Prepared for
Pacific National Pty Ltd
Prepared by
Ramboll Australia Pty Ltd
Date
6 October 2020
Project Number
318001047
Audit Number
TO-078

SITE AUDIT REPORT
NEW REFUELLING INFRASTRUCTURE AREA, 20 DASEA STREET, CHULLORA NSW

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ENVIRONMENT
& HEALTH

6 October 2020

Pacific National Pty Ltd
Attn.: Troy Favell
15 Blue Street
North Sydney NSW 2065

By email: troy_favell@pacificnational.com.au

Dear Troy

SITE AUDIT REPORT - NEW REFUELLING INFRASTRUCTURE AREA, 20 DASEA STREET, CHULLORA NSW

I have pleasure in submitting the Site Audit Report for the subject site. The Site Audit Statement, produced in accordance with the NSW *Contaminated Land Management Act 1997*, is included as Appendix B of the Site Audit Report. The Audit was commissioned by Pacific National Pty Ltd to assess the suitability of the site for its intended ongoing commercial/industrial (refuelling infrastructure) land use.

This Site Audit Report is not currently required by regulation or legislation and is therefore a non-statutory audit.

Thank you for giving me the opportunity to conduct this Audit. Please call me on 9954 8100 if you have any questions.

Yours faithfully,
Ramboll Australia Pty Ltd

Tom Onus
EPA Accredited Site Auditor 1505

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LIST OF ABBREVIATIONS

Measures

%	per cent
µg/L	Micrograms per Litre
ha	Hectare
km	Kilometres
m	Metre
mAHD	Metres Australian Height Datum
mbgl	Metres below ground level
mg/kg	Milligrams per Kilogram
mm	Millimetre
ppm	Parts Per Million

General

ACM	Asbestos Containing Material
ADWG	Australian Drinking Water Guidelines
AHD	Australian Height Datum
ALS	Australian Laboratory Services
ANZG	Australian & New Zealand Guidelines
ASS	Acid Sulphate Soil
AST	Aboveground Storage Tank
BaP	Benzo(a)pyrene
BGL	Below Ground Level
BTEXN	Benzene, Toluene, Ethylbenzene, Xylenes & Naphthalene
CLM Act	NSW Contaminated Land Management Act 1997
COC	Chain of Custody
Council	Canterbury Bankstown Council
CSM	Conceptual Site Model
DA	Development Application
DNAPL	Dense Non-Aqueous Phase Liquids
DP	Deposited Plan
DQI	Data Quality Indicator
DQO	Data Quality Objective
EMP	Environmental Management Plan
Envirolab	Envirolab Services Pty Ltd
EPA	Environment Protection Authority (NSW)
GIL	Groundwater Investigation Level
HIL	Health Investigation Level
HSL	Health Screening Level
JBS&G	JBS&G Australia Pty Ltd
LCS	Laboratory Control Sample
LEP	Local Environment Plan
LOR	Limit of Reporting
LNAPL	Light Non-Aqueous Phase Liquids
Metals	As: Arsenic, Cd: Cadmium, Cr: Chromium, Cu: Copper, Ni: Nickel, Pb: Lead, Zn: Zinc, Hg: Mercury
ML	Management Limits
MS	Matrix Spike
NATA	National Association of Testing Authorities
NC	Not Calculated
ND	Not Detected
NEHF	National Environmental Health Forum
NEPM	National Environment Protection Measure
NHMRC	National Health and Medical Research Council
NL	Non-Limiting
n	Number of Samples
OCPs	Organochlorine Pesticides
OEH	Office of Environment and Heritage
OTEK	OTEK Australia Pty Ltd
OPPs	Organophosphorus Pesticides
PAHs	Polycyclic Aromatic Hydrocarbons

PCBs	Polychlorinated Biphenyls
PFAS	Per- and Poly-fluoroalkyl substances
pH	A measure of acidity, hydrogen ion activity
PID	Photoionisation Detector
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
Ramboll	Ramboll Australia Pty Ltd – previously Ramboll Environ Australia Pty Ltd and ENVIRON Australia Pty Ltd
RL	Relative Level
RPD	Relative Percent Difference
SAR	Site Audit Report
SAS	Site Audit Statement
SVOCs	Semi Volatile Organic Compounds
SWL	Standing Water Level
TEQ	Toxic Equivalence Quotient
TPHs	Total Petroleum Hydrocarbons
TRHs	Total Recoverable Hydrocarbons
UFP	Unexpected Finds Procedure
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VOCs	Volatile Organic Compounds
-	On tables is "not calculated", "no criteria" or "not applicable"

1. INTRODUCTION

1.1 Audit Details

A site contamination audit has been conducted in relation to the locomotive refuelling area within the Pacific National Sydney Freight Terminal at 20 Dasea Street, Chullora (Attachment 1, Appendix A).

The Audit was conducted to provide an independent review by an EPA Accredited Auditor of whether the land is suitable for any specified use or range of uses i.e. a "Site Audit" as defined in Section 4 (1) (b) (iii) of the NSW *Contaminated Land Management Act 1997* (the CLM Act).

A development application (DA-478/2020) was lodged with Canterbury-Bankstown Council (Council) for redevelopment of the existing locomotive refuelling facility. Correspondence from Council in a letter dated 11 September 2020 requested a site audit prior to approval of the development application as follows:

> *"A NSW Environment Protection Authority accredited Site Auditor must be appointed to Audit the Detailed Site investigation report submitted in support of this application prepared by JBS&G PTY LTD, dated, 11 December 2019, reference: 54005/112485 (Rev 0).*
>
> *The Site Audit Statement and Site Audit Report must be provided to Council from the Site Auditor that clearly states that the site is, or can be, made suitable for the intended use. The Site Audit Statement and Site Audit Report must include any restrictions or management requirements for the site."*

The Audit was initiated to comply with item 3 of the letter from Council, however there is no statutory requirement at this stage and the Audit is therefore non-statutory.

Details of the Audit are:

Requested by:	Troy Favell on behalf of Pacific National Pty Ltd (Pacific National)
Request/Commencement Date:	25 September 2020
Auditor:	Tom Onus
Accreditation No.:	1505

1.2 Scope of the Audit

The scope of the Audit included:

- Review of the following reports:
  - 'Targeted Environmental Site Assessment (DRAFT), Pacific National Sydney Freight Terminal, 20 Dasea St, Chullora, NSW', 19 January 2010, OTEK Australia Pty Ltd (OTEK) (*the ESA*).
  - 'Detailed Site Investigation for Proposed New Refuelling Infrastructure Area, Part Lot 35 in DP 1007367, 20 Dasea Street, Chullora', 11 December 2019, JBS&G Australia Pty Ltd (JBS&G) (*the DSI*)
- A site visit by the Auditor on 30 September 2020.
- Discussions with Pacific National (the site owner).

The investigations were completed prior to the Auditor's engagement and no discussion with OTEK or JBS&G was undertaken. The OTEK ESA report provided to the Auditor was missing the majority of the appendices.

2. SITE DETAILS

2.1 Location

The site locality is shown on Attachment 1, Appendix A.

The site details are as follows:

Street address:	20 Dasea Street, Chullora, NSW 2190
Identifier:	Part Lot 35 DP 1007367
Local Government:	Canterbury Bankstown Council
Owner:	Pacific National
Site Area:	Approximately 4,965 m^2

The boundaries of the audit site are defined by the proposed development layout and are not well defined within the larger Lot. A draft plan of the proposed development is provided in Attachment 4, Appendix A.

2.2 Zoning

The current zoning of the site is IN1 General Industrial under Bankstown Local Environment Plan (LEP) 2015.

2.3 Adjacent Uses

The site is located within the Pacific National Sydney Freight Terminal which is located within an area of commercial/industrial land uses. The immediate surrounding land use is predominantly railyards and rail lines.

The Cooks River is located approximately 50 m to the north and west of the site. The river was not able to be observed during the site visit as it was overgrown with vegetation.

2.4 Site Condition

The site layout is shown on Attachment 2, Appendix A. JBS&G noted the following in the DSI:

- The site comprised a locomotive provisioning facility and a cleared vacant portion of the Sydney Freight Terminal owned by Pacific National.
- The site surface comprised compacted roadbase, rail ballast, and an asphalt paved road.
- A fuel dispenser (bowser) with associated transfer lines connected to two large diesel aboveground storage tanks (ASTs) and a disused AST were located in the central portion of the site. There were no signs of surface staining visible on concrete plinths underlying the ASTs. Surface oil staining was visible in the concrete bunded area containing the diesel bowser.
- A lubricant tank shed was located in the southern portion of the site with associated underground transfer lines to dispensers (for locomotives) in the eastern portion of the site.
- The locomotive refuelling area was located in the eastern portion of the site. A fuel overflow/spill trap was located underlying the rail tracks within the area. Any liquids collected within the trap are transferred to an oil/water separator in the northern portion of the site. Surface oil staining was observed around the location of the fuel overflow/spill trap.

The following was noted by the Auditor during the site visit on 30 September 2020:

- The disused AST was no longer present on the site. A review of aerial images available from Nearmap indicates that it was removed from the site between December 2017 and January 2018. It had been replaced by a demountable office.

- A pump manifold was present near the northern AST. It was located within a metal bund.

2.5 Proposed Development

It is understood that the site is to be redeveloped by Pacific National as a new locomotive refuelling infrastructure area. The existing provisioning point is to be decommissioned and reconstructed within the southwest of the site with a refuelling shed adjacent to new rail spur. Some existing infrastructure is to be relocated, including the wastewater treatment plant, oil tank, coolant tank containers, demountable buildings and two diesel ASTs. Existing sheds/structures are to be demolished.

