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ADDITIONAL DETAILED SITE INVESTIGATION

PROPOSED UPGRADES TO NORTHMEAD PUBLIC SCHOOL

52A MOXHAMS ROAD, NORTHMEAD

REPORT NO 20429/10-AA

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COVER PAGE

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Document Information

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Client Address	Level 9, 20 Bond Street, Sydney NSW 2001
Client Contact	Joe Wood

Document Control

Rev	Date	Revision Detail/Status	Author	Reviewer	Approver
0	05/12/2024	Initial Issue	Anwar Barbhuyia		Anwar Barbhuyia

Author Signature	
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Title	Senior Associate

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Job No: 20429/10
Our Ref: 20429/10-AA
5 December 2024

NSW Department of Education
School Infrastructure NSW (SINSW)
c/- RP Infrastructure Pty Ltd
Level 9, 20 Bond Street
SYDNEY NSW 2001
Email: joe.wood@rpinfrastructure.com.au

Attention: Mr Joe Wood

Dear Sir

re: **Upgrades to Northmead Public School (ID 2763)**
52A Moxhams Road, Northmead
Additional Detailed Site Investigation (ADSI) Report

Please find herewith additional Detailed Site Investigation (ADSI) report prepared for the proposed upgrade works in Northmead Public School.

If you have any questions, please do not hesitate to contact the undersigned.

Yours faithfully
GEOTECHNIQUE PTY LTD

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EXECUTIVE SUMMARY

Schools Infrastructure NSW (SINSW) has commissioned Geotechnique Pty Ltd to carry out an Additional Detailed Site Investigation (ADSI) in an area (known as the site--Refer to Figure 2 in Page 2 of this report) within Northmead Public School (PS) proposed for upgrade works, located at 52A Moxhams Road, Northmead.

Based on the findings of the previously completed detailed site investigation (DSI) and review and recommendation by Structural & Civil designer, this ADSI was carried out to characterise and confirm the asbestos contamination status of the fill, and to assess whether remediation work is required.

In order to achieve the objectives of this assessment, the scope of work included review of preliminary desktop site investigation (PSI) and DSI reports prepared by Geotechnique, site inspection, as well as soil sampling, asbestos and laboratory testing.

The findings of this ADSI are summarised as follows:

- The investigation area (refer to the Figure 2 in Page 2) was vacant at the time of sampling and site inspection.
- All the laboratory test results satisfied the criteria for stating that the analytes selected are either not present i.e. concentrations less than laboratory limits of reporting, or present in the sampled soil at concentrations that do not pose a risk of hazard to human health or the environment under the condition for the proposed school upgrade, with the exception of asbestos. The identified contaminant being bonded ACM and friable asbestos in a number of test pit locations, as indicated and tabulated on Drawing No 20429/10-AA2 in Appendix A. Bonded ACM pieces / fragments generally do not present a significant health risk unless tooled, cut, sanded, abraded or machined, which may release asbestos dust or fibres. Asbestos dust contains tiny almost indestructible fibres, which can cause damage to the lungs when breathed in. Friable asbestos presents a risk of harm to human health due to the exceedance of relevant Health Screening Level (HSL) for residential setting.
- Potential off-site impacts of contaminants on groundwater and waterbodies are considered to be low.

Based on this assessment, Geotechnique considers that the investigation area can be made suitable for the proposed school upgrade if the asbestos contamination which present a risk to human health are addressed in accordance with mitigation measures provided in this report. Furthermore, from environmental engineering considerations the required mitigation measures will not have a significant effect on the environment.

Reference should be made to Section 10.0 for details of the recommendations regarding any materials to be excavated and removed from the site, and any fill to be imported to the site.

Reference should be made to Section 11.0 for the limitations of this report.

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APPENDICES

1.0 INTRODUCTION

This Additional Detailed Site Investigation (ADSI) report has been prepared to accompany a Review of Environmental Factors (REF) prepared for the Department of Education (DoE) relating to upgrades to Northmead Public School (the activity) under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and *State Environmental Planning Policy (Transport and Infrastructure) 2021* (SEPP TI).

This document has been prepared in accordance with the *Guidelines for Division 5.1 assessments* (the Guidelines) by the Department of Planning, Housing and Infrastructure.

This report examines and takes into account the relevant environmental factors in the Guidelines and *Environmental Planning and Assessment Regulations 2021* under Section 170, Section 171 and Section 171A of the EP&A Regulation**.**

2.0 PROPOSED ACTIVITY DESCRIPTION

The proposed activity for upgrades to Northmead Public School includes:

- One (1) new single storey classroom building comprising of four (4) general learning spaces (GLS), two (2) special program spaces, a singular learning commons space and a singular multi-purpose space;
- Minor internal alterations to an existing Admin Building (known as Building A); and
- Removal of existing portable classroom buildings containing six (6) classrooms.

3.0 ACTIVITY SITE

The project site is located at 52A Moxhams Road, Northmead, and is legally described as:

- Lot 1 DP 366405;
- Lot 1 DP 176742;
- Lot 1 DP 20061; and
- Lot 1 DP 209810.

Northmead Public School is located on the southern side of Moxhams Road and on the western side of Kleins Road.

Figure 1 in the following page is an aerial photograph of the school.

Figure 2 shows the footprint of proposed single storey classroom building.

4.0 DECLARATION

This report has been prepared to characterise and confirm the asbestos contamination status of the fill, and to assess whether remediation work is required, as proposed by the Structural & Civil designer. The ADSI report was prepared generally in accordance with the NSW EPA, “Consultants Reporting on Contaminated Land" – 2020

Figure 1 - Location of Northmead Public School

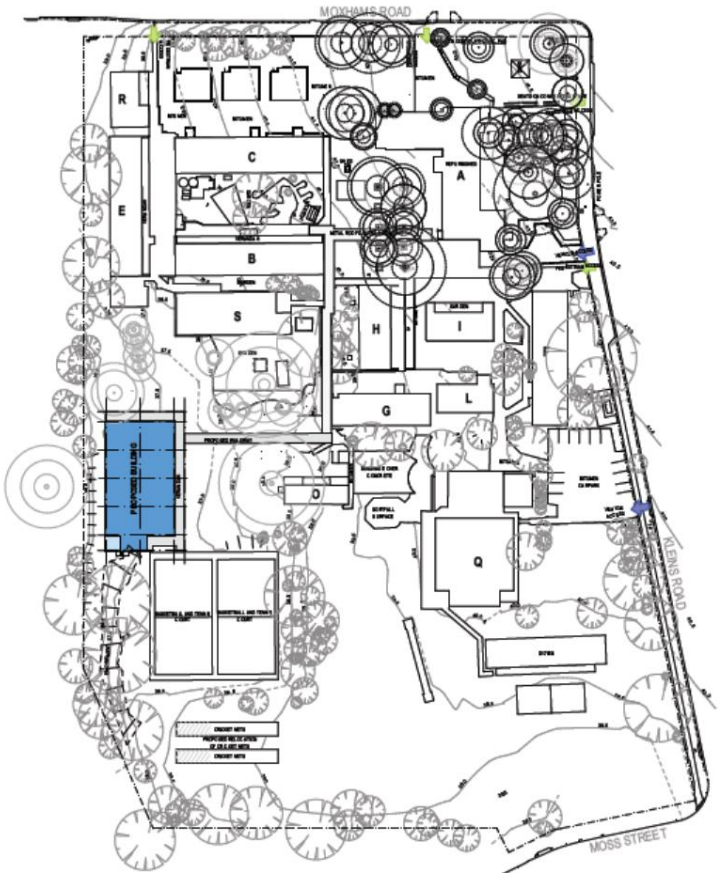


Figure 2 – Footprint of Proposed Classroom Building (Shaded Blue) in Northmead Public School

5.0 BACKGROUND INFORMATION

5.1 Site History Information

Geotechnique Pty Ltd (Geotechnique) carried out a review of site history information as part of the Preliminary Desktop Site Investigation (PSI) for the site in August 2023, as detailed in the PSI report 20429/2-AA dated 23 October 2023. The review included historical aerial photographs, NSW Department of Lands records, Planning Certificates under Section 10.7 (2 & 5) of the Environmental Planning and Assessment Act 1979 and NSW EPA record of Notices for Contaminated Land and records of the POEO Public Register, Council records and SafeWork NSW records.

Aerial photographs reveal that the site had been used for schooling purposes since 1950s, and gradually expanded with additional buildings since 1960s. Moxhams Road and Kleins Road West had been formed and located immediately to the north and east of the site respectively in or prior to 1950s. The properties to the north and east of the site across the roads had been residential land since 1950s. The adjoining southern and western properties had been vacant and developed into urban residential in 1960s. During the development, ground disturbance was noted along the western boundary of the site and Moss Street had been formed and located immediately to part of the south of the site.

