Mace Group

Stage 2 Site Contamination Assessment

Former Grafton Correctional Centre

170 Hoof Street, Grafton

Report No. RGS33320.2-AC(Rev1)

12 September 2023

REGIONAL GEOTECHNICAL SOLUTIONS

REGIONAL GEOTECHNICAL SOLUTIONS

Manning-Great Lakes
Port Macquarie
Coffs Harbour

RGS33320.2-AC(Rev1)

12 September 2023

Mace Group
S14.02 Level 14, 68 Pitt Street
SYDNEY NSW 2000

Attention: Jack Davenport

Dear Jack

RE: Former Grafton Correctional Centre – 170 Hoof Street, Grafton
Stage 2 Site Contamination Assessment

As requested, Regional Geotechnical Solutions Pty Ltd (RGS) has undertaken a Stage 2 site contamination assessment on a portion of the former Grafton Correctional Centre that is located at 170 Hoof Street, Grafton (Lot 2 DP 1276261).

The assessment found that based on the results of the investigation the site is suitable in its current state for the proposed residential land use with regards to the presence of soil contamination, provided the recommendations and advice of this report are adopted, and site works (if any) are conducted in accordance with appropriate site management protocols and legislative requirements.

The work presented herein was reviewed by Dr David Tully CEnvP SC. A copy of Dr Tully's letter pertaining to the review is appended to the report.

For and on behalf of **Regional Geotechnical Solutions Pty Ltd**

Prepared by

Simon Keen

Associate Geotechnical Engineer

Regional Geotechnical Solutions Pty Ltd
ABN 51141848820

Unit 14, 25-27 Hurley Drive
Coffs Harbour NSW 2450
Ph. (02) 6650 0010

Email simon.k@regionalgeotech.com.au
Web: www.regionalgeotech.com.au

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1 INTRODUCTION & BACKGROUND

1.1 General

Regional Geotechnical Solutions Pty Ltd (RGS) has undertaken a Stage 2 Site Contamination Assessment (SCA) of a portion of the former Grafton Correctional Facility that is located at 170 Hoof Street, Grafton. The site is identified as Lot 2 DP 1276261, and the portion of the site that forms the assessment presented herein covers an area of approximately 9,800m^2. The location of the site is illustrated on Figure 1.

It is understood that it is proposed to redevelop the site. The development will not involve the construction of new structures or additions to the existing structures. It is understood that new underground services will be installed which will involve excavations to depths of up to about 2m.

A site contamination assessment is required to characterise the nature and extent of potential soil contamination that may be present on the site, and to evaluate the site's suitability for the proposed development from a contamination perspective.

The proposed land use for the site is not known to RGS, however, we understand that the site may support a hospital administration centre and potentially residential land use. It has therefore been assumed that for the purpose of the assessment presented herein that the site will be used for residential purposes.

1.2 Objectives

The objectives of the Stage 2 site contamination assessment were to:

- Characterise the nature and extent of potential soil contamination present on the site (if any);
- Assess the suitability of the site for future residential land use; and
- Provide recommendations for on-site management, the need and options for remediation and any further investigation and testing that is required.

1.3 Scope of Works

In accordance with the relevant sections of the *National Environment Protection (Assessment of Site Contamination) Measure 1999 (Amended 2013*), the assessment involved the following process:

- A review of the previous Stage 1 SCA prepared by RGS, report no. RGS33320.1-AD, dated 19 September 2022;
- Undertake targeted sampling and analysis for the presence of soil and groundwater contamination;
- Analyse samples for a suite of potential contaminants associated with the past activities;
- Evaluate the results against industry accepted criteria for future residential land use; and
- Preparation of a Stage 2 site contamination assessment report.

1.4 Site Identification

General site information is provided below in Table 1. The site location is shown in Figure 1.

Table 1: Summary of Site Details

Site Details	Description
Site location:	170 Hoof Street, Grafton
Approximate site area:	9,800m^2
Title Identification Details:	Lot 2 DP 1276261
Current Landuse:	Former Grafton Correctional Facility
Proposed Landuse:	Unknown – Assumed residential land use
Adjoining Site Uses:	Southwest & Northwest – Former Grafton Correctional Facility Southeast – Queen Street & further is residential developments Northeast – Arthur Street, Grafton Hospital and Commercial Developments
Government Area:	Clarence Valley Council

1.5 Previous Assessment

RGS has undertaken a Stage 1 and Preliminary Stage 2 SCA at the site, RGS Report No. RGS33320.1-AD, dated 19 September 2022. The report made the following points and recommendations:

- The site was likely used for agricultural purposes prior to the 1980s when the existing correctional facility was constructed. The site appears to have remained largely unchanged from its current state since the 1980s;
- Above ground LPG tanks and underground storage tanks are located beyond but close to the northwest site boundary;
- Preliminary soil sampling and testing was undertaken at six near surface samples. The samples were submitted to a NATA accredited laboratory to be analysed for polycyclic aromatic hydrocarbons (PAH), total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene and xylene (BTEX), organochlorine and organophophorus pesticides (OC/OP), heavy metals, polychlorinated biphenyls (PCB) and the presence of asbestos. The preliminary sampling and testing indicated that the site is likely to be suitable for residential land use with regard to the presence of soil contamination.

Based on the site observations, and knowledge obtained about site activities as outlined above, potential Areas of Concern and Chemicals of Concern were identified as outlined in Table 1.

Table 2: Areas of Environmental Concern & Chemicals of Concern

AEC	Mode of Potential Contamination	Potential COCs
AEC1: Former agricultural land use (entire site)	Potential intensive use of or spillage of stored chemicals and from vehicles and machinery including agrochemicals, fuels/oils	Heavy Metals, TRH, BTEX, PAH, OC/OPP
AEC2: Soils and groundwater around the above ground LPG tanks and underground fuel tanks that are located beyond the northwest site boundary	Leaking above ground LPG tank/lines and/or underground fuel tanks/lines	Heavy metals, TRH
AEC3: Isolated areas of soil contamination associated with construction and maintenance of the existing structures/infrastructure (entire site)	Potential spillage of fuels/oils and chemicals from containers including agro-chemicals, fuels/oils, pesticides	Heavy Metals, TRH, BTEX, PAH, OC/OPP and asbestos

2 GUIDELINES AND ASSESSMENT CRITERIA

2.1 Soil Contamination

The assessment was aimed at fulfilling the requirements of a Stage 2 CSA in accordance with NSW EPA *Guidelines for Consultants Reporting on Contaminated Land (2020)*.

To evaluate results and for guidance on assessment requirements, the assessment adopted the guidelines provided in the *National Environment Protection (Assessment of Site Contamination) Measure (NEPM 2013)*. The NEPM document provides a range of guidelines for assessment of contaminants for various land use scenarios.