For the purposes of this audit, the 'commercial/industrial' land use scenario will be assumed.

3. SITE HISTORY

JBS&G provided a summary of the site history based on aerial photographs, site photographs, NSW EPA records, Council planning certificates and Certificates of Title.

JBS&G reported that the site was vacant bushland prior to 1955 when the site appeared to have then been extensively filled to achieve similar level to adjoining land. Railway land uses were visible in aerial photographs in 1965, however, the land title records indicate that the site was owned by a rail related owner from 1923. Prior to 1923 the site was owned by a wool broking company. Extensive filling, rail uses and storage of shipping containers were noted from 1965 at the site and in surrounding areas. The aerial photographs indicate that the existing refuelling facility was constructed at some point between 1994 and 2003.

A review of the NSW EPA public records was conducted by JBS&G which did not identify any notifications for the site. Chullora Railway Workshops, located approximately 500 m east of the site, was identified as a notified contaminated site. Based on the local topography, indicating land slopes to the east, JBS&G indicated that any impacts at the Chullora Railway Workshops were unlikely to affect the site.

OTEK reviewed historical investigations which included integrity testing and installation of ASTs. OTEK indicated that the site contained a small oil storage shed, a contractor's supply shed, an uncommissioned new 110,000 L self-bunded diesel AST, a decommissioned (pre-1996) self-bunded 110,000 L diesel AST (the secondary containment shell of this tank was noted to have failed a tank integrity test), two locomotive refueling points including dispensing equipment and drip tray area, several pumps and fuel system piping and associated connections, a mobile tank and vehicle refueling point, bunding in several areas, a trade waste control station and a drainage network both to the sewer and trade waste system, and to the surrounding environment. The site layout appears to have undergone some changes since site works undertaken by OTEK in 2009.

3.1 Auditor's Opinion

In the Auditor's opinion, the site history provides an adequate indication of past activities. The primary sources of contamination include the historical extensive filling, railway land uses and the storage and dispensing of fuels/oils.

Review of aerial photographs taken between November 2009 to September 2020 available on Nearmap indicated that the site layout remained largely unchanged following the DSI, apart from the removal of the decommissioned UST around the end of 2017.

The aerial photographs indicate that the south-western portion of the site has been used as a laydown area for various materials. These appear to have included stockpiles of soil, concrete, ballast, railway sleepers and building materials. The area was resurfaced around 2014 during construction of the adjacent road and turning circle.

4. CONTAMINANTS OF CONCERN

OTEK and JBS&G provided a list of the contaminants of concern and potentially contaminating activities. These have been tabulated in Table 4.1.

Table 4.1: Contaminants of Concern

Consultant	Activity	Potential Contaminants
OTEK	Mobile tank refuelling, diesel ASTs, fuel pumps and fuel lines, oil drums and spillages.	Heavy metals, total petroleum hydrocarbons (TPH), BTEX (benzene, toluene, ethylbenzene and xylenes) and polycyclic aromatic hydrocarbons (PAHs).
JBS&G	Presence of fill and the storage/handling of petroleum hydrocarbons	Heavy metals, total recoverable hydrocarbons (TRH), BTEX, organochlorine pesticides (OCPs), polychlorinated biphenyls (PCBs), PAHs and asbestos.

4.1 Auditor's Opinion

The Auditor considers that the analyte list used by OTEK and JBS&G adequately reflects the site history and condition.

There has been no assessment by the consultants for the presence of per- and poly-fluoroalkyl substances (PFAS) but in the Auditor's opinion there are no indications in the site history that they would be potential contaminants of concern.

5. STRATIGRAPHY AND HYDROGEOLOGY

5.1 Stratigraphy

JBS&G reviewed geological maps and reported that the site is underlain by Bringelly Shale comprising shale, carbonaceous claystone, laminite, fine to medium grained lithic sandstone and rare coal.

JBS&G undertook 11 boreholes during the DSI (Attachment 2, Appendix A). The Auditor has summarised the sub-surface profile based on these boreholes, as presented in Table 5.1.

Table 5.1: Stratigraphy

Depth (mbgl)	Subsurface Profile
0.0 – 3.2	Fill material comprising gravelly clay and gravelly sand with inclusions of ash, slag, sandstone and igneous gravels.
0.6 – 3.2 to depth	Natural clay and silty clay encountered beneath the fill.

mbgl – metres below ground level

OTEK undertook 24 boreholes at the site (Attachment 3, Appendix A) however the borehole logs were not provided. The fill depths and natural soil descriptions discussed by OTEK in the ESA appear similar to the subsurface profiles encountered by JBS&G.

The DSI indicated that the site was located within an area of no known occurrence of acid sulfate soil (ASS).

5.2 Hydrogeology

The Auditor undertook a search for registered bores in September 2020. Eight bores were identified to the southeast within a 500 m radius of the site. The bores were registered for monitoring purposes. These bores were also identified by JBS&G during the DSI.

As part of the ESA, OTEK installed one groundwater monitoring well in the vicinity of the oil storage shed. OTEK indicated that groundwater had stabilised at a depth of 4.16 mbgl. As part of the DSI works, JBS&G installed four groundwater monitoring wells: one shallow well (MW01) screened across fill and silty clay to a depth of 2.5 mbgl; and three wells (MW02, MW03 and MW05) to depths of 6.5 to 7.6 mbgl screened within natural clay/silty clay. The standing water level (SWL) in the monitoring wells ranged from 4.15 to 4.75 mbgl, however MW01 was dry at the time of sampling. JBS&G indicated that the inferred direction of groundwater flow could not be assessed based on the available data. JBS&G considered that groundwater flow would be to the north and north-west towards the Cooks River.

5.3 Auditor's Opinion

The Auditor considers that the site stratigraphy and hydrogeology are sufficiently well known for the purpose of assessing site suitability. Fill material was present at all investigation locations and was fairly consistent in composition, with ash and slag noted in all locations. Other anthropogenic materials were not noted in the logs. Fill thickness increased from the east of the site (0.6 to 0.8 m) to the west (2.7 to 3.2 m) towards the Cooks River alignment.

The shallow aquifer underlying the site is likely to be of low permeability and therefore the potential for significant migration of contamination is low. The groundwater flow direction is likely to follow local topography towards the Cooks River alignment to the west.

6. EVALUATION OF QUALITY ASSURANCE AND QUALITY CONTROL

The Auditor has assessed the overall quality of the data by review of the information presented in the referenced reports, supplemented by field observations. The data sources are summarised in Table 6.1.

Table 6.1: Summary of Investigations

Stage of Works	Field Data	Analytical Data
Targeted Environmental Site Assessment (OTEK, 2010) *Fieldwork date: November to December 2009*	25 boreholes (SB001-SB025) across the site for site coverage and to target areas of concern. One borehole (SB025) converted to monitoring well (MW001).	Soil: Metals, TRH/BTEX, PAHs. Groundwater: Metals, TRH/BTEX, PAHs.
Detailed Site Investigation (JBS&G, 2019) *Fieldwork date: October to November 2017*	11 boreholes (B1-B11) across the site for site coverage and to target areas of concern. Four boreholes (B1, B4, B5 and B11) converted to monitoring well (MW1, MW2, MW3 and MW5).	Soil: Metals, TRH/BTEX, PAHs, OPP, PCBs and asbestos. Groundwater: Metals, TRH/BTEX, PAHs and volatile organic compounds (VOCs).

The Auditor's assessment of data quality follows in Tables 6.2 and 6.3.

Table 6.2: QA/QC – Sampling and Analysis Methodology Assessment

Sampling and Analysis Plan and Sampling Methodology	Auditor's Opinion
Data Quality Objectives (DQO) The ESA and DSI defined specific DQOs in accordance with the seven-step process outlined in Schedule B2 of NEPM (2013). The following decisions for the DSI were identified in the DQOs: • Are there any unacceptable risks to likely future on-site receptors from impacted soil or groundwater on site? • Are there any issues relating to local area background soil concentrations that exceed the appropriate soil criteria? • Are there any impacts of chemical mixtures? • Are there any additional aesthetic concerns (odours) in soil present at the site? • Is there any evidence of, or potential for, migration of contaminants off-site? • Is a site management strategy required?	Overall, the DQOs presented were considered appropriate for the investigations conducted.
Sampling pattern and locations *Soil:* Investigation locations were generally spaced to gain coverage of the majority of the site and to target areas of concern including staining, ASTs, fuel dispensers and the oil/water separator. The various fill and natural materials at the site were also targeted for sampling. *Groundwater:* Monitoring wells were concentrated in the vicinity of the ASTs, fuel dispensers and the oil/water separator, in assumed down-gradient positions.	In the Auditor's opinion these investigation locations adequately target the main areas of concern and provide adequate site coverage.
Sampling density *Soil:* The sampling density of the combined 36 OTEK and JBS&G locations over approximately 0.5 ha exceeds the minimum recommended by EPA (1995) *Sampling Design Guidelines* (13 locations). The coverage provides a 95% confidence of detecting a residual hot spot of approximately 13.9 m diameter.	In the Auditor's opinion the sampling density was appropriate to identify contamination likely to present a risk to human health or the environment.

