audit process, when the Auditor is satisfied all relevant matters have been adequately addressed to the satisfaction of the Auditor. This advice does not pre-empt or constrain the final outcome(s) of the audit or any conditions that may be placed by the Auditor in the Site Contamination Audit Report or Site Contamination Audit Statement.

Preamble

The Auditor, who is an employee of Coffey Environments Australia Pty Ltd, has been engaged NSW Public Works – Government Architect's Office (the Principal) to conduct a non-statutory site audit regarding suitability of land for development of a proposed primary school on land known as Part No. 3 Burroway Road, Wentworth Point NSW (the site). The site is the western part of Lot 2 in DP 859608 and has an area of approximately 2.2 hectares. Environmental Investigation Services, a division of Jeffery and Katauskas Pty Limited, is appointed as environmental consultant for the Principal for assessment and remediation planning (as required) at the site.

I understand that the purpose of this audit is to provide a Site Audit Statement in support of an application for redevelopment of the site to provide a primary school and associated playing fields. This development application is being coordinated by the Principal.

About this Interim Audit Advice

I have reviewed:

Environmental Investigation Services: Report to NSW Public Works – Government Architects Office on Sampling, Analysis and Quality Plan for Proposed School Development at Part of 3 Burroway Road, Wentworth Point, NSW (Part of Lot 2 in DP859608). Reference E27299Krpt-SAQP Draft, dated 23 July 2014.

The above document is referred to as the SAQP in this Interim Audit Advice.

In company with yourself and Adrian Kingswell and Mitch Delaney (EIS), I visited the site on Wednesday 4 June 2014 and observed the condition of the site and surrounding land.

General Comments

I consider that the SAQP is prepared to a standard which generally meets recommendations detailed in the NSW EPA Guidelines for Consultants Reporting on Contaminated Sites (2011).

I consider that the analysis of current Data Gaps presented in Section 5 of the SAQP lacks sufficient detail to provide a clear rationale for the sampling design presented in subsequent sections of the SAQP. In particular, I note the following data gaps, in addition to those identified by EIS, from my independent review of existing data:

- Placing a grid approximately 30m square across the site showed the need for additional investigation at five locations which were not in the vicinity of existing boreholes.
- Identification of asbestos impact in fill materials on the adjacent site to the east, and sparse coverage along the eastern side of the site raises the potential for unidentified asbestos impact along the eastern side of the site. The proposed placement of additional fill material would probably provide an adequate barrier for future use of the site, however, the fill cannot be relied on to provide an adequate barrier for construction workers involved in earthworks.
- The electrical transformer in the southeastern part of the site should be assessed for potential release of oil.

I do not agree with EIS' reference to HSLs as part of Groundwater Investigation Levels because the application of HSLs requires depth to groundwater of at least 2m, and the depth to groundwater on the site is approximately 1m. I also do not agree with EIS' reference to Tap Water values from USEPA Region 9 PRGs (now RSLs or Regional Screening Levels) because risk to human health is not relevant to groundwater quality on the site.

Specific Comments on SAQP

No.	Section	Auditor's Comment
1	1.1	I understand that the proposed development is a primary school.
2	1.2	The object is to identify data gaps regarding assessment of suitability of the site for future use as a primary school and plan additional investigation to address identified data gaps.
3	1.3, Table 1-1	The usual reference date for the Contaminated Land Management Act is 1997. The reference in Table 1-1 is basically the changes to the CLM Act, and is not the entire Act.

No.	Section	Auditor's Comment
4	2	With reference to reports listed in paragraph 1, I note that additional relevant historical aerial photographs are included in Appendix B of AECOM (2010) Wentworth Point Maritime precinct, Geotechnical Report, Preliminary Desk Study.
5	3.5	I observed an electrical power transformer founded on a concrete slab on the ground near a large tree in the southeast corner of the site. Although this equipment did not appear to be damaged, the potential for oil leakage, possibly including PCBs, exists and warrants consideration..
6	3.8	The final sentence in the first paragraph is incomplete. I disagree with EIS' conclusion in the last paragraph that "groundwater may be a potential resource in the vicinity of the site", because the site is in an area which was naturally inundated during tidal rise and fall of water in Parramatta River and Homebush Bay and groundwater extracted from a higher yielding saturated zone is likely to quickly become salty due to recharge from these water bodies.
7	4.1, Table 4-1	Reference at the bottom of page 27 to a possible underground storage tank in the central section of the site is not clearly supported by annotations on Figure 3. The location on Figure 3 should be clarified.
8	4.1, Table 4-1	With reference to Hazardous Building Materials, the presence of a materials recycling facility on the adjacent property to the east may be a source of asbestos or lead impacted dust on the eastern part of the site.
9	4.2, Table 4-2	Regarding fate and transport of volatile contaminants, the second paragraph does not appear to be relevant to reported subsurface conditions. I request that this second paragraph be revised to refer to reported subsurface conditions on the site.
10	4.3, Table 4-3	Given my comments on groundwater extraction in item 6, I consider that the pathway associated with abstraction and use of groundwater is not complete for this site.
11	5	I refer to General Comments above this table regarding the need for this section to be more detailed and specific.
12	6.1, and other similar references	I request that any reference to NEPM 2013 also include the particular Schedule and, if applicable, the section(s) in the Schedule.
13	6.1, Table 6-1	The study boundary should also be defined vertically.
14	7, Table 7-1	Health Investigation Levels – the proposed land use is for a primary school and this description should be maintained.
15	7, Table 7-1	Ecological Assessment Criteria – a description of the development provided by Michael Mossman (GAO) indicated that approximately

No.	Section	Auditor's Comment
		50% of the area of the site would be vegetated open space.
16	7, Table 7-1	Asbestos in Soil – as noted in General Comments above, I disagree with EIS and consider that assessment of asbestos in soil is required for appropriate management of the site until a capping layer is placed and also as relevant information for long-term management of this capping layer.
17	7, Table 7-1	Groundwater Investigation Levels - as noted in General Comments above, I disagree with EIS about reference to HSLs and Tap Water values in USEPA RSLs.
18	7	Regarding ASS assessment discussed in the final paragraph on page 37, I note that any assessment would be targeted to the area of disturbance.
19	8.2	Regarding assessment of the adequacy of the existing sampling locations for systematic characterisation of the entire site, I do not agree that the GHD investigations comprised "27 evenly spaced sampling points". I suggest that use of a 30m square grid overlay on Figure 3 could assist in identifying locations for up to 5 additional systematic sampling locations than those proposed by EIS. The grid I used for my review was approximately 15m in from the western and southern boundaries of the site.
20	8.2	As I noted in item 16, I require assessment of asbestos impact at the ground surface and at 0.5m below ground surface at least in the eastern part of the site.
21	8.3	A sampling method for assessment of asbestos impact in soil should be included.
22	8.3.1	If headspace screening indicates the presence of VOCs in soil and the sampling location is not associated with an identified petroleum fuel source, then a broader analysis for VOCs than BTEX should be requested.
23	8.4.1	The Groundwater Sampling Rationale should identify which water bearing zone is being targeted for sampling. This could be water immediately above the base of fill material, or could be water within the natural soils beneath the site.
24	8.4.2	The design of the monitoring well, including total depth and screened interval, should be provided.
25	8.4.4	I note that NEPM (2013) Schedules B2 and B3 do not address sampling details for water. An alternate reference is required.
26	8.5.2	The design of the gas monitoring well, including total depth and screened interval, should be provided.

No.	Section	Auditor's Comment
27	8.5.3	Given that one sample of ground gas will be collected during each sampling round, I suggest that analysis for the expected gases of concern (methane, carbon monoxide, carbon dioxide and hydrogen sulfide) would be appropriate, rather than for methane only.
28	9	The reference to NSW EPA reporting guidelines is out of date.
29	Appendix A2	Sampling protocols for Asbestos in Soil and for Soil Gas should be included.

Closure

I request that EIS consider the comments made above and, where appropriate, respond to issues of concern or other specific issues I have identified.

To minimise the time required to reach a satisfactory resolution of the issues I have identified, I suggest that EIS representative(s) and I meet at a time and place to be arranged for the purpose of finalising the SAQP.

For and on behalf of Coffey

Michael Dunbavan
Senior Principal & NSW EPA Accredited Site Auditor

cc Mitch Delaney, EIS

Level 19, Tower B, 799 Pacific Highway
Chatswood
NSW 2067 Australia

t: +61 2 9406 1119
f: +61 2 9911 10032

coffey.com

25 August 2014

Our ref: ENAURHOD01055AA-IA02

NSW Public Works - Government Architect's Office
Level 18, McKell Building
2 - 24 Rawson Place
Sydney NSW 2000

Attention: Michael Mossman

Dear Michael

Interim Audit Advice 02 - Acceptance of EIS SAQP for Proposed Primary School Development, Burroway Road, Wentworth Point NSW

The advice presented in this document represents interim advice only, and does not constitute a Site Contamination Audit Report or Site Contamination Audit Statement. This advice provides the opinion of the Auditor based on the knowledge that is available at the time of this advice. A Site Contamination Audit Report and Site Contamination Audit Statement will be issued at the end of the Audit process, when the Auditor is satisfied all relevant matters have been adequately addressed to the satisfaction of the Auditor. This advice does not pre-empt or constrain the final outcome(s) of the audit or any conditions that may be placed by the Auditor in the Site Contamination Audit Report or Site Contamination Audit Statement.

Preamble

The Auditor, who is an employee of Coffey Environments Australia Pty Ltd, has been engaged NSW Public Works – Government Architect's Office (the Principal) to conduct a non-statutory site audit regarding suitability of land for development of a proposed primary school on land known as Part No. 3 Burroway Road, Wentworth Point NSW (the site). The site is the western part of Lot 2 in DP 859608 and has an area of approximately 1.5 hectares. Environmental Investigation Services, a division of Jeffery and Katauskas Pty Limited, is appointed as environmental consultant for the Principal for assessment and remediation planning (as required) at the site.

I understand that the purpose of this audit is to provide a Site Audit Statement in support of an application for redevelopment of the site to provide a primary school and associated playing fields. This development application is being coordinated by the Principal.

About this Interim Audit Advice

I have reviewed:

Environmental Investigation Services: Report to NSW Public Works – Government Architects Office on Sampling, Analysis and Quality Plan for Proposed Primary School Development at Part of 3 Burroway Road, Wentworth Point, NSW (Part of Lot 2 in DP859608). Reference E27299Krpt-SAQP, dated 18 August 2014.

The above document is referred to as the SAQP in this Interim Audit Advice.

General Comments

With reference to my comments in Interim Audit Advice 01 on the Draft SAQP, I am satisfied that EIS has addressed those comments. Consequently, I accept the revised SAQP (issued 18 August 2014) and consider that implementing the additional investigations described in the SAQP should close data gaps regarding potential effects of contamination on the proposed future use of the site for development of a primary school.

I offer a minor comment on the description of Ground Gas Sampling in Appendix A2 of the SAQP. With reference to the method described as Passive Vacuum Gas Sampler, I consider that use of an evacuated canister is an active rather than passive method because the pressure differential between the ground gas and inside the canister forces gas to flow into the canister. I also note that the sample volume for a single event collection is sufficient when the pressure differential is substantially reduced. The stated method indicates that the volume of sample is determined by a specified time that the canister remains open (in this case, 30 seconds).

I ask that EIS give consideration to my second comment. The SAQP does not need to be reissued if a minor change to gas sampling procedure is made.

Closure

I look forward to implementation of additional site investigation works.

For and on behalf of Coffey

Michael Dunbavan
Senior Principal & NSW EPA Accredited Site Auditor

cc Mitch Delaney, EIS

Level 19, Tower B, 799 Pacific Highway
Chatswood
NSW 2067 Australia

t: +61 2 9406 1206
f: +61 2 9406 1004

coffey.com

Memorandum

Recipient name	Michael Mossman	**Recipient company**	NSW Public Works - Government Architect's Office
Copied recipients	Mitch Delaney & Adrian Kingswell - EIS	**Memo date**	12/11/2014
Author	Michael Dunbavan - NSW EPA accredited Site Auditor		
Project number	ENAUHOD01055AA		
Memo Subject	Additional Contamination Investigation - Revised Approach Proposed Primary School Site, Burroway Road, Wentworth Point		

Context of this memo

Environmental Investigation Services (EIS) undertook a gap analysis of existing environmental information about the subject site (the site) and prepared a Sampling, Analysis and Quality Plan (SAQP) to address recognised information gaps. The objective of sampling and analysis was to assess the suitability of the site, from the aspect of contamination, for construction of and future use as a primary school.

Following review and amendment of the SAQP, I issued Interim Audit Advice IA02 which confirmed that I was satisfied that the SAQP should achieve the stated objective when implemented as described. EIS subsequently prepared a detailed proposal for additional investigation to implement the SAQP.

Review by NSW Public Works found that the estimated cost of EIS's additional investigation was substantially more than expected, and for that order of cost would require call for open tender under NSW government procurement guidelines. NSW Public Works called a meeting with EIS and myself to discuss options for change in approach which could reduce costs to an extent which would not trigger calling an open tender, and which would also achieve the overall objective.

Option for achieving objective and reducing scale of additional investigation

One important factor in considering options is the requirement for raising the surface level of the site to provide for adequate protection from future flood level predictions. That is, the site will be effectively "capped" by a layer of clean fill to raise the surface level by between 0.5 and 1 metre.

The current SAQP was developed to provide a comprehensive contamination assessment of the site regardless of the known future capping of the site. Including the placement of a capping layer, potential exposure pathways related to human health are reduced to:

- Demolition and placement of capping layer: direct dermal contact, incidental ingestion and inhalation of dust, including asbestos fibres in surface soils and localised excavation for removal of footings and buried services (as required);
- Construction: any activity which requires excavation through the capping layer, excluding installation of displacement piles;
- School activities: accumulation of hazardous ground gas(es) in enclosed spaces and indoor air; and
- School buildings and grounds maintenance: any activity which requires excavation through the capping layer.

Given that mature trees exist along the perimeter of the site, and that no use of deep rooted plants is indicated in the concept drawings available to date, potential ecological impacts appear limited to the potential migration of impacted groundwater from the site to the Parramatta River immediately to the north.

Taking account of substantially reduced exposure due to placement of a capping layer would trigger the need for implementation of an on-going environmental management plan (EMP) to ensure that this control measure was appropriately managed into the future. I reasonably expect that the imposition of such an EMP would not have a noticeable impact on school operational activity or costs. I understand that this constraint is open for consideration by NSW Public Works.

Review of information gaps – issues of concern

Demolition and placement of capping layer: is the available data set of the upper 0.5m of the FILL profile sufficient to conclude site conditions do not present an unacceptable health risk to construction workers?

Construction: at this time, detailed plans for construction are not available and this aspect will need to be held over until specific and relevant information is available.

School activities: what risk is posed by hazardous ground gases (particularly methane and carbon dioxide) for the proposed layout of school buildings, which is sufficiently developed at this time.

School buildings and grounds maintenance: at this time, detailed plans for construction are not available and this aspect will need to be held over until specific and relevant information is available.

Assessment of available information on the upper 0.5m of the FILL profile

I have reviewed the available data for the site and selected results relevant to the top 0.5m of the FILL profile. I have summarised my findings in the following table.

Chemical Group	Data Points	Comment
Heavy Metals as Arsenic, Cadmium, Total Chromium, Copper, Lead, Mercury, Nickel and Zinc	21	Except for mercury, maximum concentrations of heavy metals were outside the range expected for an old urban setting with high traffic, based on Appendix 1 of Olszowy et al (1995). Maximum concentrations were below HIL D, which relates to a commercial / industrial exposure scenario relevant to the demolition and construction phase of activity on the site. The Hazard Index for the eight metals using maximum reported concentration and HIL D as the allowable concentration was 0.51, which is well below the acceptable limit of 1. Lead had the highest Hazard Quotient, contributing 0.36 to the combined HI of 0.51. I confirmed that the available number of results for lead is sufficient to determine the average concentration through use of Procedure B in the NSW EPA Sampling Design Guidelines (1995). I identified an error in equation 3 in these guidelines, but this did not affect the outcome of the calculation.
Hydrocarbons as TPH and PAHs	20	Reportable concentrations of TPH C_{10}-C_{36} occurred in 6 samples and of PAHs in 4 samples of 20. PAH concentrations were well below the HIL D values for Total PAHs (4,000mg/kg) and carcinogenic PAHs (40mg/kg). For a health-based investigation level for demolition and construction activity on the site, I adopted the Health Screening Level (HSL) for direct contact with petroleum hydrocarbons, as TRH F2 (>C_{10}-C_{16}) which is published in Table B4 of CRC CARE Technical Report No.10 (E Friebel and P Nadebaum, *Health screening levels for petroleum hydrocarbons in soil and groundwater*, Part 2: Application document; September 2011). The maximum reported concentration of TPH C_{10}-C_{36} is2,200mg/kg which is well below the HSL value is 20,000mg/kg.
Asbestos	21	Asbestos impact was detected in 1 of 21 samples from the top 0.5m of the FILL profile. I noted that asbestos impact was detected in 2 of 9 shallow samples collected just outside the eastern boundary of the site.

Given the above, I am satisfied that data currently available to characterise the upper 0.5m of the FILL profile on the site is sufficient for heavy metals, TPH, PAHs, OC Pesticides and PCBs for likely demolition and construction activity on the site, including placement of a capping layer of clean fill. Although asbestos impact was identified in an isolated part of the site, the nature of this contaminant is distinctly different from the other chemical contaminants I have discussed and I am not satisfied that the shallow FILL on the site has been adequately characterised. My suggested approach is to make a visual inspection for suspected ACM on the surface on a 15m square grid with sampling of surface FILL for presence / absence of ACM and asbestos fibres where asbestos impact is identified.

Assessment of available information about potential for ecological impacts attributable to contamination on the site

Because regional impact to ground is reasonably excepted to have occurred as a result of historical reclamation of land across Wentworth Point, assessment of groundwater quality beneath the site should also consider results available for the property to the east of the site. Groundwater flow direction was inferred from gauging results from three wells on the site and one well of-site and adjacent to the southeast corner of the site. Groundwater flows to the north with discharge to Parramatta River immediately to the north of the site.

Regional groundwater appears to be impacted by dissolved arsenic, chromium, copper and zinc. Concentrations of these dissolved metals are generally above the ANZECC 2000 trigger value for protection of marine species for slightly to moderately disturbed ecosystems. The level of this impact beneath the site appears similar to that beneath the property to the east, except for a localised higher concentration of arsenic at well BHW42. Reported concentrations of arsenic in fill and soil at and surrounding BHW42 indicate that leaching of arsenic from contaminated soil on the site is not a likely cause of arsenic impact in groundwater.

Reported concentrations of petroleum hydrocarbons in soil on the site are comparable to relevant Ecological Screening Levels listed in Table 1B(6) in Schedule B1 of the ASC NEPM (NEPC 2013), and reported TPH concentrations in groundwater are below the Netherlands intervention level for mineral oil in groundwater (Netherlands Soil Remediation Circular 2009). Volatile hydrocarbons were not detected in groundwater beneath the site.

Given the above discussion, I am satisfied that data currently available to characterise the groundwater quality beneath the site is sufficient for the known types and distribution of contaminants on the site and adjacent to the site to the southeast which is the direction from which contaminated groundwater could migrate onto the site.

Assessment of available information on hazardous ground gases

Only one location has information relevant to the assessment of potential risk posed by hazardous ground gases. I am not satisfied that the current information is sufficient for provision of reliable advice of the design team about possible gas control measures required.

Auditor concerns requiring additional information

At the current level of design information, my concerns are:

1. Potential for asbestos impact on the surface of the site which may pose an unacceptable health risk to demolition and construction workers.

2. Characteristic of hazardous ground gases in the area proposed for construction of school buildings.

Closure

I suggest that NSW Public Works request a revised scope and fee proposal for additional investigation works to address my concerns outlined in the previous section. I suggest that the SAQP remain as is, because the new sampling plan should be consistent with the SAQP. Any departures should be explained in the scope.

