



School Infrastructure NSW
c/- Richard Crookes Constructions

Edmondson Park Public School
Unexpected Finds Protocol

Part 1 & 2, DP 1257105
Buchan Avenue, Edmondson Park, NSW

16 August 2021

60756/139,860 (Rev A)

JBS&G

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1. Introduction

1.1 Background

JBS&G Australia Pty Ltd (JBS&G) was engaged by Richard Crookes Construction (RCC, the client) on behalf of School Infrastructure NSW (SINSW) to prepare an Unexpected Finds Protocol (UFP) for the construction of the proposed Edmondson Park Primary School (EPPS), located at Buchan Avenue, Edmondson Park, NSW (the site) as shown in **Figure 1 (Attachment 2)**. The site is legally identified as part Lots 1 and 2 on DP 1257105 and comprises part of the former Landcom Precinct 9 Edmondson Park Town Centre redevelopment site. The site has an area of approximately 6 hectares (ha), of which approximately 2 ha are proposed to be the subject of site preparation and bulk earthworks activities.

As part of a broader land parcel, the site has previously been the subject of environmental assessment, remediation and validation activities (JBS 2013¹) and a subsequent site audit (Environ 2013²) that identified the site as being suitable for the purposes of ‘residential with gardens and accessible soil’ and other less sensitive uses including schools, open space and commercial, subject to compliance with the environmental management plan (EMP) relevant to the proposed open space areas within RZNRA (JBS&G 2013³). This EMP does not relate to the footprint of this site.

The site is a portion of a greater area formerly used by Department of Defence as a training facility. Investigation of the greater site area identified military objects (concertina wire, weapons pits, etc.), waste material on the ground surface and buried in pits and trenches, unexploded ordnance (UXO), exploded ordnance waste (EOW) and small arms ammunition (SAA) from military training exercises, and lead impacted material used to form tracks. Remediation of the site was undertaken to remove waste material, UXO, EOW and SAA, asbestos and lead impacted material. UXO, EOW and SAA was generally disposed off-site, whilst lead and asbestos impacted material was retained within land situated to the south of the railway line, remote from the site.

Since the finalisation of the remediation/validation works and issue of the final site audit statement (Environ 2013), the site has been managed by Landcom, or an appointed principal contractor as associated with subdivision construction activities nearby to the site. This resulted in use of the site at times as a temporary stockpiling yard for broader site generated excess fill material.

To support the submission of the state significant development approval (SSDA) process with the Department of Planning, Industry and Environment (DPIE) (SSD 10224), an additional Environmental Site Assessment (ESA) was completed in 2021 (JBS&G 2021⁴) to document site conditions current at the time of the planning proposal. This assessment, based on the review of existing environmental data sets obtained following removal of temporarily stockpiled material, concluded that there were no potential unacceptable health risks with respect to the proposed development and that it is considered that the site is suitable for residential with accessible soil land uses, including gardens and accessible soil, day care centre, pre-school, primary and secondary school and park, recreational open space, playing fields without the preparation of a Remedial Action Plan.

The previous reports did not identify any presence of contamination at the site that would require a specific remediation or management strategy for the proposed primary school works. A UFP is required to facilitate the construction of the proposed Primary School and to satisfy a

¹ Validation Report – RZNRA, prepared for Landcom, Zouch Road, Edmondson Park. JBS Environmental. 24 September 2013 (JBS 2013)

² Site Audit Report – Residential Zone North of Rail Alignment, Zouch Road Edmondson Park NSW, prepared for Landcom, ENVIRON Australia Pty Ltd. October 2013 (Environ 2013)

³ Urban Growth, Public Open Space, Site Environmental Management Plan, Residential Zone North of Rail Alignment, Zouch Road, Edmondson Park, NSW, JBS&G (NSW & WA) Pty Ltd. 2 September 2013 (JBS&G 2013)

⁴ Environmental Site Assessment - Proposed Public School, Buchan Avenue, Edmondson Park NSW. JBS&G 21 May 2021, prepared for School Infrastructure NSW c/- Richard Crookes Constructions (JBS&G 2021)

recommendation of the NSW EPA in response to submission of Environmental Impact Statement (SSD 10224) to ensure appropriate management of any small scale impacts that may be encountered during inground works for the proposed development which has not previously been assessed or identified.

1.2 Objective

The objective of this document is to provide an appropriate UFP presenting a framework documenting the actions required to adequately protect human and environmental health should small scale unexpected finds relating to potential soil and/or groundwater contamination be identified during the proposed development works.

