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Report on
Detailed Site (Contamination) Investigation

Proposed North Kellyville New Primary School
120-126 Hezlett Road, North Kellyville

Prepared for
GHD Pty Ltd

Project 85998.01
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1. Introduction

This report presents the results of a detailed site (contamination) investigation (DSI) undertaken at 120-126 Hezlett Road, Kellyville (Drawing 1, Appendix A). The DSI was commissioned by Mike Warren of GHD Pty Ltd and was undertaken in accordance with Douglas Partners Pty Ltd (DP) proposal SYD170387.P.001.Rev1 dated 10 May 2017.

DP understands that the site is proposed for a new primary school. Whilst the final design details of the proposed school are not yet known, it is also understood from initial schematics that the primary school building will be located in the eastern portion of the site, whilst playing fields and extensions to Prentice and Hipwell Avenues will occupy the remainder of the site.

The objectives of the DSI were to:

- Assess the risk of contamination based on historical site use;
- Assess the nature of potential contamination at the site;
- Develop a conceptual site model identifying potential contamination sources, receptors and pathways;
- Provide recommendations for further investigations (if necessary) and/ or remediation and/ or management; and
- Comment on the suitability of the site for the proposed land use.

A preliminary waste classification has been included to inform the disposal requirements for excess spoil which could be generated from excavations.

The DSI was conducted with reference to guidelines produced or approved by the NSW EPA under Section 105 of the *Contaminated Land Management Act*, 1997, including:

- National Environment Protection Council (NEPC), National Environment Protection (Assessment of Site Contamination) Measure (NEPM) 1999 (as amended 2013);
- NSW Office of Environment & Heritage (OEH) 2011, *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Site;* and
- NSW EPA 1995, *Contaminated Sites: Sampling Design Guidelines*.

This DSI was undertaken in conjunction with a geotechnical investigation reported separately in DP Report 85998.00.R.001.

2. Scope of Works

The scope of works for the DSI included:

- Review of published geological, soil landscape and acid sulfate soil maps;
- Review of the NSW Office of Water groundwater database for registered groundwater bores in the vicinity of the site;
- Review of readily available historical aerial photographs to identify previous land uses that may indicate potential contamination;
- Review of current and historical titles deeds to identify previous owners that may indicate potentially contaminating activities;
- Review of Section 149 Planning Certificates provided by the client;
- Review of the NSW EPA Register for notices issued under the *Contaminated Land Management Act* 1997 and the *Protection of the Environment Operations Act* 1997;
- Review of the NSW Safework Stored Chemical Information Database to identify dangerous goods and thereby contamination sources that may have been kept on site;
- Review of Council records accessible under an informal application under the Government Information (Public Access) (GIPA) Act 2009;
- DBYD and service scanning at proposed test pit locations;
- Excavation of 71 test pits at least 0.5 m into natural soils or prior refusal;
- All test pits incorporated soil sampling at regular intervals and upon signs of contamination for potential chemical testing;
- Collection and testing of up to 10 asbestos samples for AF/FA;
- Collection and testing of any uncovered asbestos fragments for ID purposes;
- All fill samples were screened for volatiles using a calibrated photo-ionisation detector (PID);
- Laboratory analysis was conducted on selected soil (including replicate QA/QC samples) at a NATA accredited laboratory for combinations of the following potential contaminants:
  - Heavy metals - As, Cd, Cr, Cu, Pb, Hg, Ni, Zn;
  - Total recoverable hydrocarbons (TRH);
  - Monocyclic aromatic hydrocarbons (Benzene, Toluene, Ethylbenzene and Xylene – BTEX);
  - Polycyclic aromatic hydrocarbons (PAH);
  - Polychlorinated biphenyls (PCB);
  - Organochlorine pesticides (OCP);
  - Organophosphate pesticides (OPP);
  - Phenols;
  - and
  - Asbestos.
- Analysis of QA/QC samples including replicate soil, trip blank and rinsate;
- Analysis of cation exchange capacity (CEC) and pH analysis for calculation of environmental investigation levels;

- Analysis of toxicity characteristic leaching procedures (TCLP) for preliminary waste classification; and
- Provision of this DSI report.

3. Site Identification

For the purpose of this DSI "the site" refers to the area of the proposed school development, being part of Lot 101 in DP 1216659, as shown on Drawing 1, Appendix A. The site is located at 120-126 Hezlett Road, Kellyville and occupies an approximate area of 3.1 Ha. The site is located approximately 43 km North West of Sydney's CBD and is situated in the local government authority of the Hills Shire Council and zoned R1 General Residential and R2 Low Density Residential. Drawing 1, Appendix A shows the site location and boundary.

The site was largely vacant with previous structures on site having been demolished prior to the DP field investigation. A dam is located in the north western corner of the site, with an additional dam located outside the proposed school boundary on the proposed Hipwell Avenue extension. Adjacent land uses are dominated by low density residential development (south, east and west).

Table 1: Summary of Site Details

Street Address	120-126 Hezlett Road, Kellyville
Lot and Plan	Part Lot 101, DP 1216659
Size	Approximately 3.1 Ha
Current Zoning	R1 General Residential and R2 Low Density Residential
Current Use	Vacant Land

4. Site Geology, Topography and Hydrogeology

Geological mapping indicates that the site is underlain by Ashfield Shale typically comprising black to dark-grey shale and laminite. Landscape mapping sheets indicate that the site is also underlain by residual Blacktown soils comprising yellow, red and brown podzolic soils and soloths. This is consistent with the field observations made as part of this DSI (refer to Section 11).

A review of the NSW Acid Sulfate Soil Risk Map indicates that the site is located in an area with no known occurrence of acid sulphate soils.

The level of the site is at approximately 65-80 m AHD. Smalls Creek is located approximately 496 m to the south west of the site. Cattai Creek is located approximately 1190 m north east of the site. Both creeks flow in a south east to north west direction. Surface drainage direction at the site is difficult to identify due to the relatively flat nature of the area, however is anticipated to flow in a south west direction toward Smalls Creek.

A search of NSW Office of Water registered groundwater bores in the vicinity of the site indicated one bore located at the end of Halloway Street drilled to a depth of 128 m (approximately 280 m south west of the site and hydraulically down-gradient). Information was available for the bore, with a full work summary attached in Appendix C.

Groundwater flow direction at the site is anticipated to be in a south west direction based on topography and local water sources.

5. Historical Information

The desktop component of this investigation involved a review of historical information relating to potential contamination sources at the site. Relevant findings are provided below and are based on a review of:

- Aerial photographs;
- Title deeds;
- Section 149 Planning Certificates;
- Regulatory Notices
- Dangerous Goods records; and
- Council records.

The historical review documents are provided in Appendix C.

5.1 Aerial Photograph Review

Historical aerial photographs were obtained from databases held by the NSW Department of Property and Land Information Division for the years 1930, 1961, 1970, 1986, 1991, 1994 and 2005. SixMaps and Nearmap images were used for the years 1943 and 2017 respectively. Extracts of the photographs are provided in Appendix C and a summary of the features observed on the site and the surrounding land is presented in Table 2 below.