Please call me if you have any questions or need to clarify any point.

Level 19, Tower B, 799 Pacific Highway
Chatswood
NSW 2067 Australia

t: +61 2 9406 1206
f: +61 2 9406 10042

coffey.com

28 May 2015

Our ref: ENAURHOD01055AA-IA03

NSW Public Works - Government Architect's Office
Level 18, McKell Building
2 - 24 Rawson Place
Sydney NSW 2000

Attention: Michael Mossman

Dear Michael

Interim Audit Advice 03 - Comment EIS Additional Detailed Environmental Site Assessment for Proposed Primary School Development, Burroway Road, Wentworth Point NSW

The advice presented in this document represents interim advice only, and does not constitute a Site Contamination Audit Report or Site Contamination Audit Statement. This advice provides the opinion of the Auditor based on the knowledge that is available at the time of this advice. A Site Contamination Audit Report and Site Contamination Audit Statement will be issued at the end of the Audit process, when the Auditor is satisfied all relevant matters have been adequately addressed to the satisfaction of the Auditor. This advice does not pre-empt or constrain the final outcome(s) of the audit or any conditions that may be placed by the Auditor in the Site Contamination Audit Report or Site Contamination Audit Statement.

Preamble

The Auditor, who is an employee of Coffey Environments Australia Pty Ltd, has been engaged NSW Public Works – Government Architect's Office (the Principal) to conduct a non-statutory site audit regarding suitability of land for development of a proposed primary school on land known as Part of 3 Burroway Road, Wentworth Point NSW (the site). The site is the western part of Lot 2 in DP 859608 and has an area of approximately 1.46 hectares. Environmental Investigation Services, a division of Jeffery and Katauskas Pty Limited, is appointed as environmental consultant for the Principal for assessment and remediation planning (as required) at the site.

I understand that the purpose of this audit is to provide a Site Audit Statement in support of an application for redevelopment of the site to provide a primary school and associated playing fields. This development application is being coordinated by the Principal.

About this Interim Audit Advice

I have reviewed:

> Environmental Investigation Services: Report to NSW Public Works – Government Architects Office on Additional Detailed Environmental Site Assessment for Proposed Primary School Development at Part of 3 Burroway Road, Wentworth Point, NSW (Part of Lot 2 in DP859608). Reference E27299Krpt-SAQP, dated 22 May 2015.

The above document is referred to as the EIS Report in this Interim Audit Advice.

I have referred to the following reports:

- Environmental Investigation Services: Report to NSW Public Works – Government Architects Office on Additional Detailed Environmental Site Assessment for Proposed Primary School Development at Part of 3 Burroway Road, Wentworth Point, NSW (Part of Lot 2 in DP859608). Reference E27299Krpt2- Draft, dated 18 August 2014. (referred to as the SAQP)
- GHD: Report for Roads and Maritime Services, Wentworth Point, Homebush Bay West, Interim Site Management Plan, Rev. No. 5, dated 12 September 2013. (referred to as the ISMP)
- GHD: Report for Roads and Maritime Services, Wentworth Point Burroway Road Site, Homebush Bay West, Conceptual Remediation Action Plan, Rev. No. 2, dated 12 September 2013. (referred to as the GHD RAP)
- GHD: Report for Roads and Maritime Services, Wentworth Point, Homebush Bay West, Ground Gas Monitoring, Rev. No. 1, dated 12 September 2013. (referred to as the GHD GGM Sep13 report)
- GHD: Report for Roads and Maritime Services, Wentworth Point, Homebush Bay West, Ground Gas Monitoring, Final, dated 22 March 2013. (referred to as the GHD GGM Mar13 report)

I visited the site on Tuesday 28 April 2015 and observed field activity associated with the additional contamination assessment being conducted by EIS.

General Comments

I consider that the EIS Report is prepared to a standard which generally meets recommendations detailed in the NSW EPA Guidelines for Consultants Reporting on Contaminated Sites (2011).

I consider that the investigations completed were consistent with those described in the SAQP and that the works described in the SAQP have been substantially completed. I have reviewed the results presented in the EIS Report and that my quality assurance assessment indicates that results from the additional investigation are suitable for their intended purpose.

I have several editorial comments which apply throughout the EIS Report and request that the text be amended accordingly:

- The site for the proposed school is nominated as "the site", however, some references regarding previous investigations across the RMS Stage 1 area also use "the site" to refer to that larger area. I request that any reference to the site be specifically to the proposed school site and that references to the larger area (which includes the proposed school site) use the Stage 1 area, or the area.
- Reference to parts of the National Environment Protection (Assessment of Site Contamination) Measure (NEPC 1999, as amended 2013) should include at least the particular Schedule and also a section or table in that Schedule, if appropriate.

- References to supporting information in the EIS Report is typically indicated o be "in the appendices". I request that the particular appendix be nominated in the text. Similarly, references to results in a table should state the particular table.
- EIS uses SWL to represent standing water level, however, it appears that this measurement may be intended to refer to depth to observed water below ground surface rather than the level of observed water against a datum. I request that this item is clarified throughout the EIS Report, including in tables where relevant.
- Table 2-2 notes, amongst other items, that the site is subject to "flood related development controls". I request clarification that such controls include raising the surface level of the site to reduce risk of flooding as a likely consent condition for planning approval. Thus, the purpose of placement of a layer of fill on the site is to reduce flooding risk rather than providing a capping layer over existing fill material. I request that reference to a capping layer through the EIS Report be replaced by a reference to a construction fill layer, or similar term.
- Regarding sampling of HGG described initially in Table 6-3 of the EIS Report, the type of sample container is a Summa canister. Please correct the current spelling.

Issues of technical concern

I have two issues of technical concern regarding your recommendations, which I have outlined in this section.

A: Surface soil around the stockpile of impacted soil

The three samples of stockpiled materials reported impact from chromium, lead and zinc. Inspection of results in Table A shows that sample TP5(0.0-0.1m) has a similar pattern of impact. I am concerned that the stockpiled material may represent an attempted "clean-up" by former tenants of that area of impacted surface soil around the stockpile, and that surface soil between the stockpile and the location of TP5 may have impact similar to that of stockpiled material.

I request review of EIS' recommendation regarding the amount of material in addition to that in the existing stockpile to be removed for disposal to landfill.

B: Preliminary HGG risk assessment

With reference to results in Table K, I note that monitoring of hazardous ground gas (HGG) by EIS was undertaken when air pressure was low and groundwater was slightly closer to the surface than generally observed during monitoring by GHD.

I note that the maximum methane concentrations at wells 1CW02 and BHW42 were measured in the early rounds of a monitoring program and when air pressure was high.

I have discussed this combination of results and field conditions with a member of my audit support team who is an expert in landfill gas monitoring, amongst other skills. Given these circumstances, the early results for methane concentration from wells 1CW02 and BHW42 appear to be inconsistent with the conceptual site model and with the accumulated results for the site to date.

I request that EIS reconsider the reliability of the results for methane concentrations from GHD Rounds 1 and 2 in 2012, and review the gas protection recommended by EIS if appropriate.

Specific Comments on EIS Report

No.	Section	Auditor's Comment
1	Executive Summary	I understand that this section will be provided in subsequent revisions.
2	Abbreviations	CoPC representing Contaminant of Primary Concern is commonly used to represent Contaminant of Potential Concern. The latter term is represented by EIS as PCC. I suggest that the common usage of CoPC be adopted and that no acronym be used for contaminants of concern.
3	Abbreviations	FCF is used to represent Fibre Cement Fragments, which is not a commonly used term. I request that acronyms related to asbestos cement materials be consistent with those defined in Section 4 of Schedule B1 in the ASC NEPM. If the presence of asbestos is uncertain then the qualifier "potential" or "suspected" may be used.
4	1.3	I note that the reference to an interim audit advice in paragraph 1 should have the extension IA02 rather than 1A02; and that November 2015 in paragraph 4 should be November 2014.
5	2.1, page 7	I request confirmation of the relevance of the last dot point on page 7 to the site.
6	2.1, page 8	One reference is made to a "timber site" and another to a "timber yard". To the extent practicable, clarify the activity in the timber yard, in particular any occurrence of timber treatment activity in that part of the site.
7	2.2, page 9	In the first paragraph, I note that borehole BH41 is outside the proposed school site.
8	2.2, page 9	In the last sentence of paragraph 4, I suggest that the clause "if the natural soils were naturally occurring" be replaced for clarity with "if the natural soils were undisturbed deposits".
9	2.4	Information in this section does not appear relevant to the objective of the EIS Report.
10	2.5, page 11	In paragraph 5, the recent change in the boundary of the site means that some of the nominated locations are immediately adjacent to the site.
11	2.5, page 12	In the second last paragraph, I request clarification of the reference to test pit "1C110" and also inclusion of a reference to the location of the wharf with respect to the site and the year of the aerial photograph showing this structure.
12	2.5, page 13	In paragraph 7, I note that location 1CW01 is only just beyond the site boundary.

No.	Section	Auditor's Comment
13	2.5, page 13	In paragraph 10, GHD is reported as identify a risk due to "vapour intrusion from volatile petroleum hydrocarbons". I request clarification of the nature of these VOCs.
14	2.6, page 14	Regarding the 4th dot point describing the scope of works, I request inclusion of a distance of the Woo-La-Ra landfill from the site and assessment of the potential for any HGG at the landfill to affect the site. The 5th paragraph on page 15 should be reconsidered with reference to this issue and amended if appropriate.
15	2.6, page 15	Is the 5th dot point in paragraph 3 relevant to the site? Table K indicates that peak gas flow from monitoring wells on the site was <1 L/hour.
16	2.7, page 16	In paragraph 7, the 2nd dot point refers to 500cm of capping, however this intended thickness appears to be 50cm.
17	2.9, page 20	To avoid potential confusion, I request that the Site Auditor be identified as Andrew Lau.
18	2.10, page 22	In the 1st dot point, I suggest that "contained asbestos" be replaced with "had identified asbestos impact", because asbestos impact is difficult to be definitive about. In the 3rd dot point, I suggest that EIS refer to the prior period of heavy rain over several days to emphasise the point that surface water was not the result of a passing shower.
19	3.4, page 24	Regarding the observed ACM fragments, I suggest that a photograph of the affected area be included and referenced in this paragraph, if available.
20	3.4, page 24	I note that the electrical transformer in the southeast corner of the site is not identified. My recollection is that the unit was slab-on-ground and that there was no evidence of oil leakage surrounding the unit.
21	3.5, page 25	The description of activity on the land to the east of the site is inadequate. Figure 1 clearly shows a major building materials (primarily concrete) recycling facility with the majority of the premises being unsealed. I request amendment of the text.
22	3.8, page 25	I request inclusion of EIS' opinion regarding the presence / absence of PASS or ASS beneath the site.
23	3.10, page 26	I note that the current site boundary is approximately 25m south of the nearest bank of the Parramatta River.
24	3.11, page 27	The information presented in Table 3-3 does not appear relevant to the site, particularly the annual rainfall. I request confirmation and amendment of this table as appropriate.

No.	Section	Auditor's Comment
25	3.11, page 27	In the last paragraph, the observation of very shallow groundwater during field investigations immediately after a period of heavy rainfall is evidence for infiltration which may be included in this section.
26	4.1, page 28	The wording of paragraph 1 makes the nature of EIS' review unclear. I suggest that the EIS review was on a subset of the data, rather than being a "limited review", and that the selected data related to the proposed school site which formed a part of Area 1C identified in the GHD investigation. I request revision of the wording of paragraph 1.
27	4.1, page 30	Regarding Ecological Assessment Criteria in Table 4-1, I note that mature trees around the site boundary and in the SE part of the site appear unstressed and growing well. This may be useful evidence for low risk for landscaping of the site.
28	4.1, page 31	Regarding Groundwater in Table 4-1, I do not agree with the reference to HSL-A as being the "most conservative" criterion. A criterion could be estimated by assuming groundwater was immediately below a floor slab and using Henry's law and the constant for naphthalene to calculate the concentration of naphthalene in vapour immediately below the slab and then comparing that to HSL-A for naphthalene (sand, 0 to <1m) for soil vapour from Table 1A(5) from Schedule B1 in the ASC NEPM. I note that the location of BHW42 is not near any proposed enclosed structure for the school.
29	4.1, page 31	Regarding HGG in Table 4-1, I note that HGG generated from landfills or decaying organic matter are the main contaminants of concern for application of the guidelines, however, these are a subset of possible HGGs. I request that the HGG of concern (methane, carbon dioxide, carbon monoxide and hydrogen sulfide) are named.
30	5.1, Table 5-1	I acknowledge that the CSM is reviewed later in the EIS Report, however, I request amendment of details noted below: • Page 32, Fill Material, Environmental Receptors – distance to the Parramatta River (25m). • Page 33, Former Activity – metal drums were 200L capacity. • Page 33, Hazardous Building Material – concrete appeared to be the main material recycled.
31	6.2, page 38	Sampling Plan / Density and Rationale, 2nd paragraph – the grid shown in Appendix F was 15 m square, which has a grid size of 225m^2. I note that the adopted grid size was slightly more than the more conservative sampling density recommended in the WA DoH guidelines (section 3.2.4).

No.	Section	Auditor's Comment
32	6.4, page 42	I note that the COC record and the Sample Receipt Advice show that 62 soil samples were submitted to the laboratory. I request a discussion of the rationale for selection of fill samples for analysis.
33	7, page 44	In Table 7-1: • Regarding selection of ACLs, I do not accept that a default "worst case" value is reasonable. I suggest that for generally silty fill materials, the pH is likely to be slightly acidic (say 6), the CEC is likely to be low (say 10 cmol/kg) and clay content is likely to be at least 10%. I request reconsideration of assessment in Table E. • regarding ABC values for estimation of Ecological Assessment Criteria, I consider that fill material placed on the site (being the predominant medium investigated) should be assumed to represent an area of low traffic density.
34	7, page 44	In Table 7-1, I note that Direct Contact Limits are not included in Schedule B1 of the ASC NEPM, and regarding Asbestos in Soil, the reference to a Preliminary Site Investigation appears to be in error.
35	7, page 45	In Table 7-1, regarding HGG Criteria, I do not accept the Safe Work Australia TWA concentration as sufficiently protective for the proposed future use of the site. I have provided (as a separate document) a copy of the WA DoH Environmental Health Guide for Hydrogen Sulphide and Public Health, and suggest that a value of 2ppm is relevant. I was unable to identify any NSW guideline for hydrogen sulfide.
36	8.1, page 47	In Table 8-1, regarding odours reported in Natural Soil, I suggest that the type of organic odour be qualified. For example, odour attributable to decay of natural organic matter.
37	8.2, page 48	In Table 8-2, regarding Groundwater Depth & Flow, I request that a reference to a relevant GHD report be provided.
38	8.2, page 48	In Table 8-2, regarding HGG Screening, Section 6.3 describes the screening method but does not provide results of that process. I request that results are provided, either on excavation logs or in a separate table.
39	9, page 56	Regarding analysis of the Field Rinsate sample, I consider that the choice of analytes (BTEXN) was not appropriate for the site and that analysis for metals and PAHs would have been appropriate.
40	11, page 59	In Table 11-1, I request that construction of the school and future use of the school be considered in two separate risk assessments. The placement of construction fill will be an issue for construction, and excavation into that layer will be an issue for future use of the school.

No.	Section	Auditor's Comment
41	11.1.1, page 60	The stockpile of impacted soil (and possibly other impacted soil added from the surrounding area) should be a source only for the construction works during which the material will be removed for disposal off-site. Residual impact to soil in that area may be an issue for the future and sampling and analysis may need to be included in site validation.
42	11.1.1, page 61	In the last paragraph, the reference to liquid waste transfer is in direct conflict with the statement to the contrary in section 2.1. Also, the area leased by the liquid waste contractor (Lot 60) does not seem to coincide with the impacted location. I require that this issue be resolved.
43	11.1.2, page 61	In the first paragraph, I suggest that the second sentence is moved to the end of this paragraph and the comment is amended to indicate that the available results from analysis of natural sediments supports low risk of downward migration of contaminants in overlying fill material.
44	11.1.3, page 61	Rather than additional investigation beneath the footprint of buildings after demolition, I suggest that any suspected contamination be managed through an Unexpected Finds Procedure which would be part of a Construction EMP.
45	11.1.4, page 61	Effective removal of hazardous building materials should be confirmed through issue of an asbestos clearance certificate by a properly licensed assessor.
46	11.1.5, page 62	I suggest repeating that extraction of groundwater for beneficial use is considered impractical because of the risk of saltwater intrusion from the Parramatta River through higher permeability sediment layers.
47	11.2, page 62	In Table 11-2, I note the following: • Presence of Ash and Slag – for clarity, the matrix is a crystalline matrix. • Presence of Asbestos – The incidence of asbestos fines appears to be very low in the existing fill. Imported fill for raising site surface level will be free of asbestos and, given the proposed use of piled foundations, the majority of excavation works are expected to be shallow. I request that the wording regarding presence of asbestos be reconsidered to address site specific incidence of asbestos. • Site Conditions – At the end of the first sentence, "subject" should be replaced by "site".

No.	Section	Auditor's Comment
48	11.3, page 63	In the 2nd dot point, I request that the word "limited" be removed and the TCLP analysis be qualified by insertion of the number of samples analysed using TCLP preparation and the chemical groups analysed. In the last sentence, I request that material for PASS assessment be qualified as natural material from below the water table.
49	13.1, page 64	I note in Table K that HGG concentrations for "Steady" conditions have been adopted for analysis, but the gas flow rates are for maximum flow rather than steady flow. I request clarification of the selection of results for calculation of GSVs.
50	13.3, page 66	I note that I have requested revision of the SAC for hydrogen sulfide which also affects this section.
51	13.4, page 66	With reference to paragraph 3, I note that under Section 4.1 of the GHD ISMP, Roads and Maritime Services are obliged to conduct monthly monitoring for HGG across the Stage 1 area. I suggest that details of this HGG monitoring relevant to the site be discussed with RMS by EIS as the Principle's representative so that data collection can be optimised in the context of the proposed school development.
	13.4, page 67	In the last sentence, I suggest that selection of gas protection measures is a building design requirement and is not considered to be remediation of land under SEPP 55.
	14, page 68	I note the following regarding conclusions stated by EIS: • Paragraph 2: I consider that this statement is too broad and requires clarification of the type and level of "risk to the receptors", and to indicate which receptors, with distinction between the construction works and future use of the site as a primary school. • Paragraph 4: EIS state that "the site can be made suitable", which implies that remediation of the site is required. I suggest that the site is suitable for construction of the school, from the aspect of contamination, providing that the stockpile of impacted soil, and any similar impacted soil surrounding that stockpile is disposed off-site to landfill prior to commencement of demolition works and a site-specific Construction EMP, including an Unexpected Finds Procedure and an Asbestos Management Plan, is prepared and implemented. Similarly, I suggest that the site is reasonably expected to be suitable for future use as a primary school, from the aspect of contamination, providing that the layer of construction fill placed to raise the surface level of the site is at least 0.5m thick, an appropriate gas protection system is included in building design and installed and a long term Environmental Management Plan is prepared and implemented.

No.	Section	Auditor's Comment
	Tables	I suggest that the titles for Tables A, A1 and B, B1 could include the exposure scenario (that is, future school use or construction works) to make the purpose of these tables. I note my request above for reconsideration of EILs and assessment in Table E.

Closure

I request that EIS consider the comments made above and, where appropriate, respond to issues of concern or other specific issues I have identified. To minimise the time required to reach a satisfactory resolution of the issues I have identified, I am available to meet with EIS representatives to discuss details presented in this Interim Audit Advice.