2. Unexpected Finds Protocol

2.1 Unexpected Finds Identification

Previous contamination assessments and subsequent validation of the site completed between 2013 and 2021 (as noted in **Section 1.1**) did not identify any contaminants in soil at concentrations that would pose an unacceptable risk to potential future users, assuming the adjoining land is developed for residential use. However, due to the inherent limitations of intrusive investigations at discrete sampling locations, there is the possibility that unexpected materials may be encountered during future inground works.

It is understood that the broad site area was historically used for Department of Defence as a training facility and then following a program of remediation, including instrumental clearance of UXO, EOW and SAA, has been vacant apart from periodic use for the temporary stockpiling of excavated material during subdivision works on adjoining parcels. Based on experience, it is expected that the nature of any contaminant hazards which may be present at a site of this type is generally detectable through visual or olfactory means, as shown in **Appendix A**, and may include:

- petroleum contaminated soils (staining / discolouration visible, odours);
- asbestos containing material (ACM) in or on soils (visible, with exception of free asbestos (FA) fibres and asbestos fines (AF));
- construction / demolition / general waste (visible);
- ash and/or slag contaminated soils / fill materials (visible);
- remnant UXO, EOW and SAA (visible);
- burnt material (visible); and
- unknown stockpiled/dumped/buried material.

As a precautionary measure to ensure the protection of the workforce, surrounding community and future site users, should any of the abovementioned substances be identified during inground works (or any other unexpected potentially hazardous substance), the procedure summarised in **Appendix B** and detailed in the following sections is to be followed.

An enlarged version of the unexpected finds protocol, suitable for use on site, should be posted in the Site Office and referred to during the Site Specific Induction by the Principal Contractor.

2.2 Unexpected Finds Register

All unexpected finds identified on site should be documented in an unexpected find register by the Principal Contractor. An example register is provided in **Appendix C**. A copy should be made available onsite to allow initial documentation of any unexpected finds and to provide a record of successfully managed unexpected finds.

2.3 Assessment of Unexpected Finds

The sampling strategy for each 'unexpected find' shall be designed by a suitably qualified and experienced environmental consultant, in accordance with guidelines made or endorsed by EPA. The strategy will, however, be aimed at determining the nature of the substance – that is, is it hazardous and, if so, is it at concentrations which pose an unacceptable risk to human health or the environment.

The assessment strategy will specifically consider both short term exposure/management risks associated with the roundabout works and the potential long term considerations associated with future use of the site.

The assessment approach for the identified substance / materials shall meet the requirements NEPC 2013⁵ and EPA 1995⁶. Approaches to the assessment and management of potential unexpected finds are provided below.

2.4 Appropriate Assessment and Management Strategy

To enable timely planning in the event of any unexpected finds, the following indicative assessment and management strategies are outlined in advance of project commencement. Specific consideration of the suitability of each strategy will be undertaken upon identification of each unexpected find by the appointed environmental consultant.

2.4.1 General Management Strategy

It is anticipated that excavation of unexpected finds and offsite disposal is the most likely management strategy to be implemented for small / minor unexpected finds. All soil requiring offsite disposal will be classified, managed and disposed in accordance with the Waste Classification Guidelines (EPA 2014⁷) or EPA waste exemptions if appropriate. Documentary evidence for all soil disposal shall be maintained and provided to the appointed environmental consultant for inclusion within validation advice or an overarching validation report documenting the close out of unexpected finds management activities during the works.

2.4.2 Asbestos

All known instances of asbestos contamination have been remediated and validated in the prior works completed on the site. The identification of additional ground surface and/or buried materials known or suspected to contain asbestos will trigger implementation of assessment activities as per the Unexpected Finds Protocol (**Appendix B**).

Should significant asbestos unexpected finds or impacts be identified during the initial assessment, the assessment may identify that alternative remedial works procedures to excavation and off-site disposal are more appropriate to address the finds. Where such conditions are encountered, one or more of the following procedures may be considered most appropriate to address/ remediate the identified impacts. Consideration of the suitability of the various options will be undertaken with SINSW and its representatives in addition to the Principal Contractor.

In addition to consideration of NSW EPA endorsed guidance for contaminated land, the presence of asbestos will also trigger compliance with the requirements of NSW Work Health and Safety legislation, regulations and Codes of Practice^{8, 9}.