NSW Land Registry Services Records indicate the site has been used as Northmead PS since at least early 1950s. A search of school information from the SINSW website did not reveal when the Northmead PS was established.

The Section 10.7 (2 & 5) Planning Certificate indicates no issues arising under the Contaminated Land Management Act 1997.

Available records of Parramatta City Council associated with the Northmead PS indicated various Council DA approval for renovation and/or construction activities between 2000 and 2010.

A search of the NSW EPA records revealed no EPA Notices issued for the site. A search of the Protection of the Environment Operations (POEO) Public Register found no records for the site.

A search of the records held by SafeWork NSW has not located any records pertaining to the site.

5.2 Outcomes of the PSI

Based on the desktop review and assessment of a range of available site historical data sources, several areas of environmental concern (AEC) / PAEC including ACM, metal & GI features and possible pest control around the buildings, the areas of possible filling, as well as associated contaminants of potential concern (CoPC) had been identified within the site.

The following data gaps were identified:

- A desktop review of land survey plans has not been conducted as the plans have not been provided by SINSW for review.
- Details of the proposed development for the proposed school upgrade, which will support a more targeted investigation approach, were not available at that time.

Based on the assessment, Geotechnique considers that the risk of harm to human health and environment is low at present site condition without any disturbance to the ground surface / soil within the site; therefore, the site is considered environmentally suitable for the proposed school upgrade for Northmead PS.

However, it is likely that there would be disturbance of the ground surface / soil within the site; subsequently and based on the findings of the PSI, data gaps assessment and intrusive investigations including sampling and testing for a detailed site investigation (DSI) will be required to address the identified AEC / PAEC and the associated potential contaminants to assess and characterise the site respect to contamination, to update the CSM, to assess the suitability of the site for the proposed land use, and to make recommendations regarding any future remedial works if required.

It was recommended that sampling and testing for the DSI, including the preparation and implementation of a Sampling, Analysis and Quality Plan (SAQP), be undertaken after completion of data gaps assessment. It is also recommended that details of the proposed development, when available, be provided to Geotechnique, prior to undertaking data gaps assessment, as well as sampling and testing for the DSI.

5.3 Outcomes of the DSI

Geotechnique carried out a detailed site investigation (DSI) between September and October 2023 in an area within Northmead Public School (PS) known as the site, located at 52A Moxhams Road, Northmead, as as detailed in the DSI report 20429/6-AA dated 24 October 2023.

The objectives of the DSI were to determine the contamination status of the area, to assess the suitability of the area for the proposed land use, and to make recommendations with regard to any future remedial works if required.

To achieve the objectives of this assessment, the scope of work included review of preliminary desktop site investigation (PSI) report prepared by Geotechnique, site inspection, as well as soil sampling and laboratory testing.

An Environmental Scientist from Geotechnique made the following observations during site inspection for this DSI in the investigation area on 28 September 2023:

- The area is between western boundary and the western toe of the fibro / GI demountable buildings located in the western side of the central portion of the site.
- The majority was open area and covered by grass.
- A small portion comprised part of cricket pitch.

On 28 September 2023, the Environmental Scientist also carried out sampling as follow:

- Five boreholes BH1 to BH5 were drilled nominated for geotechnical investigation at and in the vicinity of the investigation area determined by SINSW.
- Fibro cement pieces (FCPs) were noted within the fill in BH5. One FCP sample was collected.

Collected soil samples were analysed for Metals, TRH, BTEX, PAH, PCB and/or asbestos. FCP was tested for asbestos.

Based on the test results for this DSI, most of the laboratory test results satisfied the criteria for stating that the analytes selected are either not present (i.e. concentrations less than laboratory limit of reporting), or present in the sampled soils at concentrations that do not pose a risk of hazard to human health or the environment for the proposed school upgrade.

However, the results of sampling and testing for this assessment identified soil contamination, with the identified contaminant being bonded asbestos containing material (ACM) in one borehole location BH5, as indicated and tabulated on Drawing No 20429/6-AA2.

Based on the assessment, Geotechnique considers that the site can be made suitable for the proposed school upgrade, subject to implementation of the following recommendations, prior to earth works / site preparation:

- Carrying out further site investigation to determine and confirm the asbestos (bonded ACM) status of the fill, and to assess whether remediation work is required.
- If the asbestos contamination is identified based on the outcome of the further site investigation, a remedial action plan (RAP) should be prepared to devise strategies for remediation / management of the asbestos impacted fill.
- Site validation is to be carried out following the remediation of the asbestos impacted fill if required.

6.0 ADDITIONAL DETAILED SITE INVESTIGATION

6.1 Scope of Works

Based on the findings of the previously completed DSI and review and recommendation by Structural & Civil designer, an additional DSI was carried out within the proposed building site (as shown in Figure 2 in Page 2) to characterise and confirm the asbestos contamination status of the fill, and to assess whether remediation work is required.

The following scope of works was carried out for the additional DSI:

- Review of the previous contamination assessment report prepared by Geotechnique in 2023.
- Scanning of sample locations by a services locator.
- Detailed sampling by an Environmental Engineer form Geotechnique using an excavator at 10 locations within the site; 4 locations around previously identified asbestos containing material (ACM) at BH5 and 6 locations in the proposed building footprint area. Approximate test pit locations are indicated on Drawing No 20429/10-AA1 presented in Appendix A. Test pit logs are also presented in Appendix A,
- Re-instatement of the sample locations after sampling.
- Carry out on-site sieving tests of the fill materials.
- A calibrated Photo-Ionisation Detector (PID) was used to screen the recovered soil samples for the presence of any volatile organic compounds (VOC).
- Implementation of industry standard quality assurance (QA) and quality control (QC) measures.
- Asbestos testing and chemical analysis by laboratories accredited by the National Association of Testing Authorities (NATA), in accordance with Chains of Custody (COC) prepared by Geotechnique.
- Assessment of the laboratory analytical results.
- Assessment of field and laboratory QA and QC.
- Assessment of the contamination status of the investigation area
- Preparation of a ADSI report.

6.2 Subsurface Profile

Reference should be made to Table 1 – Test Pit logs in Appendix A for descriptions of the soils encountered during sampling on 6 November 2024 for this assessment. Based on information from all test pit locations the sub-surface profile is generalised as follows:

Fill	Silty Sand, fine grained, brown with trace of gravel and inclusion of brick fragments, was encountered in TP-BH5a, TP-BH5b and TP-BH5c to depth approximately 1.0m below the existing ground level (EGL); underlain by natural soil. Gravelly Sandy Clay, low plasticity, brown was encountered in TP1 to depth approximately 1.0m below the existing ground level (EGL); underlain by natural soil. Silty Sand, fine grained, brown, inclusion of brick fragments was encountered in TP2 to TP5 to depth about 1.0m below the EGL. Inclusion of ceramic, brick and fibro-cement fragments in the fill was noted.
Natural Soil	Silty Sandy CLAY, low to medium plasticity, brown

All the recovered fill samples were screened for the presence of VOC using a calibrated PID. The PID readings on recovered soil samples, as presented in Table 1 – Test Pit logs in Appendix B, were equal to zero, suggesting that the presence of volatiles in the fill is unlikely.

There were no detectable odour and no obvious staining / discolouration of the soil and vegetation in the borehole locations and recovered soil samples that would indicate potential for contamination. Inclusion of fibro-cement fragments in the fill was noted in TP-BH5a, TP-BH5c and TP2.

Based on the contents of the fill material, the profiles of natural soils within the site, as well as regional geological information, it appears that the fill might have resulted from cutting of the natural soil and levelling the ground during the residential development in the adjoining western properties in the late 1960s.

No groundwater or perched water was encountered during sampling to a maximum depth of approximately 1.5m below the EGL and during the short time the test pits remained open. It should be noted that fluctuations in the level of groundwater might occur due to variations in rainfall and / or other factors not evident during investigation.

6.3 Laboratory Tests, Assessment & Discussion

Collected soil and FCP samples were analysed for asbestos. A number of soil samples were also analysed for Metals, TRH, BTEX, PAH and/or PCB for screening purposes.

Investigation levels and screening levels developed in the NEPM 1999 (April 2013) was used for this assessment, as follows:

- Risk-based Health Investigation Levels (HIL) for a broad range of metals and organic substances. The HIL are applicable for assessing human health risk via all relevant pathways of exposure. The HIL as listed in Table 1A (1) of Schedule B1 "*Guideline on Investigation Levels for Soil and Groundwater*" are provided for different land uses.