Sampling and Analysis Plan and Sampling Methodology	Auditor's Opinion
The density of asbestos analysis (8 samples) was less than the minimum required by NEPM (2013) Schedule B1 (13 samples). *Groundwater*: Five groundwater wells were installed at the site by OTEK and JBS&G, however MW1 was dry.	
Sample depths Soil samples were collected and analysed from a range of depths, with the primary intervals being within the shallow fill (0.5-0.6 mbgl), and generally every 0.5 to 1.0 m through fill and at and around the fill/natural interface. DSI samples were also obtained from changes in fill profile and from underlying natural soils/bedrock (where encountered). Borehole logs were not provided for the ESA so it is not known if samples represent fill material or natural material. Most samples were collected from <0.5 mbgl, which is likely to be representative of fill material. Groundwater sampling depths were not specified.	In the Auditor's opinion, the sampling strategy was appropriate and adequate to characterise the primary material types present on site.
Well construction The constructions details for the monitoring well installed by OTEK as part of the ESA are not known. The JBS&G monitoring wells were typically installed to depths of 6.5-7.6 mbgl, with screen length intervals of 2.5-5.6 m backfilled with gravel. Wells were constructed of 50 mm uPVC. A bentonite seal of 0.5 m thickness was placed above the screen and the well backfilled with soil cuttings or cement grout to the ground surface. A shallow well (MW1) was installed to 2.5 m in an assumed upgradient location with a screen length of 2.0 m from 0.5 to 2.5 mbgl. The SWL intersects the screen interval in wells installed in the natural clay. Shallow well MW1 was dry.	In the Auditor's opinion the well construction was acceptable.
Sample collection method *Soil*: Sample collection for the ESA was via hand auger, a drill rig with push tube equipment and solid flight augers. Sample collection for the DSI was via a drill rig fitted with push tube equipment. It is not clear whether push tube samples were collected with a nickel-plated sampler tube or whether sampler tubes were fitted with clear PVC sleeves. It is also not clear whether the external material was removed from the hand auger or solid flight augers prior to collecting the sample. 500 mL samples were collected for laboratory analysis for asbestos fines (AF) and fibrous asbestos (FA). Field quantification for asbestos (10 L samples) was not undertaken. No asbestos analysis was performed during the ESA. *Groundwater*: The DSI reported that wells were installed by solid flight augers, developed with a bailer and samples were collected by low flow peristaltic pump with dedicated sample tubing. The development and sampling methods were not specified in the ESA.	Sample collection from the auger flights during the ESA is not ideal as it can result in loss of volatiles and sample cross contamination, however the more recent DSI samples were collected by pushtube. The use of borehole drilling limits the ability to visually inspect the soil profile for asbestos and other indicators of contamination. There is the potential for unexpected finds of anthropogenic materials, including asbestos containing materials (ACM), in fill material during redevelopment of the site. Overall, the sample collection method was found to be acceptable in the context of the proposed development.
Decontamination procedures *Soil:* Re-useable sampling equipment was not used during soil sampling. New gloves were reportedly used for each new sample. Decontamination of augers between locations was not explicitly reported. Decontamination procedures were not provided in the ESA. *Groundwater*: Dedicated sampling equipment was used for each well. New gloves were reportedly used for each new sample. The interface probe was cleaned with detergent, tap water and then de-ionised water prior to sampling and between sampling events to prevent cross contamination. Decontamination procedures were not provided in the ESA.	Decontamination procedures provided in the DSI are considered adequate. The ESA does not discuss decontamination (noting that the report was incomplete). It is considered likely that decontamination was undertaken, however the absence of evidence raises some doubt about the accuracy of the data.

Sampling and Analysis Plan and Sampling Methodology	Auditor's Opinion
Sample handling and containers Samples were placed into prepared and preserved sampling containers provided by the laboratory and chilled during storage and subsequent transport to the labs. Samples for asbestos analysis were placed in plastic zip-lock bags. JBS&G did not indicate whether groundwater samples to be analysed for heavy metals were field filtered, however, the laboratory certificates indicate that metals concentrations were dissolved (rather than total). It is not clear if samples were filtered in the field or by the laboratory.	Acceptable where provided
Chain of Custody (COC) COC forms were not provided in the ESA report. Completed COC forms were provided in the DSI report.	Acceptable where provided
Detailed description of field screening protocols *Soil:* Field screening for volatiles was undertaken using a PID. Soil sub-samples were placed in ziplock plastic bags and the headspace measured for VOCs after allowing time for equilibration. *Groundwater:* Field parameters were measured during well sampling during the DSI. The ESA does not indicate whether field parameters were measured during development or sampling.	Acceptable where provided
Calibration of field equipment The DSI report indicated that calibration had been undertaken prior to use and checks were performed during use. Calibration certificates from the equipment supplier were provided. The ESA did not specify whether calibration was undertaken prior to use.	Acceptable where provided
Sampling logs Soil logs are provided within the DSI report, indicating sample depth and lithology. The logs indicate inclusions of ash/slag and hydrocarbon odours however report no other indications of contamination. Surface staining was reported in the body of the ESA and DSI reports, and investigation locations were targeted to these areas. Soil logs were not provided in the ESA. Groundwater field sampling records were provided in the DSI, indicating SWL, field parameters, methodology and observations. No groundwater field records were provided in the ESA.	Acceptable where provided

Table 6.3: QA/QC – Field and Lab Quality Assurance and Quality Control

Field and Lab QA/QC	Auditor's Opinion
Field quality control samples Field quality control samples including trip blanks, trip spikes, rinsate blanks, field intra-laboratory and inter-laboratory duplicates were undertaken during the DSI. The field quality control samples included in the ESA were not specified in the report provided.	Acceptable where provided
Field quality control results The results of field quality control samples were generally within appropriate limits with the exception of metals, PAH and TRH in intra-laboratory and inter-laboratory duplicate samples. Elevated RPDs for metals, TRH and PAHs were considered by JBS&G to be due to the heterogeneity of the fill material and considered to not affect the suitability of the data for the site assessment as all concentrations were significantly less than the adopted health based assessment criteria.	Overall, in the context of the dataset reported, the elevated RPD results are not considered significant and the field quality control results are acceptable.

Field and Lab QA/QC	Auditor's Opinion
NATA registered laboratory and NATA endorsed methods Laboratories used included: ALS, Envirolab, LabMark, and Eurofins | mgt. Laboratory certificates were NATA stamped. Laboratory certificates were not provided in the ESA however the report outlines the laboratories used.	Acceptable
Analytical methods Analytical methods were included in the laboratory test certificates. The laboratories provided brief method summaries of in-house NATA accredited methods used based on USEPA and/or APHA methods (excluding asbestos) for extraction and analysis in accordance with the NEPM (2013). Asbestos identification was conducted by Envirolab using polarised light microscopy with dispersion staining by method AS4964-2004 *Method for the Qualitative Identification of Asbestos Bulk Samples*. Asbestos quantification for AF/FA was undertaken in accordance with NEPM (2013).	The analytical methods are considered acceptable for the purposes of the site audit.
Holding times Review of the COCs and laboratory certificates for the DSI indicate that the majority of holding times had been met. Some organic analytes were analysed outside the recommended holding time, however, JBS&G noted that given the trip spike recoveries were within acceptable limits, the samples were appropriately stored under refrigeration at the laboratory during the period prior to analysis and that the primary contaminants of concern were semi-volatile, the rate of relative breakdown is considered such that generally minor exceedances in holding times are of minor concern. Laboratory certificates were not provided for the ESA to provide comment on holding times and a discussion was not provided in the report.	Acceptable where provided.
Practical Quantitation Limits (PQLs) *Soil:* PQLs were less than the threshold criteria for the contaminants of concern. *Groundwater:* The following criteria were less than the PQLs: • Mercury 0.1 µg/L, trigger value 0.06 µg/L • Anthracene 1 µg/L, trigger value 0.01 µg/L • Phenanthrene 1 µg/L, trigger value 0.6 µg/L • Benzo(a)pyrene 1 µg/L, trigger value 0.1 µg/L	*Soil:* Overall the soil PQLs are acceptable. *Groundwater*: The elevated PQLs were only marginally elevated above the trigger values and in the context of the results reported these discrepancies do not materially affect the outcome of the audit. Significant mercury or PAH impacts were also not detected in the soil samples analysed.
Laboratory quality control samples Laboratory quality control samples including laboratory control samples, matrix spikes, surrogate spikes, blanks, internal standards and duplicates were undertaken by the laboratory during the DSI. Laboratory quality control samples undertaken for the ESA are not known.	Acceptable where provided
Laboratory quality control results The results of laboratory quality control samples were generally within appropriate limits, with the exception of two TRH and PAH RPDs for laboratory duplicates obtained during the DSI.	In the context of the dataset reported, the elevated RPDs are not considered significant and the laboratory quality control results are acceptable.
Data Quality Indicators (DQI) and Data Evaluation (completeness, comparability, representativeness, precision, accuracy) Predetermined data quality indicators (DQIs) were set in the DSI for laboratory analyses including blanks, replicates, duplicates, laboratory control samples, matrix spikes, surrogate spikes and internal standards. These were discussed with regard to the five category areas. An evaluation of data quality was not presented in the ESA.	An assessment of the data quality with respect to the five category areas has been undertaken by the Auditor and is summarised below.

6.1 Auditor's Opinion

In considering the data as a whole the Auditor concludes that:

- The OTEK ESA report provided for review was a draft version and incomplete. It did not include the following appendices: the health and safety plan; photographic log; groundwater database search; soil and groundwater sampling program (including soil boring logs and bore license); and sample analysis and QA/QC (including laboratory reports). Data from the ESA is therefore considered of low to moderate reliability, however, has been considered as a line of evidence during the audit.
- The data from the investigations are likely to be representative of the overall site conditions with the exception of metals concentrations in groundwater from samples that potentially were not field filtered. Field records indicate that samples were highly turbid, which may impact on the metal concentrations reported.
- The DSI data is considered to be adequately complete, accurate and representative.
- The primary laboratory used during the DSI provided sufficient information to conclude that data is of sufficient precision.