The historical aerial photographs were observed for information on past land uses and changes to the site and surrounding areas, in particular those of a potentially contaminating nature.

Table 2: Historical Aerial Photograph Summary

Year	Site Features	Surrounding Features
1930	The site is largely vacant other than what appears to be two crop fields and some natural bush land. Remnants of historical cropping are also evident.	The site surrounds comprise primarily of agricultural farming land to the east and natural bush land to the west, with no evidence of residential housing. Major roads can be seen joining the farmlands.

Year	Site Features	Surrounding Features
1943	No image available on SixMaps	No image available on SixMaps
1961	The bush land on the site has been removed and potential storage sheds have been built in its place. A residential house has also been constructed on the north eastern corner of the site. Virtually the whole of the site area comprises market gardens and a dam has been constructed on the north western boundary of the site.	An additional dam has been constructed adjacent to the western boundary of the site. Most surrounding subdivisions have constructed dams and additional housing and/or sheds. A larger industrial sized development with multiple sheds can be seen north of the site. Vacant land to the west appears unchanged.
1970	There is no significant change to the appearance of the site since 1961. What appears to be two additional sheds have been constructed west of the residential house on site. Other sheds have been removed from the centre of the site. Some development in the south west corner can also be seen.	Residential housing developments have increased on the surrounding farmlands as well as the construction of more industrial sized farm operations. Development of a dam, roads and some buildings can be seen on the previously vacant land to the south east.
1986	Active market gardening on the site appears to be in decline. A larger residential building has been constructed adjacent to the Hezlett Road frontage. No other significant changes can be seen in this photograph compared to the 1970 photograph.	Evidence of the surrounding bush being cleared for some residential developments to the far east and the addition of a few potential industrial developments can be seen.
1991	No significant changes can be seen in this photograph compared to the 1986 photograph.	Some further industrial and residential developments in the surrounds to the east and north have taken place.
1994	No significant changes can be seen in this photograph compared to the 1991 photograph.	No significant changes to the surrounds can be seen in this photograph compared to the 1991 photograph. Although, potential development of roads in the surrounding areas can be seen.
2005	No significant changes can be seen in this photograph compared to the 1994 photograph.	Significant change of vacant land to medium density residential housing area in the west and south of the surrounds. Further clearing of bush land can be seen in the north and eastern surrounds as well as the construction of some large industrial/commercial buildings in the north.

Year	Site Features	Surrounding Features
2017	No significant changes can be seen in this photograph compared to the 2005 photograph. However it is clear that market gardening ceased some time before. The spread of general debris is more prominent in the southern part of the site.	Areas surrounding the site have been substantially developed into low density residential housing.

5.2 Historical Title Deeds

An historical title deeds search was used to obtain ownership and occupancy information including company names and the occupations of individuals. The title information can assist in the identification of previous land uses by the company names or the site owners and can, therefore, assist in establishing whether there were potentially contaminating activities occurring at the site. A summary of the title deeds and possible land uses (with reference to the aerial photographs) is presented in the tables below. Leases were not investigated in detail as part of this search. A full copy of the search is included in Appendix C.

Table 3a: Search as regards Lot 100 and 101 D.P. 1216659, as regards to the whole of the subject lands

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Potential Land Use
28.08.1888 (1888 to 1927 – as regards the parts numbered 1 & 3 on the attached cadastre) 11.03.1890 (1890 to 1927) (1888 to 1927 – as regards the parts numbered 2 & 4 on the attached cadastre)	John Stranger (Orchardist)	Farming Land
08.09.1927 (1927 to 1927)	Leslie Stranger (Orchardist) Elihu Stranger (Orchardist) (Transmission Application not investigated)	Farming Land
21.10.1927 (1927 to 1927)	Gladys May Stranger (No occupation noted) Daisy Elizabeth Lill (No occupation noted) Dulcie Ann Stranger (No occupation noted)	Farming Land
21.10.1927 (1937 to 1946)	John Victor Carl Bye (Builder) Edith Annie Bye (Married Woman)	Farming Land
21.05.1946 (1946 to 1955)	Harold Leslie Worthing (Farmer)	Farming Land
09.09.1955 (1955 to 1955)	Alice Ursula Worthing (Widow) (Transmission Application not investigated)	Farming Land

Leases: -

- 28.07.1939 to Harold Leslie Worthing (Farmer) – expired 28.06.1946

Table 3b: Search continued as regards the parts tinted yellow and numbered (1) and (2) on the attached cadastre

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Potential Land Use
20.09.1955 (1955 to 1956)	Joan Naughton (Married Woman)	Farming Land
02.02.1956 (1956 to 1956)	Thomas George Maughan (Grocer)	Farming Land
14.12.1956 (1956 to 1959)	Peter Paul Camilleri (Farmer) Reno Camilleri (Farmer)	Farming Land
06.10.1959 (1959 to 1963)	Reno Camilleri (Farmer, now Market Gardener)	Market Garden
15.11.1963 (1963 to 1966)	Charlie Bugeja (Factory Worker) Philomena Bugeja (Married Woman)	Market Garden
09.06.1966 (1966 to 2014)	Zaren Bugeja (Market Gardener) Rose Bugeja (Married Woman)	Market Garden
14.07.2014 (2014 to date)	# Minister for Education	Market Garden

# Denotes Current Registered Proprietors

Table 3b: Search continued as regards the parts tinted yellow and numbered (3) and (4) on the attached cadastre

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Potential Land Use
20.09.1955 (1955 to 1956)	Joan Naughton (Married Woman)	Market Garden
01.06.1956 (1956 to 2003)	Paul Vello (Market Gardener) Now Paul Vella	Market Garden
27.06.2003 (2003 to 2013)	Sam Vella Now Salvator Joseph Vella Nina Vella Now Antonia Vella Christopher Vella Darren Vella	Unknown
18.09.2013 (2013 to date)	# Minister for Education	Vacant Land

# Denotes Current Registered Proprietor

Leases continued as regards both Lots 100 & 101 D.P. 1216659: - NIL

Easements continued as regards both Lots 100 & 101 D.P. 1216659: - NIL

The search indicates that the site has been used primarily as farming and market garden space prior to becoming vacant land. This is confirmed by the aerial photographs.

5.3 Council Section 149 Planning Certificates

Section 149 (2) and (5) Planning certificates made available to DP were reviewed for the site. The review indicated that:

- The site is currently zoned R1 General Residential and R2 Low Density Residential;
- The land has not been identified as significantly contaminated land within the meaning of the *Contaminated Land Management Act 1997* (CLM Act);
- The land is not subject to a management order within the meaning of the CLM Act;
- The land is not the subject of an approved voluntary management proposal within the meaning of the CLM Act;
- Council has not been provided with a site audit statement for this land;
- The land is not the subject of an ongoing maintenance order within the meaning of the CLM Act; and
- The land is not identified as Acid Sulfate Soils.