2.4.2.1 Assessment of ACM Impacted Materials

If bonded (non-friable) asbestos containing material (ACM) is identified within buried material rather than on the surface, dependant on the extent and/or quality of the material, asbestos quantification may be a suitable option to assess the potential suitability of such material to remain on site and so reduce costs associated with offsite disposal.

Potential areas of fill can undergo quantification assessment to establish if the concentrations of asbestos in soil are within the acceptable NSW EPA endorsed NEPC 2013 site criteria applicable for

⁵ *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1)*, National Environment Protection Council (NEPC 2013).

⁶ *Contaminated Sites Sampling Design Guidelines* NSW EPA, September 1995 (EPA 1995)

⁷ *Waste Classification Guidelines – Part 1: Classification of Waste*. NSW Environment Protection Authority, EPA 2014/0796, November 2014 (EPA 2014)

⁸ *How to Manage and Control Asbestos in the Workplace: Code of Practice*. Safe Works Australia dated September 2019 (SWA 2019a)

⁹ *How to Safely Remove Asbestos: Code of Practice*. NSW Safe Works Australia dated 2019 (SWA 2019b)

the appropriate proposed land use (residential). The outcome of the assessment will determine the options for reuse and/or requirements for remediation of the identified material.

2.4.2.2 Asbestos Quantification

To assess the material via quantification methods, a systematic grid would be used to characterise the material by environmental consultant/hygienist qualified, trained and experienced in the identification of asbestos.

Test pits will be advanced through the impacted material until non-impacted materials are identified. At each test pit location, each different soil identified from the test pits will be placed on a plastic sheet and spread out so that a maximum height of 0.1 m. The soil on the plastic sheeting shall be raked and handpicked with all identifiable ACM placed in an appropriate bag. The approximate mass of the soil will be calculated using a soil density of 1.6 g/cm³. The collected ACM will be weighed using a calibrated scale with an accuracy of 1 g. Selected ACM samples may be sent to the laboratory to confirm the presence of asbestos. Soil samples will also be collected which will be sent to a laboratory to assess the soils for the presence of friable asbestos/asbestos fines.

2.4.2.3 Assessment Criteria

Concentrations of friable asbestos/asbestos fines and of bonded ACM in soil as documented via field sampling will be assessed against the adopted site criteria (residential) derived from NEPC (2013).

In addition, the criteria will be considered met where the top 100 mm of soil is free of visible asbestos.

Where the concentrations are reported below the adopted criteria, the material will be considered suitable for use within the site without ongoing management.

Where soil is identified above the adopted criteria, the soil will require on-site treatment, off-site disposal to a licenced facility with appropriate waste classification documentation) or onsite management.

2.4.2.4 Asbestos Management Procedure

All asbestos removal works must be carried out by an appropriately licenced (Class A or Class B) contractor depending on the type (friable or non-friable) and amount (greater than 10 m² of non-friable ACM) to be removed.

If less than 10 m² of non-friable ACM is to be removed, a licence is not required but the person or persons undertaking the works must be trained in the identification and safe handling of asbestos prior to undertaking the works. The person(s) is also required to comply with the duties as outlined in SafeWork Australia (SWA 2019a & SWA 2019b).

During any remediation works associated with asbestos, dust suppression will be required at all times.

2.4.2.5 General Waste Impacted Material

Any general waste material in fill materials should be inspected by an appropriately qualified and experienced environmental consultant, and if required will be sampled and analysed for relevant contaminants. The extent of impact may be determined by excavation of the unexpected find or by test pitting on a grid pattern surrounding the location of the unexpected find.

General waste material can pose an aesthetic issue if present in sufficient quantities and may require assessment to assist with management of soil.

If assessment deems the general waste material unsuitable for the proposed land use, this material will require remediation or management. For minor unexpected finds it is likely that waste classification, excavation and offsite disposal at a licensed waste disposal facility will be the

preferred method of management. Waste for disposal should be classified, managed and disposed in accordance with the Waste Classification Guidelines (EPA 2014).

Uncontrolled filling may also present compaction and geotechnical issues, which would require assessment by appropriately qualified and experienced geotechnical engineers.

2.4.3 UXO, EOW and SAA items

Where suspected items of UXO, EOW and/or SAA are identified by site workers, the find should be managed as per the following:

- The surrounding area should be immediately evacuated of all workers to a distance of at least 50 m and where possible, the area isolated from members of the public.
- The Police should be contacted as soon as practicable via the emergency services number, 000, to report the find's location. Details of the location, a description of the shape, colour, material and approximate dimensions of the item should be provided where possible (without touching the item).
- Contact the project site superintendent and site owner (SINSW) to report the location of the find and provide a Police reference number.
- The Police will arrange for appropriately trained military explosives personnel to attend site and remove it.
- Works should not recommence until such time as the Police or defence personnel have provided the 'all clear' to return to the area.