7. ENVIRONMENTAL QUALITY CRITERIA

The Auditor has assessed the results against Tier 1 criteria from National Environmental Protection Council (NEPC) *National Environmental Protection (Assessment of Site Contamination) Measure 1999*, as Amended 2013 (NEPM, 2013). Other guidance has been adopted where NEPM (2013) is not applicable or criteria are not provided. Based on the proposed development (ongoing use as a refuelling infrastructure area), the human health criteria for 'commercial/industrial' land uses were adopted.

7.1 Soil Assessment Criteria

7.1.1 Human Health Assessment Criteria

The Auditor has adopted human health assessment criteria from the following sources:

- NEPM (2013) Health Investigation Levels (HILs) for 'Commercial/Industrial' (HIL D) land use.
- NEPM (2013) Health Screening Levels (HSLs) for 'Commercial/Industrial' (HSL D) land use. The HSLs assumed a sand soil type. Depth to source adopted was <1 m as an initial screen.
- NEPM (2013) Management Limits (MLs) for petroleum hydrocarbons for 'Commercial/Industrial' land use and assuming coarse soil texture. Criteria are relevant for operating sites where significant sub-surface leakage of petroleum hydrocarbons has occurred and when decommissioning industrial and commercial sites.
- NEPM (2013) HSLs for Asbestos Contamination in Soil for 'Commercial/Industrial' (HSL D) land use (AF/FA).
- Friebel & Nadebaum (2011) HSLs for direct contact for all land use categories, and vapour inhalation/direct contact pathways for intrusive maintenance workers.

7.1.2 Ecological Assessment Criteria

The Auditor has not adopted ecological soil assessment criteria as the site is covered with asphalt or compacted hardstand gravels and road-base material. There are no landscaped areas present on the site and site soils are not accessible to ecological receptors.

7.1.3 Soil Aesthetic Considerations

The Auditor has considered the need for soil remediation based on 'aesthetic' contamination as outlined in *Section 3.6 Aesthetic Considerations* of NEPM (2013) Schedule B1, which acknowledges that there are no chemical-specific numerical aesthetic guidelines. Instead, site assessment requires a balanced consideration of the quantity, type and distribution of foreign material or odours in relation to the specific land use and its sensitivity.

7.2 Groundwater Assessment Criteria

7.2.1 Human Health Assessment Criteria

The Auditor has adopted human health assessment criteria from the following sources:

- NEPM (2013) HSLs for 'Commercial/Industrial' (HSL D) land use. The HSLs assumed a clay soil type and a depth to groundwater of 4 to <8 m.

7.2.2 Ecological Assessment Criteria

The Auditor has adopted ecological groundwater assessment criteria from the following sources:

- ANZG (2018) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.* Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT, Australia (www.waterquality.gov.au/anz-guidelines). Criteria for freshwater and 95% level of protection were adopted.

7.3 Auditor's Opinion

The environmental quality criteria referenced by the Auditor are consistent with those adopted by JBS&G with the exception of the following:

- JBS&G adopt ANZG (2018) marine water criteria rather than the likely freshwater ecosystem of the nearest surface water receptor (the Cooks River).

Given the results obtained, the Auditor considers that these discrepancies do not affect the overall conclusions reached by JBS&G and the Auditor.

8. EVALUATION OF SOIL RESULTS

As outlined in Table 6.1, 36 sample locations were undertaken historically by both OTEK and JBS&G. The sample locations are presented in both Attachment 2 and 3 (Appendix A) and the following sections outline the soil field and analytical results for the OTEK and JBS&G investigations.

8.1 Field Results

OTEK noted moderate to strong diesel odours in the boreholes located to the southeast of the railway tracks. Hydrocarbon staining and light non-aqueous phase liquid (LNAPL) was also observed on surface water in several boreholes (SB011, SB013, SB019, SB020, SB021 and SB022A). Light to moderate diesel odours were also noted during advancement of SB004 and SB007 which were in the vicinity of the decommissioned AST. Strong diesel odours and an oily texture were observed in soil samples collected from SB007. OTEK also observed a black bitumen layer within the bunded and vehicle refueling areas (SB014 and SB015) which contained moderate to strong diesel odours, and an oily texture.

Investigation of the site by JBS&G was undertaken eight years later and did not identify LNAPL or significant hydrocarbon staining. Hydrocarbon odours were noted in fill/soils at several locations by JBS&G, including near the fill points at sampling locations B01 and B04. Odours, where noted, were generally noted as stronger in surface and shallow fill soils to a depth of approximately 1.0 mbgl. No odours were reported to have been observed in underlying natural clay soils. The DSI did not provide PID readings for individual samples, however reported that results were between 0.1 to 21 ppm.

8.2 Analytical Results

Soil samples collected during the OTEK and JBS&G investigations were analysed for a variety of contaminants as detailed in Tables 8.1 (fill) and 8.2 (natural). The results have been assessed against the environmental quality criteria outlined in Section 7 and are summarised below. Due to the fill/natural samples not being identified by OTEK in the incomplete ESA provided for review, the Auditor has included the entire OTEK dataset has been included in Table 8.1. Based on the typical sample depth of <0.5 mbgl, it is likely that the majority of samples were of fill material.

Table 8.1: Evaluation of Fill Soil Analytical Results – Summary Table

Analyte	n	Detections	Maximum (mg/kg)	n > Human Health Screening Criteria
Asbestos (AF/FA)	8	1	**0.017% w/w**	**1 above 0.001%**
BTEX	22	0	<PQL	0 above HSL D 0-1 m, sand
F1 (TRH C_6–C_{10} minus BTEX)	16	1	21	0 above HSL D 0-1 m, sand 260 mg/kg
F2 (TRH >C_{10}–C_{16} minus naphthalene)	16	4	3,800	0 above HSL D 0-1 m, sand NL
TRH C_6–C_{10}	16	1	21	0 above ML (commercial/industrial) 700 mg/kg
TPH C_6–C_9	6	0	<PQL	-
TRH >C_{10}–C_{16}	16	4	**3,800**	**2 above ML (commercial/industrial) 1000 mg/kg**
TPH C_{10}–C_{14}	35	8	520	**-**

Analyte	n	Detections	Maximum (mg/kg)	n > Human Health Screening Criteria
TRH >C_{16}-C_{34}	16	7	**5,100**	**1 above ML (commercial/industrial) 3500 mg/kg**
TPH C_{15}–C_{28}	35	18	2,080	**-**
TRH >C_{34}-C_{40}	16	6	320	0 above ML (commercial/industrial) 10,000 mg/kg
TPH C_{29}–C_{36}	35	9	3,100	-
Naphthalene	16	0	<PQL	0 above HSL D 0-1 m, sand NL
Benzo(a)pyrene	49	6	6.6	-
Benzo(a)pyrene TEQ	16	3	4	0 above HIL D 40 mg/kg
Total PAHs	49	18	73.3	0 above HIL D 4000 mg/kg
Arsenic	15	14	97	0 above HIL D 3000 mg/kg
Cadmium	15	2	3	0 above HIL D 900 mg/kg
Chromium	15	15	51	0 above HIL D 3600 mg/kg
Copper	15	15	150	0 above HIL D 240,000 mg/kg
Lead	15	15	120	0 above HIL D 1500 mg/kg
Mercury	15	1	0.2	0 above HIL D 730 mg/kg
Nickel	15	14	43	0 above HIL D 6000 mg/kg
Zinc	15	15	900	0 above HIL D 400,000 mg/kg
PCB	18	0	<PQL	0 above HIL D 7 mg/kg
OCP	18	0	<PQL	0 above HIL D

n number of samples
- No criteria available/used
NL Non-limiting
<PQL Less than the practical quantitation limit

In reviewing the analytical results, the Auditor notes the following:

- Asbestos was detected as a single fibre cement fragment in the QC02 sample, a duplicate of the fill sample B10 0-1.0 m. Asbestos was not identified in the primary sample.
- Detections of TPH were widespread and at varying depths (typically within fill). Concentrations of TRH >C_{10}–C_{16} were above the ML criteria in two fill samples (B1 and B2) at depths of 0.5-0.6 mbgl. TRH >C_{16}–C_{34} was also above the ML criteria in the B1 sample. JBS&G indicated that the ML criteria are designed to address a number of potential risks including the formation of observable LNAPL and effects on buried infrastructure, e.g. penetration of, or damage to, in-ground services by hydrocarbons. JBS&G inferred that the identified TRH impacts were confined to shallow soils <1 m and were not contributing to the formation of LNAPL at the site. JBS&G concluded that the identified impacts do not pose a risk to future on-site receptors under the current land-use, however, potential impact of any underground utilities (if any) at the site may require consideration.
- Concentrations of metals, BTEX, PAHs, PCBs and OCP were below the screening criteria (where detected).

Table 8.2: Evaluation of Natural Soil Analytical Results – Summary Table

Analyte	n	Detections	Maximum (mg/kg)	n > Human Health Screening Criteria
BTEX	6	0	<PQL	0 above HSL D 0-1 m, sand
F1 (TRH C_6–C_{10} minus BTEX)	6	0	<PQL	0 above HSL D 0-1 m, sand 260 mg/kg
F2 (TRH >C_{10}–C_{16} minus naphthalene)	6	1	63	0 above HSL D 0-1 m, sand NL
TRH C_6–C_{10}	6	0	<PQL	0 above ML (commercial/industrial) 700 mg/kg
TRH >C_{10}–C_{16}	6	1	63	0 above ML (commercial/industrial) 1000 mg/kg
TRH >C_{16}-C_{34}	6	0	<PQL	0 above ML (commercial/industrial) 3500 mg/kg
TRH >C_{34}-C_{40}	6	0	<PQL	0 above ML (commercial/industrial) 10,000 mg/kg
Naphthalene	6	0	<PQL	0 above HSL D 0-1 m, sand NL
Benzo(a)pyrene	6	0	<PQL	-
Benzo(a)pyrene TEQ	6	0	<PQL	0 above HIL D 40 mg/kg
Total PAHs	6	0	<PQL	0 above HIL D 4000 mg/kg

n number of samples
- No criteria available/used
NL Non-limiting
<PQL Less than the practical quantitation limit

In reviewing the analytical results, the Auditor notes the following:

- TRH >C_{10}–C_{16} was detected in the natural sample obtained from B4 at a depth of 1.5-1.6 mbgl. TRH >C_{10}–C_{16} was not detected in the underlying deeper natural sample obtained from 2.0-2.1 mbgl.
- Concentrations of BTEX and PAHs were less than the detection limit.