The Section 149 Planning certificates are attached in Appendix C.

5.4 Regulatory Notices Search

The Protection of the Environment Operations Act public register, published by NSW Environmental Protection Authority (EPA), contains information about environment protection licences and other regulatory information required under the *Protection of the Environment Operations Act 1997* (POEO Act). A search of the register on 19 June 2017 did not reveal any licences or information in regards to the site or neighbouring properties.

The Contaminated Land Record of Notices, published by NSW EPA, contains a database of:

- Orders made under Part 3 of the *Contaminated Land Management Act 1997* (CLM Act);
- Approved voluntary management proposals under the CLM Act that have not been fully carried out and where the approval of the NSW EPA has not been revoked;
- Site audit statements provided to the NSW EPA under section 53B of the CLM Act that relate to significantly contaminated land;
- Where practicable, copies of anything formerly required to be part of the public record; and
- Actions taken by EPA under section 35 or 36 of the *Environmentally Hazardous Chemicals Act 1985* (EHC Act).

A search of the record on 19 June 2017 did not reveal any notices for the site or nearby properties.

The NSW EPA provides a 'List of NSW contaminated sites notified to the EPA' for sites that have been notified to the NSW EPA about contamination under Section 60 of the *Contaminated Land Management Act 1997.* It should be noted that not all contaminated sites in NSW are listed. A search of the list on 19 June 2017 revealed that the subject site was not listed as a contaminated site.

5.5 Safework NSW Search

A search of the Stored Chemical Information Database held by Safework NSW revealed no known licenses or records to store dangerous goods on-site.

A copy of the Dangerous Goods Search is attached in Appendix C.

5.6 Review of Council Records

An application was made by DP to The Hills Shire Council on the 7 July 2017. Council have indicated that there are no records for 56 – 58 Hezlett Road, North Kellyville due to the age of the original file which has since been destroyed. Current records for the site only pertain to the current proposed subdivision which can be viewed via the online council DA Tracker.

6. Site Walkover

An environmental scientist from DP attended the site on 15 June 2017.

At the time of the walkover the site was unoccupied. Previous dwellings on the site consisted of residential houses and a number of detached structures. All buildings had been previously demolished and removed from site prior to DPs arrival onsite (Photograph 1 and 2). The site was predominantly covered by grass and some low lying shrubs in some areas (Photograph 3). A small dam was located to the north west of the site (Photograph 4). Shallow shale bedrock was observed along the southern boundary of the dam. A suspected asbestos contaminated soil stockpile was observed to the south west of the dam with an approximate volume of 5 m^3. The suspected asbestos containing stockpile to the south east of the dam was observed to have been removed sometime between the initial site walkover and sampling events at the site.

The northern boundary of the dam appeared to have been bunded up approximately three metres from the property immediately north of the site during the construction of the dam (Photograph 5). Bund materials observed consisted of shaly clay material which was consistent with natural material observed throughout the site. Potential asbestos containing material (ACM) was identified on the ground surface and sampled in a small area on the eastern edge of the dam, designated as AA on Drawing 2, Appendix A; however this was prior to asbestos removal and clearance by the asbestos assessor.

At the time of the walkover, access was restricted to the previous building footprints due to the presence of suspected ACM until clearance and validation had been conducted. DP conducted sampling of this area following a clearance inspection by an external licensed asbestos assessor.

Building rubble and ACM were observed on the ground surface in these areas of the site after the clearance inspection had been conducted, as indicated in Drawing 2, Appendix A, as well as small stockpiles of mulch on the eastern boundary of the site (Photograph 6, 7 and 8).

A grass covered stockpile was observed on the southern boundary adjacent to the previously demolished structure (Photograph 9) as shown on Drawing 2, Appendix A. DP undertook sampling of the stockpile at the request of the client. The stockpile was estimated at about 300 cubic metres.

The site is bounded by residential housing to the north, west and south and Hezlett Road to the east. Temporary fencing was present to the east, north and south in some areas (Photograph10).

Site photographs are attached in Appendix B.

7. Conceptual Site Model

A conceptual site model (CSM) is a representation of site-related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The CSM provides the framework for identifying how the site became contaminated and how potential receptors may be exposed to contamination either in the present or the future i.e. it enables an assessment of the potential source – pathway – receptor linkages (complete pathways).

The preliminary CSM for the site, developed prior to undertaking intrusive sampling and testing, is presented below.

7.1 Potential Sources

Based on the current investigation, the following potential sources of contamination and associated contaminants of potential concern (COPC) have been identified.

S1 – Uncontrolled filling: Associated with disturbed terrain in the local area and the site, from the demolition of former buildings on site and previous levelling/filling at the site:

COPC include metals, TRH, BTEX, PAH, PCB, OCP, phenols, and asbestos.

S2 – Former Farming and Market Garden Activities:

COPC include metals, OCP, and OPP.

S3 – Former buildings on site.

COPC include hazardous building materials such as asbestos, lead based paints, PCB capacitors and/or synthetic mineral fibres (SMF).

7.2 Potential Receptors

Human Health Receptors:

R1 – Construction and maintenance workers;

R2 – Site users (end users – school, visitors); and

R3 – Adjacent users (residential).

Environmental Receptors:

R4 – Surface water (Smalls Creek/Cattai Creek);

R5 – Groundwater (freshwater); and

R6 – Terrestrial Ecology

7.3 Potential Pathways

P1 – Ingestion and dermal contact;

P2 – Inhalation of dust and/or vapours;

P3 – Leaching of contaminants and vertical migration into groundwater;

P4 – Lateral migration of groundwater providing base flow to water bodies

P5 – Surface water run-off

7.4 Summary of CSM

A 'source–pathway–receptor' approach has been used to assess the potential risks of harm being caused to the identified receptors from contamination sources on or in the vicinity of the site, via exposure pathways (complete pathways). The possible pathways between the above sources (S1 to S3) and receptors (R1 to R6) are provided in Table 4 below.

Table 4: Potential Complete Pathways

Source	Transport Pathway	Receptor	Risk Management Action Recommended
S1: Uncontrolled Filling Metals, TRH, BTEX, PAH, PCB, OCP, phenols, and asbestos **S2: Former Farm and Market Gardens** Metals, OCP, OPP	P1: Ingestion and dermal contact	R1: Construction and maintenance workers R2: Site users (School) R6: Terrestrial Ecology	An intrusive investigation should be conducted to assess possible contamination including chemical testing of the soils as addressed in this DSI. If the contamination source is found on site, a groundwater assessment is recommended to assess potential for offsite migration. If the site soils or groundwater are contaminated, mitigation / remediation measures will need to be implemented to manage the risk to the identified receptors.
	P2: Inhalation of dust and/or vapours	R1: Construction and maintenance workers R2: Site users (School) R3: Adjacent users (residential) R6: Terrestrial Ecology	
	P3 – Leaching of contaminants and vertical migration into groundwater	R5: Groundwater (freshwater)	
	P4: Lateral migration of groundwater providing base flow to water bodies P5: Surface Water Runoff	R4: Surface water (Smalls Creek/Cattai Creek) R6: Terrestrial Ecology	
S3: Former buildings Asbestos, lead, PCB and SMF	P1: Ingestion and dermal contact P2: Inhalation of dust and/or vapours	R1: Construction and maintenance workers R2: Site users (residential) R6: Terrestrial Ecology	A hazardous building materials assessment is recommended. If found, hazardous materials would need to be removed in accordance with relevant legislation and guidelines prior to demolition, with the footprint of the buildings validated upon completion of demolition.