For and on behalf of Coffey

M. Dunbavan.

Michael Dunbavan
NSW EPA Accredited Site Auditor (0804)

cc Mitch Delaney, EIS

Issues of technical concern

No.	Issue	Auditor's Comment	Status
A	Surface soil around the stockpile of impacted soil	The three samples of stockpiled materials reported impact from chromium, lead and zinc. Inspection of results in Table A shows that sample TP5(0.0-0.1m) has a similar pattern of impact. I am concerned that the stockpiled material may represent an attempted "clean-up" by former tenants of that area of impacted surface soil around the stockpile, and that surface soil between the stockpile and the location of TP5 may have impact similar to that of stockpiled material. I request review of EIS' recommendation regarding the amount of material in addition to that in the existing stockpile to be removed for disposal to landfill.	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*
B	Preliminary HGG risk assessment	With reference to results in Table K, I note that monitoring of hazardous ground gas (HGG) by EIS was undertaken when air pressure was low and groundwater was slightly closer to the surface than generally observed during monitoring by GHD. I note that the maximum methane concentrations at wells 1CW02 and BHW42 were measured in the early rounds of a monitoring program and when air pressure was high. I have discussed this combination of results and field conditions with a member of my audit support team who is an expert in landfill gas monitoring, amongst other skills. Given these circumstances, the early results for methane concentration from wells 1CW02 and BHW42 appear to be inconsistent with the conceptual site model and with the accumulated results for the site to date. I request that EIS reconsider the reliability of the results for methane concentrations from GHD Rounds 1 and 2 in 2012, and review the gas protection recommended by EIS if appropriate.	Noted and amended. EIS has have assumed that the Auditor intended to include monitoring round 3 in considering the reliability of the GHD data. EIS should assess reliability of data for itself. ***Auditor:*** *accepted – item closed. 29 May 2015.*

Specific Comments on EIS Report

No.	Section	Auditor's Comment	Status
1	Executive Summary	I understand that this section will be provided in subsequent revisions.	Noted to be included in final report. ***Auditor:*** *accepted – item closed. 29 May 2015.*
2	Abbreviations	CoPC representing Contaminant of Primary Concern is commonly used to represent Contaminant of Potential Concern. The latter term is represented by EIS as PCC. I suggest that the common usage of CoPC be adopted and that no acronym be used for contaminants of concern.	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*
3	Abbreviations	FCF is used to represent Fibre Cement Fragments, which is not a commonly used term. I request that acronyms related to asbestos cement materials be consistent with those defined in Section 4 of Schedule B1 in the ASC NEPM. If the presence of asbestos is uncertain then the qualifier "potential" or "suspected" may be used.	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*
4	1.3	I note that the reference to an interim audit advice in paragraph 1 should have the extension IA02 rather than 1A02; and that November 2015 in paragraph 4 should be November 2014.	Noted and amended. First point not changed, but not material. ***Auditor:*** *accepted – item closed. 29 May 2015.*
5	2.1, page 7	I request confirmation of the relevance of the last dot point on page 7 to the site.	Noted and deleted. ***Auditor:*** *accepted – item closed. 29 May 2015.*
6	2.1, page 8	One reference is made to a "timber site" and another to a "timber yard". To the extent practicable, clarify the activity in the timber yard, in particular any occurrence of timber treatment activity in that part of the site.	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*

No.	Section	Auditor's Comment	Status
7	2.2, page 9	In the first paragraph, I note that borehole BH41 is outside the proposed school site.	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*
8	2.2, page 9	In the last sentence of paragraph 4, I suggest that the clause "if the natural soils were naturally occurring" be replaced for clarity with "if the natural soils were undisturbed deposits".	Noted and deleted. ***Auditor:*** *accepted – item closed. 29 May 2015.*
9	2.4	Information in this section does not appear relevant to the objective of the EIS Report.	Noted and deleted. ***Auditor:*** *accepted – item closed. 29 May 2015.*
10	2.5, page 11	In paragraph 5, the recent change in the boundary of the site means that some of the nominated locations are immediately adjacent to the site.	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*
11	2.5, page 12	In the second last paragraph, I request clarification of the reference to test pit "1C110" and also inclusion of a reference to the location of the wharf with respect to the site and the year of the aerial photograph showing this structure.	Noted and amended. Location 1C110 was a typo. ***Auditor:*** *accepted – item closed. 29 May 2015.*
12	2.5, page 13	In paragraph 7, I note that location 1CW01 is only just beyond the site boundary.	Noted and amended.
13	2.5, page 13	In paragraph 10, GHD is reported as identify a risk due to "vapour intrusion from volatile petroleum hydrocarbons". I request clarification of the nature of these VOCs.	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*
14	2.6, page 14	Regarding the 4th dot point describing the scope of works, I request inclusion of a distance of the Woo-La-Ra landfill from the site and assessment of the potential for any HGG at the landfill to affect the site. The 5th paragraph on page 15 should be reconsidered with reference to this issue and amended if appropriate.	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*

No.	Section	Auditor's Comment	Status
15	2.6, page 15	Is the 5th dot point in paragraph 3 relevant to the site? Table K indicates that peak gas flow from monitoring wells on the site was <1 L/hour.	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*
16	2.7, page 16	In paragraph 7, the 2nd dot point refers to 500cm of capping, however this intended thickness appears to be 50cm.	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*
17	2.9, page 20	To avoid potential confusion, I request that the Site Auditor be identified as Andrew Lau.	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*
18	2.10, page 22	In the 1st dot point, I suggest that "contained asbestos" be replaced with "had identified asbestos impact", because asbestos impact is difficult to be definitive about. In the 3rd dot point, I suggest that EIS refer to the prior period of heavy rain over several days to emphasise the point that surface water was not the result of a passing shower.	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*
19	3.4, page 24	Regarding the observed ACM fragments, I suggest that a photograph of the affected area be included and referenced in this paragraph, if available.	Noted. Photographs of the approximate ACM sampling locations will be included in the final report. ***Auditor:*** *accepted – item closed. 29 May 2015.*
20	3.4, page 24	I note that the electrical transformer in the southeast corner of the site is not identified. My recollection is that the unit was slab-on-ground and that there was no evidence of oil leakage surrounding the unit.	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*
21	3.5, page 25	The description of activity on the land to the east of the site is inadequate. Figure 1 clearly shows a major building materials (primarily concrete) recycling facility with the majority of the premises being unsealed. I request amendment of the text.	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*

No.	Section	Auditor's Comment	Status
22	3.8, page 25	I request inclusion of EIS' opinion regarding the presence / absence of PASS or ASS beneath the site.	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*
23	3.10, page 26	I note that the current site boundary is approximately 25m south of the nearest bank of the Parramatta River.	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*
24	3.11, page 27	The information presented in Table 3-3 does not appear relevant to the site, particularly the annual rainfall. I request confirmation and amendment of this table as appropriate.	Noted. Mean climatic condition summarised for the Sydney Olympic Park AWS (Archery centre). ***Auditor:*** *accepted – item closed. 29 May 2015.*
25	3.11, page 27	In the last paragraph, the observation of very shallow groundwater during field investigations immediately after a period of heavy rainfall is evidence for infiltration which may be included in this section.	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*
26	4.1, page 28	The wording of paragraph 1 makes the nature of EIS' review unclear. I suggest that the EIS review was on a subset of the data, rather than being a "limited review", and that the selected data related to the proposed school site which formed a part of Area 1C identified in the GHD investigation. I request revision of the wording of paragraph 1.	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*
27	4.1, page 30	Regarding Ecological Assessment Criteria in Table 4-1, I note that mature trees around the site boundary and in the SE part of the site appear unstressed and growing well. This may be useful evidence for low risk for landscaping of the site.	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*

No.	Section	Auditor's Comment	Status
28	4.1, page 31	Regarding Groundwater in Table 4-1, I do not agree with the reference to HSL-A as being the "most conservative" criterion. A criterion could be estimated by assuming groundwater was immediately below a floor slab and using Henry's law and the constant for naphthalene to calculate the concentration of naphthalene in vapour immediately below the slab and then comparing that to HSL-A for naphthalene (sand, 0 to <1m) for soil vapour from Table 1A(5) from Schedule B1 in the ASC NEPM. I note that the location of BHW42 is not near any proposed enclosed structure for the school.	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*
29	4.1, page 31	Regarding HGG in Table 4-1, I note that HGG generated from landfills or decaying organic matter are the main contaminants of concern for application of the guidelines, however, these are a subset of possible HGGs. I request that the HGG of concern (methane, carbon dioxide, carbon monoxide and hydrogen sulfide) are named.	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*
30	5.1, Table 5-1	I acknowledge that the CSM is reviewed later in the EIS Report, however, I request amendment of details noted below: • Page 32, Fill Material, Environmental Receptors – distance to the Parramatta River (25m). • Page 33, Former Activity – metal drums were 200L capacity. • Page 33, Hazardous Building Material – concrete appeared to be the main material recycled.	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*

No.	Section	Auditor's Comment	Status
31	6.2, page 38	Sampling Plan / Density and Rationale, 2nd paragraph – the grid shown in Appendix F was 15 m square, which has a grid size of 225m^2. I note that the adopted grid size was slightly more than the more conservative sampling density recommended in the WA DoH guidelines (section 3.2.4).	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*
32	6.4, page 42	I note that the COC record and the Sample Receipt Advice show that 62 soil samples were submitted to the laboratory. I request a discussion of the rationale for selection of fill samples for analysis.	Noted and discussion provided. ***Auditor:*** *accepted – item closed. 29 May 2015.*
33	7, page 44	In Table 7-1: • Regarding selection of ACLs, I do not accept that a default "worst case" value is reasonable. I suggest that for generally silty fill materials, the pH is likely to be slightly acidic (say 6), the CEC is likely to be low (say 10 cmol/kg) and clay content is likely to be at least 10%. I request reconsideration of assessment in Table E. • regarding ABC values for estimation of Ecological Assessment Criteria, I consider that fill material placed on the site (being the predominant medium investigated) should be assumed to represent an area of low traffic density.	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*
34	7, page 44	In Table 7-1, I note that Direct Contact Limits are not included in Schedule B1 of the ASC NEPM, and regarding Asbestos in Soil, the reference to a Preliminary Site Investigation appears to be in error.	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*

No.	Section	Auditor's Comment	Status
35	7, page 45	In Table 7-1, regarding HGG Criteria, I do not accept the Safe Work Australia TWA concentration as sufficiently protective for the proposed future use of the site. I have provided (as a separate document) a copy of the WA DoH Environmental Health Guide for Hydrogen Sulphide and Public Health, and suggest that a value of 2ppm is relevant. I was unable to identify any NSW guideline for hydrogen sulfide.	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*
36	8.1, page 47	In Table 8-1, regarding odours reported in Natural Soil, I suggest that the type of organic odour be qualified. For example, odour attributable to decay of natural organic matter.	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*
37	8.2, page 48	In Table 8-2, regarding Groundwater Depth & Flow, I request that a reference to a relevant GHD report be provided.	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*
38	8.2, page 48	In Table 8-2, regarding HGG Screening, Section 6.3 describes the screening method but does not provide results of that process. I request that results are provided, either on excavation logs or in a separate table.	Noted. No room on borehole log for the HGG field monitoring results due to logs showing the monitoring well construction details. The HGG field results were attached in the appendices. A reference relevant appendix provided. ***Auditor:*** *accepted – item closed. 29 May 2015.*
39	9, page 56	Regarding analysis of the Field Rinsate sample, I consider that the choice of analytes (BTEXN) was not appropriate for the site and that analysis for metals and PAHs would have been appropriate.	Noted. ***Auditor:*** *item closed. 29 May 2015.*
40	11, page 59	In Table 11-1, I request that construction of the school and future use of the school be considered in two separate risk assessments. The placement of construction fill will be an issue for construction, and excavation into that layer will be an issue for future use of the school.	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*

No.	Section	Auditor's Comment	Status
41	11.1.1, page 60	The stockpile of impacted soil (and possibly other impacted soil added from the surrounding area) should be a source only for the construction works during which the material will be removed for disposal off-site. Residual impact to soil in that area may be an issue for the future and sampling and analysis may need to be included in site validation.	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*
42	11.1.1, page 61	In the last paragraph, the reference to liquid waste transfer is in direct conflict with the statement to the contrary in section 2.1. Also, the area leased by the liquid waste contractor (Lot 60) does not seem to coincide with the impacted location. I require that this issue be resolved.	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*
43	11.1.2, page 61	In the first paragraph, I suggest that the second sentence is moved to the end of this paragraph and the comment is amended to indicate that the available results from analysis of natural sediments supports low risk of downward migration of contaminants in overlying fill material.	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*
44	11.1.3, page 61	Rather than additional investigation beneath the footprint of buildings after demolition, I suggest that any suspected contamination be managed through an Unexpected Finds Procedure which would be part of a Construction EMP.	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*
45	11.1.4, page 61	Effective removal of hazardous building materials should be confirmed through issue of an asbestos clearance certificate by a properly licensed assessor.	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*
46	11.1.5, page 62	I suggest repeating that extraction of groundwater for beneficial use is considered impractical because of the risk of saltwater intrusion from the Parramatta River through higher permeability sediment layers.	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*

No.	Section	Auditor's Comment	Status
47	11.2, page 62	In Table 11-2, I note the following: • Presence of Ash and Slag – for clarity, the matrix is a crystalline matrix. • Presence of Asbestos – The incidence of asbestos fines appears to be very low in the existing fill. Imported fill for raising site surface level will be free of asbestos and, given the proposed use of piled foundations, the majority of excavation works are expected to be shallow. I request that the wording regarding presence of asbestos be reconsidered to address site specific incidence of asbestos. • Site Conditions – At the end of the first sentence, "subject" should be replaced by "site".	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*
48	11.3, page 63	In the 2nd dot point, I request that the word "limited" be removed and the TCLP analysis be qualified by insertion of the number of samples analysed using TCLP preparation and the chemical groups analysed. In the last sentence, I request that material for PASS assessment be qualified as natural material from below the water table.	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*
49	13.1, page 64	I note in Table K that HGG concentrations for "Steady" conditions have been adopted for analysis, but the gas flow rates are for maximum flow rather than steady flow. I request clarification of the selection of results for calculation of GSVs.	Noted and amended. The maximum flow rate was selected for the calculation of the GSV value as the flow rates were very low. No steady state flow rate conditions were observed. ***Auditor:*** *accepted – item closed. 29 May 2015.*
50	13.3, page 66	I note that I have requested revision of the SAC for hydrogen sulfide which also affects this section.	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*

No.	Section	Auditor's Comment	Status
51	13.4, page 66	With reference to paragraph 3, I note that under Section 4.1 of the GHD ISMP, Roads and Maritime Services are obliged to conduct monthly monitoring for HGG across the Stage 1 area. I suggest that details of this HGG monitoring relevant to the site be discussed with RMS by EIS as the Principal's representative so that data collection can be optimised in the context of the proposed school development.	Noted. EIS to discuss with the client. ***Auditor:*** *accepted – item closed. 29 May 2015.*
	13.4, page 67	In the last sentence, I suggest that selection of gas protection measures is a building design requirement and is not considered to be remediation of land under SEPP 55.	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*

No.	Section	Auditor's Comment	Status
	14, page 68	I note the following regarding conclusions stated by EIS: • Paragraph 2: I consider that this statement is too broad and requires clarification of the type and level of "risk to the receptors", and to indicate which receptors, with distinction between the construction works and future use of the site as a primary school. • Paragraph 4: EIS state that "the site can be made suitable", which implies that remediation of the site is required. I suggest that the site is suitable for construction of the school, from the aspect of contamination, providing that the stockpile of impacted soil, and any similar impacted soil surrounding that stockpile is disposed off-site to landfill prior to commencement of demolition works and a site-specific Construction EMP, including an Unexpected Finds Procedure and an Asbestos Management Plan, is prepared and implemented. Similarly, I suggest that the site is reasonably expected to be suitable for future use as a primary school, from the aspect of contamination, providing that the layer of construction fill placed to raise the surface level of the site is at least 0.5m thick, an appropriate gas protection system is included in building design and installed and a long term Environmental Management Plan is prepared and implemented.	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*
	Tables	I suggest that the titles for Tables A, A1 and B, B1 could include the exposure scenario (that is, future school use or construction works) to make the purpose of these tables. I note my request above for reconsideration of EILs and assessment in Table E.	Noted and amended. ***Auditor:*** *accepted – item closed. 29 May 2015.*

Document history: M.Dunbavan – issued 28 May, revised and final 29 May 2015. M. Dunbavan

Level 19, Tower B, 799 Pacific Highway
Chatswood
NSW 2067 Australia

t: +61 2 9406 1206
f: +61 2 9406 10042

coffey.com

29 May 2015

Our ref: ENAURHOD01055AA-IA04

NSW Public Works - Government Architect's Office
Level 18, McKell Building
2 - 24 Rawson Place
Sydney NSW 2000

Attention: Michael Mossman

Dear Michael

Interim Audit Advice 04 - Suitability of Site for Proposed Primary School Development, Burroway Road, Wentworth Point NSW

The advice presented in this document represents interim advice only, and does not constitute a Site Contamination Audit Report or Site Contamination Audit Statement. This advice provides the opinion of the Auditor based on the knowledge that is available at the time of this advice. A Site Contamination Audit Report and Site Contamination Audit Statement will be issued at the end of the Audit process, when the Auditor is satisfied all relevant matters have been adequately addressed to the satisfaction of the Auditor. This advice does not pre-empt or constrain the final outcome(s) of the audit or any conditions that may be placed by the Auditor in the Site Contamination Audit Report or Site Contamination Audit Statement.

Preamble

The Auditor, who is an employee of Coffey Environments Australia Pty Ltd, has been engaged NSW Public Works – Government Architect's Office (the Principal) to conduct a non-statutory site audit regarding suitability of land for development of a proposed primary school on land known as Part of 3 Burroway Road, Wentworth Point NSW (the site). The site is the western part of Lot 2 in DP 859608 and has an area of approximately 1.46 hectares. Environmental Investigation Services, a division of Jeffery and Katauskas Pty Limited, is appointed as environmental consultant for the Principal for assessment and remediation planning (as required) at the site.

I understand that the purpose of this audit is to provide a Site Audit Statement in support of an application for redevelopment of the site to provide a primary school and associated playing fields. This development application is being coordinated by the Principal.

About this Interim Audit Advice

The purpose of this Interim Audit Advice is to confirm that I am satisfied with the assessment of site contamination on the proposed school site (as defined in the attached figure) and that I agree with the conclusions and recommendations made by EIS regarding the suitability of the site for its proposed future use. I confirm that I will prepare a Site Audit Statement in support of a Development Application intended to be submitted by the Principal.

I have reviewed:

> Environmental Investigation Services: Report to NSW Public Works – Government Architects Office on Sampling, Analysis and Quality Plan for Proposed Primary School Development at Part of 3 Burroway Road, Wentworth Point, NSW (Part of Lot 2 in DP859608). Reference E27299Krpt-SAQP, dated 18 August 2014.
>
> Environmental Investigation Services: Report to NSW Public Works – Government Architects Office on Additional Detailed Environmental Site Assessment for Proposed Primary School Development at Part of 3 Burroway Road, Wentworth Point, NSW (Part of Lot 2 in DP859608). Reference E27299Krpt-SAQP, dated 22 May 2015.

The above documents are referred to as the SAQP and EIS Report (respectively) in this Interim Audit Advice.

I have referred to the following reports:

- GHD: Report for Homebush Bay West Contamination Assessment, Preliminary Site Investigation. Revision 0, dated November 2009.
- AECOM Australia Pty Ltd: Geotechnical Assessment, Wentworth Point. Dated 28 November 2012
- GHD: Additional Contamination Assessment, Homebush Bay West, Stage 1 Area. Revision 2, dated November 2012.
- GHD: Report for Roads and Maritime Services, Wentworth Point, Homebush Bay West, Ground Gas Monitoring, Final, dated 22 March 2013.
- GHD: Report for Roads and Maritime Services, Wentworth Point, Homebush Bay West, Interim Site Management Plan, Rev. No. 5, dated 12 September 2013.
- GHD: Report for Roads and Maritime Services, Wentworth Point Burroway Road Site, Homebush Bay West, Conceptual Remediation Action Plan, Rev. No. 2, dated 12 September 2013.
- GHD: Report for Roads and Maritime Services, Wentworth Point, Homebush Bay West, Ground Gas Monitoring, Rev. No. 1, dated 12 September 2013.