8.3 Auditor's Opinion

In the Auditor's opinion, the soil analytical results are consistent with the site use and field observations. The results indicate that shallow soils have been impacted by petroleum hydrocarbons (diesel). Elevated TRH concentrations appear to be localised and associated with fill material in areas of surface staining. Based on the DSI data, the reported concentrations in fill material have not significantly impacted underlying natural soil or groundwater, and are not considered to present a risk to human health based on the proposed continued use of the site as a refuelling facility. There is potential for hydrocarbon stained and odorous soils to be encountered during development works. If aesthetically unsuitable materials (stained and odorous soils) are identified during redevelopment, it could be managed under an unexpected finds procedure (UFP). If material is disposed offsite, material would require appropriate sampling to allow classification in accordance with NSW EPA (2014) *Waste Classification Guidelines, Part 1: Classifying Waste*.

A fragment of ACM was identified in one sample collected from fill material in the laydown areas in the southwest of the site. Aerial photographs indicate that this area of the site has been used

for storage of materials, including stockpiles of what appears to be soil, crushed concrete and other materials. Asbestos was not observed during the ESA or DSI, nor by the Auditor during the site inspection. There is the potential for asbestos to be present in fill material given the limitations of the investigation methodology adopted. If asbestos is identified in fill material during redevelopment of the site, it could be managed under a UFP and occupation health and safety (OH&S) procedures. If disposed off-site, fill material would require appropriate sampling to allow classification in accordance with NSW EPA (2014) *Waste Classification Guidelines, Part 1: Classifying Waste*.

The Auditor is satisfied that no further soil investigations are required to demonstrate the suitability of the site for the proposed use. It is recommended that a UFP is prepared and implemented during site redevelopment.

9. EVALUATION OF GROUNDWATER RESULTS

As outlined in Table 6.1, groundwater monitoring wells and sampling events were undertaken by both OTEK and JBS&G. The following sections outline the groundwater field and analytical results for the OTEK and JBS&G investigations.

9.1 Field Results

Field results were not provided by OTEK. JBS&G noted that groundwater samples were typically brown and moderately turbid. JBS&G noted that no odours, sheen or NAPL were observed within the monitoring wells.

9.2 Analytical Results

The results of groundwater samples collected during the ESA and DSI have been assessed against the environmental quality criteria outlined in Section 7 and are summarised in Table 9.1.

Table 9.1: Summary of Maximum Groundwater Investigation Analytical Results (µg/L)

Analyte	n	Detections	Maximum	n > HSL D clay, 4-<8 m NEPM (2013)	n > GILs Freshwater ANZG (2018)
TRH C_6-C_{10} less BTEX (F1)	3	0	<PQL	0 above HSL of NL	-
TRH >C_{10}-C_{16} less naphthalene (F2)	3	0	<PQL	0 above HSL of NL	-
TRH C_6-C_{10}	3	0	<PQL	-	-
TRH >C_{10}-C_{16}	3	0	<PQL	-	-
TRH >C_{16}-C_{34}	3	1	100	-	-
TRH >C_{34}-C_{40}	3	0	<PQL	-	-
TPH C_{10}-C_{36}	1	0	<PQL	-	-
BTEX	3	0	<PQL	0 above HSL	0 above GIL
Naphthalene	4	0	<PQL	0 above HSL of NL	0 above GIL of 16
Benzo(a)pyrene	4	0	<PQL	-	0 above GIL of 0.1
Anthracene	4	0	<PQL	-	0 above GIL of 0.01
Fluoranthene	4	0	<PQL	-	0 above GIL of 1
Phenanthrene	4	0	<PQL	-	0 above GIL of 0.6
Arsenic	3	2	1	-	0 above GIL of 13
Cadmium	3	2	**0.6**	-	**1 above GIL of 0.2**
Chromium	3	2	2	-	0 above GIL of 3.3
Copper	3	2	**21**	-	**2 above GIL of 1.4**
Lead	3	2	**4**	-	**1 above GIL of 3.4**
Mercury	3	2	**0.1**	-	**2 above GIL of 0.06#**
Nickel	3	3	**24**	-	**3 above GIL of 11**
Zinc	3	3	**46,000**	-	**3 above GIL of 8**
VOCs	3	2	14*	-	-

n number of samples
- No criteria available/used
<PQL Less than the practical quantitation limit
NL non limiting
* Detections of 2-Propanone (Acetone) in MW2 and MW3
# 99% freshwater criteria

In assessing the analytical results, the Auditor makes the following observations:

- TPH concentrations were less than the detection limit in the sample obtained from MW001 by OTEK.
- The concentration of TRH >C_{16}-C_{34} was equal to the detection limit in the samples from MW2 collected during the DSI.
- A significantly elevated concentration of zinc was identified at MW3 (46,000 µg/L). This was significantly greater than concentrations reported in MW2 (44 µg/L) and MW5 (82 µg/L). In the absence of any soil impacts, JBS&G indicated that the source of the zinc impact is unknown. They speculated that it may be due to isolated pockets of leachable zinc in fill.
- Concentrations of other metals (cadmium, copper, lead, mercury and nickel) exceeded the adopted ecological criteria. JBS&G considered it unlikely that these metals were related to an on-site source as no significant soil impacts were detected at the site. On this basis, JBS&G indicated that the reported concentrations were considered likely to be representative of background levels of metals in groundwater in the area. The Auditor notes that the JBS&G discussion was based on adopting the ANZG (2018) marine water criteria and not the applicable freshwater criteria appliable to the adjacent Cooks River.
- Low concentrations of the VOC 2-Propanone (Acetone) were detected in samples obtained from MW2 and MW3.

9.3 Auditor's Opinion

In the Auditor's opinion, the groundwater monitoring undertaken was adequate to assess the groundwater conditions at the site. Groundwater monitoring wells were adequately located to identify significant impact from petroleum hydrocarbons. Elevated hydrocarbon concentrations were not identified in groundwater. There is the potential for localised impact to be present in perched groundwater, which may be present intermittently and may be encountered during redevelopment of the site.

A significantly elevated concentration of zinc was identified in groundwater at MW3. The zinc concentration reported is not considered representative of groundwater at the site given that zinc results in MW2 and MW5 were three orders of magnitude lower, no known sources of zinc were identified at the site or greater Pacific National facility, and zinc concentrations in fill material and natural soil were not significantly elevated. The groundwater at MW3 was noted to be brown and turbid, therefore the result may be indicative of poor filtering of the sample.

Acetone is a common laboratory reagent and the results are likely to represent cross contamination during sample handling and analysis by the laboratory, rather than contamination present on site.

In the Auditor's opinion, based on the data obtained during the ESA and DSI, significantly contaminated groundwater has not been identified and further assessment of groundwater is not considered to be required as part of the site redevelopment.

10. EVALUATION OF CONCEPTUAL SITE MODEL

A conceptual site model (CSM) is a representation of the source, pathway and receptor linkages at a site. JBS&G developed a CSM during the DSI. Table 10.1 provides the Auditors review of the CSM.

Table 10.1: Review of the Conceptual Site Model

Element of CSM	Consultant	Auditor Opinion
Contaminant source and mechanism	JBS&G considered the key site contamination issues to be: • The presence of fill used to level the site; and • The storage and handling of petroleum hydrocarbons as associated with the ASTs and vehicle/train refuelling points which may have caused environmental impact through surface leaks and spills. Based on the above, JBS&G identified the following contaminants of potential concern: • Metals • TRH • BTEX • OCPs • PCBs • PAHs • Asbestos.	The sources of contamination and contaminants of concern including the mechanism of contamination have generally been appropriately identified. It is however noted that investigation of the site by JBS&G did not identify significant soil or groundwater impact associated with the storage and handling of petroleum hydrocarbons. Localised areas of contaminated soil were present in fill material around fuel fill points and bowsers, however this was not found to present a risk to human health or the environment based on the ongoing use of the site as a refuelling facility. Fill material was generally not found to be impacted by other contaminants, with the exception of one detection of ACM in fill material. Asbestos was not observed in fill material during the DSI and ESA, nor by the Auditor during the site inspection. However, it is noted that there were limitations associated with the soil investigation methodology adopted and there is a potential that more widespread ACM may be present in fill material than indicated by the results.
Affected media	Fill materials, natural soils and groundwater	The affected media have been appropriately identified.
Receptor identification	Commercial/industrial workers and intrusive maintenance workers (short duration). Due to the presence of compacted roadbase gravels and asphalt pavement present on the site surface, and lack of significant vegetation, consideration of ecological receptors is not applicable to the site.	The onsite receptors have been identified. The auditor notes that offsite ecological receptors would include the nearby Cooks River.
Exposure pathways	Oral, dermal and inhalation (vapours and particulates) of contaminated soils. Oral, dermal and inhalation (vapours) of contaminated groundwater	The exposure pathways for soils and groundwater are generally appropriate. It is however noted that oral and dermal exposure to groundwater is unlikely to be a relevant pathway given the depth to groundwater (>4 mbgl) and absence of abstraction bores on the site and within a 500 m radius of the site. Groundwater migration and discharge to surface water is unlikely based on the data presented, including the low petroleum hydrocarbon concentration in downgradient wells, the low permeability of the aquifer, and the distance to the receptor.