8. Fieldwork

This DSI has been devised broadly in accordance with the seven step data quality objective (DQO) process as specified in Schedule B2 of NEPC (2013). The DQO process is included in Appendix F. Field and laboratory procedures were assessed against data quality indicators (DQIs) which are also included in Appendix F.

8.1 Soil Sampling Locations and Rationale

In accordance with NSW EPA (1995), for a site area of 3.1 Ha, a minimum of 42 sampling locations is recommended for site characterisation based on the detection of a circular "hot spot" of contamination of at least 32 m diameter. However, as required under the project brief, sampling for the DSI was undertaken on a pre-determined 20 m x 20 m grid, as shown on Drawing 2, Appendix A.

The sampling locations were labelled as TP1 to TP71 Environmental fieldwork was conducted between the 15 and 19 June 2017 under the full time supervision of an experienced Environmental Scientist. Soil samples were collected from all test locations, from the surface and at regular depth intervals, with additional 500 mL samples recovered for asbestos fines screening based on visual observation of surface materials at the time of fieldwork.

In addition to the above, a total of four samples were recovered from the stockpile of soil observed to the south of the site, as shown on Drawing 2, Appendix A. The samples were recovered at the request of the client to assess the suitability to be retained within the site, and the waste classification informing off-site disposal.

8.2 Test Pit Excavation Methods

The test pits were excavated using a 5T Yanmar ViO55 excavator with a 400 mm sized bucket. Test pit excavation depths ranged from 0.7 m to 3.0 m below ground level (bgl), as shown on the test pit logs in Appendix D.

8.3 Soil Sampling Procedures

Environmental sampling was performed according to standard operating procedures outlined in the DP *Field Procedures Manual*. All sampling data was recorded on test pit logs included in Appendix D and samples selected for laboratory analysis were recorded on DP chain-of-custody (COC) sheets (Appendix E). The general soil sampling procedure comprised:

- Use of disposable sampling equipment including disposal nitrile gloves;
- Recovery of soil samples from the excavator bucket or side walls of the test pit, avoiding soils coming into contact with the excavator bucket;
- Transfer of samples into laboratory-prepared glass jars and capping immediately with Teflon lined lids;

- Labelling of sampling containers with individual and unique identification, including project number, sample location and sample depth;
- Field screening of replicate soil samples collected in sealed plastic bags for Total Photoionisable Compounds (TOPIC) using a calibrated photo-ionisation detector (PID); and
- Placement of sample containers and bags into a cooled, insulated and sealed container for transport to the laboratory.

Envirolab Services Pty Ltd (Envirolab), accredited by NATA, was employed to conduct the primary sample analysis and ALS, accredited by NATA, was employed to conduct analysis of inter-laboratory duplicates. The laboratories are required to carry out in-house QC procedures.

8.4 Analytical Rationale

The analytical scheme for soil samples was designed to obtain an indication of the potential presence and possible distribution of potential contaminants of concern identified in the CSM, being metals, TRH, BTEX, PAH, OCP, OPP, PCB, phenols, and asbestos. For calculation of site specific ecological investigation levels (Section 9), six soil samples were selected for analysis for pH and CEC from the upper 2 m soil profile.

The results of the analytical testing were compared with the adopted site assessment criteria (SAC) discussed in Section 9.

9. Site Assessment Criteria

The site is proposed for a primary school development.

A residential with access to gardens, including primary schools land use setting has therefore been adopted as the land use in determining the SAC.

The SAC applied in the current investigation are informed by the CSM which identified human and environmental receptors to potential contamination on the site (Section 7). Soil and groundwater analytical results were assessed (as a Tier 1 assessment) against the SAC comprising the investigation and screening levels of Schedule B1, NEPC (2013) Petroleum based health screening levels for direct contact have been adopted from the *Cooperative Research Centre for Contamination Assessment and Remediation of the Environment (CRC CARE) Technical Report no.10 Health screening levels for petroleum hydrocarbons in soil and groundwater* (2011) as referenced by NEPC (2013).

The investigation and screening levels are applicable to generic land use settings and include consideration of, where relevant, the soil type and the depth of contamination. The investigation and screening levels are not intended to be used as clean up levels. Rather, they establish concentrations above which further appropriate investigation (e.g. Tier 2 assessment) should be undertaken. They are intentionally conservative and are based on a reasonable worst-case scenario.

9.1 Soils

9.1.1 Health Investigation and Screening Levels

The Health Investigation Levels (HIL) and Health Screening Levels (HSL) are scientifically-based, generic assessment criteria designed to be used in the first stage (Tier 1) of an assessment of potential human health risk from chronic exposure to contaminants.

HILs are applicable to assessing health risk arising via all relevant pathways of exposure for a range of metals and organic substances. The HIL are generic to all soil types and apply generally to a depth of 3 m below the surface for residential use. Site-specific conditions may determine the depth to which HILs apply for other land uses.

HSLs are applicable to selected petroleum compounds and fractions to assess the risk to human health via inhalation and direct contact pathways. HSLs have been developed for different land uses, soil types and depths to contamination.

The generic HIL and HSL are considered to be appropriate for the assessment of contamination at the site. Given the proposed land use the adopted HIL and HSL are:

- **HIL-A** – Residential with garden/accessible soil;
- **HSL-A & B** – Low –high density residential (for vapour intrusion); and
- **HSL-A** – Residential (low-density) (for direct contact).

It is noted that health screening levels for intrusive maintenance workers are listed in CRC CARE (2011), however, these have not be used as SAC for the current investigation as the screening levels are higher than HSL-A and therefore are considered unlikely to be risk drivers for further assessment.

The HSL adopted are predicated on the inputs summarised in Table 5.

Table 5: **Inputs to the Derivation of HSLs**

Variable	Input	Rationale
Potential exposure pathway	Soil vapour intrusion (inhalation) / Direct contact *	Both potential exposure pathways were identified in the CSM. It is noted that direct contact HSLs are generally not the risk drivers for further site assessment for the same contamination source as the HSLs for vapour intrusion (NEPC, 2013).
Soil Type	Clay	Clay filling type was recorded at the site and is the most conservative medium for soil HSLs.
Depth to contamination	0 m to <1 m	Filling comprising clay was present within the top 1 m at the site.