I also referred to an existing Site Audit Statement (No. 0503-0912, Andrew Lau) issued on 9 July 2010 relevant to the Stage 1 and Stage 2 areas on Wentworth Point which concluded that GHD contamination investigations were appropriate for assessment of "gross, widespread contamination" of soil and fill and of "the contamination status of groundwater".

I visited the site on 4 June 2014 for initial site observations and on 28 April 2015 to observe field activity associated with the additional contamination assessment being conducted by EIS.

I confirm that I have not existing or potential conflict of interest regarding the conduct of this site audit.

General Comments

I consider that the SAQP and the EIS Report have been prepared to a standard which generally meets recommendations detailed in the NSW EPA Guidelines for Consultants Reporting on Contaminated Sites (2011).

I consider that the investigations completed were consistent with those described in the SAQP and that the works described in the SAQP have been substantially completed. I have reviewed the results presented in the EIS Report and that my quality assurance assessment indicates that results from the additional investigation are suitable for their intended purpose.

I consider that the SAQP:

- Adequately considered historical activity on and around the site which caused or had the potential to cause land contamination.
- Presented a sampling and analysis program to provide additional information for assessment of contamination on the site in the context of future use of the site as a primary school.

I consider that the EIS Report:

- Adequately summarises existing information for assessment with additional information arising from the EIS investigation.
- Adequately describes sample collection, handling and analysis and provides quality assurance that the additional data is suitable for the assessment. I note that the existing Site Audit Statement confirms the suitability of previous soil and groundwater results for contamination assessment.
- Presents an appropriate and representative Conceptual Site Model which is updated based on interpretation of relevant information.

Consultant's conclusions and recommendations

EIS concluded that contamination identified at the site poses a:

- Low potential health risk to construction workers provided that a Construction Environmental Management Plan is prepared and implemented; and
- A very low potential health risk to the proposed primary school users as on completion of development under the current design concept which includes placement of a construction fill layer to reduce flood risk and installation of ground gas protection measures (to be specified).

Based on the results of the assessment EIS consider that a Remediation Action Plan (RAP) is not necessary for this site because:

- The current site will be covered with 0.5m to 1.0m of compacted engineered fill as a flood protection measure. This will effectively remove the major contamination exposure pathway for the contaminants encountered at the site during routine school activities.
- Potential exposure of construction workers to contaminants can be controlled through a Construction Environmental Management Plan (CEMP).
- Gas protection measures for the proposed buildings will be incorporated into the building design.

EIS consider that the site will be suitable for the proposed construction of the primary school, from the aspect of contamination provided that:

- The stockpile of impacted soil located in the central section of the site and any summarily impacted fill is disposed of to a NSW EPA licensed landfill prior to earthworks associated with the construction fill layer; and
- A Construction Environment Management Plan (CEMP) is prepared and implemented. An Asbestos Management Plan (AMP) and an unexpected finds procedure should be incorporated into the CEMP. The construction fill layer design should be included in the CMP.

EIS consider that the site will be suitable for the proposed future use as primary school, from the aspect of contamination provided that:

- The layer of construction fill placed to raise the surface of the site is at least 0.5m thick.
- An appropriate gas protection system is included in the building design and installed.
- A long term Environment Management Plan (EMP) is prepared and implemented. The EMP should be a matter of public record available under Section 149(2) of the NSW *Environmental Planning and Assessment Act 1979*, or similar arrangement.

EIS recommend that:

- The implementation of the above management procedures should be documented in a validation assessment report.
- The HGG monitoring program should be continued until such point as the HGG mitigation measures for the buildings have been selected.
- In the event unexpected conditions are encountered during development work or between sampling locations that may pose a contamination risk, all works should stop and an environmental consultant should be engaged to inspect the site and address the issue.

Auditor's opinion

Given the above comments, I consider that:

- The site is suitable for development of a primary school in that the contamination status of the site does not warrant remediation of soil or groundwater, in the context of the development concept which includes raising site surface levels by at least 0.5m through placement of construction fill and design and installation of gas protection measures as part of school buildings.
- The stockpile of impacted soil and any similarly impacted material in the vicinity must be removed as part of demolition activity.
- A Construction Environment Management Plan (CEMP) must be prepared and implemented prior to demolition. An Asbestos Management Plan (AMP) and an Unexpected Finds Procedure must be incorporated into the CEMP.
- Imported fill material must be validated as consistent with future use of the site as a primary school.

I expect that my Site Audit Statement regarding the suitability of the site for future use in its condition at the end of construction will require implementation of a long-term Environmental Management Plan. I reasonably expect that such Plan will not have any noticeable impact on routine primary school activity.

Closure

I recommend continuation of monthly ground gas monitoring from wells on the site until commencement of demolition works. I appreciate that the person conducting and payment for this activity will need to be agreed between NSW Public Works and Roads and Maritime Services.

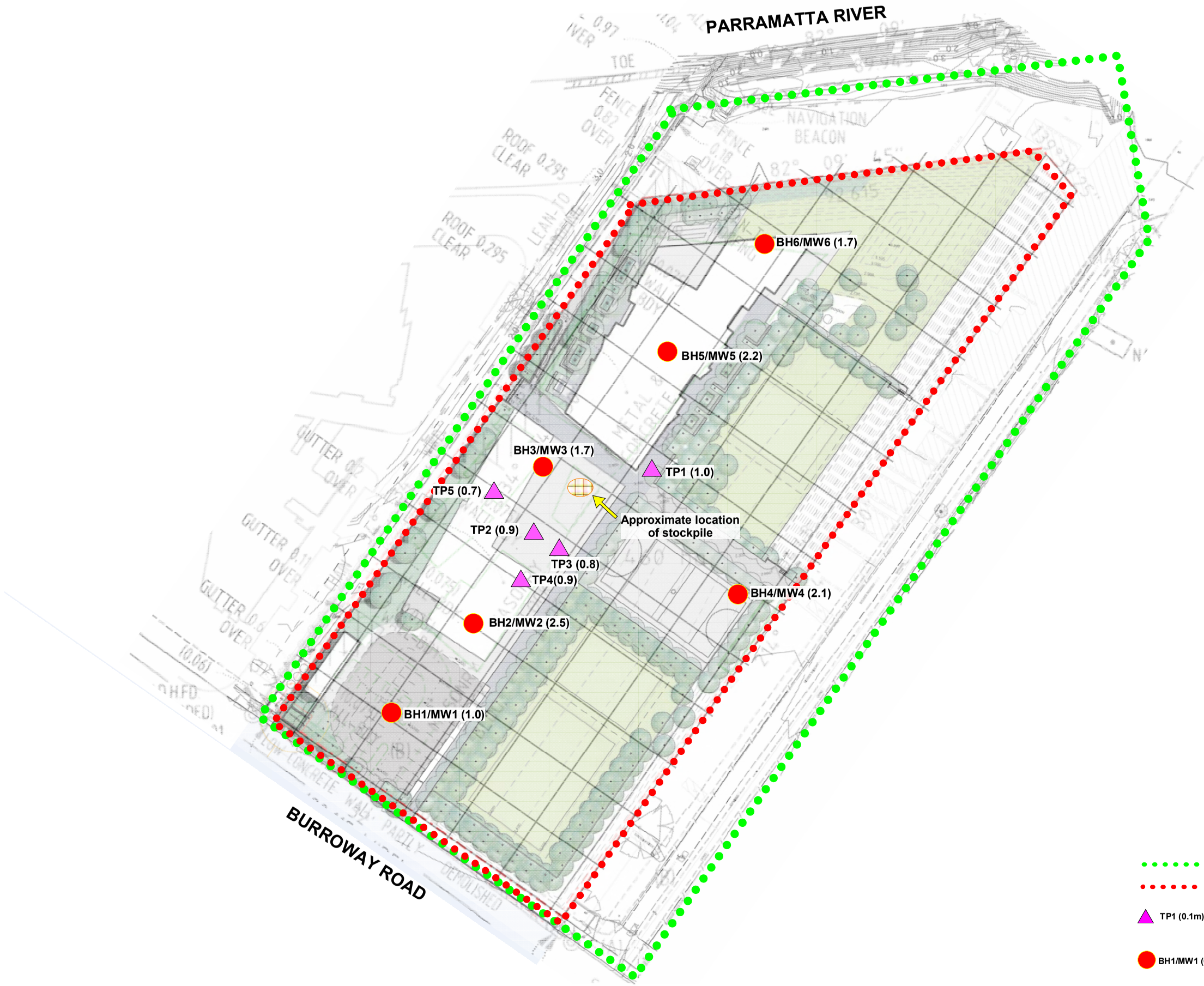
I will proceed with preparation of a Site Audit Statement and associated Site Audit Report confirming my above opinion. Should this Interim Audit Advice be sufficient for the purpose of the Planning Authority to consider the Principal's development application, then I would be able to terminate preparation of other supporting documents. I am available to meet with you to discuss details presented in this Interim Audit Advice.

For and on behalf of Coffey

M. Dunbavan.

Michael Dunbavan
NSW EPA Accredited Site Auditor (0804)

cc Mitch Delaney, EIS



EIS LEGEND:

- Approximate former site boundary
- Approximate School site boundary
- TP1 (0.1m) — Tespit sampling location and depth of fill (m)
- BH1/MW1 (0.1m) — Borehole/ground gas well sampling location and depth of fill (m)
- \+ — Asbestos sampling location (approximate 15m grid). Further details regarding the asbestos sampling locations are provided in the appendices

NOTES:
Figure 2 has been recreated from the the survy plan and proposed development plans provided by the client.

The borehole locations presented on this plan have been established from site measurements only and should not be construed as survey points. The fill depths include the pavement thickness where pavement was encountered.

Reference should be made to the report text for a full understanding of this plan.

Approximate Scale (m) @ A3: 0 10 20 30 40 50

ENVIRONMENTAL INVESTIGATION SERVICES

Project Number:	Title:
E27299K	SAMPLE LOCATION PLAN
Figure: 2	Address: PART OF 3 BURROWAY ROAD, WENTWORTH POINT, NSW

Michael Dunbavan

From: Michael Dunbavan
Sent: Wednesday, 3 June 2015 3:46 PM
To: Peter Hogan (Peter.Hogan@finance.nsw.gov.au)
Subject: Proposed Primary School - Burroway Road, Wentworth Point: Remediation Strategy
Attachments: ENAURHOD01055AA-IA04 Interim Audit Advice 04_29may15.pdf

Peter – comments in this email are provided to expand on my Interim Audit Advice 04, issued 29 May 2015 regarding the subject site. A copy of this Advice is attached for your convenience. The context of this email is our conversation regarding the existence of the RMS Conceptual Remedial Action Plan, Wentworth Point Burroway Road Site, Homebush Bay West (Rev 2, issued by GDH on 12 September 2013).

I note that since GHD issued its Conceptual RAP, NSW Public Works has commissioned EIS to undertake additional contamination investigations on the proposed school site and has engaged a NSW EPA accredited site auditor (myself) to review these additional works.

I note from my Interim Advice 04, I concluded that:

- The site is suitable for development of a primary school in that the contamination status of the site does not warrant remediation of soil or groundwater, in the context of the development concept which includes raising site surface levels by at least 0.5m through placement of construction fill and design and installation of gas protection measures as part of school buildings.

- The stockpile of impacted soil and any similarly impacted material in the vicinity must be removed as part of demolition activity.

- A Construction Environment Management Plan (CEMP) must be prepared and implemented prior to demolition. An Asbestos Management Plan (AMP) and an Unexpected Finds Procedure must be incorporated into the CEMP.

- Imported fill material must be validated as consistent with future use of the site as a primary school.

I confirm that in preparing this Advice, that I made reference to GHD's Conceptual RAP which includes the following items in Section 7, Remedial Strategy:

7.2 Roles and responsibilities - Site Auditor: the appointed Site Auditor will review all the plans / reports prepared by the Environmental Consultant and Contractor and visit the site to verify that remedial works are conducted in accordance with this RAP or amended RAP(s).

7.3 Development of CEMP - comprehensive Construction Environmental Management Plan (CEMP) should be implemented including asbestos management plan (AMP) and piling management plan.

7.5 Capping - For school yard, residential gardens where no slab is planned, a minimum 500 mm capping material is required. Placement of a layer of geotextile marker under the capping material where hard ground surface is not built.

7.9 Ground gas / soil vapour protection measures - The NSW EPA (2012) guidelines derive scores for protection measures for different Characteristic Situations (CS). Based on the calculated CS values from the monitoring data collected to date, and given the property will be developed into medium to high density residential properties, schools, open space and commercial properties, the guidance value for gas protection is considered to be "5" for the residential and school areas.

As the appointed Site Auditor, I have reviewed the plans and reports prepared by EIS (*7.2 in strategy has been implemented*) and have confirmed information through detailed reference to other reports by GHD, AECOM and Douglas Partners.

The Environmental Consultant concluded that remediation of soil or groundwater on the school site was not warranted on condition that:

- The site surface level is to be raised by at least 0.5m to mitigate flood risk (*7.5 in strategy is addressed*);
- Gas protection measures will be designed and installed in the school buildings, however additional ground gas monitoring results have allowed the gas protection level to be reduced to 2 (*7.9 in strategy is addressed*);
- A Construction Environmental Management Plan is prepared and implemented, including an Unexpected Finds Procedure and associated Asbestos Management Plan (*7.3 in strategy is addressed*); and

- Imported construction fill must be properly validated (*relevant part of 7.5 in strategy is addressed*) .

Thus, I consider that this amendment of the remediation strategy to have no specific Remediation Action Plan for the school site is consistent with meeting the objectives of the GHD Conceptual RAP for the Homebush Bay West area.

I confirm that for issue of a Site Audit Statement providing my opinion about the suitability of the site for use as a primary school (after construction activity is completed) will require validation of the above conditions by the Environmental Consultant and my independent review of the resulting Validation Report. I consider that my Site Audit Statement will be conditional on implementation of a long-term Environmental Management Plan for the school site which must be prepared by the Environmental Consultant to my satisfaction before issue of the Statement.

Please contact me if you would like to discuss any point in the above.

Regards

Dr Michael Dunbavan
NSW EPA Accredited Site Auditor (0804)

Level 19, Tower B, Citadel Towers

799 Pacific Highway
Chatswood NSW 2067

t: +61 2 9406 1206
m: +61 419 395 971

coffey

Appendix C - Site Survey and Locality Plans

WENTWORTH POINT PUBLIC SCHOOL

DRAWING SCHEDULE

ARCHITECTURAL

DRG. No.	SCALE @ A1	DESCRIPTION
DA01	AS SHOWN	DRAWING SCHEDULE, SITE PLAN AND LOCATION PLAN
DA02	1:500	SITE DEMOLITION PLAN AND SITE PLAN
DA03	1:200	EXTERNAL WORKS - SITE PLAN 1
DA04	1:200	EXTERNAL WORKS - SITE PLAN 2
DA05	1:200	GROUND FLOOR PLAN & FIRST FLOOR PLAN
DA06	1:200	SECOND FLOOR PLAN & ROOF PLAN
DA07	1:200	ELEVATIONS & SECTIONS
DA08	1:200	LANDSCAPE PLAN - LEVEL 1
DA07	NTS	SHADOW DIAGRAMS
DA08	NTS	3D VIEWS / EXTERNAL FINISHES

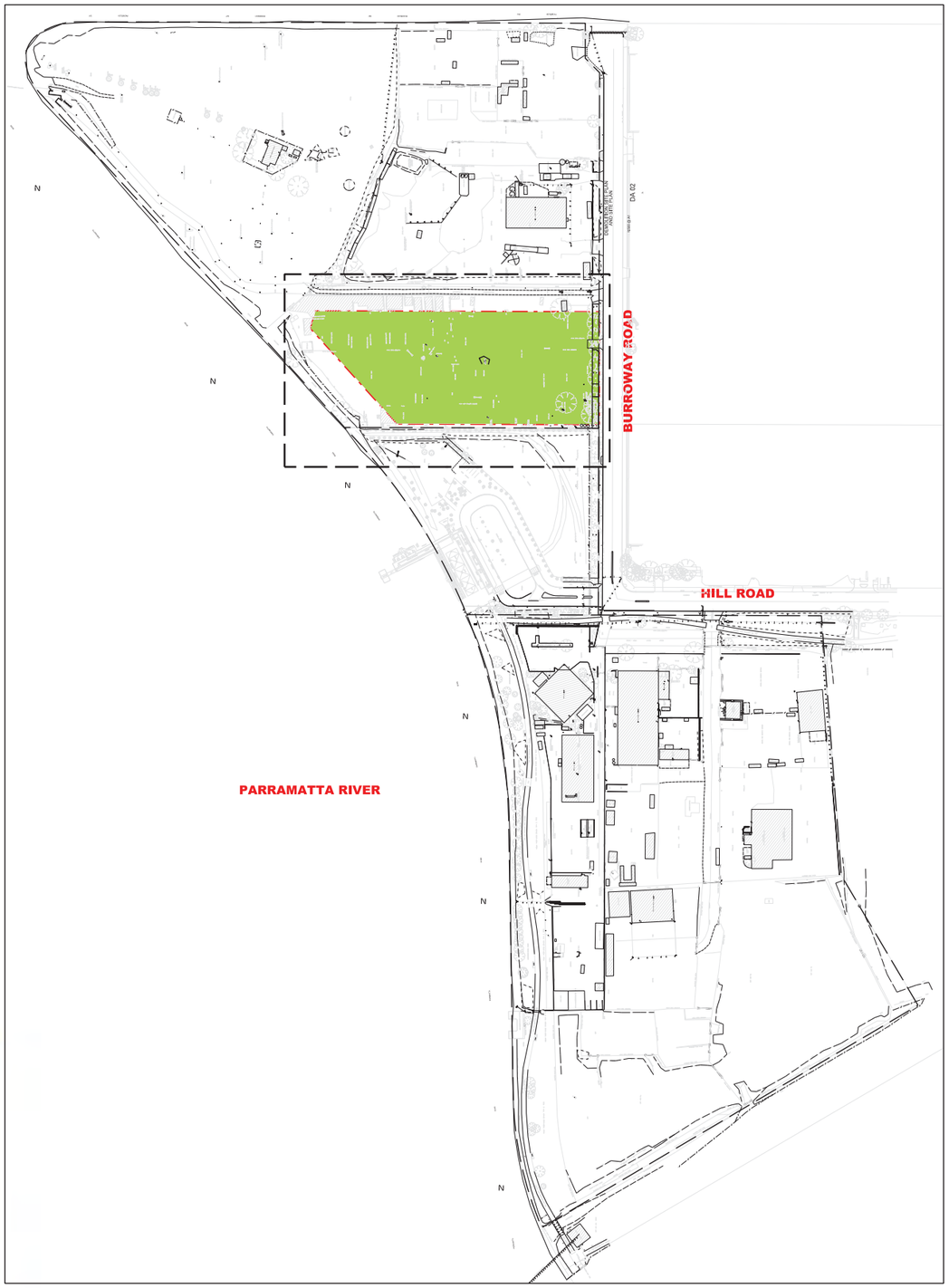
SURVEY

DRG. No.	SCALE @ A1	DESCRIPTION
113925500SH1	1:500	DETAIL AND COUNTOUR SURVEY - SHEET 1
113925500SH2	1:200	DETAIL AND COUNTOUR SURVEY - SHEET 2
113925500SH3	1:200	DETAIL AND COUNTOUR SURVEY - SHEET 3
113925500SH4	1:200	DETAIL AND COUNTOUR SURVEY - SHEET 4
113925500SH5	1:200	DETAIL AND COUNTOUR SURVEY - SHEET 5

STATE LOCATION NTS

LOCALITY PLAN NTS

LOCATION PLAN NTS



SITE PLAN

1:2000

1 The Government Architect's Office, a division of the Office of Finance & Services shall not be liable or responsible for any loss or damage arising out of the conversion of any electronic document, data or program to any other format or medium, or arising out of any modification or changes that occur in the handling or use of the electronic document, data or program.