Following the occurrence, records of the nature of the UXO, EOW and/or SAA and location, and actions taken, should be maintained by the project superintendent and SINSW.

2.4.4 Petroleum / Chemically Impacted Soils

Should any malodorous, stained or otherwise impacted soils be observed, the unexpected find should be inspected and sampled by an appropriately qualified and experienced environmental consultant consistent with NEPC (2013) and EPA guidelines.

Soil analytical data will be assessed against the validation criteria in **Appendix D**, classified according to the Waste Classification Guidelines (EPA 2014) or compared against relevant waste exemptions to determine the management of the soils. Soils not suitable to be retained onsite will require offsite disposal to an appropriately licensed waste disposal facility.

2.4.5 Stockpiled / Fly-tipped Material

Unexpected finds comprising stockpiles or illegally dumped material will be inspected by an appropriately qualified and experienced environmental consultant and assessed in accordance with NEPC (2013) and EPA guidance, as detailed in **Table 2.1** below if they are intended for site re-use or waste disposal.

Table 2.1: Stockpile Sampling Frequency

Stockpile Volume (m ³)	Number of Samples
<75	3
75 - <100	4
100 - <125	5
125 - <150	6
150 - <175	7
175 - <200	8
> 200	1 sample per each additional 100 m ³ above 200 m ³

Per NEPC 2013, lower sampling frequency rates are applicable for soil quantities greater than 200m³ by applying statistical analysis.

Stockpiled spoil may be able to be assessed under NSW EPA waste exemptions, such as excavated natural material (ENM), subject to advice from an environmental consultant.

If ACM is present the stockpiles will either require assessment and off-site disposal as mixed special waste in accordance with EPA (2014), or assessment in accordance with NEPC (2013) and WA DoH (2009)¹⁰ to reduce ACM to acceptable levels for on-site reuse at depth or below structures.

Stockpiled or spoil materials that satisfy the site validation criteria presented in **Appendix D** (as well as aesthetic criteria) may be reused onsite. Stockpiled or spoil material that does not meet the site validation criteria or aesthetic criteria will require offsite disposal, to an appropriately licensed waste disposal facility or may be removed off-site under EPA waste exemptions where appropriate. Appropriate waste classification documentation will be required prior to off-site disposal of any soils.

2.4.6 Personal Protective Equipment (PPE) Requirements

2.4.6.1 Asbestos

Should ACM be identified during the development works, appropriate PPE will be required while working within the nominated asbestos removal works boundaries. The PPE will be required for any ground workers within the asbestos works area. The PPE required is:

- Disposable 'Tyvek' coverall suit must be worn;
- Disposable gloves – non-disposable glove must be cleaned within the decontamination unit (if required) in accordance with Safe Work Australia (2019b);
- P2 class respirator or higher – non disposable respirators must be cleaned in the decontamination unit (if present) in accordance with Safe Work Australia; and
- Laceless steel capped rubber soled work shoes or gumboots.

Plant operators must close cabin doors and windows and set air conditioning to re-circuit when operating within asbestos work areas.

It is noted that further PPE may be required depending on the unexpected find.

2.4.6.2 Non-Asbestos

Where non asbestos impacted soil is identified, the appropriate PPE will be considered on a case by case basis. The additional PPE required (in addition to those required on the construction site) may include but is not limited to:

- Respirators where volatile chemicals are identified;
- 'Tyvek' coverall suits; and
- Gloves.

2.5 Validation of Unexpected Finds

Validation inspection and possible sampling/analysis is required to be undertaken to demonstrate that unexpected finds have been managed to a standard suitable for the proposed land use.

2.5.1 Assessment / Validation Criteria

It is understood that the future use of the site will be as a primary school. The applicable EPA endorsed generic assessment/validation criteria for residential land use are health investigations levels (HILs) for residential with garden/accessible soil (home grown produce <10% fruit and vegetable intake (no poultry), also includes childcare centres, preschools and primary schools

¹⁰ *Guidelines for the Assessment Remediation and Management of Asbestos Contaminated Sites in Western Australia*, WA Department of Health, May 2009 (WA DoH 2009).

provided in NEPC (2013). Health and ecological investigation / screening levels (HIL-A, NEPC 2013) are proposed to be adopted as the assessment and validation criteria for unexpected contamination finds on the site. The adopted site criteria for unexpected finds are tabulated in **Appendix D**.