* Developed by CRC CARE (2011)

The adopted soil HIL and HSL for the potential contaminants of concern are presented in Table 6.

Table 6: Health Investigation and Screening Levels (HIL and HSL) in mg/kg Unless Otherwise Indicated

Contaminants		HIL- A and HSL- A Direct Contact	HSL- AB Vapour Intrusion 0-<1 m
Metals	Arsenic	100	-
	Cadmium	20	-
	Chromium (VI)	100	-
	Copper	6 000	-
	Lead	300	-
	Manganese	3 800	-
	Mercury (inorganic)	40	-
	Nickel	400	-
	Zinc	7 400	-
PAH	Benzo(a)pyrene TEQ[1]	3	-
	Naphthalene	1 400	3
	Total PAH	300	-
TRH	C6 – C10 (less BTEX) [F1]	4 400	45
	>C10-C16 (less Naphthalene) [F2]	3 300	110
	>C16-C34 [F3]	4 500	-
	>C34-C40 [F4]	6 300	-
BTEX	Benzene	100	0.5
	Toluene	14 000	160
	Ethylbenzene	4 500	55
	Xylenes	12 000	40
Phenol	Pentachlorophenol (used as an initial screen)	100	-
OCP	Aldrin + Dieldrin	6	-
	Chlordane	50	-
	DDT+DDE+DDD	240	-
	Endosulfan	270	-
	Endrin	10	-
	Heptachlor	6	-
	HCB	10	-
	Methoxychlor	300	-
OPP	Chlorphyrifos	160	-
PCB [2]		1	-

Notes:

1 sum of carcinogenic PAH

2 non dioxin-like PCBs only

9.1.2 Ecological Investigation Levels

Ecological Investigation Levels (EIL) have been derived for selected metals and organic compounds and are applicable for assessing risk to terrestrial ecosystems (NEPC, 2013). EIL depend on specific soil physiochemical properties and land use scenarios and generally apply to the top 2 m of soil, which corresponds to the root zone and habitation zone of many species. The EIL is determined for a contaminant based on the sum of the ambient background concentration (ABC) and an added contaminant limit (ACL). The ABC of a contaminant is the soil concentration in a specific locality that is the sum of naturally occurring background levels and the contaminants levels that have been introduced from diffuse or non-point sources (e.g. motor vehicle emissions). The ACL is the added concentration (above the ABC) of a contaminant above which further appropriate investigation and evaluation of the impact on ecological values is required.

The EIL is calculated using the following formula:

EIL = ABC + ACL,

The ABC is determined through direct measurement at an appropriate reference site (preferred) or through the use of methods defined by Olszowy et al *Trace element concentrations in soils from rural and urban areas of Australia*, Contaminated Sites monograph no. 4, South Australian Health Commission, Adelaide, Australia 1995 (Olszowy, 1995) or Hamon et al, *Geochemical indices allow estimation of heavy metal background concentrations in soils*, Global Biogeochemical Cycles, vol. 18, GB1014, (Hamon, 2004). ACL is based on the soil characteristics of pH, CEC and clay content.

EIL (and ACLs where appropriate) have been derived in NEPC (2013) for only a short list of contaminants comprising As, Cu, Cr (III), DDT, naphthalene, Ni, Pb and Zn. An *Interactive (Excel) Calculation Spreadsheet* may be used for calculating site-specific EIL for these contaminants, and has been provided in the ASC NEPM Toolbox available on the SCEW (Standing Council on Environment and Water) website (http://www.scew.gov.au/node/941).

The adopted EIL, derived from the *Interactive (Excel) Calculation Spreadsheet* are shown in the following Table 7.

The following assumptions have been used to determine the EILs:

- A protection level of 80% for urban residential areas and public open space has been adopted;
- The EILs will apply to the top 2 m of the soil profile which corresponds to the root zone and habitation zone of many species;
- Given the likely predominant source of soil contaminants (i.e. historical site uses / fill) the contamination is considered as “aged” (>2 years);
- ABCs have been derived using the *Interactive (Excel) Calculation Spreadsheet* using input parameters of NSW, and low for traffic volumes; and
- Location specific pH and CEC values have been used as input parameters from six locations (TP8, TP18, TP38, TP42, TP57 and TP71). The average values obtained from these locations were pH 6.78 and CEC 14.7 $cmol_c/kg$, respectively.

Table 7: Ecological Investigation Levels (EIL) in mg/kg

Analyte		EIL	Comments
Metals	Arsenic	100	*Adopted pH of 6.78 and CEC of 14.7 $cmol_c/kg$; **A conservative assumed clay content of 10% was adopted.
	Copper*	230	
	Nickel*	220	
	Chromium III**	410	
	Lead	1,100	
	Zinc*	670	
PAH	Naphthalene	170	
OCP	DDT	180	

9.1.3 Ecological Screening Levels – Petroleum Hydrocarbons

Ecological Screening Levels (ESL) are used to assess the risk of selected petroleum hydrocarbon compounds, BTEX and benzo(a)pyrene to terrestrial ecosystems. ESL apply to the top 2 m of the soil profile as for EIL.

ESL have been derived in NEPC (2013) for petroleum fractions F1 to F4 as well as BTEX and benzo(a)pyrene. Site specific data and assumptions as summarised in Table 8 have been used to determine the ESL. The adopted ESL, from Table 1B(6), Schedule B1 of NEPC (2013) are shown in Table 9.

Table 8: Inputs to the Derivation of ESL

Variable	Input	Rationale
Depth of ESL application	Top 2 m of the soil profile	The top 2 m depth below ground level corresponds to the root zone and habitation zone of many species
Land use	Residential/Open Space	Proposed land use is a primary school
Soil Texture	Fine	Site soils include clay in filling

Table 9: Ecological Screening Levels (ESL) in mg/kg

Analyte		ESL	Comments
TRH	C6 – C10 (less BTEX) [F1]	180*	All ESLs are low reliability apart from those marked with * which are moderate reliability
	>C10-C16 (less Naphthalene) [F2]	120*	
	>C16-C34 [F3]	1300	
	>C34-C40 [F4]	5600	
BTEX	Benzene	65	
	Toluene	105	
	Ethylbenzene	125	
	Xylenes	45^	
PAH	Benzo(a)pyrene	0.7	

9.1.4 Management Limits – Petroleum Hydrocarbons

In addition to appropriate consideration and application of the HSL and ESL, there are additional considerations which reflect the nature and properties of petroleum hydrocarbons, including:

- Formation of observable light non-aqueous phase liquids (LNAPL);
- Fire and explosion hazards; and
- Effects on buried infrastructure e.g. penetration of, or damage to, in-ground services.