2 The recipient or user of any electronic document, data or program is solely responsible for ascertaining its accuracy and its suitability for their purposes.

3 The Department uses virus scanning software to prevent file and system virus attacks but gives no warranty. The recipient or user is solely responsible for their own virus protection.

LEGEND

AC	AIR CONDITIONER
ALUM	ALUMINIUM
BAL	BALUSTRADE
BOL	BOLLARD
C	CONCRETE
CB	CONCRETE BLOCK
CBW	CONCRETE BLOCK WALL
CFC	COMPRESSED FIBRE CEMENT
CK	CONCRETE KERB
CM	CORRUGATED METAL
COL	COLUMN
COLA	COVERED OUTDOOR LEARNING AREA
COS	CHECK ON SITE
CP	CONCRETE PAVING
CPA	CONCRETE PAVING - ASPHALTIC
CPC	CONCRETE PAVING - COLOURED
CPD	CUPBOARD
CPW	CONCRETE PAVING – WASHED AGGREGATE
CSW	CONCRETE SEATING WALL
DP	DOWNPIPE
EDB	ELECTRICAL DISTRIBUTION BOARD
EX	EXISTING
FC	FIBRE CEMENT
FCB	FACE CONCRETE BLOCK
FFL	FINISHED FLOOR LEVEL
FHR	FIRE HOSE REEL
FIP	FIRE INDICATOR PANEL
FNC	FENCE
GL	GROUND LINE
OFC	OFF-FORM CONCRETE
MC	METAL CLADDING
MP	MASS PLANTING
MO	MULCH ONLY
PA	PAVER
PAA	PRACTICAL ACTIVITIES AREA
PB	PLASTERBOARD
PBX	PLANTER BOX
PCFC	PREFINISHED COMPRESSED FIBRE CEMENT
PERF	PERFORATED
PP	PERMEABLE PAVING
RL	REDUCED LEVEL
RS	ROOF SHEETING
RW	RETAINING WALL
RWG	RAINWATER GUTTER
SFP	SOFTFALL PAVING
STE	SYNTHETIC TURF EMBANKMENT
STF	SYNTHETIC TURF
TC	TRANSLUCENT CLADDING
TF	TURF
TOW	TOP OF WALL
WS	WHEEL STOP

REVISION

ISS	DATE	COMMENT

STRUCTURAL
GOVERNMENT ARCHITECT'S OFFICE
T 9372 8230 F 9372 8399

ARCHITECTURAL
GOVERNMENT ARCHITECT'S OFFICE
T 9372 8411 F 9372 8399

ELECTRICAL
GOVERNMENT ARCHITECT'S OFFICE
T 9372 8253 F 9372 8133

LANDSCAPE
GOVERNMENT ARCHITECT'S OFFICE
T 9372 8428 F 9372 8444

MECHANICAL
GOVERNMENT ARCHITECT'S OFFICE
T 9372 8253 F 9372 8133

QUANTITY SURVEYOR
GOVERNMENT ARCHITECT'S OFFICE
T 9372 8311 F 9372 8444

HYDRAULIC
GOVERNMENT ARCHITECT'S OFFICE
T 9372 8202 F 9372 8133

PROJECT MANAGEMENT
PROJECT MANAGEMENT GROUP
T 9372 8558 F 9372 8566

NSW GOVERNMENT Public Works
Government Architect's Office

PETER POULET
NSW Government Architect
Nominated Architect: ARN 5754
Level 19 McKell Building, 2-24 Rawson Place
Sydney NSW 2000 AUSTRALIA

A division of the Office of Finance & Services
PHIL GAETJENS
Secretary

WENTWORTH POINT PUBLIC SCHOOL
BURROWAY ROAD

DRAWING SCHEDULE SITE PLAN AND LOCATION PLAN

PLAN RM NO | CONTRACT NUMBER

SCALES: AS SHOWN @ A1

SHEET NO: DA 01

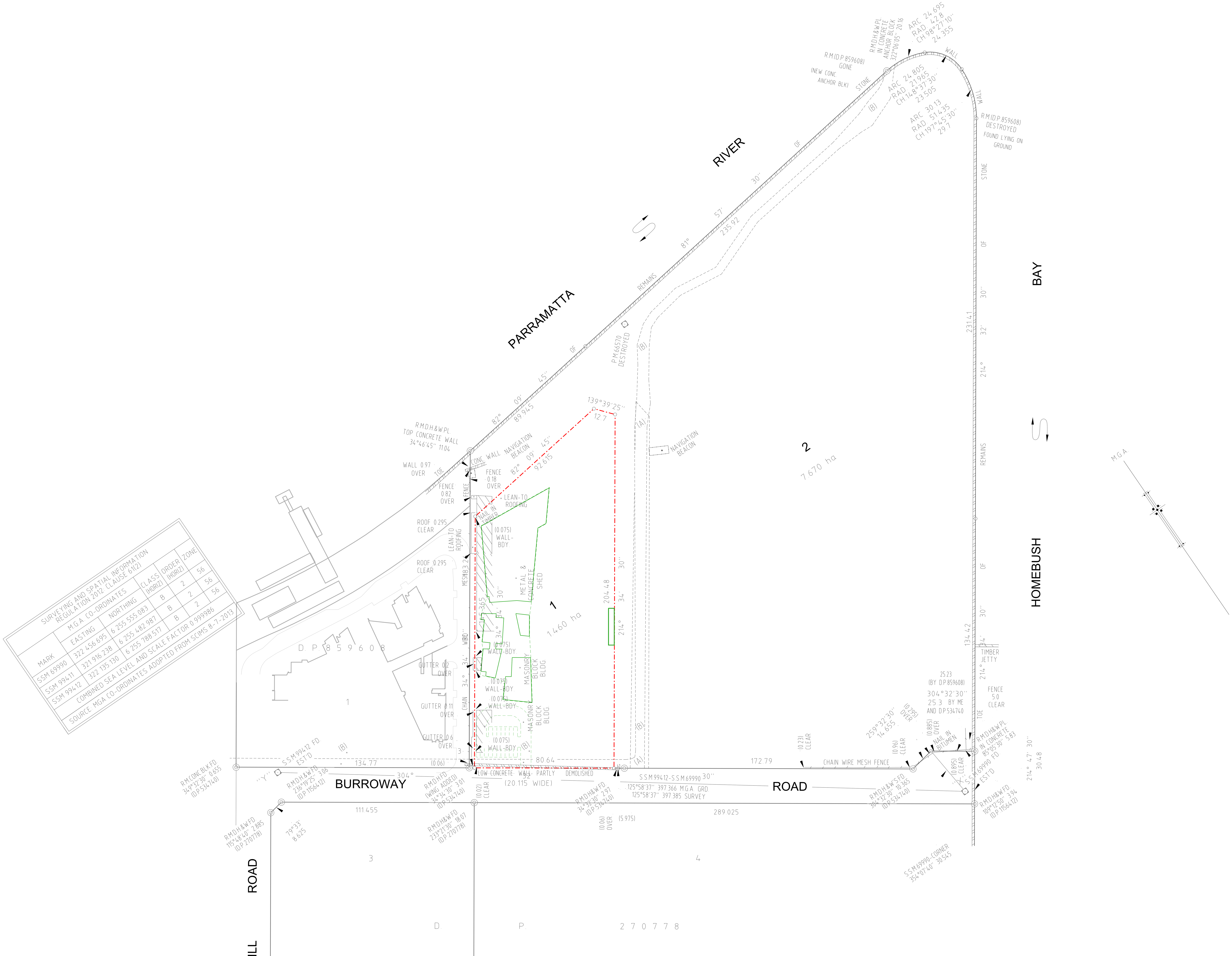
DESIGNED: GAO | PLOT DATE: 2/12/2014

DRAFTED: GAO | VERIFIED: GAO | REVISION: A

2/12/2014 10:43:29 AM G:\Projects\Educ\PPS\Wentworth_Pt\4_ds\arch\WENTPT_DA 01-cover.PLT

mossmorn $NODE$

A1 0 10 20 30 40 50 60 70 80 90 100 | USE FIGURED DIMENSIONS IN PREFERENCE TO SCALING. CHECK ALL DIMENSIONS ON SITE | 200MM | 300MM ON ORIGINAL



PARRAMATTA
RIVER
HOMEBUSH
BAY
BURROWAY
ROAD
ROAD
(20.115 WIDE)
D P 859608
D P 270778
1
2
3
4
7.670 ha
M.G.A
SURVEYING AND SPATIAL INFORMATION REGULATION 2012 CLAUSE 61(2)
M.G.A. CO-ORDINATES
MARK | EASTING | NORTHING | CLASS (HORIZ) | ORDER (HORIZ) | ZONE
SSM 69990 | 322 456.695 | 6 255 555.083 | B | 2 | 56
SSM 99411 | 321 916.238 | 6 255 482.987 | B | 2 | 56
SSM 99412 | 322 135.130 | 6 255 788.517 | B | 2 | 56
COMBINED SEA LEVEL AND SCALE FACTOR 0.999986
SOURCE MGA CO-ORDINATES ADOPTED FROM SCIMS 8-7-2013
METAL & CONCRETE SHED
MASONRY BLOCK BLDG
NAVIGATION BEACON
TIMBER JETTY
CHAIN WIRE MESH FENCE
LOW CONCRETE WALL PARTLY DEMOLISHED

Appendix D - Summary of Contamination Assessment Results

Table D1 Soils Analytical Results – Inorganics Summary based on GHD (2012)

Reference	Depth (m bgs)	Description	Date collected	Arsenic	Cadmium	Chromium (total)	Copper	Lead	Mercury	Nickel	Zinc	Asbestos
1C01	1.2	Fill	Aug 2011	16	<0.1	6.6	27	27	0.17	4.9	68	Detected
1C01	1.7	Clay	Aug 2011	13	<0.1	8.6	18	49	0.31	3.4	67	nt
1C02	0.1	Fill	Aug 2011	16	<0.1	18	80	82	0.07	27	540	ND
1C02	0.8	Fill	Aug 2011	7.7	<0.1	4.7	11	38	0.15	2.7	34	nt
1C03	0-0.1	Fill	Aug 2011	140	22	81	1200	220	0.12	34	3700	ND
1C04	0.1	Fill	Aug 2011	1	<0.1	19	50	16	<0.05	80	100	ND
1C04	1.3	Sandy Clay	Aug 2011	6.7	<0.1	3.3	5	25	0.07	1.8	23	nt
1C05A	0.5	Fill	Aug 2011	4.2	0.5	8.6	15	97	<0.05	2.7	54	ND
1C05A	1.8	Sand	Aug 2011	5.9	<0.1	2.3	6.7	15	0.06	1.1	16	nt
1C06	0.8	Fill	Aug 2011	4.9	0.2	7.7	8.9	29	0.09	4.4	64	ND
1C06	1.7	Clay	Aug 2011	13	0.2	6	19	59	0.31	3.7	76	nt
1C06b	0-0.1	Not stated	Aug 2011	35	1.4	67	440	170	0.09	27	1600	nt
1C07	0.4	Fill	Aug 2011	2.8	0.1	17	27	36	<0.05	9.3	140	ND
1C07	1.2	Fill	Aug 2011	14	0.2	16	42	140	1.1	6.2	170	nt
1C08	0.4	Fill	Aug 2011	5	<0.1	17	35	18	<0.05	30	52	ND
1C08	1.2	Sandy Clay	Aug 2011	18	<0.1	9.5	7.9	29	0.17	3.4	43	nt
1C09	0.9-1	Fill	Aug 2011	8.7	<0.1	6.3	19	36	0.12	7.3	57	Detected
1C10	0.3	Fill	Aug 2011	6.8	1	45	380	540	0.16	13	6600	Detected
1C10	1.7	Sand	Aug 2011	18	<0.1	<2	3	8.5	0.09	<1	15	nt

Reference	Depth (m bgs)	Description	Date collected	Arsenic	Cadmium	Chromium (total)	Copper	Lead	Mercury	Nickel	Zinc	Asbestos
1C11	0.6-0.8	Fill	Aug 2011	60	0.5	16	91	100	0.12	10	690	Detected
1C12	0.6	Fill	Aug 2011	5.2	<0.1	3.6	11	23	0.61	2.2	60	ND
1C12	1.6	Silty Clay	Aug 2011	8	<0.1	2.8	6.1	23	0.17	1.5	26	nt
1C13	0.3	Fill	Aug 2011	8.6	<0.1	6.4	22	59	0.1	3.4	77	ND
1C13	0.8	Fill	Aug 2011	6.5	<0.1	4.7	5.2	17	0.09	1.5	22	nt
1C14	0.1	Fill	Aug 2011	19	2.3	40	320	150	0.13	23	1100	ND
1C14	1.5	Clay	Aug 2011	12	<0.1	6.2	10	27	0.16	2.9	37	nt
1CW01	0.9-1	Fill	Aug 2011	5.9	<0.1	5.1	13	36	0.11	2	37	ND
1CW01	1.7-1.8	Sand	Aug 2011	7.3	<0.1	2.4	17	21	0.1	<1	26	nt
1CW02	0-0.1	Fill	Aug 2011	24	1.3	120	1000	240	0.07	43	2200	ND
1CW02	1.6-1.8	Fill	Aug 2011	11	<0.1	5	10	31	<0.05	3	27	nt
BH14	0.3-0.4	Fill	Oct 2009	<5	<1	16	<5	19	<0.1	<2	10	ND
BH14	0.6-0.7	Fill	Oct 2009	7	<1	27	7	26	<0.1	<2	17	nt
BH14	2-2.1	Sand	Oct 2009	<5	<1	6	9	15	<0.1	2	209	nt
BH33	0.1-0.2	Fill	Oct 2009	<5	<1	23	67	11	<0.1	157	86	ND
BH33	0.2-0.3	Fill	Oct 2009	<5	<1	14	73	8	<0.1	96	50	nt
BH33	0.5-0.6	Fill	Oct 2009	<5	<1	7	48	13	<0.1	6	18	nt
BH38	0.15-0.25	Fill	Oct 2009	7	<1	66	68	48	<0.1	40	303	ND
BH38	0.6-0.7	Fill	Oct 2009	8	<1	21	44	38	<0.1	35	78	nt
BH38	1.7-1.8	Sand	Oct 2009	13	<1	6	7	28	<0.1	3	370	nt

Reference	Depth (m bgs)	Description	Date collected	Arsenic	Cadmium	Chromium (total)	Copper	Lead	Mercury	Nickel	Zinc	Asbestos
BH39	0.2-0.3	Fill	Oct 2009	20	<1	21	94	63	<0.1	19	93	ND
BH39	0.6-0.7	Fill	Oct 2009	21	<1	16	886	238	<0.1	17	1020	nt
BH39	1.85-1.95	Clay	Oct 2009	8	<1	6	10	26	<0.1	3	30	nt
BH40	0.4-0.5	Fill	Oct 2009	<5	<1	10	31	29	<0.1	8	146	ND
BH40	1.1-1.2	Fill	Oct 2009	6	<1	6	20	55	0.1	2	53	nt
BH40	1.65-1.75	Sand	Oct 2009	6	<1	6	9	45	<0.1	3	28	nt
BH42	0.5	Fill	Oct 2009	7	<1	24	100	71	<0.1	59	406	ND
BH42	1.2	Not stated	Oct 2009	12	<1	23	71	71	<0.1	26	388	nt
BH42	1.6-1.7	Sand	Oct 2009	6	<1	2	6	11	<0.1	<2	10	nt
BH43	0.45-0.55	Not stated	Oct 2009	<5	<1	11	77	26	<0.1	<2	10	ND
BH43	1.1-1.2	Not stated	Oct 2009	7	<1	22	44	78	<0.1	25	225	nt
BH43	1.3	Not stated	Oct 2009	7	<1	18	43	50	<0.1	18	140	nt

Note: analytical results are in mg/kg

Table D2 Soils Analytical Results – TPH & BTEX Summary based on GHD (2012)

Reference	Depth (m bgs)	Description	Date collected	Benzene	Ethylbenzene	Toluene	Xylenes	TPH C_6-C_9	TPH C_{10}-C_{14}	TPH C_{15}-C_{28}	TPH C_{28}-C_{36}	TPH C_{10}-C_{36}
1C01	1.2	Fill	Aug 2011	<0.5	<0.5	<0.5	<1.5	<10	<50	<100	<100	<100
1C01	1.7	Clay	Aug 2011	<0.5	<0.5	<0.5	<1.5	<10	<50	<100	<100	<100
1C02	0.1	Fill	Aug 2011	<0.5	<0.5	<0.5	<1.5	<10	<50	<100	<100	<100
1C02	0.8	Fill	Aug 2011	<0.5	<0.5	<0.5	<1.5	<10	<50	140	<100	140
1C03	0-0.1	Fill	Aug 2011	<0.5	<0.5	<0.5	2.5	<10	<50	170	130	300
1C04	0.1	Fill	Aug 2011	<0.5	<0.5	<0.5	<1.5	<10	260	1900	<100	2200
1C04	1.3	Sandy Clay	Aug 2011	<0.5	<0.5	<0.5	<1.5	<10	<50	150	<100	150
1C05A	0.5	Fill	Aug 2011	<0.5	<0.5	<0.5	<1.5	<10	<50	<100	<100	<100
1C05A	1.8	Sand	Aug 2011	<0.5	<0.5	<0.5	<1.5	<10	<50	<100	<100	<100
1C06	0.8	Fill	Aug 2011	<0.5	<0.5	<0.5	<1.5	<10	<50	<100	<100	<100
1C06	1.7	Clay	Aug 2011	<0.5	<0.5	<0.5	<1.5	<10	<50	130	<100	130
1C06b	0-0.1	Not stated	Aug 2011	<0.5	<0.5	<0.5	<1.5	<10	<50	460	710	1200
1C07	0.4	Fill	Aug 2011	<0.5	<0.5	<0.5	<1.5	<10	<50	130	<100	130
1C07	1.2	Fill	Aug 2011	<0.5	<0.5	<0.5	<1.5	<10	<50	<100	<100	<100
1C08	0.4	Fill	Aug 2011	<0.5	<0.5	<0.5	<1.5	<10	<50	<100	<100	<100
1C08	1.2	Sandy Clay	Aug 2011	<0.5	<0.5	<0.5	<1.5	<10	<50	<100	<100	<100
1C09	0.9-1	Fill	Aug 2011	<0.5	<0.5	<0.5	<1.5	<10	<50	<100	<100	<100
1C10	0.3	Fill	Aug 2011	<0.5	<0.5	<0.5	<1.5	<10	<50	<100	<100	<100
1C10	1.7	Sand	Aug 2011	<0.5	<0.5	<0.5	<1.5	<10	<50	<100	<100	<100