Statistical assessment of the data, consistent with NEPC (2013) guidance may be appropriate, depending on the characteristics of each unexpected find. Alternate criteria may be appropriate in the event there are no NEPC (2013) or other EPA endorsed criteria available, subject to assessment by an appropriately qualified and experienced environmental consultant.

In addition to the numerical criteria, consideration shall be given to the presence of odorous or discoloured soils (caused by contamination).

2.5.2 Clearance / Validation Reporting

Clearance / validation letter reports will be prepared at the completion of the management of each unexpected find. The clearance / validation letter will be prepared in general accordance with relevant EPA published or endorsed guidelines, documenting the works undertaken.

The letter report will generally contain:

- Details on type of contaminant, size, extent and location of the unexpected find;
- Information demonstrating that the unexpected find was adequately assessed (including sampling plan, all relevant analytical or observational data, QA/QC);
- Information on the remediation / management of the unexpected find (such as disposal dockets from a licensed waste facility or asbestos surface picking);
- Information on the clearance / validation of the unexpected find to meet the adopted site criteria (including all relevant analytical and / or observational data); and
- Advice on the removal of temporary exclusion zones and return to work as per the Unexpected Find Protocol (see Flowchart in **Appendix B**).

3. Limitations

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only, and has been based in part on information obtained from the client and other parties.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

JBS&G accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by JBS&G, and should not be relied upon by other parties, who should make their own enquiries.

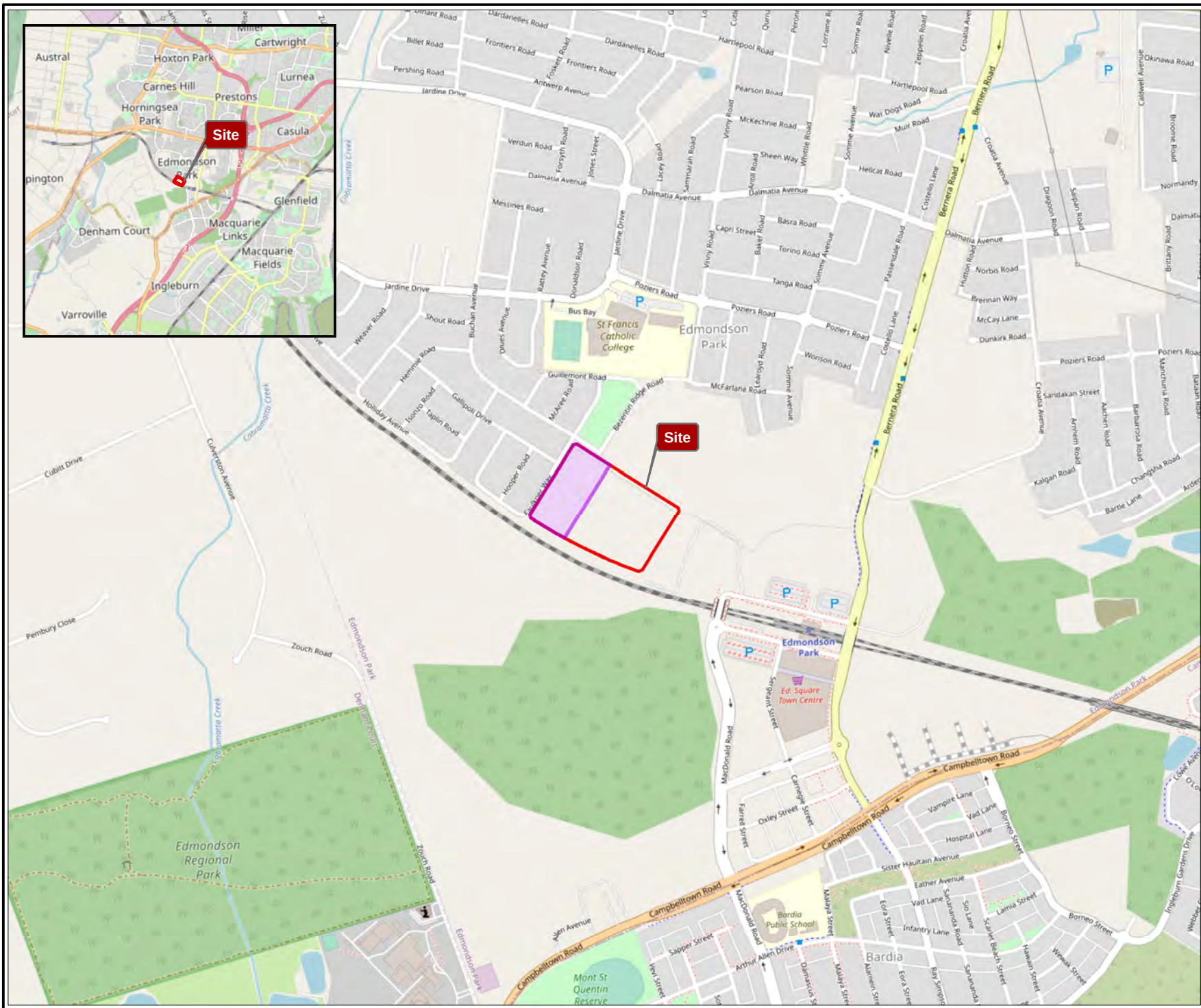
Sampling and chemical analysis of environmental media is based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate based on the regulatory requirements.