Management Limits to avoid or minimise these potential effects have been adopted in NEPC (2013) as interim Tier 1 guidance. Management Limits have been derived in NEPC (2013) for the same four petroleum fractions as the HSL (F1 to F4). The adopted Management Limits, from Table 1B(7), Schedule B1 of NEPC (2013) are shown in the following Table 10. The following site specific data and assumptions have been used to determine the Management Limits:

- The Management Limits will apply to any depth within the soil profile;
- The Management Limits for residential land uses apply; and
- Site soils include sand both in natural soils and filling. A “fine” soil texture has been adopted and is the most conservative texture for soil Management Limits.

Table 10: Management Limits in mg/kg

Analyte		Management Limit
TRH	$C_6 – C_{10}$ (F1) #	800
	$>C_{10}-C_{16}$ (F2) #	1000
	$>C_{16}-C_{34}$ (F3)	3500
	$>C_{34}-C_{40}$ (F4)	10,000

Separate management limits for BTEX and naphthalene are not available hence these have not been subtracted from the relevant fractions to obtain F1 and F2

9.1.5 Asbestos in Soil

Bonded asbestos-containing material (ACM) is the most common form of asbestos contamination across Australia, generally arising from:

- Inadequate removal and disposal practices during demolition of buildings containing asbestos products;
- Widespread dumping of asbestos products and asbestos containing fill on vacant land and development sites; and
- Commonly occurring in historical fill containing unsorted demolition materials.

Mining, manufacturing or distribution of asbestos products may result in sites being contaminated by friable asbestos including free fibres. Severe weathering or damage to bonded ACM may also result in the formation of friable asbestos comprising fibrous asbestos (FA) and/or asbestos fines (AF).

Asbestos only poses a risk to human health when asbestos fibres are made airborne and inhaled. If asbestos is bound in a matrix such as cement or resin, it is not readily made airborne except through substantial physical damage. Bonded ACM in sound condition represents a low human health risk, whilst both FA and AF materials have the potential to generate, or be associated with, free asbestos fibres. Consequently, FA and AF must be carefully managed to prevent the release of asbestos fibres into the air.

A detailed asbestos assessment was not undertaken as part of these investigations; however, identified fragments were collected and submitted to a NATA Laboratory for testing along with a 500 ml bag for AF/FA testing at a reporting limit of 0.001% w/w, which is also the HSL for a residential land use. The presence or absence of asbestos was also tested, at a limit of reporting of 0.1 g/kg.

10. Preliminary Waste Classification

The preliminary waste classification was generally conducted with reference to the six step process as set out in NSW EPA *Waste Classification Guidelines* 2014 (EPA, 2014) which is summarised in Table 11 below.

Table 11: Six Step Classification

Step	Classification	Rationale
1. Is it special waste?	No / Yes	Waste generally not considered to be clinical, asbestos or tyre waste. Asbestos waste has been, and is likely to be found in surface soils in footprints of former structures, and possibly in the dam walls.
2. Is it liquid waste?	No	Waste composed of soil matrix (*i.e.* no liquids)
3. Is the waste "pre-classified"?	No	Waste not observed to contain coal tar, batteries, lead paint or dangerous goods containers.

Step	Classification	Rationale
4. Does the waste have hazardous waste characteristics?	No	Waste not observed to/ or considered at risk to contain explosives, gases, flammable solids, oxidising agents, organic peroxides, toxic substances or corrosive substances.
5. Chemical Assessment	Undertaken	Refer to Section 13.
6. Is the waste putrescible?	No	All observed components of material were composed of materials pre-classified as non-putrescible (*i.e.* soils). Organic content is assessed to be minor.

Contaminant threshold (CT1, CT2, SCC1 and SCC2) values for the waste classification are presented in Table R2, Appendix E.

11. Fieldwork Observations

Details of the subsurface conditions encountered in each test pit are provided in the test pit logs in Appendix D, together with notes defining classification methods and descriptive terms.

Based on observations, the subsurface profile can be broadly summarised as:

TOPSOIL: Brown silty and/or shaly clay filling with some fine igneous gravel and rootlets. May be shallow fill in part. Disturbance due to demolition is widespread;

RESIDUAL CLAY: Orange yellow mottled clay; and

SHALE: Light grey and yellow shale.

Suspected ACM in the form of fibre cement fragments were visually observed on the surface soils during the site walkover and within TP54 at a depth of 0.1 – 0.2 m as indicated in Drawing 2, Appendix A. The ACM observed within TP54 and at the surface in areas shown on Drawing 2, Appendix A, is most likely associated with the former buildings at the site due to the shallow depth at which they were encountered and less likely the result of contaminated imported fill. No ACM was detected through laboratory analysis in TP54.

12. Results Summary

The results of the laboratory analysis undertaken are presented in the following tables in Appendix E:

Table R1: Soil Results;

Table R2: Preliminary Waste Classification.

The full NATA laboratory certificates of analysis together with the chain of custody and sample receipt information are included in Appendix E.

13. Analysis and Discussion of Results

13.1 Soils

All concentrations for soil samples analysed for metals, TRH, PAH, BTEX, phenols, OCP, OPP, PCB and asbestos were below laboratory limits of reporting (LOR) and the adopted SAC with the exception of the following:

- TRH fraction C16 – C34 exceeded HIL- A (direct contact), ESL and Management Limits in TP36/0.1 – 0.2 (5,600 mg/kg). TP36 is located in the footprint of previous sheds and structures in the centre of the site which were not inspected by an environmental scientist prior to demolition and may have been used to store equipment such as fuels and chemicals for farming and may account for the exceedance in that area. The results indicate that the TRH contamination extends marginally into natural soils however does not exceed the adopted SAC beyond 0.4 m depth; and
- Benzo(a)pyrene exceeded the ESL in TP11/0.0 – 0.1 (0.89 mg/kg). The source is not clear, but possibly related to the nature of the fill at that location.

No asbestos was detected above the 0.1g/kg laboratory reporting limit.

AF/FA was detected in the sample taken from the side wall of the dam AA (0.029 w/w%) exceeding the <0.001 w/w% SAC.

Fragment ID analysis indicated the sample taken for TP54 did not contain any asbestos, however the sample taken from AA tested positive for chrysotile asbestos.

All concentrations for samples of the stockpile adjacent to the southern boundary of the site, analysed for metals, TRH, PAH, BTEX, phenols, OCP, OPP, PCB and asbestos were below laboratory limits of reporting (LOR) and the adopted SAC.

The results are provided in Appendix E and waste classification is discussed in Section 13.2.

13.2 Preliminary Waste Classification

As shown on Table R2, Appendix E, contaminant concentrations for the analysed filling samples were within the contaminant thresholds (CT1s) for General Solid Waste (GSW) with the exception benzo(a)pyrene in TP11/0.0 – 0.1 and lead in TP23/0.0 – 0.1, TP24/0.0 – 0.1, TP30/0.0 – 0.1. TCLP was conducted for benzo(a)pyrene and lead in the respective samples. The SCC and TCLP concentrations were within the contaminant thresholds SCC1 and TCLP1 for GSW.