  The investigation area is proposed for primary school upgrade and as such the analytical results for the assessment will be assessed against the available HIL for *residential with garden / accessible soil including primary schools* (HIL A).

- Health Screening Levels (HSL) for selected petroleum compounds, fractions and Naphthalene are applicable for assessing human health risk via inhalation pathways.

  For this assessment, the analytical results will be assessed against the available HSL for clay and sand to depth of 0m to <1m for *low density residential* (HSL A).

- Ecological Screening Levels (ESL) for selected petroleum hydrocarbon compounds, TPH fractions and Benzo(a)Pyrene (BaP) are applicable for assessing the risk to terrestrial ecosystems.

  For this assessment, the analytical results will be assessed against the available ESL for fine-grained soil (clay) and coarse-grained soil (sand) for *urban residential* land use.

- Ecological Investigation Levels (EIL), a specific type of Soil Quality Guidelines (SQG) for selected metals, Naphthalene and DDT are applicable for assessing the risk to terrestrial ecosystems.

  For this assessment, the analytical results were assessed against the available EIL for aged contamination in soil for *urban residential* land use.

  For arsenic, Naphthalene and DDT, generic EIL for urban residential are adopted for aged contaminants. For other metals, EIL are the sum of the added contaminant limit (ACL) and the ambient background concentration (ABC). Where available, EIL are calculated using the EIL calculator developed by CSIRO for NEPC.

For asbestos assessment, the adopted assessment criteria are:

- 0.01% w/w for bonded ACM for *residential with garden / accessible soil including primary schools* land uses;
- 0.001% for friable asbestos in soil; and
- No visible asbestos on ground surface.

Laboratory test results are summarised in Tables E1, E2 and F to I in Appendix B. In total thirteen (13) sets of in-situ sieving testing were carried out. Each set of sieve testing involves sieving 10L fill samples in accordance with gravimetric procedures as per NEPM 1999 (April 2013). The in-situ sieving test results for asbestos for 13 fill samples are presented in Table J in Appendix B.

Metals (As, Cd, Cr, Cu, Pb, Hg, Ni & Zn), CEC& pH

The test results of CEC and pH in Tables E1 to E2 were adopted to calculate the relevant EIL.

The Metals test result for all discrete fill samples are presented in Tables E1 and Table E2.

The Metals test results indicated that all concentrations of Metals were below the relevant available EIL and Health Investigation Levels (HIL) for residential development with garden/accessible soil (HIL A).

Total Petroleum / Recoverable Hydrocarbons (TPH / TRH) and BTEX

The TRH and BTEX test results for selected fill samples are presented in Table F. As shown in Table F, the concentrations of F1 TRH, F2 TRH, F3 TRH, F4 TRH and BTEX were below the relevant HSL A and / or ESL adopted. Moreover, all BTEX and most of the TRH concentrations were below the laboratory limits of reporting (LOR).

There was no HSL A (not limiting) for clay for Ethyl Benzene.

Polycyclic Aromatic Hydrocarbons (PAH)

The PAH test results for selected fill samples are presented in Table G. As shown in Table G, all the concentrations of Benzo(a)pyrene (BaP) (TEQ), Total PAH, Naphthalene and BaP were well below the relevant HIL A, HSL A, EIL and / or ESL with an exception to the BaP at TP4, which exceeded the relevant ESL. As the site is proposed for building construction, there is a limited ecological value for the site. Hence, the exceedance at TP4 will no longer be a concern.

Organochlorine Pesticides (OCP)

The OCP test results for selected fill samples are presented in Table H. As shown in Table H, the concentrations of OCP were well below the relevant HIL A and less than the laboratory LOR. Concentrations of DDT were also below the EIL.

Polychlorinated Biphenyls (PCB)

The PCB test results for selected fill samples are presented in Table H. As shown in Table H, the concentrations of PCB were below the HIL A and less than laboratory LOR.

Asbestos

As indicated in Table I, with the exception of samples TP2 (0.5-0.8m), no ACM (>7mm) was found at the LOR of 0.01% w/w for the remaining samples analysed. ACM (>7mm) in excess of the SAC (0.01% w/w) was detected in sample TP2 (0.5-0.8m).

As shown in Table I, with the exception of samples TPBH5a (0.0-0.15m) and TP2 (0.0-0.15), no AF or FA was found at the LOR of 0.001% w/w for the all the samples analysed. AF (<7mm) in excess of the SAC (0.001% w/w) was detected in sample TPBH5a (0.0-0.15m) and TP2 (0.0-0.15).

As presented in Table I, the analysed FCP samples TP-BH5a (0.5-0.8m), TP-BH5c (0.0-0.5) and TP2 (0.5-0.85) were ACM.

Based on the site observation at and in the vicinity of previous identified asbestos impacted location step-out sampling was carried to determine the extent of the presence of FCP (potential ACM). The step-out sampling was triggered by the presence of FCP during the previous investigation and the presence of FCP during this further assessment for the site, as indicated in Table I. As indicated in Table J, with the exception of the highlighted concentrations of ACM in some [(TPBH5a (0.5-0.8m), TPBH5c (0-0.15m) & TP2 (0.5-0.8m)] exceeding the allowable concentration of 0.01% w/w for *residential with garden / accessible soil* land use, the concentrations of ACM in the remaining samples, including the step-out samples, were zero.

7.0 POTENTIAL CONTAMINATION CONSTRAINTS OR RISKS

Based on the previous DSI and current ADSI, most of the laboratory test results satisfied the criteria for stating that the analytes selected are either not present (i.e. concentrations less than laboratory LOR), or present in the sampled soils at concentrations that do not pose a risk of hazard to human health or the environment, environment under the condition for the proposed school upgrade, with the exception of asbestos. The identified contaminant being bonded ACM and friable asbestos in a number of test pit locations, as indicated and tabulated on Drawing No 20429/10-AA2 in Appendix A.

Bonded ACM pieces / fragments generally do not present a significant health risk unless tooled, cut, sanded, abraded or machined, which may release asbestos dust or fibres. Asbestos dust contains tiny almost indestructible fibres, which can cause damage to the lungs when breathed in.

Friable asbestos presents a risk of harm to human health due to the exceedance of relevant Health Screening Level (HSL) for residential setting.

However, it is our assessment that the abovementioned asbestos contamination risks can be managed so that the site is suitable for proposed upgrade works. Recommended mitigation measures to address the abovementioned contamination risk are provided below in this report.

8.0 MITIGATION MEASURES FOR ASBESTOS CONTAMINATION RISKS

As discussed above in this report, the asbestos contamination which present a risk to human health was identified in the fill materials in proposed upgrade works area. Table 12 below presents recommended mitigation measures to address the asbestos contamination risks.

Table 1 – Recommended Mitigation Measures to Manage Asbestos Contamination Risks

Mitigation Name	When to Mitigation Measure to be complied with	Mitigation Measures	Reasons for Mitigation Measures
Asbestos risk to human health	Prior to commencement of any earthworks	Prepare a remedial action plan (RAP) and carry out remediation by excavating and disposing asbestos contaminated fill material in an EPA licensed landfill facility followed by validation of the excavation pit according to the RAP.	To minimise risk to human health during construction works

9.0 SIGNIFICANCE OF ENVIRONMENTAL IMPACTS

Based on asbestos contamination at the proposed development site, it is our assessment that the potential impacts of the proposed upgrade work or activity can be appropriately mitigated or managed by excavating and disposing asbestos contaminated fill material in an EPA licensed landfill facility in accordance with the recommended mitigation measures presented in Table 12. Excavation and disposal of soil is a common practice in construction works. Hence, the required mitigation measures will not have a significant effect on the environment.

10.0 CONCLUSIONS & RECOMMENDATIONS

The findings of this ADSI are summarised as follows:

- The investigation area (refer to the Figure 2 in Page 2) was vacant at the time of sampling and site inspection.
- All the laboratory test results satisfied the criteria for stating that the analytes selected are either not present i.e. concentrations less than laboratory limits of reporting, or present in the sampled soil at concentrations that do not pose a risk of hazard to human health or the environment under the condition for the proposed school upgrade, with the exception of asbestos. The identified contaminant being bonded ACM and friable asbestos in a number of test pit locations, as indicated and tabulated on Drawing No 20429/10-AA2 in Appendix A. Bonded ACM pieces / fragments generally do not present a significant health risk unless tooled, cut, sanded, abraded or machined, which may release asbestos dust or fibres. Asbestos dust contains tiny almost indestructible fibres, which can cause damage to the lungs when breathed in. Friable asbestos presents a risk of harm to human health due to the exceedance of relevant Health Screening Level (HSL) for residential setting.
- Potential off-site impacts of contaminants on groundwater and waterbodies are considered to be low.