The proposed landuse is not known to RGS, however, we understand that there is the potential that part of the site could be reused for hospital administration purposes, while other areas of the site may be reused as temporary or short term accommodation. It has therefore been assumed that the site will be reused for residential purposes and as such comparison with the NEPM guideline values for Residential A landuse was considered appropriate. In accordance with the NEPM guideline the following criteria were adopted for this assessment with respect to soil contamination:

- Health Investigation Levels (HILs) for Residential land use were used to assess the potential human health impact of heavy metals and polycyclic aromatic hydrocarbons (PAH);
- Health Screening Levels (HSLs) for coarse textured (sand) or fine textured (silt and clay) soils on a Residential site were adopted as appropriate for the soils encountered to assess the potential human health impact of petroleum hydrocarbons and benzene, toluene, ethyl-benzene, xylenes (BTEX) compounds;
- Ecological Investigation Levels (EILs) for Residential land use were used for evaluation of the potential ecological / environmental impact of heavy metals and naphthalene;
- Ecological Screening Levels (ESLs) for coarse textured (sand) soils or fine textured (silt and clay) soils on a Residential land use site were adopted as appropriate for the soils encountered, to assess the potential ecological / environmental impact of petroleum hydrocarbons, BTEX compounds and benzo(a)pyrene.

In accordance with NEPM 2013, exceedance of the criteria does not necessarily deem that remediation is required, but is a trigger for further assessment of the extent of contamination and associated risks. The adopted soil criteria are presented in the results summary table in Appendix B.

2.2 Groundwater

The *National Environment Protection (Assessment of Site Contamination) Measure* (NEPM 2013) provides a series of Groundwater Investigation Levels (GILs) for the protection of drinking water or aquatic ecosystems, as appropriate based on down-gradient recipients of groundwater emanating from the site.

The adopted criteria are presented in the results summary table in Appendix B. The water screening assessment criteria are for comparative purposes only and should not be regarded as "clean-up" levels.

For assessing groundwater quality therefore, it is first necessary to assess the beneficial uses or sensitive receptors of groundwater down-gradient of the site being assessed.

Potential beneficial users include groundwater bores used for extraction for domestic, rural, or irrigation purposes. A search of NSW Government records was undertaken to check for the presence of registered bores in the vicinity of the site. The results indicate that there is one groundwater bore located about 440m to the southeast of the site. The nearest off-site receptor would be Alumy Creek which is located about 80m to the west of the site.

Based on this information, the most sensitive receptor in the likely direction of groundwater flow is the disturbed freshwater / saltwater aquatic ecosystems located within the creek. It is therefore reasonable to adopt GIL's aimed at protecting the aquatic ecosystem. On this basis, the results were evaluated against ANZECC 2000 criteria for protection of freshwater ecosystems. The guidelines apply to water entering an ecosystem and are therefore conservative values for assessment of groundwater.

The following scenarios which are not a beneficial use of groundwater have also been considered in selection of environmental values for the site:

- Human health in non-use scenarios: this includes exposure to volatile chemicals through vapour flux where there is no contact with the groundwater; and
- Buildings and structures: this includes protection from chemical substances degrading building materials through contact (e.g. weakening of footings).

Both these scenarios are considered relevant in this assessment.

NEPM (2013) provides health screening levels (HSLs) applicable for selected petroleum compounds for assessing human health risk via inhalation and direct contact pathways for groundwater for low and high density residential land uses, recreational / open space land uses, and commercial / industrial land uses.

3 METHODOLOGY

In accordance with the relevant sections of the *National Environment Protection (Assessment of Site Contamination) Measure 1999 (Amended 2013)*, the assessment involved the following process:

- Undertake targeted soil sampling and analysis at the selected Areas of Environmental Concern;
- Installation of one groundwater well in the northwest corner of the site followed by water sampling and analysis;
- Analyse soil and water samples for a suite of potential contaminants associated with the past activities; and
- Evaluate the results against industry accepted criteria for the proposed landuse and provide recommendations regarding the need for further assessment and/or remediation.

4 SITE SETTING AND HISTORY

4.1 Site Description

The site is situated within a region characterised by gently undulating alluvial deposits associated with the Clarence River. The site is flat.

Drainage is anticipated to be via infiltration into the upper soil profile or via surface flows into the site stormwater system.

The site is occupied by two storey brick structures and associated amenities structures. Beyond the buildings the site is vegetated with maintained grasses and well established garden beds that comprise mature trees and shrubs.

A satellite image that shows the location of the site and the site setting is reproduced below.

The extent of the SCA presented herien is shown by a red outline

4.2 Site History Summary

Details of the site history are presented in Report RGS33320.1-AD which should be read in conjunction with this report. Based on available data the chronological development of the subject site within Lot 1 Section 118 DP 758470 was undertaken as summarised below:

- Prior to the 1980's when the existing structures were constructed, the site was cleared of vegetation and likely used for agricultural purposes;
- In the 1980's the existing structures were constructed as an extension to the original gaol facility that forms the southwest boundary of the site;
- Above ground LPG tanks and underground fuel tanks are located beyond but close to the northwest boundary of the site;
- Bonded Synthetic Mineral Fibres (SMF) were identified within structures and hot water systems within the site. Ozone Depleting Substances (ODS) were identified within air conditioning units in 2010; and
- The site appears to have remained largely unchanged from its current state since the 1980's.

4.3 Subsurface Conditions & Geology

The NSW Government '*MinView*' Geological Survey of NSW indicates that the site is underlain by Alluvial Levee Deposits that comprise fluvially deposited sand, silt and clay, and by Alluvial Paleochannel Deposits that comprise gravel and clayey sand.

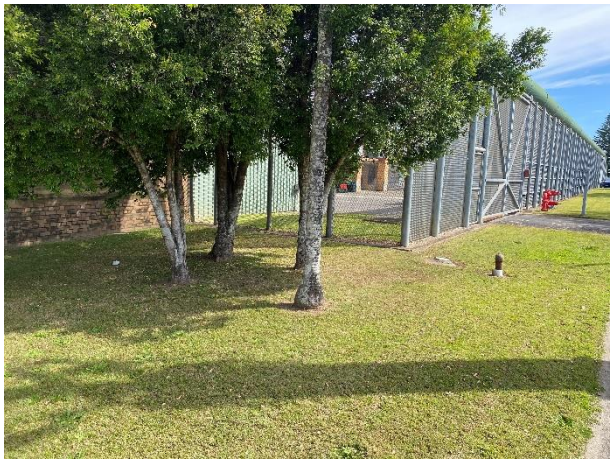
A preliminary geotechnical assessment was undertaken by RGS (RGS Report No. RGS33320.1-AC) which included the drilling of boreholes to a depth of up to 2m. The investigation encountered a profile that comprises well compacted granular fill and alluvial sand, silt and clay deposits. Groundwater was encountered at a depth of 7m within BH101. Groundwater levels do fluctuate.