Element of CSM	Consultant	Auditor Opinion
Presence of preferential pathways for contaminant movement	Preferential pathways would be associated with historical sub-surface infrastructure on the site, including pipelines/trenches etc. Based on the gravelly nature of the underlying fill materials, these materials are also considered to provide preferential pathways for contaminant migration.	Potential preferential pathways for migration have been appropriately identified.
Potentially complete source-pathway-receptor (SPR) linkages requiring remediation or management	The DSI did not specify potentially complete SPR linkages.	No complete SPR linkages are considered to be present.
Evaluation of data gaps	No data gaps identified.	The potential for asbestos to be present in fill material has not been well characterised given the limitations of the investigation methodology. There may therefore be more ACM present in fill material than indicated by the results of the investigations.

10.1 Auditor's Opinion

The Auditor is of the opinion that the CSM was a reasonable representation of the potential contamination at the site.

The data gap identified relates to characterisation of fill material for asbestos. One fragments of ACM was identified in one sample of fill material during the DSI. There is the potential for asbestos to be present in fill material given the limitations of the investigation methodology adopted. An UFP should be prepared and implemented during redevelopment of the site to manage any asbestos and aesthetically unsuitable material (or other unexpected finds) encountered during works.

11. CONTAMINATION MIGRATION POTENTIAL

The potential risk of migration of contaminants from the site is considered to be low and acceptable.

Petroleum hydrocarbons were detected in fill material, however, were typically found to be localised to areas of staining associated with fill points and bowsers. Samples of underlying natural material were not found to be impacted, indicating that vertical migration of hydrocarbons is limited. Soil samples located away from potential point sources of contamination did not contain elevated hydrocarbon concentrations.

Asbestos was identified in one sample of fill material, however, was not observed visually during the ESA, DSI or by the Auditor during the site visit. There is therefore considered to be a low potential for asbestos to have migrated from the site under current conditions. However, given the limitations of the investigation methodology adopted, there is the potential for unexpected finds of asbestos to be encountered during redevelopment works. An UFP should be developed to address any unexpected finds of asbestos.

12. ASSESSMENT OF RISK

Based on the results of the investigations, risks to human and ecological receptors are considered to be low and acceptable under the current and proposed site use.

There is the risk that redevelopment of the site identifies unexpected contamination and aesthetic impact. It is therefore recommended that an UFP is prepared and implemented during works.

13. COMPLIANCE WITH REGULATORY GUIDELINES AND DIRECTIONS

13.1 General

The Auditor has used guidelines currently made and approved by the EPA under section 105 of the NSW *Contaminated Land Management Act 1997*.

The investigations were generally conducted in accordance with SEPP 55 Planning Guidelines and reported in accordance with the OEH (2011) *Guidelines for Consultants Reporting on Contaminated Sites* (which was applicable at the time the reports were prepared).

13.2 Development Approvals

A development application (DA-478/2020) was lodged with Canterbury-Bankstown Council (Council). Correspondence from Council in a letter dated 11 September 2020 requested a site audit prior to approval of the development application as follows:

> *"A NSW Environment Protection Authority accredited Site Auditor must be appointed to Audit the Detailed Site investigation report submitted in support of this application prepared by JBS&G PTY LTD, dated, 11 December 2019, reference: 54005/112485 (Rev 0).*
>
> *The Site Audit Statement and Site Audit Report must be provided to Council from the Site Auditor that clearly states that the site is, or can be, made suitable for the intended use. The Site Audit Statement and Site Audit Report must include any restrictions or management requirements for the site."*

This site audit report (SAR) and accompanying site audit statement (SAS) have been completed in order to comply with item 3 of the letter from Council.

13.3 Duty to Report

Consideration has been given to the requirements of the EPA (2015) *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997*. Based on the findings of this SAR, the Auditor considers that the site does not require notification under the Duty to Report requirements.

13.4 Conflict of Interest

The Auditor has considered the potential for a conflict of interest in accordance with the requirements of section 3.2.3 of the NSW EPA (2017) *Guidelines for the NSW Site Auditor Scheme*.

The Auditor considers that there are no conflicts of interest, given that:

1. The Auditor is not related to a person by whom any part of the land is owned or occupied.
2. The Auditor does not have a pecuniary interest in any part of the land or any activity carried out on any part of the land.
3. The Auditor has not reviewed any aspect of work carried out by, or a report written by, the site auditor or a person to whom the site auditor is related.

14. CONCLUSIONS AND RECOMMENDATIONS

JBS&G concluded that *"Based on the findings of the investigations … it is concluded the site is suitable for ongoing commercial/industrial land use subject to management of identified zinc impacts to site groundwater."*

Based on the information presented in the ESI and DSI, and observations made on site, and following the Decision-making process for assessing urban redevelopment sites in NSW EPA (2017) *Guidelines for the NSW Site Auditor Scheme (3rd Edition)*, the Auditor concludes that the site is suitable for the purposes of 'commercial/industrial land use' subject to compliance with the following items:

- Prepare and implement an unexpected finds procedure (UFP) to assess, manage and remediate unexpected contamination encountered during development works. This may include fragments of ACM in fill material, localised hydrocarbon impact, or aesthetic impact in soil and shallow groundwater. The UFP should document procedures to be undertaken in the event of an unexpected find, the responsibilities of different parties, procedures for waste classification and handling, and validation procedures.

Management of zinc impact in groundwater is not considered to be warranted. The reported zinc concentration is not considered representative of site conditions given that zinc results in MW2 and MW5 were three orders of magnitude lower, no known sources of zinc were identified at the site or greater Pacific National facility, and zinc concentrations in fill material and natural soil were not significantly elevated.

Groundwater has not been assessed for any beneficial re-use. Any future use of groundwater would require appropriate assessment and regulatory approvals from the NSW Office of Water.

15. OTHER RELEVANT INFORMATION

This Audit was conducted on the behalf of Pacific National for the purpose of assessing whether the land is suitable for the proposed commercial/industrial uses i.e. a "Site Audit" as defined in Section 4 (definition of a 'site audit' (b)(iii)) of the CLM Act.

This summary report may not be suitable for other uses. The consultants included limitations in their reports. The Audit must also be subject to those limitations. The Auditor has prepared this document in good faith, but is unable to provide certification outside of areas over which the Auditor had some control or is reasonably able to check.

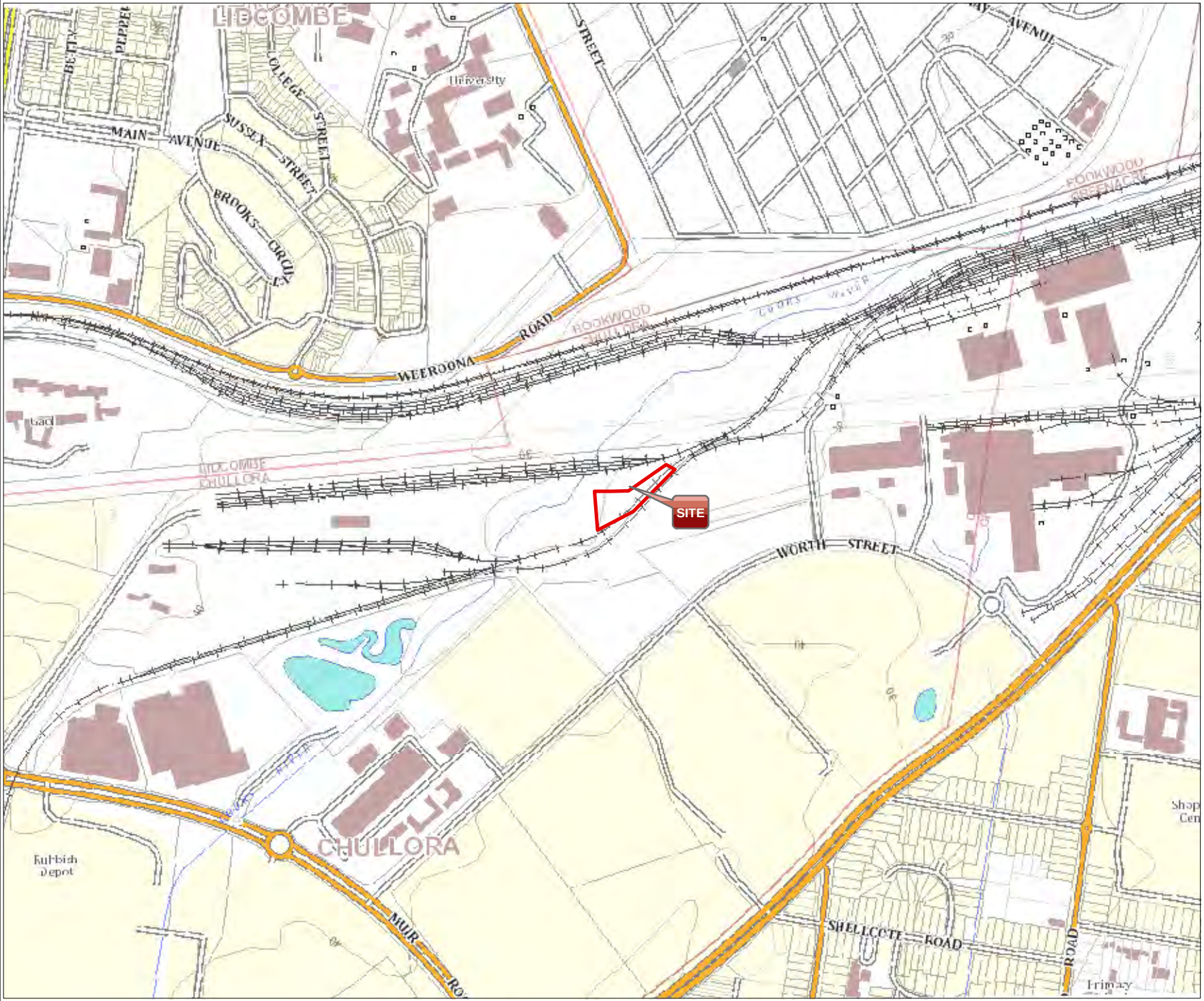
The Auditor has relied on the documents referenced in Section 1 of the Site Audit Report in preparing the Auditors' opinion. If the Auditor is unable to rely on any of those documents, the conclusions of the audit could change.