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

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

This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope defined herein. Should information become available regarding conditions at the site including previously unknown sources of contamination, JBS&G reserves the right to review the report in the context of the additional information.

Figures



Legend

Approximate Site Boundary

Proposed Public School Site



Job No: 60756

Client: Richard Crookes Construction

Version: R03 Rev A

Date 13/08/2021

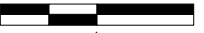
Drawn By: JA

Checked By: MD

Scale 1:12,500



0160320

metres

Coord. Sys. GDA 1994 MGA Zone 56

Edmondson Park, NSW

SITE LOCATION

FIGURE 1

File Name: N:\Projects\Richard Crookes\60756 Ed Park Precinct 9\GIS\Maps\R01 Rev A\60756_01_SiteLocation.mxd
Reference: © OpenStreetMap (and) contributors, CC-BY-SA



- Legend**
- Approximate Site Boundary
 - NSW Cadastre (DFS1, 2021)
 - Proposed Public School Site



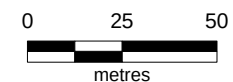
Job No: 60756

Client: Richard Crookes Construction

Version: R03 Rev A Date 13/08/2021

Drawn By: JA Checked By: MD

Scale 1:2,000



Coord. Sys. GDA 1994 MGA Zone 56

Edmondson Park, NSW

SITE LAYOUT

FIGURE 2

Appendix A Unexpected Finds Summary

BE AWARE UNEXPECTED HAZARDS MAY BE PRESENT



drums



asbestos



chemical bottles



staining



odour

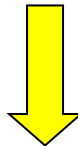


ash / slag

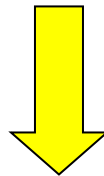


demolition waste

if you SEE or SMELL anything

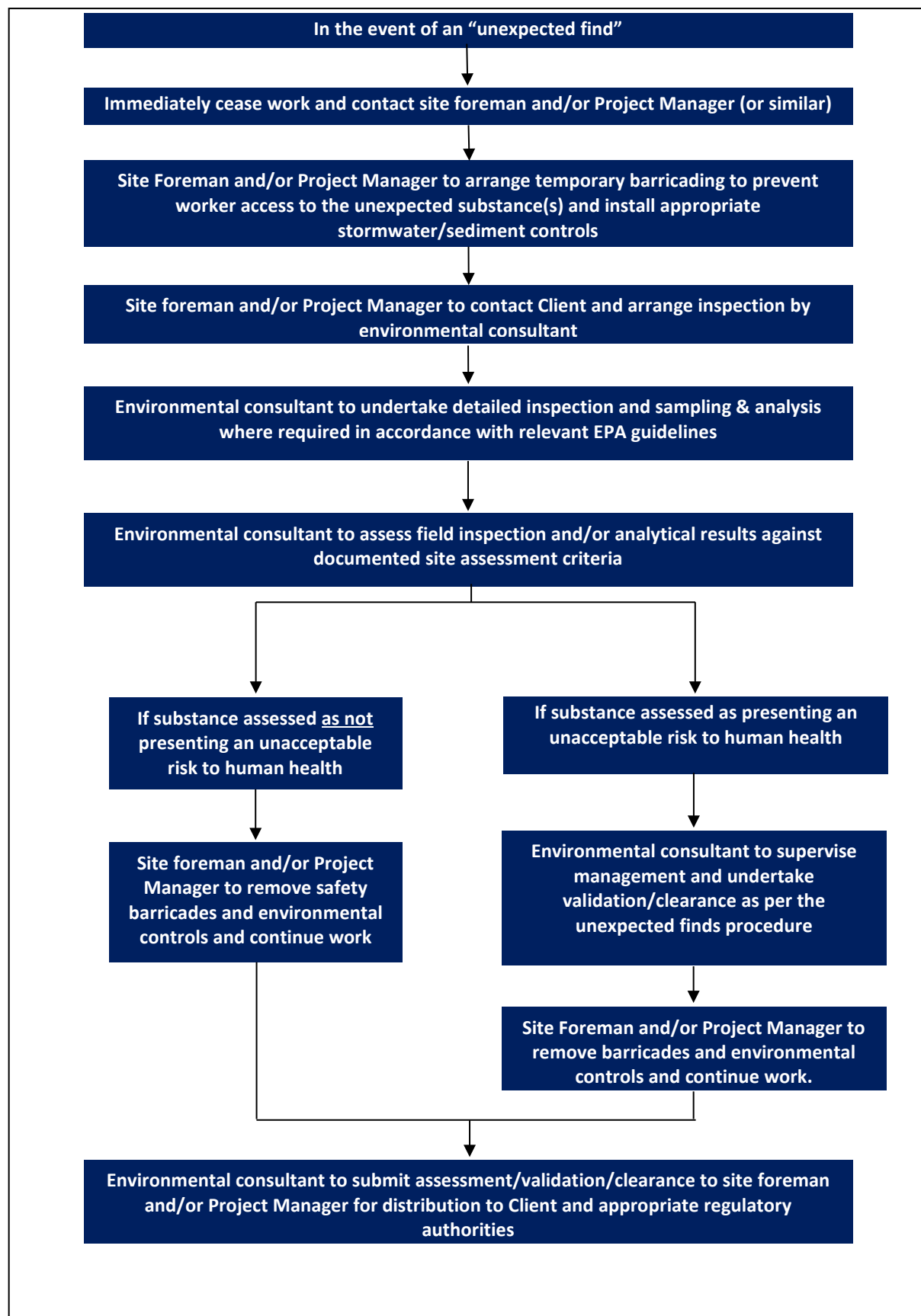


STOP WORK & contact the Site Foreman



do not restart working before the area has been investigated
and cleared by an Environmental Consultant

Appendix B Unexpected Finds Protocol Flowchart



Appendix C Unexpected Finds Register