4.4 Site Observations

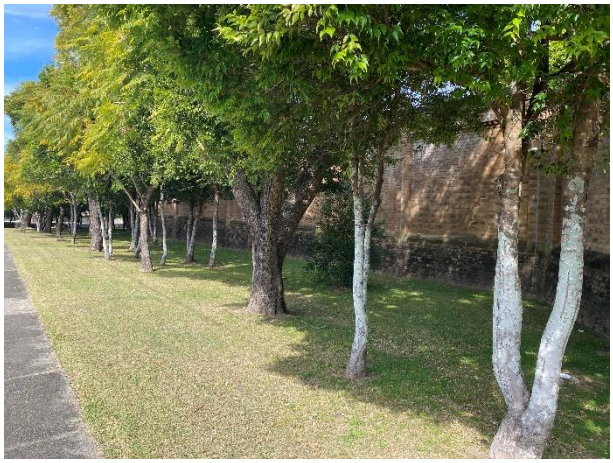
Observations from a contamination perspective made during the site visit are summarised below:

- The site is occupied by single and double storey brick structures, including former gaol cells, a perimeter wall and surrounding support/amenities structures;
- Air conditioning units and hot water heaters are located on the external walls of some of the structures;
- An above ground LPG tank and two underground fuel storage tanks are located beyond the northwest corner of the site;
- The site is vegetated with well maintained grasses and mature trees and shrubs. Lined stormwater drainage channels and stormwater pits are located at low points on the site; and
- No other visual or olfactory evidence of contamination was observed beyond what is outlined above.

A selection of images of the site is presented below.



Beyond the gaol wall in the northwest corner of the site where sample S1 was collected. The site is vegetated with maintained grasses and trees



Beyond the gaol perimeter wall in the central north of the site where sample S2 was collected. The site is vegetated with maintained grasses and trees

Looking north in the southwest corner of the site where sample S4 was collected. This area of the site has been filled with well compacted granular fill

Looking northeast at the inner courtyard. Sample S5 was undertaken within this area

Looking south in the northeast corner of the site where sample S6 was completed. This area of the site is underlain by well compacted granular fill which is likely to be attributed to backfilled service trenches

A gas hot water system attached to the wall of one of the cells in the southwest corner of the site

5 SITE CONTAMINATION ASSESSMENT

5.1 Conceptual Site Model

Based on the site observations and knowledge obtained about site activities as outlined above, a conceptual site model (CSM) has been developed.

5.1.1 Potential Sources of Contamination

Potential Areas of Environmental Concern (AECs) and Chemicals of Concern (COCs) identified for the assessment are outlined in Table 3.

Table 3: Potential AECs & COCs

AEC	Mode of Potential Contamination	Potential COCs	Likelihood of Contamination
AEC1: Former agricultural land use (entire site)	Potential intensive use of or spillage of stored chemicals and from vehicles and machinery including agrochemicals, fuels/oils	Heavy Metals, TRH, BTEX, PAH, OC/OPP	Low to moderate
AEC2: Soils and groundwater around the above ground LPG tanks and underground fuel tanks that are located beyond the northwest site boundary	Leaking above ground LPG tank/lines and/or underground fuel tanks/lines	Heavy metals, TRH	Low to moderate
AEC3: Isolated areas of soil contamination associated with construction and maintenance of the existing structures/infrastructure (entire site)	Potential spillage of fuels/oils and chemicals from containers including agro-chemicals, fuels/oils, pesticides	Heavy Metals, TRH, BTEX, PAH, OC/OPP and asbestos	Low
Heavy Metals - Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel and Zinc *BTEX - Benzene, Toluene, Ethylbenzene and Xylene* *TRH - Total Recoverable Hydrocarbons* *PAH – Polycyclic Aromatic Hydrocarbons* *PCB – Polychlorinated Biphenyls* *OC/OPP – Organochlorine and Organophophorus Pesticides*			

The approximate locations of the AEC's are shown on Figure 3.

5.1.2 Potential Exposure Pathways and Receptors

Based on the site observations and knowledge obtained about site activities as outlined above, potential exposure pathways and receptors identified for the assessment are summarised in Table 4.

Table 4: Potential Exposure Pathways & Receptors

Chemicals of Concern	Key Pathways	Key Receptors
Asbestos, heavy metals, PAHs	Generation of dust, notably during earthworks or from landscaped areas which is inhaled	Onsite - Construction and site workers, future site users Offsite – Occupants and users of adjacent sites
Heavy metals, TRH, BTEX, PAH, OC/OPP, PCBs	Skin contact / ingestion, plant uptake	Onsite - Construction and site workers, future site users, vegetation in landscaped areas
Heavy Metals, TRH, BTEX, PAH, OC/OPP	Surface runoff and leaching of soils	Offsite - Surface water ecosystems and users of surface water and groundwater
Heavy Metals - Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel and Zinc *BTEX - Benzene, Toluene, Ethylbenzene and Xylene* *TRH - Total Recoverable Hydrocarbons* *PAH – Polycyclic Aromatic Hydrocarbons* *PCB – Polychlorinated Biphenyls* *OC/OPP – Organochlorine and Organophophorus Pesticides*		

5.2 Data Quality Objectives

The Data Quality Objectives (DQOs) are presented in Table 5.

Table 5: Data Quality Objectives

DQO	Details of Process
State the Problem	A Stage 2 site contamination assessment is required to assess the suitability of the site for residential land use from a contamination perspective.
Identify the Decision	The principal study questions that are: • What is the nature and extent of soil contamination on the subject land (if any)?; and • Is the land suitable for the proposed residential development from a contamination viewpoint?
Identify Inputs to the Decision	The primary inputs are: • Site history study; • Site walkover assessment; • Chemical analysis and asbestos screening of selected soil samples; and • Results summary.
Define the Boundary of the Assessment	• The spatial boundaries are limited to the property boundaries of the subject site as shown on Figure 1; and • The investigation and screening levels for a Residential A land use scenario.
Develop a Decision Rule	The decision rules for the investigation are: • If concentrations of contaminants in soil exceed the adopted investigation and screening levels for a Residential A land use scenario, then further assessment may be required. Decision criteria for QA/QC measures are defined in Section 5.5. A decision on the acceptance of analytical data will be made on the basis of the data quality