It is not possible in a Site Audit Report to present all data which could be of interest to all readers of this report. Readers are referred to the referenced reports for further data. Users of this document should satisfy themselves concerning its application to, and where necessary seek expert advice in respect to, their situation.

APPENDIX A
ATTACHMENTS

Attachment 1: Site Location
Attachment 2: JBS&G Sample Locations
Attachment 3: OTEK Sample Locations
Attachment 4: Proposed Site Layout

Attachment 1: Site location



Legend:

Approximate Site Boundary

JBS&G

Job No: 54005	
Client: Pacific National	
Version: R01 Rev B	Date: 11-Dec-2019
Drawn By: RF	Checked By: JD

Scale 1:8,500

0 100 200

metres

Coor. Sys. GDA 1994 MGA Zone 56

20 Dasea Street
Chullora, NSW

SITE LOCATION

FIGURE: 1

File Name: 54005_01
Reference: SixMaps - https://maps.six.nsw.gov.au/ - Imagery 04-01-14

Attachment 2: JBS&G Sample Locations

Legend:

- Approximate Site Boundary
- Groundwater Monitoring Wells
- Soil Sample Location

JBS&G

Job No: 54005	
Client: Pacific National	
Version: R01 Rev B	Date: 11-Dec-2019
Drawn By: RF	Checked By: JD