Reference	Depth (m bgs)	Description	Date collected	Benzene	Ethylbenzene	Toluene	Xylenes	TPH C_6-C_9	TPH C_{10}-C_{14}	TPH C_{15}-C_{28}	TPH C_{28}-C_{36}	TPH C_{10}-C_{36}
1C11	0.6-0.8	Fill	Aug 2011	<0.5	<0.5	<0.5	<1.5	<10	<50	<100	170	170
1C12	0.6	Fill	Aug 2011	<0.5	<0.5	<0.5	<1.5	<10	<50	<100	<100	<100
1C12	1.6	Silty Clay	Aug 2011	<0.5	<0.5	<0.5	<1.5	<10	<50	<100	<100	<100
1C13	0.3	Fill	Aug 2011	<0.5	<0.5	<0.5	<1.5	<10	<50	<100	<100	<100
1C13	0.8	Fill	Aug 2011	<0.5	<0.5	<0.5	<1.5	<10	<50	<100	<100	<100
1C14	0.1	Fill	Aug 2011	<0.5	<0.5	<0.5	<1.5	<10	<50	<100	<100	<100
1C14	1.5	Clay	Aug 2011	<0.5	<0.5	<0.5	<1.5	<10	<50	<100	<100	<100
1CW01	0.9-1	Fill	Aug 2011	<0.5	<0.5	<0.5	<1.5	<10	<50	<100	<100	<100
1CW01	1.7-1.8	Sand	Aug 2011	<0.5	<0.5	<0.5	<1.5	<10	<50	<100	<100	<100
1CW02	0-0.1	Fill	Aug 2011	<0.5	<0.5	<0.5	<1.5	<10	<50	<100	220	220
1CW02	1.6-1.8	Fill	Aug 2011	<0.5	<0.5	<0.5	<1.5	<10	<50	<100	<100	<100
BH14	0.3-0.4	Fill	Oct 2009	<0.5	<0.5	<0.5	<1.5	<10	<50	<100	<100	<100
BH14	0.6-0.7	Fill	Oct 2009	<0.5	<0.5	<0.5	<1.5	<10	<50	<100	<100	<100
BH14	2-2.1	Sand	Oct 2009	<0.5	<0.5	<0.5	<1.5	<10	<50	<100	<100	<100
BH33	0.1-0.2	Fill	Oct 2009	<0.5	<0.5	<0.5	<1.5	<10	<50	180	310	490
BH33	0.2-0.3	Fill	Oct 2009	<0.5	<0.5	<0.5	<1.5	<10	<50	130	230	370
BH38	0.15-0.25	Fill	Oct 2009	<0.5	<0.5	<0.5	<1.5	<10	<50	<100	<100	<100
BH38	0.6-0.7	Fill	Oct 2009	<0.5	<0.5	<0.5	1.5	<10	<50	<100	<100	<100
BH39	0.2-0.3	Fill	Oct 2009	<0.5	<0.5	<0.5	<1.5	<10	<50	<100	<100	<100
BH39	0.6-0.7	Fill	Oct 2009	<0.5	<0.5	<0.5	<1.5	<10	<50	200	130	330

Reference	Depth (m bgs)	Description	Date collected	Benzene	Ethylbenzene	Toluene	Xylenes	TPH C_6-C_9	TPH C_{10}-C_{14}	TPH C_{15}-C_{28}	TPH C_{28}-C_{36}	TPH C_{10}-C_{36}
BH40	0.4-0.5	Fill	Oct 2009	<0.5	<0.5	<0.5	<1.5	<10	<50	640	960	1590
BH40	1.1-1.2	Fill	Oct 2009	<0.5	<0.5	<0.5	<1.5	<10	<50	120	<100	120
BH42	1.2	Not stated	Oct 2009	<0.5	<0.5	<0.5	<1.5	<10	<50	<100	<100	<100
BH42	1.6-1.7	Sand	Oct 2009	<0.5	<0.5	<0.5	<1.5	<10	<50	<100	<100	<100
BH43	1.1-1.2	Not stated	Oct 2009	<0.5	<0.5	<0.5	<1.5	<10	<50	1020	1090	2110
BH43	1.3	Not stated	Oct 2009	<0.5	<0.5	<0.5	<1.5	<10	<50	480	550	1030

Note: analytical results are in mg/kg

Table D3 Soils Analytical Results – High Molecular Weight Organics Summary based on GHD (2012)

Reference	Depth (m bgs)	Description	Date collected	Benzo[a]pyrene	Naphthalene	Total PAHs	B[a]P TEQ	OCPs	PCBs	Total VOCs	Total sVOCs
1C01	1.2	Fill	Aug 2011	0.6	<0.5	5	0.7	ND	ND	ND	ND
1C01	1.7	Clay	Aug 2011	1.8	<0.5	17	2.0				
1C02	0.1	Fill	Aug 2011	0	<0.5	<1	0.0				
1C02	0.8	Fill	Aug 2011	3.7	<0.5	36	4.3				
1C03	0-0.1	Fill	Aug 2011	0	<0.5	<1	0.0	ND	ND	ND	ND
1C04	0.1	Fill	Aug 2011	0	<0.5	<1	0.0				
1C04	1.3	Sandy Clay	Aug 2011	4.4	1	55	5.1				
1C05A	0.5	Fill	Aug 2011	0	<0.5	<1	0.0	ND	ND	ND	ND
1C05A	1.8	Sand	Aug 2011	0.8	<0.5	7	0.9				
1C06	0.8	Fill	Aug 2011	0	<0.5	2	0.0				
1C06	1.7	Clay	Aug 2011	3.8	<0.5	41	4.4				
1C06b	0-0.1	Not stated	Aug 2011	3	<0.5	25	3.4				
1C07	0.4	Fill	Aug 2011	0	<0.5	<1	0.0				
1C07	1.2	Fill	Aug 2011	2.4	<0.5	26	2.8				
1C08	0.4	Fill	Aug 2011	0.17	<0.5	<1	0.2				
1C08	1.2	Sandy Clay	Aug 2011	0.7	<0.5	5	0.8				
1C09	0.9-1	Fill	Aug 2011	0	<0.5	1	0.0				
1C10	0.3	Fill	Aug 2011	0	<0.5	<1	0.0				
1C10	1.7	Sand	Aug 2011	0	<0.5	<1	0.0				

Reference	Depth (m bgs)	Description	Date collected	Benzo[a]pyrene	Naphthalene	Total PAHs	B[a]P TEQ	OCPs	PCBs	Total VOCs	Total sVOCs
1C11	0.6-0.8	Fill	Aug 2011	2.3	<0.5	17	2.7	ND	ND	ND	ND
1C12	0.6	Fill	Aug 2011	1.9	<0.5	15	2.2				
1C12	1.6	Silty Clay	Aug 2011	1.2	<0.5	9	1.3				
1C13	0.3	Fill	Aug 2011	1.4	<0.5	14	1.6				
1C13	0.8	Fill	Aug 2011	0.7	<0.5	5	0.8	ND	ND	ND	ND
1C14	0.1	Fill	Aug 2011	2	<0.5	28	2.6	ND	ND	ND	ND
1C14	1.5	Clay	Aug 2011	0.7	<0.5	8	0.8				
1CW01	0.9-1	Fill	Aug 2011	0	<0.5	2	0.0				
1CW01	1.7-1.8	Sand	Aug 2011	1.3	<0.5	12	1.5				
1CW02	0-0.1	Fill	Aug 2011	0.7	<0.5	7.5	0.8				
1CW02	1.6-1.8	Fill	Aug 2011	4.4	0.2	15	5.1				
BH14	0.3-0.4	Fill	Oct 2009	0	<0.5	<1	0.0	ND	ND		
BH14	0.6-0.7	Fill	Oct 2009	0	<0.5	<1	0.0				
BH14	2-2.1	Sand	Oct 2009	0	<0.5	<1	0.0				
BH33	0.1-0.2	Fill	Oct 2009	0	<0.5	<1	0.0				
BH33	0.2-0.3	Fill	Oct 2009	0	<0.5	<1	0.0	ND	ND	ND	ND
BH38	0.15-0.25	Fill	Oct 2009	0	<0.5	<1	0.0				
BH38	0.6-0.7	Fill	Oct 2009	0	<0.5	<1	0.0	ND	ND		
BH39	0.2-0.3	Fill	Oct 2009	3.5	<0.5	40	4.4				
BH39	0.6-0.7	Fill	Oct 2009	0	<0.5	<1	0.0				

Reference	Depth (m bgs)	Description	Date collected	Benzo[a]pyrene	Naphthalene	Total PAHs	B[a]P TEQ	OCPs	PCBs	Total VOCs	Total sVOCs
BH40	0.4-0.5	Fill	Oct 2009	6.5	<0.5	54	8.7	ND	ND	ND	ND
BH40	1.1-1.2	Fill	Oct 2009	0	<0.5	<1	0.0				
BH42	1.2	Not stated	Oct 2009	1.5	<0.5	13	1.9				
BH42	1.6-1.7	Sand	Oct 2009	0	<0.5	<1	0.0	ND	ND		
BH43	1.1-1.2	Not stated	Oct 2009	2.9	<0.5	19	3.5				
BH43	1.3	Not stated	Oct 2009	0.6	<0.5	5	0.7	ND	ND	ND	ND

Note: analytical results are in mg/kg, grey shading indicates no result available

TABLE A

SOIL LABORATORY RESULTS COMPARED TO HILs (Applicable to Future School Assoicated Land Use Receptors)

All data in mg/kg unless stated otherwise

			HEAVY METALS								PAHs		ORGANOCHLORINE PESTICIDES (OCPs)							OP PESTICIDES (OPPs)	TOTAL PCBs	ASBESTOS FIBRES
			Arsenic	Cadmium	Chromium VI [2]	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	B(a)P TEQ [3]	HCB	Endosulfan	Methoxychlor	Aldrin & Dieldrin	Chlordane	DDT, DDD & DDE	Heptachlor	Chlorpyrifos		
PQL - Envirolab Services			4	0.4	1	1	1	0.1	1	1	-	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	100
Site Assessment Criteria (SAC) [1]			100	20	100	6000	300	40	400	7400	300	3	10	270	300	6	50	240	6	160	1	Detected/Not Detected
Sample Reference	**Sample Depth**	**Sample Description**																				
TP1	0-0.2	Fill - Silty sand	6	0.8	27	110	59	LPQL	57	370	11.34	1.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP1	0-0.2	Fill - Silty sand	6	0.7	27	100	52	LPQL	60	280	7.61	1.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP1	0.4-0.6	Fill - Silty Clay	7	0.5	15	69	41	LPQL	32	260	0.39	LPQL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP2	0.2-0.4	Fill - Silty gravelly sand	11	2	38	310	190	0.3	25	2100	25.7	**3.5**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP3	0.2-0.4	Fill - Silty sand	4	LPQL	10	86	160	0.2	10	380	10.5	1.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP4	0-0.2	Fill - Silty sand	LPQL	LPQL	19	54	21	LPQL	16	160	LPQL	LPQL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP4	0.2-0.4	Fill - Silty sand	13	LPQL	13	22	200	0.1	9	85	13.5	1.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP5	0-0.1	Fill - Silty sand	56	2	LPQL *	1300	**330**	0.1	54	4000	4.6	0.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP5	0.2-0.4	Fill - Sandy gravel	14	0.8	67	310	110	LPQL	34	1100	1.6	LPQL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH2	0-0.2	Fill - Gravelly sand	11	1	23	98	70	LPQL	22	300	3.2	0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH2	0.5-0.7	Fill - Gravelly sand	12	0.7	37	170	190	LPQL	19	410	3.1	LPQL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH2	1.8-1.95	Fill - Silty sand	7	LPQL	7	8	10	LPQL	3	37	0.8	LPQL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP01	-	Fill - Silty sand	83	2	**210**	2400	**510**	LPQL	75	**7500**	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	Not detected
SP02	-	Fill - Silty sand	80	3	**200**	2300	**480**	LPQL	90	**7500**	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	Not detected
SP03	-	Fill - Silty sand	80	2	**210**	2300	**490**	LPQL	77	**7600**	0.4	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	Not detected
S01/S1	-	Fill - Silty sand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not detected
S03/S2	-	Fill - Silty sand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not detected
S05/S3	-	Fill - Silty sand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not detected
S07/S4	-	Fill - Silty sand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not detected
S09/S5	-	Fill - Silty sand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not detected
S11/S6	-	Fill - Silty sand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not detected
S16/S9	-	Fill - Silty sand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not detected
S18/S10	-	Fill - Silty sand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not detected
S20/S11	-	Fill - Silty sand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not detected
S22/S12	-	Fill - Silty sand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not detected
S24/S13	-	Fill - Silty sand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not detected
S26/S14	-	Fill - Silty sand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not detected
S29/S16	-	Fill - Silty sand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not detected
S32/S17	-	Fill - Silty sand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not detected
S34/S18	-	Fill - Silty sand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not detected
S41/F1	-	Fibre cement fragment	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**Chrysotile & Amosite asbestos detected**
S49/S25	-	Fill - Silty sand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No asbestos detected
S51/F2	-	Fibre cement fragment	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**Chrysotile asbestos detected**
S54/S26	-	Fill - Silty sand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No asbestos detected
S56/S27	-	Fill - Silty sand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No asbestos detected
Total Number of Samples			15	15	15	15	15	15	15	15	15	15	3	3	3	3	3	3	3	3	3	23
Maximum Value			83	3	210	2400	510	0.3	90	7600	25.7	3.5	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NC

Explanation:

1 - Site Assessment Criteria (SAC): NEPM 2013, HIL-A: 'Residential with garden/accessible soils; children's day care centers; preschools; and primary schools'

2 - The results are for Total Chromium which includes Chromium III and VI. For initial screening purposes, we have assumed that the samples contain only Chromium VI unless demonstrated otherwise by additional analysis.

3 - B(a)P TEQ - Benzo(a)pyrene Toxicity Equivalence Quotient has been calculated based on 8 carcinogenic PAHs and their Toxic Equivalence Factors (TEFs) outlined in NEPM 2013

* - The initial Chromium result for the sample TP5 (0-0.1m) of 120mg/kg was above the SAC of 100mg/kg. Additional analsyis on the sample for Hexavalent Chroium Cr^{6+} was LPQL and less than the SAC.

Concentration above the SAC **VALUE**

Abbreviations:

PAHs: Polycyclic Aromatic Hydrocarbons
B(a)P: Benzo(a)pyrene
PQL: Practical Quantitation Limit
LPQL: Less than PQL
OPP: Organophosphorus Pesticides
OCP: Organochlorine Pesticides
PCBs: Polychlorinated Biphenyls
UCL: Upper Level Confidence Limit on Mean Value
HILs: Health Investigation Levels
NA: Not Analysed
NC: Not Calculated
NSL: No Set Limit
SAC: Site Assessment Criteria
NEPM: National Environmental Protection Measure

TABLE B
SOIL LABORATORY RESULTS COMPARED TO HSLs (Applicable to Future School Assoicated Land Use Receptors)
All data in mg/kg unless stated otherwise

					C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	PID [2]
PQL - Envirolab Services					25	50	0.2	0.5	1	3	1	
HSL Land Use Category [1]					**RESIDENTIAL WITH ACCESSIBLE SOIL**							
Sample Reference	**Sample Depth**	**Sample Description**	**Depth Category**	**Soil Category**								
TP1	0-0.2	Fill - Silty sand	0m to < 1m	Sand	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
TP1	0.4-0.6	Fill - Silty Clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
TP2	0.2-0.4	Fill - Silty gravelly sand	0m to < 1m	Sand	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0.1	0
TP3	0.2-0.4	Fill - Silty sand	0m to < 1m	Sand	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
TP4	0-0.2	Fill - Silty sand	0m to < 1m	Sand	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
TP4	0.2-0.4	Fill - Silty sand	0m to < 1m	Sand	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
TP5	0-0.1	Fill - Silty sand	0m to < 1m	Sand	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0.3
TP5	0.2-0.4	Fill - Sandy gravel	0m to < 1m	Sand	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH2	0-0.2	Fill - Gravelly sand	0m to < 1m	Sand	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH2	0.5-0.7	Fill - Gravelly sand	0m to < 1m	Sand	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0.4
BH2	1.8-1.95	Fill - Silty sand	1m to <2m	Sand	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0.3
SP01	-	Fill - Silty sand	0m to < 1m	Sand	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
SP02	-	Fill - Silty sand	0m to < 1m	Sand	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
SP03	-	Fill - Silty sand	0m to < 1m	Sand	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
Total Number of Samples					14	14	14	14	14	14	14	14
Maximum Value					LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0.1	0.4

Explanation:
1 - Site Assessment Criteria (SAC): NEPM 2013
2 - Field PID values obtained during the investigation

Concentration above the SAC **VALUE**
The guideline corresponding to the elevated value is highlighted in grey in the Site Assessment Criteria Table below

Abbreviations:

UCL: Upper Level Confidence Limit on Mean Value	NC: Not Calculated	PQL: Practical Quantitation Limit
HSLs: Health Screening Levels	NL: Not Limiting	LPQL: Less than PQL
NA: Not Analysed	SAC: Site Assessment Criteria	NEPM: National Environmental Protection Measure

SITE ASSESSMENT CRITERIA

					C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene
PQL - Envirolab Services					25	ASSESSMENT CRIT	0.2	0.5	1	3	1
HSL Land Use Category [1]					**RESIDENTIAL WITH ACCESSIBLE SOIL**						
					C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene
PQL - Envirolab Services					25	50	0.2	0.5	1	3	1
HSL Land Use Category [1]					**RESIDENTIAL WITH ACCESSIBLE SOIL**						
Sample Reference	**Sample Depth**	**Sample Description**	**Depth Category**	**Soil Category**							
TP1	0-0.2	Fill - Silty sand	0m to < 1m	Sand	45	110	0.5	160	55	40	3
TP1	0.4-0.6	Fill - Silty Clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
TP2	0.2-0.4	Fill - Silty gravelly sand	0m to < 1m	Sand	45	110	0.5	160	55	40	3
TP3	0.2-0.4	Fill - Silty sand	0m to < 1m	Sand	45	110	0.5	160	55	40	3
TP4	0-0.2	Fill - Silty sand	0m to < 1m	Sand	45	110	0.5	160	55	40	3
TP4	0.2-0.4	Fill - Silty sand	0m to < 1m	Sand	45	110	0.5	160	55	40	3
TP5	0-0.1	Fill - Silty sand	0m to < 1m	Sand	45	110	0.5	160	55	40	3
TP5	0.2-0.4	Fill - Sandy gravel	0m to < 1m	Sand	45	110	0.5	160	55	40	3
BH2	0-0.2	Fill - Gravelly sand	0m to < 1m	Sand	45	110	0.5	160	55	40	3
BH2	0.5-0.7	Fill - Gravelly sand	0m to < 1m	Sand	45	110	0.5	160	55	40	3
BH2	1.8-1.95	Fill - Silty sand	1m to <2m	Sand	70	240	0.5	220	NL	60	NL
SP01	-	Fill - Silty sand	0m to < 1m	Sand	45	110	0.5	160	55	40	3
SP02	-	Fill - Silty sand	0m to < 1m	Sand	45	110	0.5	160	55	40	3
SP03	-	Fill - Silty sand	0m to < 1m	Sand	45	110	0.5	160	55	40	3

TABLE I
SOIL LABORATORY RESULTS COMPARED TO MANAGEMENT LIMITS
All data in mg/kg unless stated otherwise

			C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	>C_{16}-C_{34} (F3)	>C_{34}-C_{40} (F4)
PQL - Envirolab Services			25	50	100	100
Land Use Category [1]			**RESIDENTIAL, PARKLAND & PUBLIC OPEN SPACE**			
Sample Reference	**Sample Depth**	**Soil Texture**				
TP1	0-0.2	Coarse	LPQL	LPQL	220	250
TP1	0-0.2	Coarse	LPQL	LPQL	LPQL	LPQL
TP1	0.4-0.6	Coarse	LPQL	LPQL	180	150
TP2	0.2-0.4	Coarse	LPQL	LPQL	LPQL	LPQL
TP3	0.2-0.4	Coarse	LPQL	LPQL	2200	420
TP4	0-0.2	Coarse	LPQL	LPQL	LPQL	LPQL
TP4	0.2-0.4	Coarse	LPQL	LPQL	740	420
TP5	0-0.1	Coarse	LPQL	LPQL	360	240
TP5	0.2-0.4	Coarse	LPQL	LPQL	4600	840
BH2	0-0.2	Coarse	LPQL	LPQL	1900	350
BH2	0.5-0.7	Coarse	LPQL	LPQL	LPQL	LPQL
BH2	1.8-1.95	Coarse	LPQL	LPQL	340	210
SP01	-	Coarse	LPQL	LPQL	660	410
SP02	-	Coarse	LPQL	LPQL	690	380
SP03	-	Coarse	LPQL	LPQL	350	190
Total Number of Samples			15	15	15	15
Maximum Value			LPQL	LPQL	4600	840