DQO	Details of Process
	indicators (DQIs) in the context of precision, accuracy, representativeness, completeness and comparability (PARCC) parameters as follows: • **Precision:** NATA registered laboratories were used following industry standard methods. An appropriate number of intra-laboratory samples were collected and analysed (following ASC NEPM guidance), the results of which are considered to be satisfactory; • **Accuracy:** The laboratory limit or reporting (LOR) was appropriate for the screening criteria utilised. A NATA registered laboratory was used following industry standard methods including appropriate method blanks, laboratory control samples, laboratory spikes and duplicates the results of which are considered to be satisfactory. • **Representativeness –** The samples were received by the laboratories in good condition. The data obtained is considered to be representative of the soils present on site; • **Completeness –** Experienced field staff were utilised to undertake the sampling and keep appropriate documentation. Samples were in proper custody between the field and reaching the laboratory. The laboratories performed the tests requested. The data obtained from the field investigations is considered to be relevant and usable; and • **Comparability –** Sample holding times were met and samples were properly and adequately preserved. Field sampling and handling procedures were followed. The data collected is considered to be comparable.
Specify Acceptable Limits on Decision Errors	• Acceptable limits for QA/QC measures are defined in Section 5.5; • Acceptable investigation and screening levels are those for a Residential A land use scenario; and • Specific limits are in accordance with the appropriate NSW EPA guidelines including indicators of data quality and standard procedures for field sampling and handling.
Optimise the Design for Obtaining Data	Based on the above steps of the DQO process. The design for obtaining the required data (i.e. proposed field and laboratory investigations) is presented in Sections 5.3 and 5.4.

5.3 Sampling and Analysis Quality Plan

A sampling and analysis quality plan (SAQP) was developed based on the DQO's outlined above and is summarised below.

5.3.1 Sampling Rationale, Locations and Sample Numbers

Undertake sampling and analysis of soil samples in accordance with NSW EPA (1995) *Sampling Design Guidelines* which for a site of 9,800m^2 requires 21 sample points where a systematic sampling pattern is adopted to detect a hotspot of 33.5m diameter with a 95% level of confidence. In addition, a judgemental approach was used to target the AEC's listed in Table 2.

5.3.2 Sampling

Soil and water samples were collected using disposable gloves and hand tools which were decontaminated between sampling points using Decon90 detergent and deionised water. Samples collected were placed in laboratory supplied 250ml glass jars. The samples were placed in an ice-chilled cooler box.

5.3.3 Field Work

Field work for the contamination assessment was undertaken by an Associate Geotechnical Engineer from RGS and included:

- Site walkover to assess visible surface conditions and identify any evidence of contamination, or past activities that may cause contamination;
- Collection of six near surface soil samples during the preliminary Stage 2 SCA in August 2022;
- Collection of sixteen near surface soil samples in August 2023 to supplement the previous samples collected during the preliminary assessment; and
- Installation of one groundwater monitoring well (BH101) to a depth of 7.5m within AEC2 in the northwest corner of the site and the collection of water samples. The well comprised:
    - 3m of slotted pipe and 4.5m of solid pipe
    - Granular backfill to 1m below surface level, followed by 0.8m of bentonite pellets and 0.2m of concrete and a bolted steel well cover.

An Engineering log of the borehole is presented in Appendix A. The borehole locations and the locations of the sampling points are shown on Figure 2. They were obtained on site and located by measurement relative to existing site features.

5.4 Laboratory Analysis

Samples were transported under chain-of-custody conditions to NATA accredited specialist chemical testing laboratories, to be analysed for the following suite of contaminants:

Soil:

- Polycyclic Aromatic Hydrocarbons (PAH);
- Total Recoverable Hydrocarbons (TRH);
- Benzene, Toluene, Ethyl-benzene, Xylenes (BTEX);
- Organochlorine and Organophosphorus Pesticides (OC/OPs);
- Heavy metals (arsenic, cadmium, chromium, cobalt, copper, lead, mercury, and zinc);
- Polychlorinated Biphenyls (PCB); and
- Presence of asbestos.

Groundwater:

- Polycyclic Aromatic Hydrocarbons (PAH);
- Total Recoverable Hydrocarbons (TRH);
- Benzene, Toluene, Ethyl-benzene, Xylenes (BTEX); and
- Lead

The results are presented in Appendix B.

5.5 Quality Control

Samples were obtained using industry accepted protocols for sample treatment, preservation, and equipment decontamination. Duplicates of A1 (0.05 - 0.15m), A15 (0.05 – 0.15m), S4 (0 – 0.1m) and BH101 were submitted to the laboratory for analysis. Results of the duplicate analysis indicated heavy metal concentrations correlated well between the primary samples.

The Relative Percent Differences (RPDs) were calculated for the duplicate samples and presented in the results summary table in Appendix B. RPDs were below the adopted limit of 30% for all four duplicate samples.

In addition to the field QC procedures, the laboratory conducted internal quality control testing including surrogates, blanks, and laboratory duplicate samples. The results are presented with the laboratory test results in Appendix B.

On the basis of the results of the field and laboratory quality control procedures and testing the data is considered to reasonably represent the concentrations of contaminants in the soils at the sample locations at the time of sampling and the results can be adopted for this assessment.

5.6 Analysis Results

An appraisal of the soil laboratory test results presented in Appendix B is provided below with reference to the adopted soil investigation and screening levels discussed in Section 2.

- EILs are site specific and are determined by calculating an Ambient Background Concentration (ABC) and an Added Contaminant Limit (ACL) for the site. ABC values were adopted using results from sample A2 (0.05-0.15m) excavated in an undisturbed profile. EILs are presented in the Summary Table in Appendix C and summarised in Table 6:

Table 6: EILs Summary (With Reference to NEPM, Schedule B1)

Analyte	Sample A2 (mg/kg)	EIL – Aged Residential Landuse (mg/kg)
Copper	12	110
Arsenic	<5	100
Lead	12	1100
Nickel	6	35
Chromium (III)	11	390
Zinc	43	240

- Concentrations of heavy metals are below the calculated EILs in all samples;
- Concentrations of Arsenic, Cadmium, total Chromium, Copper, Lead, Nickel, Zinc and Mercury were either below the laboratory limit of reporting or below the adopted health and ecological investigation criteria for a Recreational A site in each of the samples analysed;
- Concentrations of OC/OP pesticides, TRH, PAH, BTEX and PCB were either below the laboratory limit of reporting or below the adopted health or ecological investigation criteria in each of the samples analysed; and

- An elevated TRH >C_{16}-C_{34} fraction concentration was reported in one sample (Sample A13), although the concentration was below the relevant assessment criteria.

An appraisal of the soil laboratory test results presented in Appendix B with reference to the adopted groundwater investigation and screening levels discussed in Section 2. Concentrations of lead, TRH, PAH and BTEX were below the laboratory reporting and therefore below the relevant assessment criteria.