Scale 1:800

0 10 20
metres

Coor. Sys. GDA 1994 MGA Zone 56

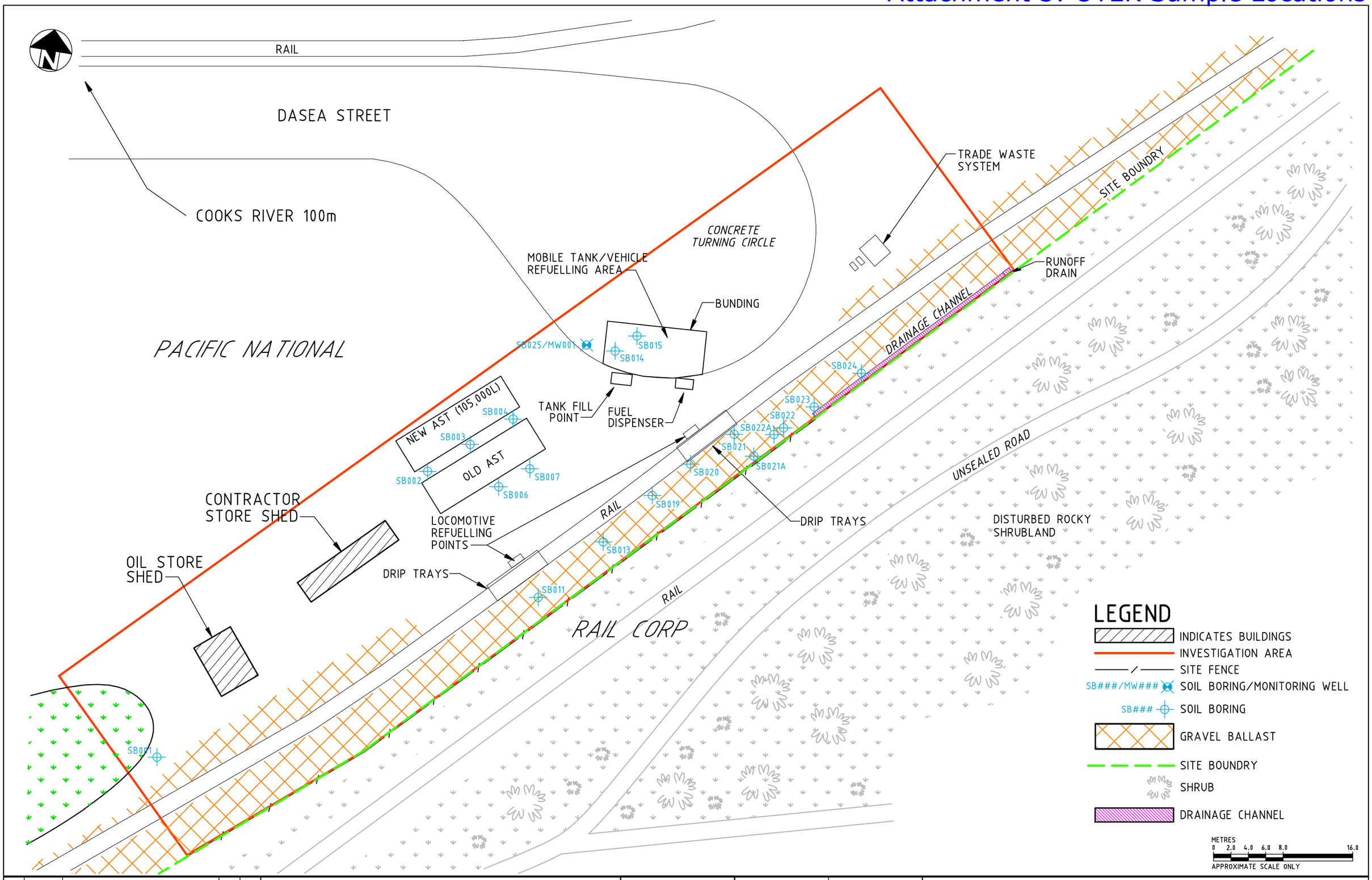
20 Dasea Street
Chullora, NSW

SAMPLE LOCATIONS

FIGURE: 3

File Name: 54005_03
Reference: Nearmap - nearmap.com.au - Imagery - 22-08-2017

Attachment 3: OTEK Sample Locations



ISSUE	DATE	AMENDMENTS	DRN	CKD
02	15.01.10	UPDATE BOUNDRY DETAILS	AL	MN
01	10.12.09	ORIGINAL ISSUE	REM	MG

OTEK
ABN 32 054 371 596

MELBOURNE
TEL (03) 9525 5155
FAX (03) 9593 8555

BRISBANE
TEL (07) 3426 5200
FAX (07) 3426 5299

SYDNEY
TEL (02) 9417 4499
FAX (02) 9417 2314

PERTH
TEL (08) 9227 9000
FAX (08) 9227 9009

www.otek.com.au

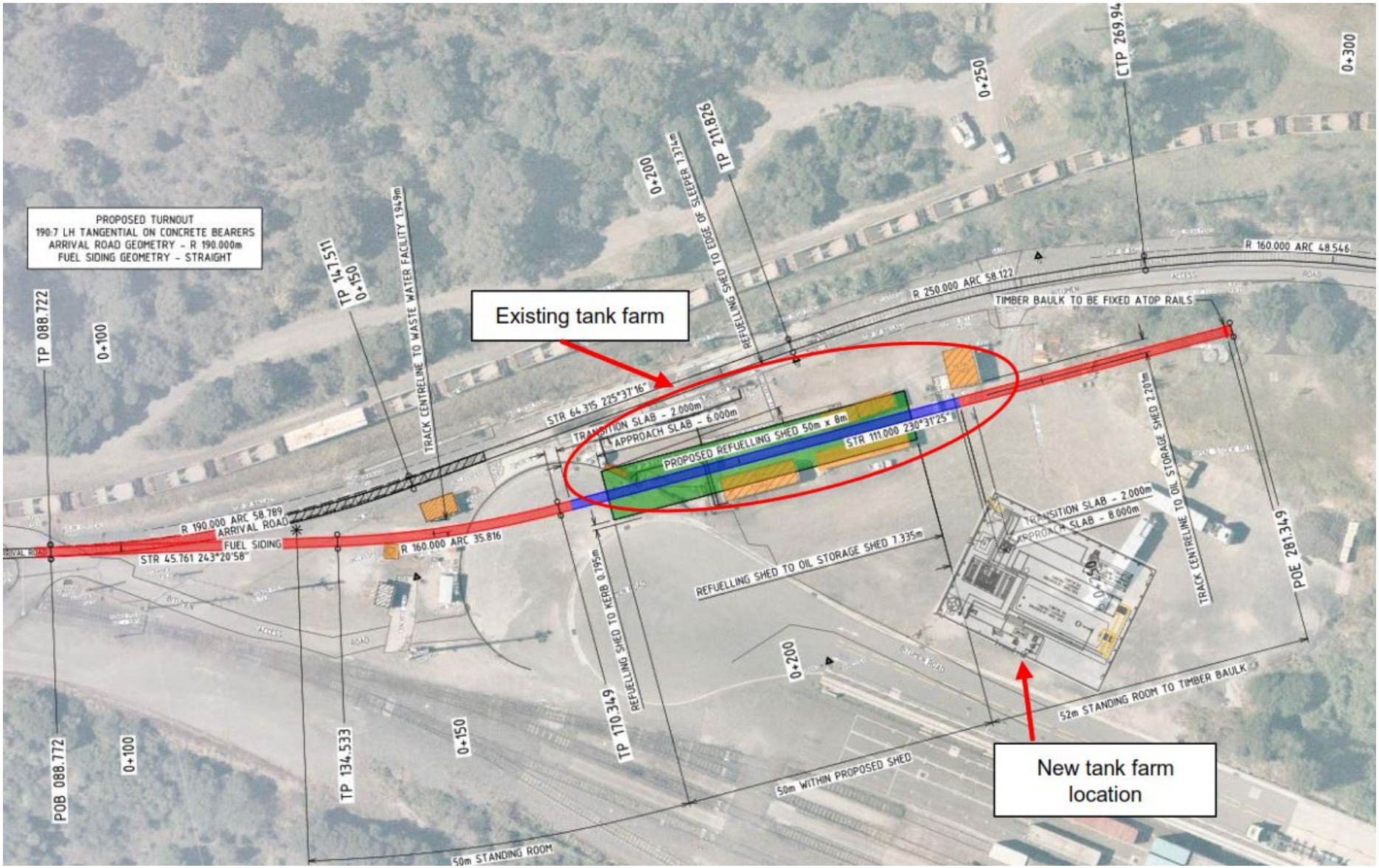
SITE MAP & SOIL BORING LOCATIONS

ENVIRONMENTAL SITE ASSESSMENT

PACIFIC NATIONAL, CHULLORA, NSW

SHEET SIZE	DRAWN: REM	DATE: 10.12.09	CHECKED	APPROVED	FIG No:
A3	REV: 02	DWG NAME: 4109157F02			FIGURE 2

Attachment 4: Proposed Site Layout



APPENDIX B
SITE AUDIT STATEMENT

NSW Site Auditor Scheme

Site Audit Statement

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

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

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

Part I: Site audit identification

Site audit statement no. TO-078

This site audit is a:

☐ statutory audit

☒ non-statutory audit

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

Site auditor details

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

Name: Tom Onus

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100 Pacific Highway, North Sydney

Postcode: 2060

Phone: 02 9954 8133

Email: tonus@ramboll.com

Site details

Address: 20 Dasea Street, Chullora, NSW

Postcode: 2190

Property description

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

Part Lot 35 DP 1007367

Local government area: Canterbury Bankstown Council

Area of site (include units, e.g. hectares): Approximately 4,965 m^2

Current zoning: IN1 General Industrial under Bankstown Local Environment Plan 2015

Regulation and notification

To the best of my knowledge:

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

- ☐ Declaration no.
- ☐ Order no.
- ☐ Proposal no.
- ☐ Notice no.

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

To the best of my knowledge:

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

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

Site audit commissioned by

Name: Troy Favell

Company: Pacific National Pty Ltd

Address: Level 16, 15 Blue Street, North Sydney

Postcode: 2060

Phone: 1300 313 027

Email: troy_favell@pacificnational.com.au

Contact details for contact person (if different from above)

Name:

Phone:

Email:

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

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

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

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

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

Purpose of site audit

☒ **A1** To determine land use suitability

Intended uses of the land: commercial/industrial

OR

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

Intended uses of the land:

OR

(Tick all that apply)

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

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

- ☐ an investigation plan
- ☐ a remediation plan
- ☐ a management plan

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

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

- ☐ **voluntary management proposal** or
- ☐ **management order** under the *Contaminated Land Management Act 1997*

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

Intended uses of the land:

Information sources for site audit

Consultancies which conducted the site investigations and/or remediation:

OTEK Australia Pty (OTEK)

JBS&G Australia Pty Ltd (JBS&G)

Titles of reports reviewed:

'Targeted Environmental Site Assessment (DRAFT), Pacific National Sydney Freight Terminal, 20 Dasea St, Chullora, NSW', 19 January 2010, OTEK

'Detailed Site Investigation for Proposed New Refuelling Infrastructure Area, Part Lot 35 in DP 1007367, 20 Dasea Street, Chullora', 11 December 2019, JBS&G

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

None

Site audit report details

Title: Site Audit Report – New Refuelling Infrastructure Area, 20 Dasea Street, Chullora NSW

Report no.: TO-078 (Ramboll Ref: 318001047) Date: 6 October 2020

Part II: Auditor's findings

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

- Use **Section A1** where site investigation and/or remediation has been completed and a conclusion can be drawn on the suitability of land uses **without the implementation** of an environmental management plan.
- Use **Section A2** where site investigation and/or remediation has been completed and a conclusion can be drawn on the suitability of land uses **with the implementation** of an active or passive environmental management plan.
- Use **Section B** where the audit is to determine:
    - (B1) the nature and extent of contamination, and/or
    - (B2) the appropriateness of an investigation, remediation or management plan[1], and/or
    - (B3) the appropriateness of a site testing plan in accordance with the *Temporary Water Restrictions Order for the Botany Sands Groundwater Source 2017*, and/or
    - (B4) whether the terms of the approved voluntary management proposal or management order have been complied with, and/or
    - (B5) whether the site can be made suitable for a specified land use (or uses) if the site is remediated or managed in accordance with the implementation of a specified plan.

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

Section A1

I certify that, in my opinion:

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

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

☐ ~~Residential, including substantial vegetable garden and poultry~~

☐ ~~Residential, including substantial vegetable garden, excluding poultry~~

☐ ~~Residential with accessible soil, including garden (minimal home-grown produce contributing less than 10% fruit and vegetable intake), excluding poultry~~

☐ ~~Day care centre, preschool, primary school~~

☐ ~~Residential with minimal opportunity for soil access, including units~~

☐ ~~Secondary school~~

☐ ~~Park, recreational open space, playing field~~

☒ Commercial/industrial

☐ ~~Other (please specify):~~

~~OR~~

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

Overall comments:

The site was vacant bushland prior to 1955 when the site appeared to have then been extensively filled with the remainder of the Pacific National facility to achieve levels for railway land uses. Development of the site as a refuelling facility occurred around the late 1990s. The existing refuelling facility comprises aboveground storage tanks (ASTs) containing diesel, oil and coolant, as well as associated fuel dispenser, fill points, transfer lines and pumps.

Investigation of the site identified minor hydrocarbon impact in fill material associated with localised staining around point sources of contamination (bowser and fill points). The reported concentrations in fill material have not impacted underlying natural soil or groundwater, and are not considered to present a risk to human health based on the proposed continued use of the site as a refuelling facility.

The southwest of the site comprises a laydown area that appears to have been used for the storage of various materials (soil, crushed concrete, ballast, sleepers and building materials). Asbestos was not observed during investigation of the site, however a single fragment of asbestos cement material (ACM) was identified in fill material by laboratory analysis. Limitations were noted with the investigation methodology adopted, therefore there is the potential for further ACM fragments to be present in fill material. An unexpected finds procedure (UFP) should be prepared and implemented during site redevelopment to assess, manage and/or remediate unexpected contamination encountered during development works. These may include ACM and soils aesthetically impacted by petroleum hydrocarbons

(odours or stained soils). The UFP should document procedures to be undertaken in the event of an unexpected find, the responsibilities of different parties, procedures for waste classification and handling, and validation procedures.

Groundwater has not been assessed for any beneficial re-use. Any future use of groundwater would require appropriate assessment and regulatory approvals from the NSW Office of Water.

Section A2

I certify that, in my opinion:

Subject to compliance with the **attached** environmental management plan[2] (EMP), the site is suitable for the following uses:

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

☐ Residential, including substantial vegetable garden and poultry

☐ Residential, including substantial vegetable garden, excluding poultry

☐ Residential with accessible soil, including garden (minimal home-grown produce contributing less than 10% fruit and vegetable intake), excluding poultry

☐ Day care centre, preschool, primary school

☐ Residential with minimal opportunity for soil access, including units

☐ Secondary school

☐ Park, recreational open space, playing field

☐ Commercial/industrial

☐ Other (please specify):

_____

EMP details

Title: _____

Author: _____

Date: _____ No. of pages: _____

EMP summary

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

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

☐ requires operation and/or maintenance of **active** control systems[3]

☐ requires maintenance of **passive** control systems only[3].

[2] Refer to Part IV for an explanation of an environmental management plan.
[3] Refer to Part IV for definitions of active and passive control systems.

Purpose of the EMP:

Description of the nature of the residual contamination:

Summary of the actions required by the EMP:

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

How there will be appropriate public notification:

Overall comments:

Section B

Purpose of the plan[4] which is the subject of this audit:

_____

_____

_____

I certify that, in my opinion:

(B1)

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

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

AND/OR (B2)

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

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

AND/OR (B3)

☐ The site testing plan:

- ☐ **is** appropriate to determine
- ☐ **is not** appropriate to determine

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

AND/OR (B4)

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

- ☐ **have** been complied with
- ☐ **have not** been complied with.

*voluntary management proposal no. _____

**management order no. _____

AND/OR (B5)

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

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

- ☐ Residential, including substantial vegetable garden and poultry
- ☐ Residential, including substantial vegetable garden, excluding poultry

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

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

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

*Strike out as appropriate

Plan title

Plan author

Plan date No. of pages

SUBJECT to compliance with the following condition(s):

Overall comments:

Part III: Auditor's declaration

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

Accreditation no. 1505

I certify that:

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

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

Signed 

Date 6 October 2020

Part IV: Explanatory notes

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

How to complete this form

Part I

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

Part II

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

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

Section A1

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

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

Section A2

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

Environmental management plan

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

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

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

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

Active or passive control systems

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

Auditor's comments

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

Section B

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

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

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

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

Part III

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

Where to send completed forms

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

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

  AND

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

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