Based on this assessment, Geotechnique considers that the investigation area can be made suitable for the proposed school upgrade if the asbestos contamination which present a risk to human health are addressed in accordance with mitigation measures provided in this report. Furthermore, from environmental engineering considerations the required mitigation measures will not have a significant effect on the environment.

For any materials to be excavated and removed from the site, it is recommended that waste classification of the materials, in accordance with the "Waste Classification Guidelines Part 1: Classifying Waste" NSW EPA 2014; NSW EPA resource recovery exemptions and orders under the Protection of the Environment Operations (Waste) Regulation 2014; or NSW EPA Certification: Virgin excavated natural material is undertaken prior to disposal at a facility that can lawfully accept the materials.

Any imported soil (fill) must be assessed by a qualified environmental consultant, prior to importation, to ensure suitability for the proposed use. In addition, the imported fill must not contain asbestos and ash, be free of unusual odour, not discoloured and not acid sulphate soil or potential acid sulphate soil. The imported fill should either be virgin excavated natural material (VENM) or excavated natural material (ENM).

11.0 LIMITATIONS

The services performed by Geotechnique in preparing this report were conducted in a manner consistent with the level of quality and skill generally exercised by members of the profession and consulting practice.

This report has been prepared for the purposes stated within. This report can also be relied upon by SINSW and Department of Education (DoE). Any reliance on this report by other parties shall be at such parties' sole risk as the report might not contain sufficient information for other purposes.

This report shall only be presented in full and may not be used to support any other objective than those set out in the report, except where written approval is provided by Geotechnique.

The information in this report is considered accurate at the date of issue, in accordance with current site conditions during site inspection and field sampling for this ADSI (6 November 2024). Any variations to the site form or use beyond that date could nullify the conclusion stated.

No contamination assessment can eliminate all risk; even a rigorous professional assessment might not detect all contamination within a site. Whilst the assessment conducted at the site was carried out in accordance with current NSW guidelines, the potential always exists for contaminants and contaminated soils to be present between sampled locations and in the grass covered areas.

Presented in Appendix C is a document entitled "Environmental Notes", which should be read in conjunction with this report

LIST OF REFERENCES

Contaminated Land Management Act 1997

Contaminated Land Management Regulation 1998

Contaminated Sites: Consultants Reporting on Contaminated Land – NSW Environment Protection Authority 2020

Contaminated Sites: Guidelines for the NSW Site Auditor Scheme (3rd Edition) –NSW EPA 2017

Contaminated Sites: Sampling Design Part 1- Application - NSW Environment Protection Authority 2022

Environmental Planning and Assessment Act 1979 (EP&A Act)

Geology of the Penrith 1:100,000 Sheet (9030) – Geological Survey of New South Wales, Department of Minerals and Energy 1991

National Environment Protection (Assessment of Site Contamination) Measure – National Environmental Protection Council (NEPM) 1999 (April 2013)

Protection of the Environment Operations (Waste) Regulation 2005 – General Exemption Under Part 6, Clause 51 and 51A – The Excavated Natural Material Exemption & Order 2014

Soil Landscape of the Penrith 1:100,000 Sheet (9030) – Soil Conservation Service of NSW 1989

Standard Methods for the Examination of Water and Wastewater – American Public Health Association (APHA) 2017

State Environmental Planning Policy (Transport and Infrastructure) 2021 (SEPP TI)

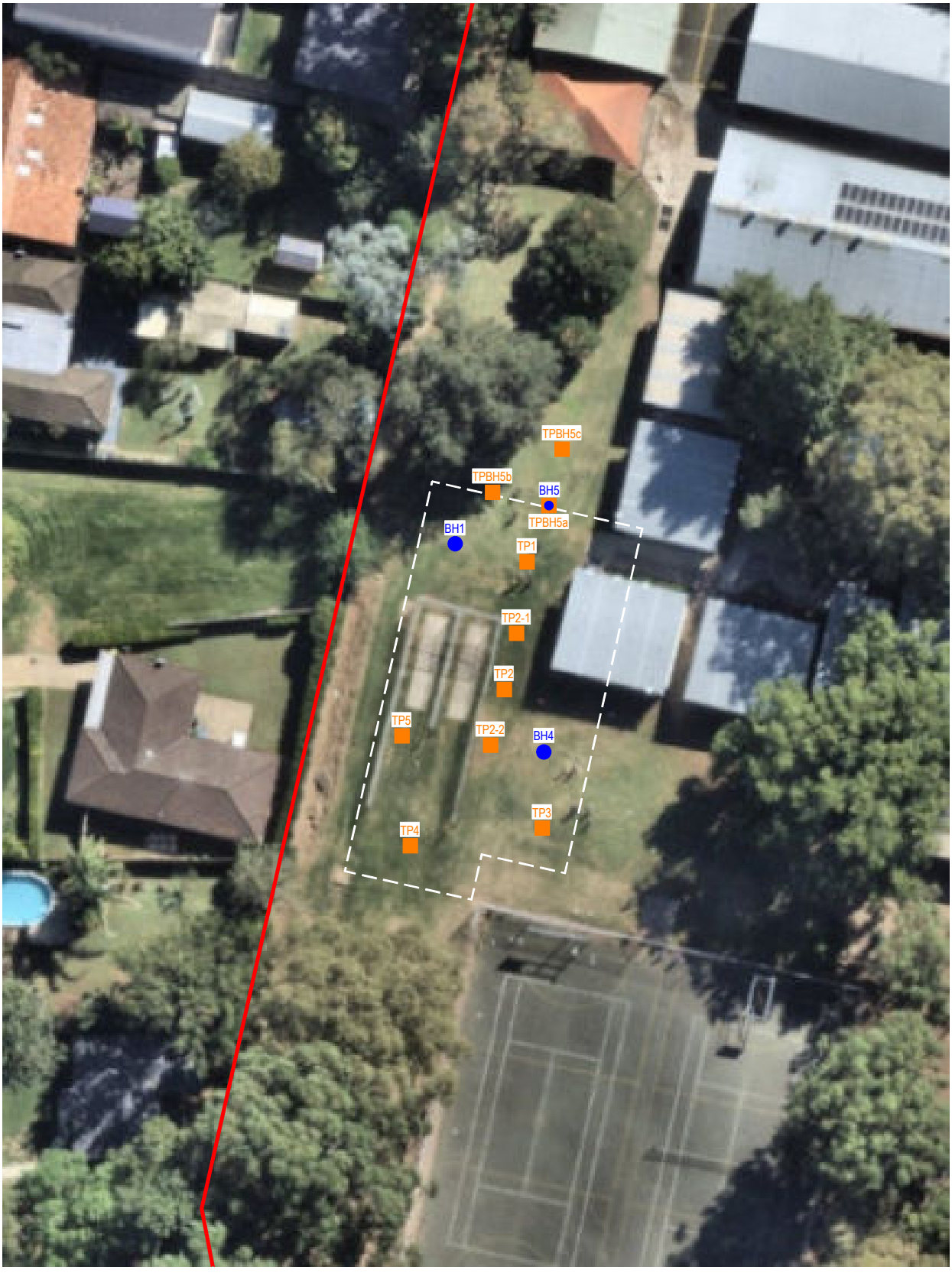
Waste Classification Guidelines Part 1: Classifying Waste - NSW DECC (November 2014)

APPENDIX A

Drawing No 20429/10-AA1 -Detailed Test Pit Locations

Drawing No 20429/10-AA2 – Locations of Contamination

Table 1- Test Pit Logs



Imagery © NearMap.com

LEGEND

- Site Boundary
- Proposed Building Footprint
- Borehole (September 2023)
- Test Pit (November 2024)

0 5 10 15 20 25m

Scale 1:500

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www.geotech.com.au

Contract No DDWO 0513/23
Northmead Public School (2763)
Various Lots
52A Moxhams Road, Northmead

Detailed Test Pit Locations

Drawing No: 20429/10-AA1
Job No: 20429/10
Drawn By: MH
Date: 11 November 2024
Checked By: MA