5.7 Discussion

A Stage 2 site contamination assessment was required to assess the nature and extent of soil contamination with regard to the site's suitability for Residential A land use.

The site history study indicates that the site was used for agricultural purposes until the 1980s when the existing correctional facility was constructed. The site layout appears to have remained unchanged since the 1980s.

Two AEC (AEC1 and AEC3) were identified which occupy the full extent of the site and details are presented within Section 4. AEC2 is located in the northwest corner of the site and is related to above ground LPG and underground fuel storage tanks on the neighbouring site.

The results of the laboratory analysis of soil and groundwater samples collected from the targeted locations revealed concentrations of chemicals of concern either below the level of laboratory reporting, or below the adopted HIL/HSL or EIL/ESL for a Residential A site.

5.8 Conclusions and Recommendations

Should potential evidence of site contamination be identified during development activities, such as soil staining, buried materials, or odours, then a site contamination specialist should be contacted for advice without delay.

Should unidentified fill materials be encountered that require removal off site, assessment for a *Resource Recovery Exemption under Part 9, Clauses 91 and 92 of the Protection of the Environment Operations (Waste) Regulation 2014* in accordance with the *Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014 – the Excavated Natural Material (ENM) Order 2014,* will be required.

Based on the results obtained in this investigation, it is considered that the site is suitable in its current state for the proposed residential land use with regard to the presence of soil contamination and a Remedial Action Plan (RAP) is not required, provided:

- The recommendations and advice of this report are adopted; and
- Site works (if any) are conducted in accordance with appropriate site management protocols and legislative requirements.

6 LIMITATIONS

This report comprises the results of an investigation carried out for a specific purpose and client as defined in the document. The report should not be used by other parties or for purposes or projects

other than those assumed and stated within the report, as it may not contain adequate or appropriate information for applications other than those assumed or advised at the time of its preparation. The contents of the report are for the sole use of the client and no responsibility or liability will be accepted to any third party. The report should not be reproduced either in part or in full, without the express permission of Regional Geotechnical Solutions Pty Ltd.

Contaminated site investigations are based on data collection, judgment, experience, and opinion. By nature, these investigations are less exact than other engineering disciplines. The findings presented in this report and used as the basis for the recommendations presented herein were obtained using normal, industry accepted practises and standards. To our knowledge, they represent a reasonable interpretation of the general condition of the site. Under no circumstances, however, can it be considered that these findings represent the actual state of the site at all points.

Recommendations regarding ground conditions referred to in this report are estimates based on the information available at the time of its writing. Estimates are influenced and limited by the fieldwork method and testing carried out in the site investigation, and other relevant information as has been made available. In cases where information has been provided to Regional Geotechnical Solutions for the purposes of preparing this report it has been assumed that the information is accurate and appropriate for such use. No responsibility is accepted by Regional Geotechnical Solutions for inaccuracies within any data supplied by others.

If site conditions encountered during construction vary significantly from those discussed in this report, Regional Geotechnical Solutions Pty Ltd should be contacted for further advice.

This report alone should not be used by contractors as the basis for preparation of tender documents or project estimates. Contractors using this report as a basis for preparation of tender documents should avail themselves of all relevant background information regarding the site before deciding on selection of construction materials and equipment.

If you have any questions regarding this project, or require any additional consultations, please contact the undersigned.

For and on behalf of **Regional Geotechnical Solutions Pty Ltd**

Prepared by

Simon Keen

Associate Geotechnical Engineer

Figures

REGIONAL GEOTECHNICAL SOLUTIONS	**Client:**	Mace Group	Job No.	RGS33320.2
	Project:	Former Grafton Correction Centre	Drawn By:	SK
			Scale:	NTS
		170 Hoof Street, Grafton	Date:	6-Sep-23
	Title:	Site Location	Drawing No.	**Figure 1**

REGIONAL GEOTECHNICAL SOLUTIONS	**Client:**	Grafton Base Hospital Planning	Job No.	RGS33320.1
	Project:	Former Grafton Correction Centre	Drawn By:	SK
			Scale:	NTS
		170 Hoof Street, Grafton	Date:	6-Sep-23
	Title:	Borehole & Sample Location Plan	Drawing No.	**Figure 2**

REGIONAL GEOTECHNICAL SOLUTIONS

Client:	Grafton Base Hospital Planning	Job No.	RGS33320.1
Project:	Former Grafton Correction Centre	Drawn By:	SK
		Scale:	NTS
	170 Hoof Street, Grafton	Date:	6-Sep-23
Title:	Site Plan - Areas of Environmental Concern	Drawing No.	**Figure 3**

Appendix A

Results of Field Investigations

REGIONAL GEOTECHNICAL SOLUTIONS

ENGINEERING LOG - BOREHOLE

BOREHOLE NO: BH101

CLIENT: Mace Group
PAGE: 1 of 1
PROJECT NAME: Forner Grafton Correctional Centre
JOB NO: RGS33320.2
SITE LOCATION: 170 Hoof Street, Grafton
LOGGED BY: ME
TEST LOCATION: Refer to Figure 1
DATE: 11/8/23

DRILL TYPE: RGS Ute Mounted Drill Rig
EASTING:
SURFACE RL:
BOREHOLE DIAMETER: 100 mm
INCLINATION: 90°
NORTHING:
DATUM: AHD

Drilling and Sampling					Material description and profile information					Field Test		
METHOD	WATER	SAMPLES	RL (Not measured)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics,colour,minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
AD/T	11/8/2023			1.0 2.0 3.0 4.0 5.0 6.0 7.0		SM	**TOPSOIL:** Silty SAND, fine to medium grained, dark brown, traces of fine grained gravel					TOPSOIL- Organics, root affected area
						SM	0.30m **Silty SAND:** Fine to medium grained, brown, low plasticity silt	M				ALLUVIAL SOIL
						ML	3.00m **Sandy SILT:** Low plasticity, brown, fine to medium grained sand	M > w_P				
						Cl	5.20m **Silty CLAY:** Medium to high plasticity, grey, brown					
						SM	6.00m **Silty SAND:** Fine to medium grained, brown	M				
								W				
							7.50m Hole Terminated at 7.50 m					

LEGEND:

Water
- Water Level (Date and time shown)
- Water Inflow
- Water Outflow

Strata Changes
- Gradational or transitional strata
- Definitive or distict strata change

Notes, Samples and Tests

U_{50}	50mm Diameter tube sample
CBR	Bulk sample for CBR testing
E	Environmental sample
ASS	Acid Sulfate Soil Sample
B	Bulk Sample