Edmondson Park Public School Unexpected Finds Register

Unexpected Find ID	Contaminant Identified	Location	Characterisation Sample Lab Batch	Classification	Validation Sample Lab Batch	Validation Achieved?

Appendix D Adopted Site Validation Criteria

Table A: Health Based Soil Investigation Criteria (All units in mg/kg)

	Limit of Reporting	Laboratory Method	Health Based Assessment Criteria		
			Residential HIL-A ¹	Screening Level – Vapour intrusion	Management Limits – Residential / Parkland
METALS					
Arsenic	2.0	ICP-AES (USEPA 200.7)	100	-	-
Cadmium	0.4	ICP-AES (USEPA 200.7)	20	-	-
Total Chromium	1.0	ICP-AES (USEPA 200.7)	100	-	-
Copper	1.0	ICP-AES (USEPA 200.7)	6 000	-	-
Nickel	1.0	ICP-AES (USEPA 200.7)	400	-	-
Lead	1.0	ICP-AES (USEPA 200.7)	300	-	-
Zinc	1.0	ICP-AES (USEPA 200.7)	7 400	-	-
Mercury (inorganic)	0.05	Cold Vapour ASS (USEPA 7471A)	40	-	-
TRH					
F1 C ₆ -C ₁₀	20	Purge Trap-GCMS (USEPA8260)	-	-	800
F2 >C ₁₀ -C ₁₆	50	Purge Trap-GCMS (USEPA8260)	-	50/280*	1000
F3 >C ₁₆ -C ₃₄	100	Purge Trap-GCFID (USEPA8000)	-	-	3500
F4 >C ₃₄ -C ₄₀	100	Purge Trap-GCFID (USEPA8000)	-	-	10000
BTEX					
Benzene	0.1	Purge Trap-GCMS (USEPA8260)	-	0.7	-
Toluene	0.1	Purge Trap-GCMS (USEPA8260)	-	480	-
Ethylbenzene	0.1	Purge Trap-GCMS (USEPA8260)	-	NL	-
Total Xylenes	0.3	Purge Trap-GCMS (USEPA8260)	-	110	-
Naphthalene	0.1	Purge Trap-GCMS (USEPA8260)	-	5	-
OCPs					
DDT + DDD + DDE	0.3	GCECD (USEPA8140,8080)	240	-	-
Aldrin + Dieldrin	0.2	GCECD (USEPA8140,8080)	6	-	-
Chlordane	0.1	GCECD (USEPA8140,8080)	50	-	-
Endosulfan	0.3	GCECD (USEPA8140,8080)		-	-
Endrin	0.1	GCECD (USEPA8140,8080)	10	-	-
Heptachlor	0.1	GCECD (USEPA8140,8080)	6	-	-
Methoxychlor	0.1	GCECD (USEPA8140,8080)	300	-	-
PAHs					
Carcinogenic PAHs (as B(a)P TPE)	0.5	GCMS (USEPA8270)	3	-	-
Total PAHs	0.5	GCMS (USEPA8270)	300	-	-
PCBS					
PCBs (total)	0.5	GCECD (USEPA8140,8080)	1	-	-