Explanation:
1 -NEPM 2013

Concentration above the SAC — VALUE

Abbreviations:
NEPM: National Environmental Protection Measure
HSLs: Health Screening Levels
NA: Not Analysed
NC: Not Calculated
NL: Not Limiting
PQL: Practical Quantitation Limit
LPQL: Less than PQL
SAC: Site Assessment Criteria

MANAGEMENT LIMIT ASSESSMENT CRITERIA

PQL - Envirolab Services			25	50	100	100
			C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	>C_{16}-C_{34} (F3)	>C_{34}-C_{40} (F4)
PQL - Envirolab Services			25	50	100	100
Land Use Category [1]			**RESIDENTIAL, PARKLAND & PUBLIC OPEN SPACE**			
Sample Reference	**Sample Depth**	**Soil Texture**				
TP1	0-0.2	Coarse	700	1000	2500	10000
TP1	0-0.2	Coarse	700	1000	2500	10000
TP1	0.4-0.6	Coarse	700	1000	2500	10000
TP2	0.2-0.4	Coarse	700	1000	2500	10000
TP3	0.2-0.4	Coarse	700	1000	2500	10000
TP4	0-0.2	Coarse	700	1000	2500	10000
TP4	0.2-0.4	Coarse	700	1000	2500	10000
TP5	0-0.1	Coarse	700	1000	2500	10000
TP5	0.2-0.4	Coarse	700	1000	2500	10000
BH2	0-0.2	Coarse	700	1000	2500	10000
BH2	0.5-0.7	Coarse	700	1000	2500	10000
BH2	1.8-1.95	Coarse	700	1000	2500	10000
SP01	-	Coarse	700	1000	2500	10000
SP02	-	Coarse	700	1000	2500	10000
SP03	-	Coarse	700	1000	2500	10000

TABLE K
HGG FIELD GAS MEASUREMENTS

		HGG (Hazardous Ground Gases)							Field Conditions						
		CH_4 (max)	CO_2 (max)	O_2 (min)	CH_4 LEL (max)	H_2S (max)	CO (max)	Flow (max)	Atmospheric pressure	SWL	PID	Calculated Methane Gas Screening Value (GSV)[1]	Calculated Carbon Dioxide Gas Screening Value (GSV)[1]	Methane Characteristic Gas Situtaion (CS)[1]	Carbon Dioxide Characteristic Gas Situtaion (CS)[1]
		% v/v	% v/v	% v/v	%LEL	ppm	ppm	L/hr	hPa	meters	ppm				
Sample Reference	**Sampling Round & Date**														
1CW02 (GHD)	Round 1 A1 (22-23/03/2012)	14.1	1.4	3.5	NC	0	0	NC	1002	0.38	NC	NC[2]	NC[2]	NC[2]	NC[2]
1CW02 (GHD)	Round 2 A2 (11-12/04/2012)	86.9	7.9	0	NC	0	0	0.9	1030	1	NC	NC[2]	NC[2]	NC[2]	NC[2]
1CW02 (GHD)	Round 3 A3 (1-2/05/2012)	65.5	5.5	3.6	NC	0	0	0.9	1023	0.92	NC	NC[2]	NC[2]	NC[2]	NC[2]
1CW02 (GHD)	Round 4 B1 (13-14/02/2013)	28.6	4.6	2.5	NC	0	1	0	1023	1.03	NC	0	0	1	1
1CW02 (GHD)	Round 5 B2 (27-28/02/2013)	0.5	0	15.2	NC	0	0	0	1008	0.95	NC	0	0	1	1
1CW02 (GHD)	Round 6 B3 (13-14/03/2013)	1.2	0.1	18	NC	0	0	0	1012	0.98	NC	0	0	1	1
1CW02 (GHD)	Round 7 B4 (27-28/03/2013)	0.2	0	10.9	NC	0	0	0	1014	1.09	NC	0	0	1	1
1CW02 (GHD)	Round 8 B5 (10-11/04/2013)	0.1	0	7.7	NC	0	0	0	1020	1.07	NC	0	0	1	1
1CW02 (GHD)	Round 9 B6 (23-24/04/2013)	0.3	0	0	NC	0	3	-0.1	1008	1.09	NC	0	0	1	1
1CW02 (GHD)	Round 10 B7 (7-8/05/2013)	0.9	7.3	7.5	NC	0	0	0	1028	1.2	NC	0	0	1	1
1CW02 (GHD)	Round 11 B8 (22-23/05/2013)	13.6	10.3	0	NC	0	0	0.1	1012	1.27	NC	1.36	1.03	3	3
1CW02 (GHD)	Round 12 B9 (5-6/06/2013)	10.7	9.2	0.3	NC	0	0	NC	1023	1.07	NC	0	0	1	1
1CW01 (GHD)	Round 1 A1 (22-23/03/2012)	0.1	0	5	NC	0	0	NC	1003	0.87	NC	NC[2]	NC[2]	NC[2]	NC[2]
1CW01 (GHD)	Round 2 A2 (11-12/04/2012)	7.5	14.1	0.2	NC	0	0	0	1034	1.15	NC	NC[2]	NC[2]	NC[2]	NC[2]
1CW01 (GHD)	Round 3 A3 (1-2/05/2012)	0.5	0.6	16.7	NC	0	0	NC	1023	1.06	NC	NC[2]	NC[2]	NC[2]	NC[2]
1CW01 (GHD)	Round 4 B1 (13-14/02/2013)	0.6	14.7	0.1	NC	0	0	0	1022	1.26	NC	0	0	1	1
1CW01 (GHD)	Round 5 B2 (27-28/02/2013)	0.5	10.3	2.8	NC	0	0	0	1008	1.13	NC	0	0	1	1
1CW01 (GHD)	Round 6 B3 (13-14/03/2013)	0.1	8.5	6.8	NC	0	0	-0.6	1012	1.2	NC	0	0	1	1
1CW01 (GHD)	Round 7 B4 (27-28/03/2013)	0	8.9	10.6	NC	0	0	0	1014	1.3	NC	0	0	1	1
1CW01 (GHD)	Round 8 B5 (10-11/04/2013)	0	7.7	8.1	NC	0	0	0	1020	1.24	NC	0	0	1	1
1CW01 (GHD)	Round 9 B6 (23-24/04/2013)	0	5.8	11.4	NC	0	3	-0.2	1008	1.24	NC	0	0	1	1
1CW01 (GHD)	Round 10 B7 (7-8/05/2013)	0	12.7	3.8	NC	0	0	0	1028	1.34	NC	0	0	1	1
1CW01 (GHD)	Round 11 B8 (22-23/05/2013)	0	8.2	12.8	NC	0	0	0.1	1012	1.4	NC	0	0.82	1	3
1CW01 (GHD)	Round 12 B9 (5-6/06/2013)	0.1	11.4	0	NC	0	0	NC	1023	1.1	NC	0	0	1	1
BHW42 (GHD)	Round 1 A1 (22-23/03/2012)	66.3	5.6	0	NC	0	0	NC	1002	0.57	NC	NC[2]	NC[2]	NC[2]	NC[2]
BHW42 (GHD)	Round 2 A2 (11-12/04/2012)	80.8	5	0	NC	0	0	0	1032	0.96	NC	NC[2]	NC[2]	NC[2]	NC[2]
BHW42 (GHD)	Round 3 A3 (1-2/05/2012)	38.2	4.4	3.4	NC	0	0	0	1023	0.76	NC	NC[2]	NC[2]	NC[2]	NC[2]
MW1 (EIS)	Round 1 (30-4-15)	0.5	0.8	14.9	12.8	2	37	0	1027	0.85	0	0	0	1	1
MW2 (EIS)	Round 1 (30-4-15)	0	2.4	13.9	0	1	24	0.3	1028	1	0	0	0.72	1	3
MW3 (EIS)	Round 1 (30-4-15)	0	0.5	14.5	0	1	5	0	1026	0.75	0	0	0	1	1
MW4 (EIS)	Round 1 (30-4-15)	0	0	19.7	0	1	7	0	1024	0.75	0	0	0	1	1
MW5 (EIS)	Round 1 (30-4-15)	0	0.4	18.5	0	2	40	0	1024	0.7	0	0	0	1	1
MW6 (EIS)	Round 1 (30-4-15)	0.8	7.9	0.3	19.7	1	8	0	1024	0.85	0	0	0	1	1
DupGas/MW6	Round 1 (30-4-15)	1.1	8.1	NA	NA	<100	<0.01	0	1024	0.85	NA	0	0	1	1
MW1 (EIS)	Round 2 (12-5-15)	0	0.7	19.4	0	0	3	-6.1	1009	0.85	0	0	0	1	1
MW2 (EIS)	Round 2 (12-5-15)	0	1.7	18.6	0	1	5	0	1008	1.04	0	0	0	1	1
MW3 (EIS)	Round 2 (12-5-15)	0	2.9	12.7	0	1	3	0	1007	0.77	0	0	0	1	1
MW4 (EIS)	Round 2 (12-5-15)	0	0.9	15.2	0	1	15	1.4	1007	0.69	0	0	1.26	1	3
MW5 (EIS)	Round 2 (12-5-15)	0	1.8	17.8	0	1	0	-2.3	1007	0.65	0	0	0	1	1
MW6 (EIS)	Round 2 (12-5-15)	0	1.6	16.3	0	1	14	0	1006	0.81	0	0	0	1	1
1CW02 (GHD)	Round 2 (12-5-15)	0	0.9	20.3	0	0	0	0.6	1007	0.85	0	0	0.54	1	2
Total Number		40	40	39	13	40	40	35	40	40	13	40	40	40	40
Maximum Value		86.9	14.7	20.3	19.7	2	40	1.4	1034	1.4	0	1.36	7.11	6	3

Explanation:

1 - GSV and CS value calculated using the Wilson Card metohd detailed in the NSW EPA *Guidelines for the Assessment and Management of Site Impacted by Hazardous Ground Gases*, 2012.

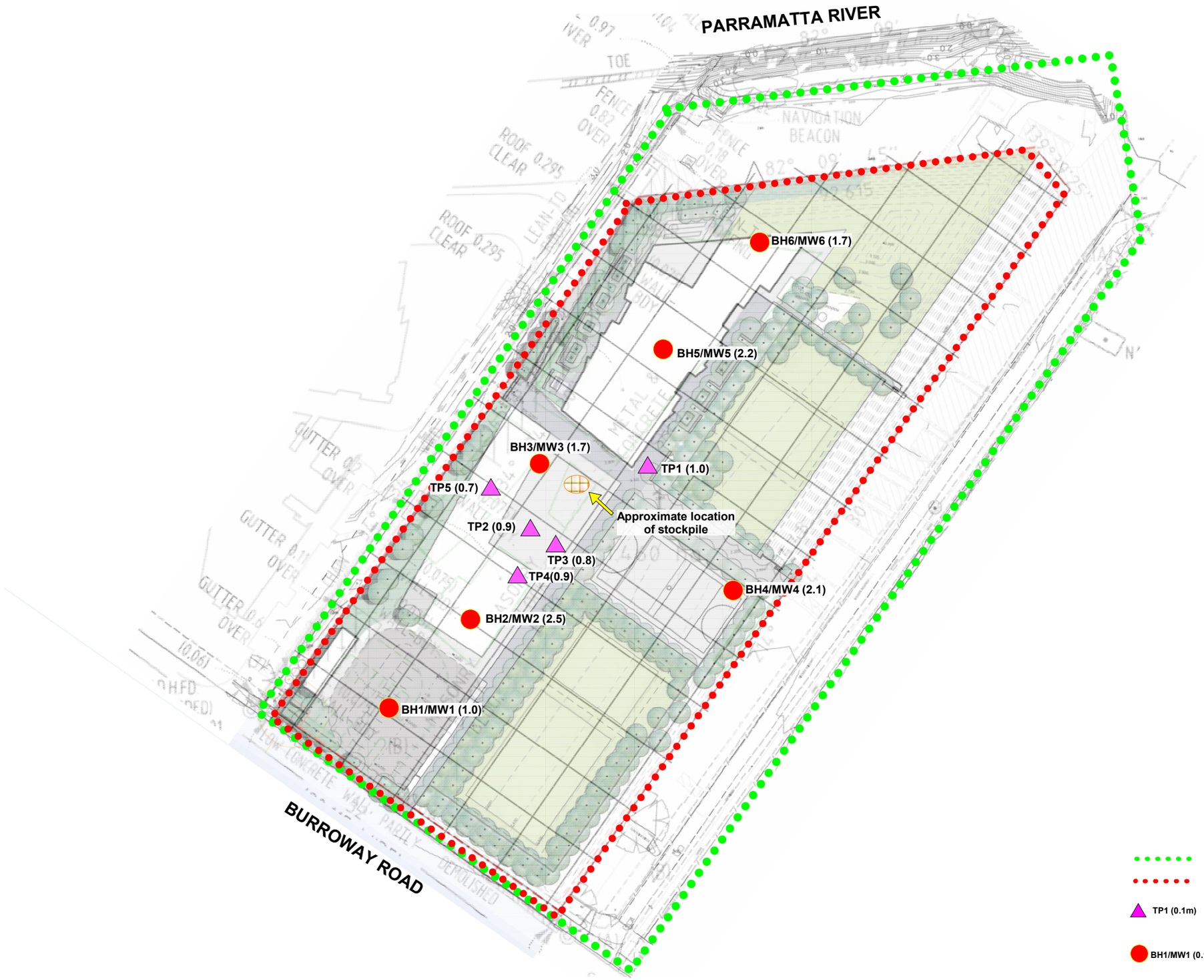
2 - The GSV and CS value have not been caluated by EIS for the Additional Detailed ESA (refer to **Section 12** of report)

Abbreviations:

SWL: Standing Water Level

NA: Not Analysed

NC: Not Calculated



EIS LEGEND:

- Approximate former site boundary
- Approximate School site boundary
- TP1 (0.1m) — Tespit sampling location and depth of fill (m)
- BH1/MW1 (0.1m) — Borehole/ground gas well sampling location and depth of fill (m)
- \+ — Asbestos sampling location (approximate 15m grid). Further details regarding the asbestos sampling locations are provided in the appendices

NOTES:
Figure 2 has been recreated from the the survy plan and proposed development plans provided by the client.

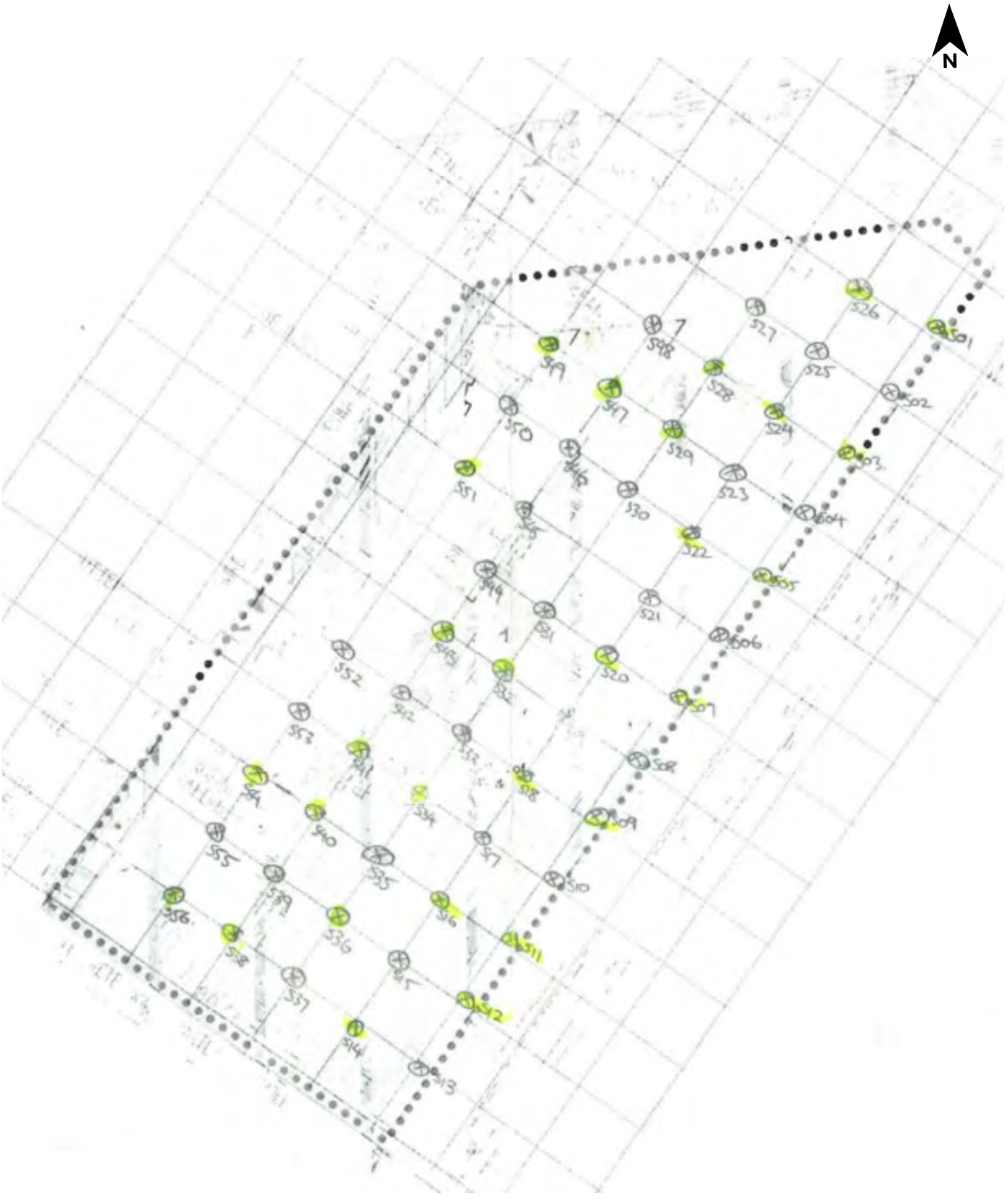
The borehole locations presented on this plan have been established from site measurements only and should not be construed as survey points. The fill depths include the pavement thickness where pavement was encountered.

Reference should be made to the report text for a full understanding of this plan.