Field Tests

PID	Photoionisation detector reading (ppm)
DCP(x-y)	Dynamic penetrometer test (test depth interval shown)
HP	Hand Penetrometer test (UCS kPa)

Consistency

		UCS (kPa)
VS	Very Soft	<25
S	Soft	25 - 50
F	Firm	50 - 100
St	Stiff	100 - 200
VSt	Very Stiff	200 - 400
H	Hard	>400
Fb	Friable	

Density

V	Very Loose	Density Index <15%
L	Loose	Density Index 15 - 35%
MD	Medium Dense	Density Index 35 - 65%
D	Dense	Density Index 65 - 85%
VD	Very Dense	Density Index 85 - 100%

Moisture Condition

D	Dry
M	Moist
W	Wet
W_p	Plastic Limit
W_L	Liquid Limit

Appendix B

Laboratory Test Result Sheets

REGIONAL GEOTECHNICAL SOLUTIONS

Comparison of Contamination Analysis Results with Adopted Investigation Levels (Results in mg/kg)

Client: Mace Group
Job No. RGS333320.2-AC
Project: Former Grafton Correctional Centre
Location: 170 Hoof Street, Grafton

SAMPLE	DEPTH (m)	MATERIAL	ASBESTOS	TOTAL RECOVERABLE HYDROCARBONS					PAH		OC/OP Pesticides	BTEX	PCBs	Heavy Metals							
				C6-C10	C10-C16	C16-C34	C34-C40	TOTAL 10-40	Total	b-a-p				As	Cd	Cr (total)#	Cu	Pb	Ni	Zn	Hg
A1	0.05-0.15		No	<10	<50	<100	<100	<50	<0.5	<0.5	<0.2	<0.2	<0.1	<5	<1	13	13	14	7	53	<0.1
D1 (A1 Duplicate)	0.05-0.15													<5	<1	13	14	14	6	52	<0.1
A2	0.05-0.15		No	<10	<50	<100	100	100	<0.5	<0.5	<0.2	<0.2		<5	<1	11	12	12	6	43	<0.1
A3	0.05-0.15		No	<10	<50	<100	<100	<50	<0.5	<0.5	<0.2	<0.2	<0.1	6	<1	15	12	20	7	60	<0.1
A4	0.05-0.15		No	<10	<50	<100	<100	<50	<0.5	<0.5	<0.2	<0.2	<0.1	7	<1	20	15	40	10	89	<0.1
A5	0.05-0.15		No	<10	<50	<100	<100	<50	<0.5	<0.5	<0.2	<0.2	<0.1	6	<1	15	12	18	9	53	<0.1
A6	0.05-0.15		No	<10	<50	<100	<100	<50	<0.5	<0.5	<0.2	<0.2	<0.1	<5	<1	20	<5	8	<2	9	<0.1
A7	0.05-0.15		No	<10	<50	<100	<100	<50	<0.5	<0.5	<0.2	<0.2	<0.1	6	<1	23	6	10	5	28	<0.1
A8	0.05-0.15		No	<10	<50	<100	<100	<50	<0.5	<0.5	<0.2	<0.2	<0.1	5	<1	24	5	10	4	25	<0.1
A9	0.05-0.15		No	<10	<50	<100	<100	<50	<0.5	<0.5	<0.2	<0.2	<0.1	<5	<1	16	<5	8	<2	23	<0.1
A10	0.05-0.15		No	<10	<50	<100	<100	<50	<0.5	<0.5	<0.2	<0.2	<0.1	6	<1	12	102	22	16	102	<0.1
A11	0.05-0.15		No	<10	<50	<100	<100	<50	<0.5	<0.5	<0.2	<0.2	<0.1	<5	<1	12	16	16	6	85	<0.1
A12	0.05-0.15		No	<10	<50	<100	<100	<50	<0.5	<0.5	<0.2	<0.2	<0.1	5	<1	15	19	26	8	86	<0.1
A13	0.05-0.15		No	<10	<50	130	<100	130	<0.5	<0.5	<0.2	<0.2	<0.1	<5	<1	12	18	17	6	59	<0.1
A14	0.05-0.15		No	<10	<50	<100	<100	<50	<0.5	<0.5	<0.2	<0.2	<0.1	<5	<1	11	13	16	7	55	<0.1
A15	0.05-0.15		No	<10	<50	<100	<100	<50	<0.5	<0.5	<0.2	<0.2	<0.1	5	<1	12	20	12	8	69	<0.1
D2 (A15 Duplicate)	0.05-0.15													<5	<1	11	18	11	7	62	<0.1
S1	0 - 0.1	Topsoil	No	<10	<50	<100	<100	<50	<0.5	<0.5	<0.2	<0.2	<0.1	6	<1	13	14	26	9	72	<0.1
S2	0 - 0.1	Topsoil	No	<10	<50	<100	<100	<50	<0.5	<0.5	<0.2	<0.2	<0.1	6	<1	17	15	26	10	87	<0.1
S3	0 - 0.1	Topsoil	No	<10	<50	<100	<100	<50	<0.5	<0.5	<0.2	<0.2	<0.1	7	<1	16	19	28	12	76	<0.1
S4	0 - 0.1	Fill	No	<10	<50	<100	<100	<50	<0.5	<0.5	<0.2	<0.2	<0.1	<5	<1	11	13	56	6	72	0.1
D1 (S4 Duplicate)	0 - 0.1	Fill	--	<10	<50	<100	<100	<50	<0.5	<0.5	<0.2	<0.2	<0.1	5	<1	12	13	58	7	78	<0.1
S5	0 - 0.1	Topsoil	No	<10	<50	<100	<100	<50	<0.5	<0.5	<0.2	<0.2	<0.1	<5	<1	8	14	55	4	39	<0.1
S6	0 - 0.1	Fill	No	<10	<50	<100	<100	<50	<0.5	<0.5	<0.2	<0.2	<0.1	<5	<1	11	<5	8	<2	28	<0.1
CRITERIA (NEPM 2013)																					
Health Investigation Level (HIL):*			*0.001% (w/w)*						*300*	*3*	*6*	*NL*	*1*	*100*	*20*	*100*	*6000*	*300*	*400*	*7400*	*40*
*Health Screening Level (HSL)***				*45*	*110*																
*Ecological Screening Level (ESL)****				*180*	*120*	*300*	*280*														
Ecological Investigation Level (EIL)@														*100*		*390*	*110*	*1100*	*35*	*240*	

CRITERIA:
* Health Based Investigation Levels for Residential A (NEPM 2013)
** Health Screening Level (F2) for residential land use and coarse grained soil
*** Ecological Screening Level for residential land use and coarse grained soil
@ Ecological Investigation Level - for residential landuse
# Total Chromium

Relative Percentage Difference (RPD)