File No: 20429-10
Layers: 0, AA1

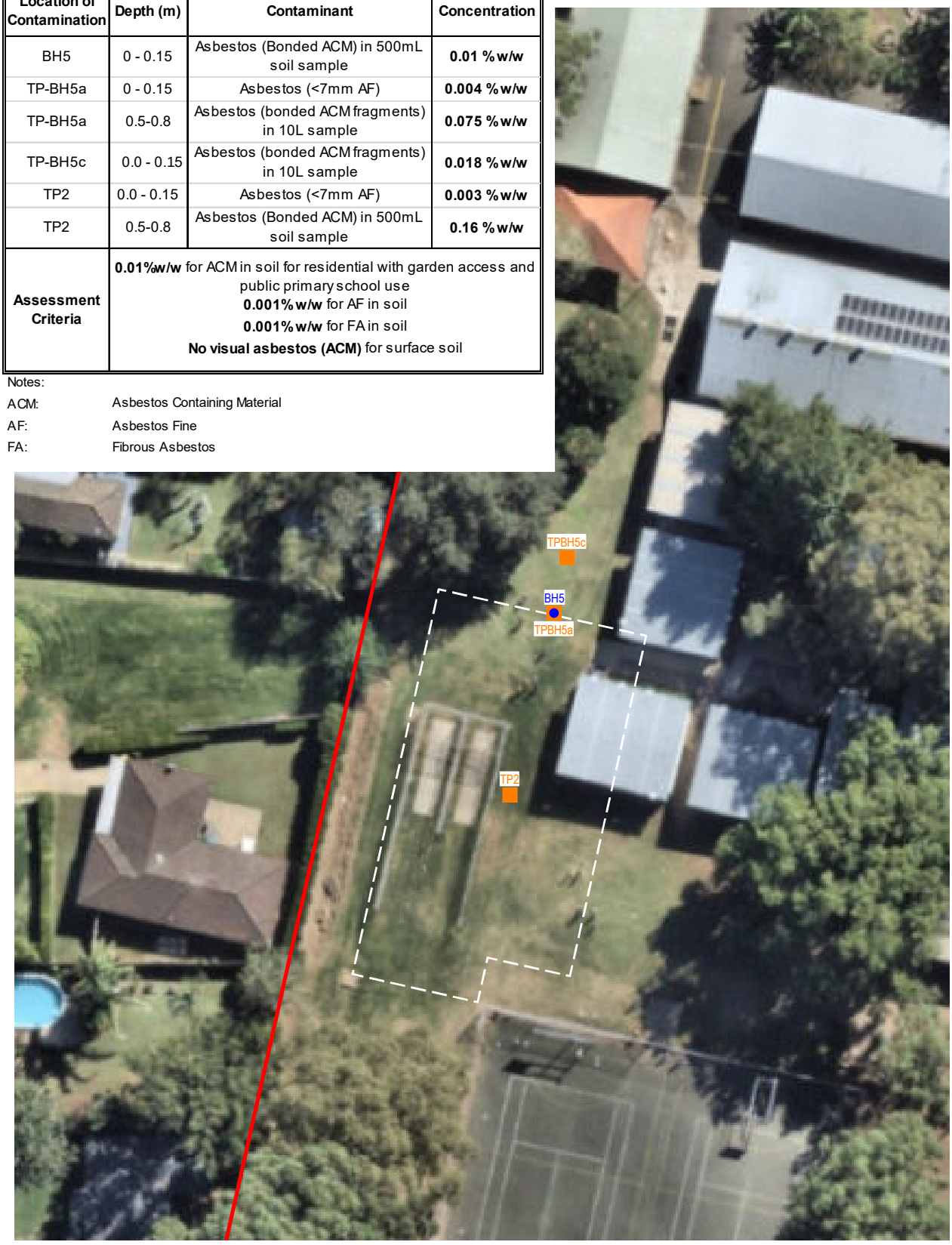
Location of Contamination	Depth (m)	Contaminant	Concentration
BH5	0 - 0.15	Asbestos (Bonded ACM) in 500mL soil sample	**0.01 %w/w**
TP-BH5a	0 - 0.15	Asbestos (<7mm AF)	**0.004 %w/w**
TP-BH5a	0.5-0.8	Asbestos (bonded ACM fragments) in 10L sample	**0.075 %w/w**
TP-BH5c	0.0 - 0.15	Asbestos (bonded ACM fragments) in 10L sample	**0.018 %w/w**
TP2	0.0 - 0.15	Asbestos (<7mm AF)	**0.003 %w/w**
TP2	0.5-0.8	Asbestos (Bonded ACM) in 500mL soil sample	**0.16 %w/w**
Assessment Criteria	**0.01%w/w** for ACM in soil for residential with garden access and public primary school use **0.001% w/w** for AF in soil **0.001% w/w** for FA in soil **No visual asbestos (ACM)** for surface soil		

Notes:

ACM: Asbestos Containing Material

AF: Asbestos Fine

FA: Fibrous Asbestos



Imagery © NearMap.com

LEGEND

Site Boundary

Proposed Building Footprint

Borehole (September 2023)

Test Pit (November 2024)

0 5 10 15 20 25m

Scale 1:500

GEOTECHNIQUE® PTY LTD
An eiaustralia company

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Contract No DDWO 0513/23
Northmead Public School (2763)
Various Lots
52A Moxhams Road, Northmead

Locations of Contamination

Drawing No: 20429/10-AA2
Job No: 20429/10
Drawn By: MH
Date: 20 November 2024
Checked By: MA

File No: 20429-10
Layers: 0, AA2

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Project:	Proposed School Upgrade	**Job No:**	20429/10
Location:	Northmead Public School - 52A Moxhams Road Northmead	**Drawing No:**	20429/10-AA1
		Logged & Sampled by:	MA

Table 1

Test Pit	Depth (m)	Sample Depth (m)	Date	Material Description	Remarks*
TPBH5a	0.0-1.0	0.0-0.15	6/11/2024	FILL: Silty Sand, fine grained, brown, trace of gravel, inclusion of brick fragments	
		0.5-0.8		FILL: Silty Sand, fine grained, brown, trace of gravel, inclusion of brick fragments	Inclusion of Fibro Cement Piece (FCP)
	1.0-1.5	1.05-1.15		(CI) Silty Sandy CLAY, low to medium plasticity, brown	
TPBH5b	0.0-0.5	0.0-0.15	6/11/2024	FILL: Silty Sand, fine grained, brown, trace of gravel, inclusion of brick fragments	
TPBH5c	0.0-0.5	0.0-0.15	6/11/2024	FILL: Silty Sand, fine grained, brown, trace of gravel, inclusion of brick fragments	Inclusion of FCP
	0.5-1.0	NS		(CI) Silty Sandy CLAY, low to medium plasticity, brown	
TP1	0.0-1.0	0.0-0.15	6/11/2024	FILL: Gravelly Sandy Clay, low plasticity, brown	
		0.5-0.8		FILL: Gravelly Sandy Clay, low plasticity, brown	Refusal at 0.8m due to concrete
TP2	0.0-1.0	0.0-0.15	6/11/2024	FILL: Silty Sand, fine grained, brown, trace of gravel, inclusion of brick fragments	
	0.0-1.0	0.5-0.8		FILL: Silty Sand, fine grained, brown, trace of gravel, inclusion of brick fragments	Inclusion of FCP
	1.0-1.5	1.05-1.15		(CI) Silty Sandy CLAY, low to medium plasticity, brown	
TP2-1	0.0-0.5	0.0-0.15	6/11/2024	FILL: Silty Sand, fine grained, brown, trace of gravel, inclusion of brick fragments	
	0.5-1.0	NS		(CI) Silty Sandy CLAY, low to medium plasticity, brown	

NS = No Sample
*Odour (O), Discolouration (D), Petroleum Hydrocarbon Staining (PHS), Asbestos Containing Material (ACM), Ash Material (ASHM), Demolition Waste (DW), Groundwater (GW), Perched Water (PW) PID reading etc.

Project:	Proposed School Upgrade	**Job No:**	20429/10
Location:	Northmead Public School - 52A Moxhams Road Northmead	**Drawing No:**	20429/10-AA1
		Logged & Sampled by:	MA

Table 1

Test Pit	Depth (m)	Sample Depth (m)	Date	Material Description	Remarks*
TP2-2	0.0-0.5	0.0-0.15	6/11/2024	FILL: Silty Sand, fine grained, brown, trace of gravel, inclusion of brick fragments	
	0.5-1.0	0.55-0.65		(CL-CI) Silty Sandy CLAY, low to medium plasticity, brown to yellow	
TP3	0.0-0.5	0.0-0.15	6/11/2024	FILL: Silty Sand, fine grained, brown, trace of gravel, inclusion of brick fragments	
	0.5-1.0	0.55-0.65		FILL: Silty Sand, fine grained, trace of gravel, inclusion of brick fragments	
TP4	0.0-0.5	0.0-0.15	6/11/2024	(CL-CI) Silty Sandy CLAY, low to medium plasticity	
	0.5-1.0	0.55-0.65		FILL: Silty Sand, fine grained, trace of gravel, inclusion of brick fragments	
TP5	0.0-0.5	0.0-0.15	6/11/2024	(CL-CI) Silty Sandy CLAY, low to medium plasticity	
	0.5-1.0	0.55-0.65		FILL: Silty Sand, fine grained, trace of gravel, inclusion of brick fragments	

NS = No Sample
*Odour (O), Discolouration (D), Petroleum Hydrocarbon Staining (PHS), Asbestos Containing Material (ACM), Ash Material (ASHM), Demolition Waste (DW), Groundwater (GW), Perched Water (PW) PID reading etc.