*F1 (C₆-C₁₀ minus BTEX)/ F2 (C₁₀-C₁₆ less Naphthalene)

Table B: Ecological Based Soil Investigation Criteria (all units in mg/kg)

	Limit of Reporting	Laboratory Method	Ecological Investigation/ Screening Levels	
			Residential Site Specific EIL ²	Urban Residential for fine soil ESL
METALS				
Arsenic	2.0	ICP-AES (USEPA 200.7)	50	-
Cadmium	0.4	ICP-AES (USEPA 200.7)	-	-
Total Chromium	1.0	ICP-AES (USEPA 200.7)	230	-
Copper	1.0	ICP-AES (USEPA 200.7)	100	-
Nickel	1.0	ICP-AES (USEPA 200.7)	75	-
Lead	1.0	ICP-AES (USEPA 200.7)	270	-
Zinc	1.0	ICP-AES (USEPA 200.7)	180	-
TRH				
F1 C ₆ -C ₁₀	20	Purge Trap-GCMS (USEPA8260)	-	
F2 >C ₁₀ -C ₁₆	50	Purge Trap-GCMS (USEPA8260)	-	180/120*
F3 >C ₁₆ -C ₃₄	100	Purge Trap-GCFID (USEPA8000)	-	1300
F4 >C ₃₄ -C ₄₀	100	Purge Trap-GCFID (USEPA8000)	-	5600
BTEX				
Benzene	0.1	Purge Trap-GCMS (USEPA8260)	-	65
Toluene	0.1	Purge Trap-GCMS (USEPA8260)	-	105
Ethylbenzene	0.1	Purge Trap-GCMS (USEPA8260)	-	125
Total Xylenes	0.3	Purge Trap-GCMS (USEPA8260)	-	-
Naphthalene	0.1	Purge Trap-GCMS (USEPA8260)	170	-
OCPs				
DDT + DDD + DDE	0.3	GCECD (USEPA8140,8080)	180	-
PAHs				
Benzo(a)pyrene	0.5	GCMS (USEPA8270)	-	0.7

Asbestos in soil thresholds adopted for the site assessment are nominated in **Table C** below.

Table C: Asbestos in Soil Health Based Assessment Criteria (all units in mg/kg)

Form of Asbestos	Health Screening Level (w/w)
	Residential with accessible soil (ResA)
Bonded ACM	0.01 %
Fibrous asbestos or asbestos fines ³	0.001 %
All forms of asbestos	No visible ACM for surface soil (0 – 0.1 m bgl).

PFAS in soil thresholds adopted for the site assessment are presented in **Table D** below.

Table D: PFAS in Soil Health Based Assessment Criteria (all units in mg/kg)

	Limit of Reporting	Laboratory Method	Health - Residential with accessible soil
Perfluorooctanoic acid (PFOA)	0.005	USEPA 537 Version 1.1	0.1
Perfluorohexanesulfonic acid (PFHxS)	0.005	USEPA 537 Version 1.1	0.01
Perfluorooctanesulfonic acid (PFOS)	0.005	USEPA 537 Version 1.1	0.01
Sum of PFHxS and PFOS	0.005	USEPA 537 Version 1.1	0.01

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