D1 (A1 Duplicate)	0	0	0	7	0	15	2	0
D2 (A15 Duplicate)	0	0	9	11	9	13	11	0
D1 (S4 Duplicate)	0	0	9	0	4	15	8	0

Summary Table - Comparison of Groundwater Chemical Analysis Results (concentrations in mg/L) **for Published Guidelines**

REGIONAL GEOTECHNICAL SOLUTIONS

Client: Mace Group
Job No. RGS333320.2-AC
Project: Former Grafton Correctional Centre
Location: 170 Hoof Street, Grafton

Location	TOTAL RECOVERABLE HYDROCARBONS					PAH			BTEX				Lead
	C6-C10	C10-C16	C16-C34	C34-C40	TOTAL 10-40	Napthalne	Benzo-a-pyrene	Total PAH	Benzene	Toluene	Ethyl-benzene	Xylenes	
BH101	<0.02	<0.1	<0.1	<0.1	<0.1	<0.001	<0.0005	<0.0005	<1	<2	<2	<2	<0.001
DW1													<0.001
CRITERIA (NEPM 2013) - GIL for Fresh Waters	NL	NL	NL	NL	NL	0.0160	NL	NL	0.95	NL	NL	0.35	0.0034
NEPM 2013 - HSL A & HSL B (4m to 8m) SAND	1	1	NL	NL	NL	NL	NL	NL	0.80	NL	NL	NL	NL
CRITERIA (ANZECC 2000) - 95% Protection of Species for Aquatic Ecosystems - Fresh Waters	NL	NL	NL	NL	NL	0.0160	NL	NL	0.950	NL	NL	0.35	0.0034
Dutch Intervention Level					1							0.35	
NSW Clean Waters Act					0.01								

NOTES:

Denotes concentration exceeds adopted guideline criteria

*TRH Criteria based on NSW Clean Waters Act criteria for oil and grease entering waters

NL No Limit available

LOR Limit of Reporting
N/D Not Detected

CERTIFICATE OF ANALYSIS

Work Order	: **ES2328689**	Page	: 1 of 23
Client	: **REGIONAL GEOTECHNICAL SOLUTION**	Laboratory	: Environmental Division Sydney
Contact	: MR SIMON KEEN	Contact	: Customer Services ES
Address	: Unit 14 25-27 Hurley Drive COFFS HARBOUR NSW, AUSTRALIA 2450	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 6553 5641	Telephone	: +61-2-8784 8555
Project	: RGS33320.2 Former Grafton Correctional Centre	Date Samples Received	: 24-Aug-2023 09:50
Order number	: ----	Date Analysis Commenced	: 24-Aug-2023
C-O-C number	: ----	Issue Date	: 31-Aug-2023 17:18
Sampler	: ----		
Site	: 170 Hoof Street, Grafton		
Quote number	: EN/222		
No. of samples received	: 19		
No. of samples analysed	: 19		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Alana Smylie	Team Leader - Asbestos	Newcastle - Asbestos, Mayfield West, NSW
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Dian Dao	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
John Williams	Lab Technician	Newcastle - Inorganics, Mayfield West, NSW
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP075 (SIM): Where reported, Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP068: Where reported, Total Chlordane (sum) is the sum of the reported concentrations of cis-Chlordane and trans-Chlordane at or above the LOR.
- EP068: Where reported, Total OCP is the sum of the reported concentrations of all Organochlorine Pesticides at or above LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2
- ED007 and ED008: When Exchangeable Al is reported from these methods, it should be noted that Rayment & Lyons (2011) suggests Exchange Acidity by 1M KCl - Method 15G1 (ED005) is a more suitable method for the determination of exchange acidity (H+ + Al3+).
- EA200: 'Yes' - Asbestos detected by polarised light microscopy including dispersion staining.
- EA200: 'No*' - No asbestos found, at the reporting limit of 0.1g/kg, by polarised light microscopy including dispersion staining. Asbestos material was detected and positively identified at concentrations estimated to be below 0.1g/kg.
- EA200: 'No' - No asbestos found at the reporting limit 0.1g/kg, by polarised light microscopy including dispersion staining.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	A1 0.05-0.15	A2 0.05-0.15	A3 0.05-0.15	A4 0.05-0.15	A5 0.05-0.15
			Sampling date / time	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00
Compound	CAS Number	LOR	Unit	ES2328689-003	ES2328689-004	ES2328689-005	ES2328689-006	ES2328689-007
				Result	Result	Result	Result	Result
EA001: pH in soil using 0.01M CaCl extract								
pH (CaCl2)	----	0.1	pH Unit	----	5.4	----	----	----
EA002: pH 1:5 (Soils)								
pH Value	----	0.1	pH Unit	----	6.1	----	----	----
EA010: Conductivity (1:5)								
Electrical Conductivity @ 25°C	----	1	µS/cm	----	26	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	15.3	4.8	4.6	5.7	5.9
EA150: Soil Classification based on Particle Size								
Clay (<2 µm)	----	1	%	----	9	----	----	----
EA152: Soil Particle Density								
Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	----	2.47	----	----	----
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	No	No
Asbestos (Trace)	1332-21-4	-	-	No	No	No	No	No
Asbestos Type	1332-21-4	-	--	-	-	-	-	-
Synthetic Mineral Fibre	----	-	--	No	No	No	No	No
Organic Fibre	----	-	--	No	No	No	No	No
Sample weight (dry)	----	0.01	g	420	656	561	539	517
APPROVED IDENTIFIER:	----	-	--	A. SMYLIE	A. SMYLIE	A. SMYLIE	A. SMYLIE	A. SMYLIE
ED007: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	----	3.7	----	----	----
Exchangeable Magnesium	----	0.1	meq/100g	----	0.8	----	----	----
Exchangeable Potassium	----	0.1	meq/100g	----	0.2	----	----	----
Exchangeable Sodium	----	0.1	meq/100g	----	<0.1	----	----	----
Cation Exchange Capacity	----	0.1	meq/100g	----	4.8	----	----	----
Exchangeable Sodium Percent	----	0.1	%	----	1.4	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Iron	7439-89-6	0.005	%	----	1.39	----	----	----
Arsenic	7440-38-2	5	mg/kg	<5	<5	6	7	6
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	13	11	15	20	15
Copper	7440-50-8	5	mg/kg	13	12	12	15	12
Lead	7439-92-1	5	mg/kg	14	12	20	40	18