Based on the observations at the time of sampling and the reported analytical results, the surface and fill soils at the site can be preliminarily classified as **General Solid Waste (non-putrescible)** as defined in EPA (2014). However, as noted in Sections 11 and 13.1, ACM has been identified on the surface of the dam wall (location AA) and at several positions in the footprints of the former buildings

(Drawing 2, Appendix A). Where present, soils impacted with ACM pre-classify as **Special Waste (Asbestos)**.

Given the low concentrations of chemical contaminants in the fill and surface soils, and the typical background concentrations of chemical contaminants in the natural soil samples analysed, it is considered that the natural soils and bedrock at the site have a preliminary classification of **virgin excavated natural material (VENM)**.

Based on the observations at the time of sampling and the reported analytical results, the soils in the stockpile at the southern boundary of the site can be preliminarily classified as **General Solid Waste (non-putrescible)** as defined in EPA (2014).

The handling, transport and disposal of the materials should be conducted in accordance with regulatory and statutory requirements.

14. Conclusions and Recommendations

Based on the results of this DSI, presented herein, it is concluded that the site can be made suitable, from a contamination perspective, for the proposed primary school development subject to:

- Delineation and localised remediation of the TRH impacted soils at TP36. Remediation could comprise either waste classification and off-site disposal, or on-site land farming and validation prior to re-using within the site;
- Delineation and localised remediation / management of the B(a)P impacted soils at TP11. Remediation / management could comprise either waste classification and off-site disposal, or on-site relocation of the impacted soils away from future landscaping;
- Delineation and removal of soils impacted with ACM, including location AA and other areas noted on Drawing 2, Appendix A, and any other ACM identified during future civil and construction works. Remediation / management could comprise either waste classification and off-site disposal, or on-site relocation of the impacted soils under a capping system and long term Environmental Management Plan (EMP);
- Testing of the dam water prior to disposal to inform the disposal requirements;
- Testing of dam sediment, which can be an accumulator of surface contaminants, to inform the requirements for specific management and/or remediation; and
- Development of a Construction Environmental Management Plan (CEMP), incorporating an unexpected finds protocol, to be initiated during the planned civil and construction works, to inform the appropriate management of asbestos or other potential contaminants encountered during the works.

15. Limitations

This report presents the results of a detailed site (contamination) investigation (DSI) undertaken for a new primary school at 120 - 126 Hezlett Road, North Kellyville. The DSI was commissioned by Mike

Warren of GHD Pty Ltd and was undertaken in accordance with Douglas Partners Pty Ltd (DP) proposal SYD170387.P.001.Rev1 dated 10 May 2017.

The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of GHD Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after DP's field testing has been completed.

Although the sampling plan adopted for these investigations is considered appropriate to achieve the stated project objectives, there are necessarily parts of the site that have not been sampled and analysed. This is either due to undetected variations in conditions, budget constraints, parts of the stockpile being inaccessible and not available for inspection/sampling, or to vegetation preventing visual inspection and reasonable access. It is therefore considered possible that hazardous building materials, including asbestos, may be present in unobserved or untested parts of the site, between and beyond sampling locations, and hence no warranty can be given that hazardous building materials are not present in the fill or surface soils at the site.

DP's advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

Douglas Partners Pty Ltd

Appendix A

About This Report

Drawings

About this Report

Douglas Partners

Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

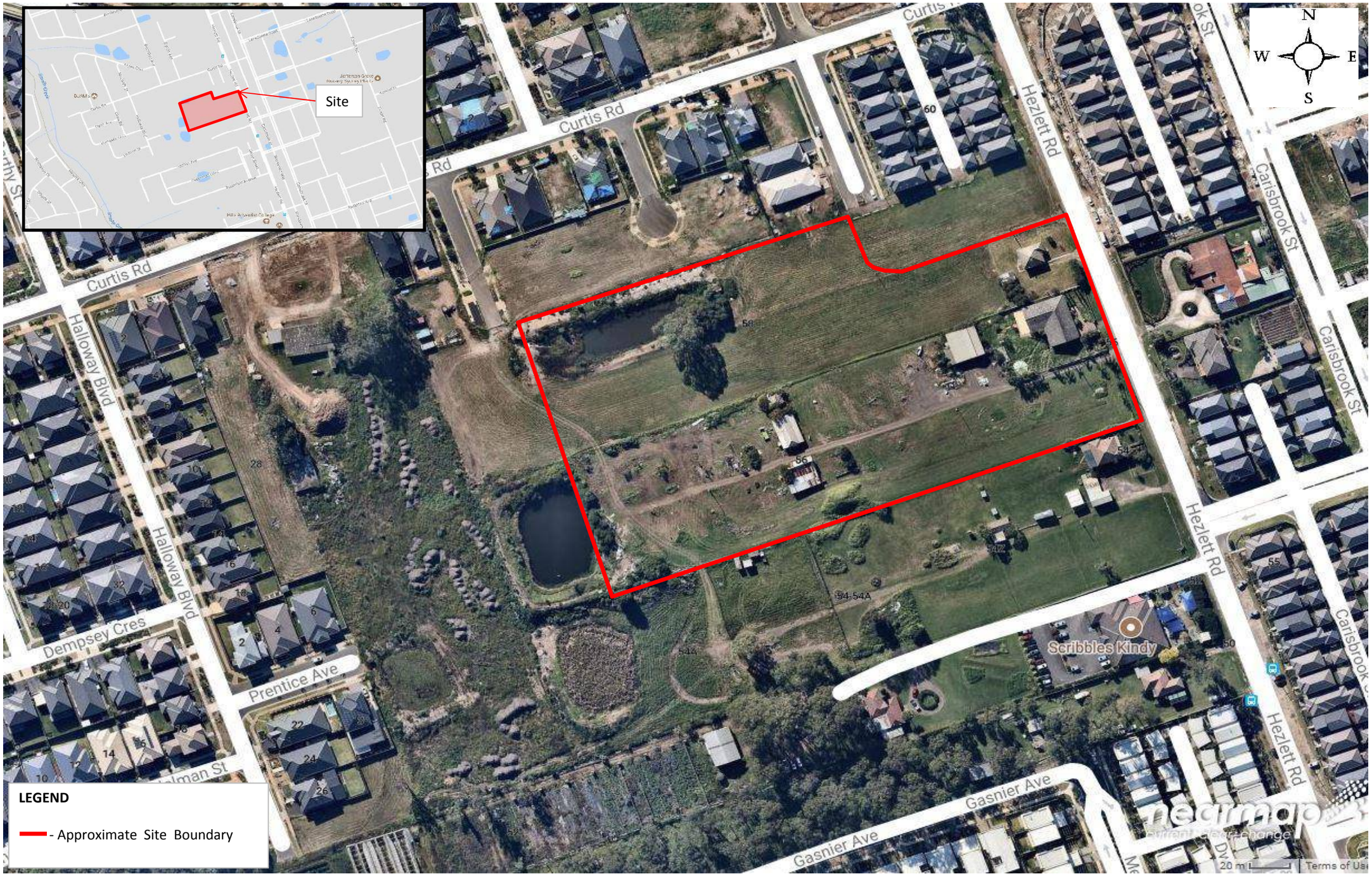
In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