APPENDIX B

Laboratory Summary Tables

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TABLE A
RINSATE
(Ref No: 20429/10-AA)

SAMPLE DATE	RS1 6/11/2024
METAL	**(mg/L)**
Arsenic	<0.02
Cadmium	<0.001
Chromium	<0.005
Copper	<0.005
Lead	<0.02
Mercury	<0.0001
Nickel	<0.005
Zinc	<0.01
TOTAL RECOVERABLE HYDROCARBON (TRH)	**(µg/L)**
F1 (C6-C10 less BTEX)	<50
F2 (>C10-C16)	<60
F3 (>C16-C34)	<500
F4 (>C34-C40)	<500
BTEX	**(µg/L)**
Benzene	<0.5
Toluene	<0.5
Ethyl Benzene	<0.5
Xylenes	<1.5
POLYCYCLIC AROMATIC HYDROCARBON (PAH)	**(µg/L)**
Total PAH	<1
Naphthalene	<0.1
Benzo(a)Pyrene	<0.1

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TABLE B
TRIP SPIKE
(Ref No: 20429/10-AA)

Sample	Sampling Date	BTEX			
		Benzene	Toluene	Ethylbenzene	Xylenes
TS1	6/11/2024	102%	102%	101%	101%

Note : results are reported as percentage recovery of known spike concentrations

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TABLE C
DUPLICATE SAMPLE
(Ref No: 20429/10-AA)

ANALYTE	TP1 0.0-0.15 (m) mg/kg	DDS1 mg/kg	RELATIVE PERCENTAGE DIFFERENCES (RPD) %
Arsenic	7	10	35
Cadmium	<0.3	0.4	-
Chromium	8.9	16	57
Copper	21	23	9
Lead	58	71	20
Mercury	0.11	0.16	37
Nickel	4.5	5	11
Zinc	180	150	18
TOTAL RECOVERABLE HYDROCARBONS (TRH)			
F1 (C6-C10 less BTEX)	<25	<25	-
F2 (>C10-C16)	<25	<25	-
F3 (>C16-C34)	180	<90	-
F4 (>C34-C40)	<120	<120	-
BTEX			
Benzene	<0.1	<0.1	-
Toluene	<0.1	<0.1	-
Ethyl Benzene	<0.1	<0.1	-
Xylenes	<0.3	<0.3	-
POLYCYCLIC AROMATIC HYDROCARBONS			
Benzo(a)Pyrene TEQ	0.3	<0.3	-
Total PAH	1.5	0.5	100
Naphthalene	<0.1	<0.1	-
Benzo(a)Pyrene	0.2	0.1	67
ORGANOCHLORINE PESTICIDES (OCP)			
Hexachlorobenzene (HCB)	<0.1	<0.1	-
Heptachlor	<0.1	<0.1	-
Aldrin+Dieldrin	<0.15	<0.15	-
Endrin	<0.1	<0.1	-
Methoxychlor	<0.1	<0.1	-
Mirex	<0.1	<0.1	-
Endosulfan (alpha, beta & sulphate)	<0.3	<0.3	-
DDD+DDE+DDT	<0.3	<0.3	-
Chlordane (alpha & gamma)	<0.2	<0.2	-

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TABLE D
SPLIT SAMPLE
(Ref No: 20429/10-AA)

ANALYTE	TP2 0.0-0.15 (m) mg/kg (SGS)	DSS1 mg/kg (ENVIROLAB)	RELATIVE PERCENTAGE DIFFERENCES (RPD) %
Arsenic	7	14	67
Cadmium	0.4	<0.4	-
Chromium	11	17	43
Copper	24	28	15
Lead	92	65	34
Mercury	0.12	0.2	50
Nickel	5.9	6	2
Zinc	370	110	108
TOTAL RECOVERABLE HYDROCARBONS (TRH)			
F1 (C6-C10 less BTEX)	<25	<25	-
F2 (>C10-C16)	<25	<50	-
F3 (>C16-C34)	180	<100	-
F4 (>C34-C40)	140	<100	-
BTEX			
Benzene	<0.1	<0.2	-
Toluene	<0.1	<0.5	-
Ethyl Benzene	<0.1	<1	-
Xylenes	<0.3	<1	-
POLYCYCLIC AROMATIC HYDROCARBONS (PAH)			
Benzo(a)Pyrene TEQ	0.3	<0.5	-
Total PAH	1.6	1.6	0
Naphthalene	<0.1	<0.1	-
Benzo(a)Pyrene	0.2	0.1	67
ORGANOCHLORINE PESTICIDES (OCP)			
Hexachlorobenzene (HCB)	<0.1	<0.1	-
Heptachlor	<0.1	<0.1	-
Aldrin+Dieldrin	<0.15	<0.2	-
Endrin	<0.1	<0.1	-
Methoxychlor	<0.1	<0.1	-
Endosulfan (alpha (I), beta (II) & sulphate)	<0.3	<0.3	-
DDD+DDE+DDT	<0.3	<0.3	-
Chlordane (alpha & gamma)	<0.2	<0.2	-

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TABLE E1
METAL, CATION EXCHANGE CAPACITY (CEC) & pH TEST RESULTS
DISCRETE SAMPLES
(Ref No: 20429/10-AA)

Sample Location	Depth (m)	METAL (mg/kg) ARSENIC	CADMIUM	CHROMIUM (Total)	COPPER	LEAD	MERCURY	NICKEL	ZINC	CEC ($cmol_c/kg$)	pH
Fill (Clay)											
TP1	0.0-0.15	7	<0.3	8.9	21	58	0.11	4.5	180	7.3	6.3
Limit of Reporting (LOR)		1	0.3	0.5	0.5	1	0.05	0.5	2	0.02	0.1
NATIONAL ENVIRONMENT PROTECTION AMENDMENT MEASURE (2013)											
Health-based Investigation Levels (HIL) [a] A - Residential A		100	20	100 [c]	6000	300	10 [d]	400	7400		
Ecological Investigation Levels (EIL) [b]- Urban residential		100 [e]	-	190[f]	160	1200 [g]	-	85	390		

Notes:
a: Residential with garden / accessible soil (home grown produce <10% fruit and vegetable intake (no poultry)), also includes childcare centres, preschools and
b: EIL of aged chromium (III), copper, nickel & zinc were derived from calculation spreadsheet developed by CSIRO for NEPC; Old Suburb with Low Traffic; the lowest CEC=7.3 cmolc/kg & pH=6.3; the assumed clay content=1 % were selected for derivation of EIL; a conservative approach.
c: Chromium (VI)
d: Methyl Mercury
e: Generic EIL for aged arsenic
f: Chromium (III)
g: Generic added contaminant limit for aged lead + ambient background concentration; Old Suburb with Low Traffic.

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TABLE E2
METAL, CATION EXCHANGE CAPACITY (CEC) & pH TEST RESULTS
DISCRETE SAMPLES
(Ref No: 20429/10-AA)

Sample Location	Depth (m)	METAL (mg/kg) ARSENIC	CADMIUM	CHROMIUM (Total)	COPPER	LEAD	MERCURY	NICKEL	ZINC	CEC ($cmol_c/kg$)	pH
Fill (Sand)											
TPBH5c	0.0-0.15	2	<0.3	14	6.2	32	0.17	1.3	32	3.9	6.4
TP2	0.0-0.15	7	0.4	11	24	92	0.12	5.9	370	9.8	6.3
TP2	0.5-0.8	6	<0.3	15	15	46	0.1	3.9	130	-	-
TP3	0.0-0.15	3	<0.3	13	6.3	27	0.06	3.8	21	5.6	5.6
TP4	0.0-0.15	8	<0.3	16	11	34	0.08	2.2	28	11	6.1
TP5	0.0-0.15	9	<0.3	12	11	35	<0.05	4.6	46	14	6.6
Limit of Reporting (LOR)		1	0.3	0.5	0.5	1	0.05	0.5	2	0.02	0.1
NATIONAL ENVIRONMENT PROTECTION AMENDMENT MEASURE (2013)											
Health-based Investigation Levels (HIL) [a] A - Residential A		100	20	100 [c]	6000	300	10 [d]	400	7400		
Ecological Investigation Levels (EIL) [b]- Urban residential		100 [e]	-	190[f]	190	1200 [g]	-	130	440		

Notes:
a: Residential with garden / accessible soil (home grown produce <10% fruit and vegetable intake (no poultry)), also includes childcare centres, preschools and
b: EIL of aged chromium (III), copper, nickel & zinc were derived from calculation spreadsheet developed by CSIRO for NEPC; Old Suburb with Low Traffic; the average CEC=8.86 cmolc/kg & pH=6.2; the assumed clay content=1 % were selected for derivation of EIL; a conservative approach.
c: Chromium (VI)
d: Methyl Mercury
e: Generic EIL for aged arsenic
f: Chromium (III)
g: Generic added contaminant limit for aged lead + ambient background concentration; Old Suburb with Low Traffic.