Approximate Scale (m) @ A3: 0 10 20 30 40 50

ENVIRONMENTAL INVESTIGATION SERVICES

Project Number:	Title:
E27299K	SAMPLE LOCATION PLAN
Figure: 2	Address: PART OF 3 BURROWAY ROAD, WENTWORTH POINT, NSW

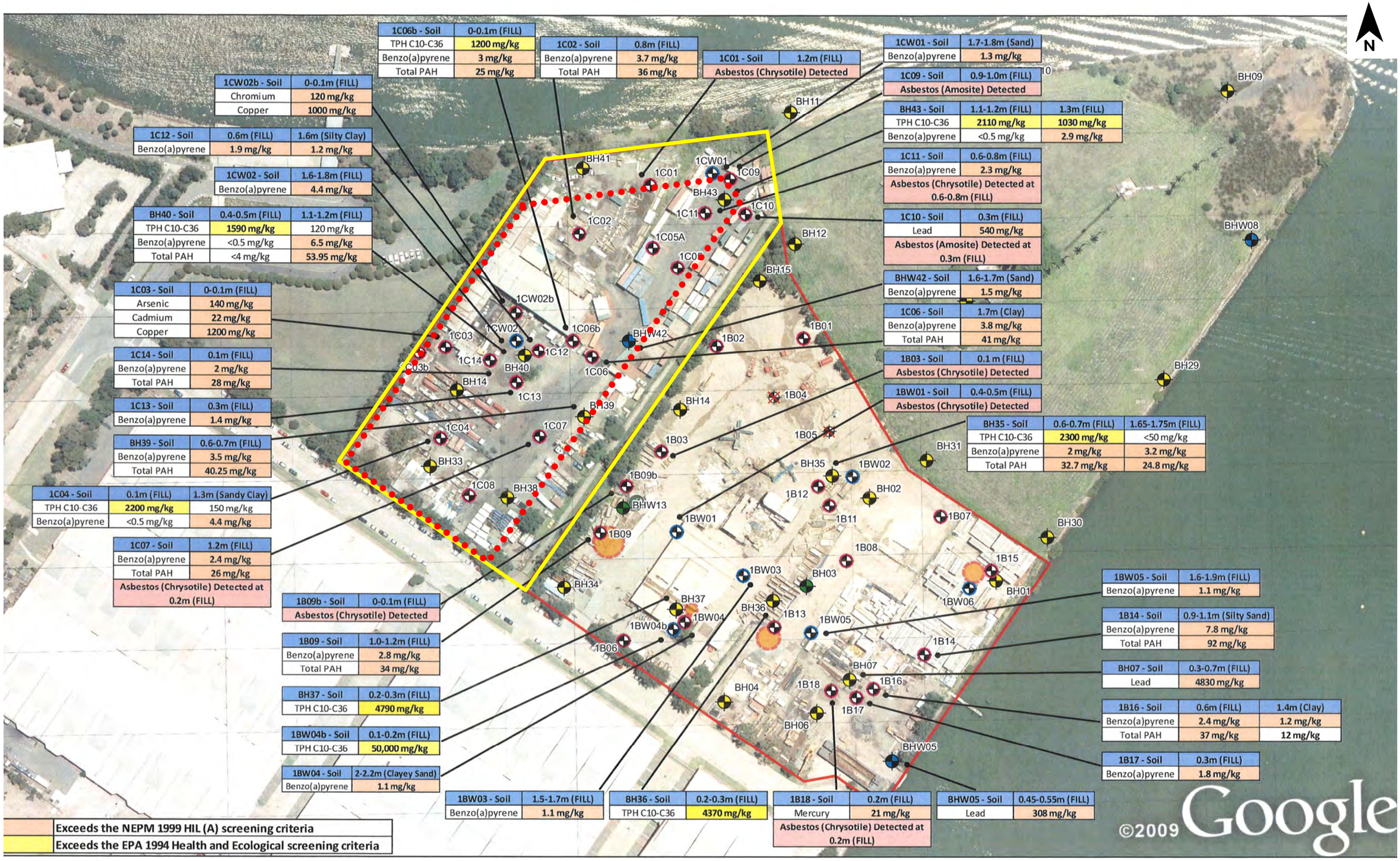


NOTES:
Figure shows the surface asbestos screening locations. Inspected on an approximate 15m2 grid across the site.

Detections of asbestos containing materials are shown in Figure 3.

Reference should be made to the report text for a full understanding of this plan.

EIS ENVIRONMENTAL INVESTIGATION SERVICES	Project Number: E27299K	Title: SURFACE ASBESTOS SCREENING LOCATION PLAN
	Figure: Appendix F	Address: PART OF 3 BURROWAY ROAD, WENTWORTH POINT, NSW



NOTES:
Figure 4 has been recreated from the GHD Figure 4 presented in the Additional Contamination Assessment (Job No:21-21835, dated 14 November 2012).

Reference should be made to the GHD report for a full understanding of this plan.

LEGEND:

- Site Boundary (Approximate)
- Removed/Abandoned/Suspected UST Areas
- Soil Sampling Location (GHD, 2011)
- Groundwater Well (GHD, 2011)
- Groundwater Well (GHD, 2009)
- Soil Sampling Location (GHD, 2009)
- Lost/Destroyed Groundwater Wells
- Sampling Location Abandoned/Refusal (GHD, 2011)

Approximate Scale (m) @ A3:	Not to scale
ENVIRONMENTAL INVESTIGATION SERVICES	
Project Number:	E27299K
Figure:	4
Title:	GHD SAMPLING LOCATION PLAN & CONTAMINATION DATA
Address:	PART OF 3 BURROWAY ROAD, WENTWORTH POINT, NSW

Appendix E - Statistical Analysis Tables

Proposed Primary School - Burroway Road, Wentworth Point
Site Audit - Statistical analysis of heavy metals: upper 2m of fill

Reference	Depth (m bgs)	Description	Date collected	Arsenic	Chromium (total)	Copper	Lead	Nickel	Zinc
1C01	1.2	Fill	Aug-11	16	6.6	27	27	4.9	68
1C01	1.7	Clay	Aug-11	13	8.6	18	49	3.4	67
1C02	0.1	Fill	Aug-11	16	18	80	82	27	540
1C02	0.8	Fill	Aug-11	7.7	4.7	11	38	2.7	34
1C03	0-0.1	Fill	Aug-11	140	81	1200	220	34	3700
1C04	0.1	Fill	Aug-11	1	19	50	16	80	100
1C04	1.3	Sandy Clay	Aug-11	6.7	3.3	5	25	1.8	23
1C05A	0.5	Fill	Aug-11	4.2	8.6	15	97	2.7	54
1C05A	1.8	Sand	Aug-11	5.9	2.3	6.7	15	1.1	16
1C06	0.8	Fill	Aug-11	4.9	7.7	8.9	29	4.4	64
1C06	1.7	Clay	Aug-11	13	6	19	59	3.7	76
1C06b	0-0.1	Not stated	Aug-11	35	67	440	170	27	1600
1C07	0.4	Fill	Aug-11	2.8	17	27	36	9.3	140
1C07	1.2	Fill	Aug-11	14	16	42	140	6.2	170
1C08	0.4	Fill	Aug-11	5	17	35	18	30	52
1C08	1.2	Sandy Clay	Aug-11	18	9.5	7.9	29	3.4	43
1C09	0.9-1	Fill	Aug-11	8.7	6.3	19	36	7.3	57
1C10	0.3	Fill	Aug-11	6.8	45	380	540	13	6600
1C10	1.7	Sand	Aug-11	18	<2	3	8.5	<1	15
1C11	0.6-0.8	Fill	Aug-11	60	16	91	100	10	690
1C12	0.6	Fill	Aug-11	5.2	3.6	11	23	2.2	60
1C12	1.6	Silty Clay	Aug-11	8	2.8	6.1	23	1.5	26
1C13	0.3	Fill	Aug-11	8.6	6.4	22	59	3.4	77
1C13	0.8	Fill	Aug-11	6.5	4.7	5.2	17	1.5	22
1C14	0.1	Fill	Aug-11	19	40	320	150	23	1100
1C14	1.5	Clay	Aug-11	12	6.2	10	27	2.9	37
1CW01	0.9-1	Fill	Aug-11	5.9	5.1	13	36	2	37
1CW01	1.7-1.8	Sand	Aug-11	7.3	2.4	17	21	<1	26
1CW02	0-0.1	Fill	Aug-11	24	120	1000	240	43	2200
1CW02	1.6-1.8	Fill	Aug-11	11	5	10	31	3	27
BH14	0.3-0.4	Fill	Oct-09	<5	16	<5	19	<2	10
BH14	0.6-0.7	Fill	Oct-09	7	27	7	26	<2	17
BH14	2-2.1	Sand	Oct-09	<5	6	9	15	2	209
BH33	0.1-0.2	Fill	Oct-09	<5	23	67	11	157	86
BH33	0.2-0.3	Fill	Oct-09	<5	14	73	8	96	50
BH33	0.5-0.6	Fill	Oct-09	<5	7	48	13	6	18
BH38	0.15-0.25	Fill	Oct-09	7	66	68	48	40	303
BH38	0.6-0.7	Fill	Oct-09	8	21	44	38	35	78
BH38	1.7-1.8	Sand	Oct-09	13	6	7	28	3	370
BH39	0.2-0.3	Fill	Oct-09	20	21	94	63	19	93
BH39	0.6-0.7	Fill	Oct-09	21	16	886	238	17	1020
BH39	1.85-1.95	Clay	Oct-09	8	6	10	26	3	30
BH40	0.4-0.5	Fill	Oct-09	<5	10	31	29	8	146
BH40	1.1-1.2	Fill	Oct-09	6	6	20	55	2	53
BH40	1.65-1.75	Sand	Oct-09	6	6	9	45	3	28
BH42	0.5	Fill	Oct-09	7	24	100	71	59	406
BH42	1.2	Not stated	Oct-09	12	23	71	71	26	388
BH42	1.6-1.7	Sand	Oct-09	6	2	6	11	<2	10
BH43	0.45-0.55	Not stated	Oct-09	<5	11	77	26	<2	10
BH43	1.1-1.2	Not stated	Oct-09	7	22	44	78	25	225
BH43	1.3	Not stated	Oct-09	7	18	43	50	18	140
TP1	0 - 0.2	Fill M Sand	Apr-15	6	27	110	59	60	370
TP1	0.4 - 0.6	Fill M Clay	Apr-15	7	15	69	41	32	260
TP2	0.2 - 0.4	Fill MG Sand	Apr-15	11	38	310	190	25	2100
TP3	0.2 - 0.4	Fill M Sand	Apr-15	4	10	86	160	10	380
TP4	0 - 0.2	Fill M Sand	Apr-15	<4	19	54	21	16	160
TP4	0.2 - 0.4	Fill M Sand	Apr-15	13	13	22	200	9	85
TP5	0 - 0.1	Fill M Sand	Apr-15	56		1300	330	54	4000
TP5	0.2 - 0.4	Fill S Gravel	Apr-15	14	67	310	110	34	1100
BH2	0 - 0.2	Fill G Sand	Apr-15	11	23	98	70	22	300
BH2	0.5 - 0.7	Fill G Sand	Apr-15	12	37	170	190	19	410
BH2	1.8 - 1.95	Fill M Sand	Apr-15	7	7	8	10	3	37

Count	54	60	61	62	56	62
Max	140	120	1300	540	157	6600
Min	1	<2	3	8	<1	10
Average	14.4	19.4	133.6	76.0	20.7	493.8
Std Dev	20.3	21.6	274.7	91.7	27.4	1104.5
CoV	1.41	1.11	2.06	1.21	1.33	2.24

Data not normally distributed - Procedure D is not applicable

Natural log of concentrations

Arsenic	Chromium (total)	Copper	Lead	Nickel	Zinc
2.7726	1.8871	3.2958	3.2958	1.5892	4.2195
2.5649	2.1518	2.8904	3.8918	1.2238	4.2047
2.7726	2.8904	4.3820	4.4067	3.2958	6.2916
2.0412	1.5476	2.3979	3.6376	0.9933	3.5264
4.9416	4.3944	7.0901	5.3936	3.5264	8.2161
0.0000	2.9444	3.9120	2.7726	4.3820	4.6052
1.9021	1.1939	1.6094	3.2189	0.5878	3.1355
1.4351	2.1518	2.7081	4.5747	0.9933	3.9890
1.7750	0.8329	1.9021	2.7081	0.0953	2.7726
1.5892	2.0412	2.1861	3.3673	1.4816	4.1589
2.5649	1.7918	2.9444	4.0775	1.3083	4.3307
3.5553	4.2047	6.0868	5.1358	3.2958	7.3778
1.0296	2.8332	3.2958	3.5835	2.2300	4.9416
2.6391	2.7726	3.7377	4.9416	1.8245	5.1358
1.6094	2.8332	3.5553	2.8904	3.4012	3.9512
2.8904	2.2513	2.0669	3.3673	1.2238	3.7612
2.1633	1.8405	2.9444	3.5835	1.9879	4.0431
1.9169	3.8067	5.9402	6.2916	2.5649	8.7948
2.8904		1.0986	2.1401		2.7081
4.0943	2.7726	4.5109	4.6052	2.3026	6.5367
1.6487	1.2809	2.3979	3.1355	0.7885	4.0943
2.0794	1.0296	1.8083	3.1355	0.4055	3.2581
2.1518	1.8563	3.0910	4.0775	1.2238	4.3438
1.8718	1.5476	1.6487	2.8332	0.4055	3.0910
2.9444	3.6889	5.7683	5.0106	3.1355	7.0031
2.4849	1.8245	2.3026	3.2958	1.0647	3.6109
1.7750	1.6292	2.5649	3.5835	0.6931	3.6109
1.9879	0.8755	2.8332	3.0445		3.2581
3.1781	4.7875	6.9078	5.4806	3.7612	7.6962
2.3979	1.6094	2.3026	3.4340	1.0986	3.2958
	2.7726		2.9444		2.3026
1.9459	3.2958	1.9459	3.2581		2.8332
	1.7918	2.1972	2.7081	0.6931	5.3423
	3.1355	4.2047	2.3979	5.0562	4.4543
	2.6391	4.2905	2.0794	4.5643	3.9120
	1.9459	3.8712	2.5649	1.7918	2.8904
1.9459	4.1897	4.2195	3.8712	3.6889	5.7137
2.0794	3.0445	3.7842	3.6376	3.5553	4.3567
2.5649	1.7918	1.9459	3.3322	1.0986	5.9135
2.9957	3.0445	4.5433	4.1431	2.9444	4.5326
3.0445	2.7726	6.7867	5.4723	2.8332	6.9276
2.0794	1.7918	2.3026	3.2581	1.0986	3.4012
	2.3026	3.4340	3.3673	2.0794	4.9836
1.7918	1.7918	2.9957	4.0073	0.6931	3.9703
1.7918	1.7918	2.1972	3.8067	1.0986	3.3322
1.9459	3.1781	4.6052	4.2627	4.0775	6.0064
2.4849	3.1355	4.2627	4.2627	3.2581	5.9610
1.7918	0.6931	1.7918	2.3979		2.3026
	2.3979	4.3438	3.2581		2.3026
1.9459	3.0910	3.7842	4.3567	3.2189	5.4161
1.9459	2.8904	3.7612	3.9120	2.8904	4.9416
1.7918	3.2958	4.7005	4.0775	4.0943	5.9135
1.9459	2.7081	4.2341	3.7136	3.4657	5.5607
2.3979	3.6376	5.7366	5.2470	3.2189	7.6497
1.3863	2.3026	4.4543	5.0752	2.3026	5.9402
	2.9444	3.9890	3.0445	2.7726	5.0752
2.5649	2.5649	3.0910	5.2983	2.1972	4.4427
4.0254		7.1701	5.7991	3.9890	8.2940
2.6391	4.2047	5.7366	4.7005	3.5264	7.0031
2.3979	3.1355	4.5850	4.2485	3.0910	5.7038
2.4849	3.6109	5.1358	5.2470	2.9444	6.0162
1.9459	1.9459	2.0794	2.3026	1.0986	3.6109

54	60	61	62	56	62	Count
2.2889	2.5185	3.6452	3.8220	2.2897	4.7898	Avg
0.7692	0.9273	1.4897	0.9751	1.2579	1.5972	Std Dev
0.34	0.37	0.41	0.26	0.55	0.33	CoV
2.082	2.219	2.836	2.264	2.579	2.969	H
2.8047	3.2163	5.3003	4.5801	3.5184	6.6726	ln UCL
16.5	24.9	200.4	97.5	33.7	790.4	95 UCL

Application of Procedure G - data is log-normal

Proposed Primary School - Burroway Road, Wentworth Point
Site Audit - Statistical analysis of PAHs: upper 2m of fill

Reference	Depth (m bgs)	Description	Date collected	Benzo[a] pyrene	Naphthalene	Total PAHs	B[a]P TEQ
1C01	1.2	Fill	Aug-11	0.6	<0.5	5	0.7
1C01	1.7	Clay	Aug-11	1.8	<0.5	17	2
1C02	0.1	Fill	Aug-11	<0.05	<0.5	<1	na
1C02	0.8	Fill	Aug-11	3.7	<0.5	36	4.3
1C03	0-0.1	Fill	Aug-11	<0.05	<0.5	<1	na
1C04	0.1	Fill	Aug-11	<0.05	<0.5	<1	na
1C04	1.3	Sandy Clay	Aug-11	4.4	1	55	5.1
1C05A	0.5	Fill	Aug-11	<0.05	<0.5	<1	na
1C05A	1.8	Sand	Aug-11	0.8	<0.5	7	0.9
1C06	0.8	Fill	Aug-11	<0.05	<0.5	2	na
1C06	1.7	Clay	Aug-11	3.8	<0.5	41	4.4
1C06b	0-0.1	Not stated	Aug-11	3	<0.5	25	3.4
1C07	0.4	Fill	Aug-11	<0.05	<0.5	<1	na
1C07	1.2	Fill	Aug-11	2.4	<0.5	26	2.8
1C08	0.4	Fill	Aug-11	0.17	<0.5	<1	0.2
1C08	1.2	Sandy Clay	Aug-11	0.7	<0.5	5	0.8
1C09	0.9-1	Fill	Aug-11	<0.05	<0.5	1	na
1C10	0.3	Fill	Aug-11	<0.05	<0.5	<1	na
1C10	1.7	Sand	Aug-11	<0.05	<0.5	<1	na
1C11	0.6-0.8	Fill	Aug-11	2.3	<0.5	17	2.7
1C12	0.6	Fill	Aug-11	1.9	<0.5	15	2.2
1C12	1.6	Silty Clay	Aug-11	1.2	<0.5	9	1.3
1C13	0.3	Fill	Aug-11	1.4	<0.5	14	1.6
1C13	0.8	Fill	Aug-11	0.7	<0.5	5	0.8
1C14	0.1	Fill	Aug-11	2	<0.5	28	2.6
1C14	1.5	Clay	Aug-11	0.7	<0.5	8	0.8
1CW01	0.9-1	Fill	Aug-11	<0.05	<0.5	2	na
1CW01	1.7-1.8	Sand	Aug-11	1.3	<0.5	12	1.5
1CW02	0-0.1	Fill	Aug-11	0.7	<0.5	7.5	0.8
1CW02	1.6-1.8	Fill	Aug-11	4.4	0.2	15	5.1
BH14	0.3-0.4	Fill	Oct-09	<0.05	<0.5	<1	na
BH14	0.6-0.7	Fill	Oct-09	<0.05	<0.5	<1	na
BH14	2-2.1	Sand	Oct-09	<0.05	<0.5	<1	na
BH33	0.1-0.2	Fill	Oct-09	<0.05	<0.5	<1	na
BH33	0.2-0.3	Fill	Oct-09	<0.05	<0.5	<1	na
BH38	0.15-0.25	Fill	Oct-09	<0.05	<0.5	<1	na
BH38	0.6-0.7	Fill	Oct-09	<0.05	<0.5	<1	na
BH39	0.2-0.3	Fill	Oct-09	3.5	<0.5	40	4.4
BH39	0.6-0.7	Fill	Oct-09	<0.05	<0.5	<1	na
BH40	0.4-0.5	Fill	Oct-09	6.5	<0.5	54	8.7
BH40	1.1-1.2	Fill	Oct-09	<0.05	<0.5	<1	na
BH42	1.2	Not stated	Oct-09	1.5	<0.5	13	1.9
BH42	1.6-1.7	Sand	Oct-09	<0.05	<0.5	<1	na
BH43	1.1-1.2	Not stated	Oct-09	2.9	<0.5	19	3.5
BH43	1.3	Not stated	Oct-09	0.6	<0.5	5	0.7
TP1	0 - 0.2	Fill M Sand	Apr-15	0.94	<1	11	1.4
TP1	0.4 - 0.6	Fill M Clay	Apr-15	2.5	<1	<1	na
TP2	0.2 - 0.4	Fill MG Sand	Apr-15	1.1	1	26	3.5
TP3	0.2 - 0.4	Fill M Sand	Apr-15	<0.05	<1	11	1.5
TP4	0 - 0.2	Fill M Sand	Apr-15	1.4	<1	<1	na
TP4	0.2 - 0.4	Fill M Sand	Apr-15	0.5	<1	14	1.9
TP5	0 - 0.1	Fill M Sand	Apr-15	0.2	<1	5	0.6
TP5	0.2 - 0.4	Fill S Gravel	Apr-15	0.4	<1	2	na
BH2	0 - 0.2	Fill G Sand	Apr-15	0.4	<1	3	0.5
BH2	0.5 - 0.7	Fill G Sand	Apr-15	0.1	<1	3	na
BH2	1.8 - 1.95	Fill M Sand	Apr-15	<0.05	<1	1	na

Samples	56	56	56	56
Detects	34	3	36	31
Max	6.5	1	55	8.7
Min	<0.05	<0.5	<1	na

This page has been left intentionally blank