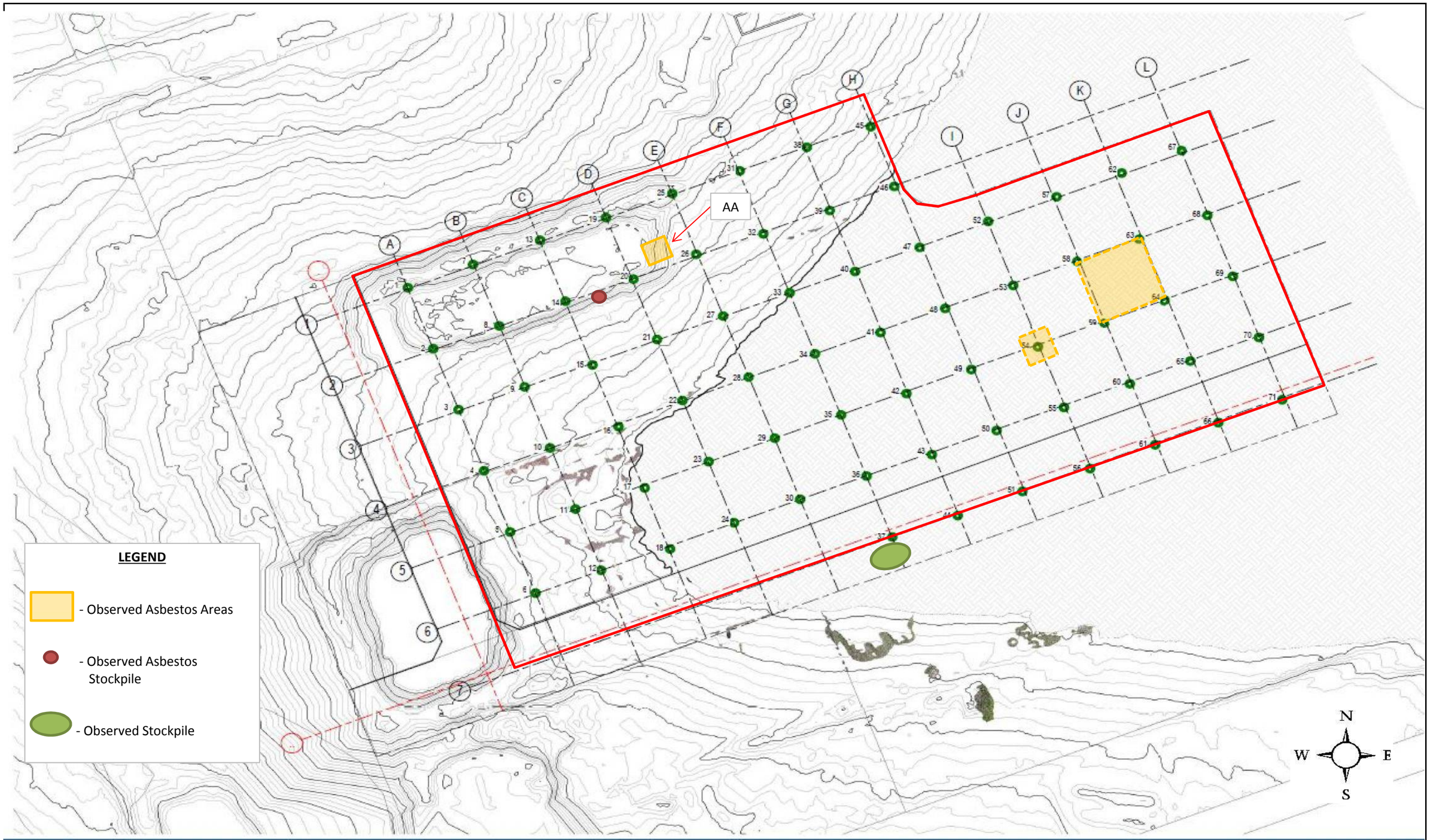
Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.



Source: Nearmap

Douglas Partners Geotechnics / Environment / Groundwater	CLIENT: GHD Pty Ltd		TITLE: **Site Locality and Boundary Map**	PROJECT No:	85998.01
	OFFICE: SYDNEY	DRAWN BY: CB	**Proposed Public School**	DRAWING No:	1
	SCALE: As Shown	DATE: 17 Jul 2017	**120-126 Hezlett Road, North Kellyville**	REVISION:	A



Source: GHD

Douglas Partners Geotechnics / Environment / Groundwater	CLIENT: GHD Pty Ltd		TITLE: **Sample Location Map**	PROJECT No:	85998.01
	OFFICE: SYDNEY	DRAWN BY: CB	**Proposed Public School**	DRAWING No:	2
	SCALE: No Scale	DATE: 17 Jul 2017	**120-126 Hezlett Road, North Kellyville**	REVISION:	A

Appendix B

Site Photographs

Photograph 1 - Cleared Structures to the East of site

Photograph 2 - Cleared Structures Centre of site

Douglas Partners Geotechnics / Environment / Groundwater	**Site Walkover**	PROJECT:	85998.01
	New Public School	PLATE No:	1
	120-126 Hezlett Road, North Kellyville	REV:	A
	CLIENT: GHD Pty Ltd	DATE:	23-Jun-17

Photograph 3 - Vacant Site

Photograph 4 - Onsite dam

Douglas Partners Geotechnics / Environment / Groundwater	**Site Walkover**	PROJECT:	85998.01
	New Public School	PLATE No:	2
	120-126 Hezlett Road, North Kellyville	REV:	A
	CLIENT: GHD Pty Ltd	DATE:	23-Jun-17

Photograph 5 - Bunded dam wall

Photograph 6 - Observed building material

Douglas Partners Geotechnics / Environment / Groundwater	**Site Walkover**	PROJECT:	85998.01
	New Public School	PLATE No:	3
	120-126 Hezlett Road, North Kellyville	REV:	A
	CLIENT: GHD Pty Ltd	DATE:	23-Jun-17

Photograph 7 - Mulch stockpiles and Observed Building Rubble

Photograph 8 - Observed Asbestos

Douglas Partners Geotechnics / Environment / Groundwater	**Site Walkover**	PROJECT:	85998.01
	New Public School	PLATE No:	4
	120-126 Hezlett Road, North Kellyville	REV:	A
	CLIENT: GHD Pty Ltd	DATE:	23-Jun-17

Photograph 9 - Observed Stockpile

Photograph 10 - Surrounding Low Density Residential Developments

Douglas Partners Geotechnics / Environment / Groundwater	**Site Walkover**	PROJECT:	85998.01
	New Public School	PLATE No:	5
	120-126 Hezlett Road, North Kellyville	REV:	A
	CLIENT: GHD Pty Ltd	DATE:	23-Jun-17