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TABLE F
TOTAL RECOVERABLE HYDROCARBONS (TRH) AND BTEX TEST RESULTS
DISCRETE SAMPLES
(Ref No: 20429/10-AA)

											NATIONAL ENVIRONMENT PROTECTION AMENDMENT MEASURE (2013)																			
			TRH (mg/kg)					BTEX (mg/kg)				Health Screening Levels (HSL) A Low density residential						Ecological Screening Levels for fine-grained soil Urban residential								Ecological Screening Levels for coarse-grained soil Urban residential							
Sample Location	Depth (m)	Soil type	F1	F2*	F2**	F3	F4	BENZENE	TOLUENE	ETHYLBENZENE	XYLENES	F1	F2*	BENZENE	TOLUENE	ETHYLBENZENE	XYLENES	F1	F2**	F3	F4	BENZENE	TOLUENE	ETHYLBENZENE	XYLENES	F1	F2**	F3	F4	BENZENE	TOLUENE	ETHYLBENZENE	XYLENES
TPBH5c	0.0-0.15	Sand	<25	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	45	110	0.5	160	55	40	-	-	-	-	-	-	-	-	180	120	300	2800	50	85	70	105
TP1	0.0-0.15	Clay	<25	<25	<25	180	<120	<0.1	<0.1	<0.1	<0.3	50	280	0.7	480	NL	110	180	120	1300	5600	65	105	125	45	-	-	-	-	-	-	-	-
TP2	0.0-0.15	Sand	<25	<25	<25	180	140	<0.1	<0.1	<0.1	<0.3	45	110	0.5	160	55	40	-	-	-	-	-	-	-	-	180	120	300	2800	50	85	70	105
TP3	0.0-0.15	Sand	<25	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	45	110	0.5	160	55	40	-	-	-	-	-	-	-	-	180	120	300	2800	50	85	70	105
TP4	0.0-0.15	Sand	<25	<25	<25	160	<120	<0.1	<0.1	<0.1	<0.3	45	110	0.5	160	55	40	-	-	-	-	-	-	-	-	180	120	300	2800	50	85	70	105
TP5	0.0-0.15	Sand	<25	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	45	110	0.5	160	55	40	-	-	-	-	-	-	-	-	180	120	300	2800	50	85	70	105
Limit of Reporting (LOR)			25	25	25	90	120	0.1	0.1	0.1	0.3																					

Notes:
F1: C6-C10 less BTEX
F2*: >C10-C16 less Naphthalene
F2**: >C10-C16
F3: >C16-C34
F4: >C34-C40
NL: Not Limiting

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TABLE G

POLYCYCLIC AROMATIC HYDROCARBONS (PAH) TEST RESULTS

DISCRETE SAMPLES

(Ref No: 20429/10-AA)

			PAH (mg/kg)				NATIONAL ENVIRONMENT PROTECTION AMENDMENT MEASURE (2013)				
							Health-based Investigation Levels (HIL) A - Residential[a] A		Health Screening Level (HSL) A - Low density residential	Generic Ecological Investigation Level (EIL) - Urban residential	Ecological Screening Level (ESL) - Urban residential
Sample Location	Depth (m)	Soil type	BaP TEQ	TOTAL PAHs	NAPHTHALENE	BENZO(a)PYRENE (BaP)	BaP TEQ	TOTAL PAHs	NAPHTHALENE	NAPHTHALENE	BENZO(a)PYRENE (BaP)
TPBH5c	0.0-0.15	Sand	0.4	2.5	<0.1	0.2	3	300	3	170	0.7
TP1	0.0-0.15	Clay	0.3	1.5	<0.1	0.2	3	300	5	170	0.7
TP2	0.0-0.15	Sand	0.3	1.6	<0.1	0.2	3	300	3	170	0.7
TP3	0.0-0.15	Sand	0.5	2.4	<0.1	0.3	3	300	3	170	0.7
TP4	0.0-0.15	Sand	2.6	15	<0.1	1.8	3	300	3	170	0.7
TP5	0.0-0.15	Sand	0.3	1.5	<0.1	0.2	3	300	3	170	0.7
Limit of Reporting (LOR)			0.3	0.1	0.1	0.1					

Notes: a: Residential with garden / accessible soil (home grown produce <10% fruit and vegetable intake (no poultry)), also includes childcare centres, preschools and primary schools.

NL: Not Limiting

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TABLE H
ORGANOCHLORINE PESTICIDES (OCP) & POLYCHLORINATED BIPHENYLS (PCB) TEST RESULTS
DISCRETE SAMPLES
(Ref No: 20429/10-AA)

Sample Location	Depth (m)	OCP (mg/kg)									(mg/kg)
		HEXACHLOROBENZENE (HCB)	HEPTACHLOR	ALDRIN+DIELDRIN	ENDRIN	METHOXYCHLOR	MIREX	ENDOSULFAN (alpha, beta & sulphate)	DDD+DDE+DDT	DDT	CHLORDANE (alpha & gamma)	PCB
TPBH5c	0.0-0.15	<0.1	<0.1	<0.15	<0.1	<0.1	<0.1	<0.3	<0.3	<0.1	<0.2	<1
TP1	0.0-0.15	<0.1	<0.1	<0.15	<0.1	<0.1	<0.1	<0.3	<0.3	<0.1	<0.2	<1
TP2	0.0-0.15	<0.1	<0.1	<0.15	<0.1	<0.1	<0.1	<0.3	<0.3	<0.1	<0.2	<1
TP3	0.0-0.15	<0.1	<0.1	<0.15	<0.1	<0.1	<0.1	<0.3	<0.3	<0.1	<0.2	<1
TP4	0.0-0.15	<0.1	<0.1	<0.15	<0.1	<0.1	<0.1	<0.3	<0.3	<0.1	<0.2	<1
TP5	0.0-0.15	<0.1	<0.1	<0.15	<0.1	<0.1	<0.1	<0.3	<0.3	<0.1	<0.2	<1
Limit of Reporting (LOR)		0.1	0.1	0.2	0.1	0.1	0.1	0.3	0.3	0.1	0.2	1
NATIONAL ENVIRONMENT PROTECTION AMENDMENT MEASURE (2013)												
Health-based Investigation Levels (HIL) A [a] - Residential A		10	6	6	10	300	10	270	240		50	1
Ecological Investigation Levels (EIL) - Urban residential										180 [b]		

Notes: a: Residential with garden / accessible soil (home grown produce <10% fruit and vegetable intake (no poultry)), also includes childcare centres, preschools and primary schools.

b: Generic EIL for DDT

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TABLE I
ASBESTOS TEST RESULTS
DISCRETE SAMPLES
(Ref No: 20429/10-AA)

Sample Location	Depth (m)	ASBESTOS (% w/w)		
Soil Sample		Bonded ACM (>7mm)	AF	FA
TPBH5a	0.0 - 0.15	<0.01	**0.004**	<0.001
TPBH5a	0.5 - 0.8	<0.01	<0.001	<0.001
TPBH5b	0.0 - 0.15	<0.01	<0.001	<0.001
TPBH5c	0.0 - 0.15	<0.01	<0.001	<0.001
TP1	0.0 - 0.15	<0.01	<0.001	<0.001
TP1	0.5 - 0.8	<0.01	<0.001	<0.001
TP2	0.0 - 0.15	<0.01	**0.003**	<0.001
TP2	0.5 - 0.8	**0.16**	<0.001	<0.001
TP2_1	0.0 - 0.15	<0.01	<0.001	<0.001
TP2 _ 2	0.0 - 0.15	<0.01	<0.001	<0.001
TP3	0.0 - 0.15	<0.01	<0.001	<0.001
TP4	0.0 - 0.15	<0.01	<0.001	<0.001
TP5	0.0 - 0.15	<0.01	<0.001	<0.001
Limits of Reporting (LOR)		0.01	0.001	0.001
NATIONAL ENVIRONMENT PROTECTION AMENDMENT MEASURE (2013)				
Health Screening Levels [a] - Residential A		-	0.001	0.001
Fibro-cement Piece				
FCP-TPBH5a	0.5-0.8	**ACM**		
FCP-TPBH5c	0.0 - 0.5	**ACM**		
FCP-TP2	0.5-0.8	**ACM**		

Notes:

ACM: Asbestos Containing Material

AF: Asbestos Fines

FA: Fibrous Asbestos

a: Residential with garden / accessible soil (home grown produce <10% fruit and vegetable intake (no poultry)), also includes childcare centres, preschools and primary schools.

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Table J

ASBESTOS IN-SITU SIEVING TEST RESULTS

Ref. No. (20429/10-AA)

Location	Depth (m)	In-Situ 10L Sieve Test			
		Soil Density (kg/L)	Weight of Bonded ACM [a] (g)	% ACM in Soil w/w [b]	Criterion [c] (% w/w)
TP-BH5a	0.0-0.15	1.23	0.00	0.000	0.01
TP-BH5a	0.5-0.8	1.23	61.60	**0.075**	0.01
TP-BH5b	0.0-0.15	1.27	0.00	0.000	0.01
TP-BH5c	0.0-0.15	1.23	14.60	**0.018**	0.01
TP1	0.0-0.15	1.21	0.00	0.000	0.01
TP1	0.5-0.8	1.21	0.00	0.000	0.01
TP2	0.0-0.15	1.27	0.00	0.000	0.01
TP2	0.5-0.8	1.27	31.60	**0.037**	0.01
TP2-1	0.0-0.15	1.27	0.00	0.000	0.01
TP2-2	0.0-0.15	1.27	0.00	0.000	0.01
TP3	0.0-0.15	1.23	0.00	0.000	0.01
TP4	0.0-0.15	1.29	0.00	0.000	0.01
TP5	0.0-0.15	1.25	0.00	0.000	0.01

Notes a: Retained on 7mm sieve

b: NEPM 1999 (April 2013) (page 31): % Asbestos in Soil = % Asbestos Content x ACM (kg) / {Soil Volume (L) x Soil Density (kg/L)}, based on asbestos content of 15% and soil volume of 10L.

c: Health Screeing Level A (NEPM 1999 [April 2013]) for bonded ACM

APPENDIX C

Environmental Notes

IMPORTANT INFORMATION REGARDING YOUR ENVIRONMENTAL SITE ASSESSMENT

These notes have been prepared by Geotechnique Pty Ltd, using guidelines prepared by the ASFE (Associated Soil and Foundation Engineers). The notes are offered to assist in the interpretation of your environmental site assessment report.

REASONS FOR AN ENVIRONMENTAL ASSESSMENT

Environmental site assessments are typically, though not exclusively, performed in the following circumstances:

- As a pre-acquisition assessment on behalf of either a purchaser or a vendor, when a property is to be sold
- As a pre-development assessment, when a property or area of land is to be redeveloped, or the land use has changed e.g. from a factory to a residential subdivision
- As a pre-development assessment of greenfield sites, to establish baseline conditions and assess environmental, geological and hydrological constraints to the development of e.g. a landfill
- As an audit of the environmental effects of previous and present site usage

Each circumstance requires a specific approach to the assessment of soil and groundwater contamination. In all cases the objective is to identify and if possible, quantify the risks that unrecognised contamination poses to the ongoing proposed activity. Such risks may be both financial (clean-up costs or limitations in site use) and physical (health risks to site users or the public).

ENVIRONMENTAL SITE ASSESSMENT LIMITATIONS

Although information provided by an environmental site assessment can reduce exposure to the risk of the presence of contamination, no environmental site assessment can eliminate the risk. Even a rigorous professional assessment may not detect all contamination within a site. Contaminants may be present in areas that were not surveyed or sampled, or may migrate to areas which did not show signs of contamination when sampled. Contaminant analysis cannot possibly cover every type of contaminant that may occur; only the most likely contaminants are screened.

AN ENVIRONMENTAL SITE ASSESSMENT REPORT IS BASED ON A UNIQUE SET OF PROJECT SPECIFIC FACTORS

In the following events and in order to avoid cost problems, you should ask your consultant to assess any changes in the conclusion and recommendations made in the assessment:

- When the nature of the proposed development is changed e.g. if a residential development is proposed, rather than a commercial development
- When the size or configuration of the proposed development is altered e.g. if a basement is added
- When the location or orientation of the proposed structure is modified
- When there is a change of land ownership, or
- For application to an adjacent site

ENVIRONMENTAL SITE ASSESSMENT FINDINGS ARE PROFESSIONAL ESTIMATES

Site assessment identifies actual sub-surface conditions only at those points where samples are taken, when they are taken. Data obtained from the sampling and subsequent laboratory analyses are interpreted by geologists, engineers or scientists and opinions are drawn about the overall sub-surface conditions, the nature and extent of contamination, the likely impact on any proposed development and appropriate remediation measures. Actual conditions may differ from those inferred, because no professional, no matter how qualified and no sub-surface exploration program, no matter how comprehensive, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than an assessment indicates. Actual conditions in areas not sampled may differ from predictions. Nothing can be done to prevent the unanticipated, however, steps can be taken to help minimise the impact. For this reason site owners should retain the services of their consultants throughout the development stages of the project in order to identify variances, conduct additional tests that may be necessary and to recommend solutions to problems encountered on site.

Soil and groundwater contamination is a field in which legislation and interpretation of legislation by government departments is changing rapidly. Whilst every attempt is made by Geotechnique Pty Ltd to be familiar with current policy, our interpretation of the investigation findings should not be taken to be that of the relevant authority. When approval from a statutory authority is required for a project, approval should be directly sought.

STABILITY OF SUB-SURFACE CONDITIONS
Sub-surface conditions can change by natural processes and site activities. As an environmental site assessment is based on conditions existing at the time of the investigation, project decisions should not be based on environmental site assessment data that may have been affected by time. The consultant should be requested to advise if additional tests are required.

ENVIRONMENTAL SITE ASSESSMENTS ARE PERFORMED FOR SPECIFIC PURPOSES AND CLIENTS
Environmental site assessments are prepared in response to a specific scope of work required to meet the specific needs of specific individuals e.g. an assessment prepared for a consulting civil engineer may not be adequate to a construction contractor or another consulting civil engineer.

An assessment should not be used by other persons for any purpose or by the client for a different purpose. No individual, other than the client, should apply an assessment, even for its intended purpose, without first conferring with the consultant. No person should apply an assessment for any purpose other than that originally contemplated, without first conferring with the consultant.

MISINTERPRETATION OF ENVIRONMENTAL SITE ASSESSMENTS
Costly problems can occur when design professionals develop plans based on misinterpretation of an environmental site assessment. In order to minimise problems, the environmental consultant should be retained to work with appropriate design professionals, to explain relevant findings and to review the adequacy of plans and specifications relative to contamination issues.

LOGS SHOULD NOT BE SEPARATED FROM THE REPORT
Borehole and test pit logs are prepared by environmental scientists, engineers or geologists, based upon interpretation of field conditions and laboratory evaluation of field samples. Logs are normally provided in our reports and these would not be redrawn for inclusion in site remediation or other design drawings, as subtle but significant drafting errors or omissions may occur in the transfer process. Photographic reproduction can eliminate this problem, however, contractors can still misinterpret the logs during bid preparation if separated from the text of the assessment. Should this occur, delays and disputes, or unanticipated costs may result.

To reduce the likelihood of borehole and test pit log misinterpretation, the complete assessment should be available to persons or organisations involved in the project, such as contractors, for their use. Denial of such access and disclaiming responsibility for the accuracy of sub-surface information does not insulate an owner from the attendant liability. It is critical that the site owner provides all available site information to persons and organisations, such as contractors.

READ RESPONSIBILITY CLAUSES CLOSELY
An environmental site assessment is based extensively on judgement and opinion; therefore, it is necessarily less exact than other disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. In order to aid in prevention of this problem, model clauses have been developed for use in written transmittals. These are definitive clauses, designed to indicate consultant responsibility. Their use helps all parties involved recognise individual responsibilities and formulate appropriate action. Some of these definitive clauses are likely to appear in the environmental site assessment and you are encouraged to read them closely. Your consultant will be happy to give full and frank answers to any questions you may have.