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	A1 0.05-0.15	A2 0.05-0.15	A3 0.05-0.15	A4 0.05-0.15	A5 0.05-0.15
				Sampling date / time	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		ES2328689-003	ES2328689-004	ES2328689-005	ES2328689-006	ES2328689-007
					Result	Result	Result	Result	Result
EG005(ED093)T: Total Metals by ICP-AES - Continued									
Nickel	7440-02-0	2	mg/kg		7	6	7	10	9
Zinc	7440-66-6	5	mg/kg		53	43	60	89	53
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP004: Organic Matter									
Organic Matter	----	0.5	%		----	3.0	----	----	----
Total Organic Carbon	----	0.5	%		----	1.8	----	----	----
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	A1 0.05-0.15	A2 0.05-0.15	A3 0.05-0.15	A4 0.05-0.15	A5 0.05-0.15
				Sampling date / time	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		ES2328689-003	ES2328689-004	ES2328689-005	ES2328689-006	ES2328689-007
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-29-3	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	A1 0.05-0.15	A2 0.05-0.15	A3 0.05-0.15	A4 0.05-0.15	A5 0.05-0.15
				Sampling date / time	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		ES2328689-003	ES2328689-004	ES2328689-005	ES2328689-006	ES2328689-007
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**1.2**	**1.2**	**1.2**	**1.2**	**1.2**
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	**100**	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	**100**	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	A1 0.05-0.15	A2 0.05-0.15	A3 0.05-0.15	A4 0.05-0.15	A5 0.05-0.15
				Sampling date / time	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		ES2328689-003	ES2328689-004	ES2328689-005	ES2328689-006	ES2328689-007
					Result	Result	Result	Result	Result
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		**98.0**	**93.1**	**80.6**	**94.2**	**87.0**
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**75.9**	**95.1**	**80.3**	**106**	**80.1**
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**94.7**	**82.2**	**71.7**	**86.3**	**80.0**
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**83.4**	**81.9**	**81.6**	**83.2**	**82.1**
2-Chlorophenol-D4	93951-73-6	0.5	%		**83.7**	**94.2**	**88.3**	**88.4**	**83.6**
2.4.6-Tribromophenol	118-79-6	0.5	%		**75.0**	**86.0**	**91.1**	**77.4**	**81.9**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**97.7**	**98.2**	**104**	**102**	**94.6**
Anthracene-d10	1719-06-8	0.5	%		**97.8**	**108**	**103**	**101**	**103**
4-Terphenyl-d14	1718-51-0	0.5	%		**102**	**111**	**106**	**106**	**110**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**88.5**	**105**	**102**	**108**	**98.7**
Toluene-D8	2037-26-5	0.2	%		**95.6**	**98.5**	**111**	**98.6**	**110**
4-Bromofluorobenzene	460-00-4	0.2	%		**100**	**99.1**	**101**	**101**	**103**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	A6 0.05-0.15	A7 0.05-0.15	A8 0.05-0.15	A9 0.05-0.15	A10 0.05-0.15
			Sampling date / time	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00
Compound	CAS Number	LOR	Unit	ES2328689-008	ES2328689-009	ES2328689-010	ES2328689-011	ES2328689-012
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	2.2	4.8	4.3	4.4	6.5
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	No	No
Asbestos (Trace)	1332-21-4	-	-	No	No	No	No	No
Asbestos Type	1332-21-4	-	--	-	-	-	-	-
Synthetic Mineral Fibre	----	-	--	No	No	No	No	No
Organic Fibre	----	-	--	No	No	No	No	No
Sample weight (dry)	----	0.01	g	766	645	739	795	600
APPROVED IDENTIFIER:	----	-	--	A. SMYLIE	A. SMYLIE	A. SMYLIE	A. SMYLIE	A. SMYLIE
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	6	5	<5	6
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	20	23	24	16	12
Copper	7440-50-8	5	mg/kg	<5	6	5	<5	102
Lead	7439-92-1	5	mg/kg	8	10	10	8	22
Nickel	7440-02-0	2	mg/kg	<2	5	4	<2	16
Zinc	7440-66-6	5	mg/kg	9	28	25	23	102
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	A6 0.05-0.15	A7 0.05-0.15	A8 0.05-0.15	A9 0.05-0.15	A10 0.05-0.15
				Sampling date / time	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		ES2328689-008	ES2328689-009	ES2328689-010	ES2328689-011	ES2328689-012
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ **Endosulfan (sum)**	115-29-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	A6 0.05-0.15	A7 0.05-0.15	A8 0.05-0.15	A9 0.05-0.15	A10 0.05-0.15
			Sampling date / time	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00
Compound	CAS Number	LOR	Unit	ES2328689-008	ES2328689-009	ES2328689-010	ES2328689-011	ES2328689-012
				Result	Result	Result	Result	Result
EP068B: Organophosphorus Pesticides (OP) - Continued								
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	A6 0.05-0.15	A7 0.05-0.15	A8 0.05-0.15	A9 0.05-0.15	A10 0.05-0.15
				Sampling date / time	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		ES2328689-008	ES2328689-009	ES2328689-010	ES2328689-011	ES2328689-012
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		**94.8**	**93.2**	**94.7**	**95.0**	**89.8**
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**91.4**	**96.0**	**98.0**	**72.4**	**71.2**
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**85.2**	**83.6**	**89.0**	**85.7**	**85.6**
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**80.3**	**83.3**	**85.1**	**84.8**	**83.6**
2-Chlorophenol-D4	93951-73-6	0.5	%		**96.4**	**90.2**	**84.8**	**87.0**	**84.5**
2.4.6-Tribromophenol	118-79-6	0.5	%		**78.7**	**76.6**	**69.1**	**68.5**	**69.2**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**93.7**	**101**	**98.9**	**103**	**99.8**
Anthracene-d10	1719-06-8	0.5	%		**110**	**105**	**100**	**96.5**	**93.2**
4-Terphenyl-d14	1718-51-0	0.5	%		**108**	**106**	**103**	**106**	**106**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**106**	**102**	**101**	**119**	**99.0**
Toluene-D8	2037-26-5	0.2	%		**108**	**99.2**	**110**	**96.8**	**101**
4-Bromofluorobenzene	460-00-4	0.2	%		**104**	**103**	**103**	**106**	**98.9**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	A11 0.05-0.15	A12 0.05-0.15	A13 0.05-0.15	A14 0.05-0.15	A15 0.05-0.15
			Sampling date / time	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00
Compound	CAS Number	LOR	Unit	ES2328689-013	ES2328689-014	ES2328689-015	ES2328689-016	ES2328689-017
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	4.8	6.9	3.9	5.7	5.4
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	No	No
Asbestos (Trace)	1332-21-4	-	-	No	No	No	No	No
Asbestos Type	1332-21-4	-	--	-	-	-	-	-
Synthetic Mineral Fibre	----	-	--	No	No	No	No	No
Organic Fibre	----	-	--	No	No	No	No	No
Sample weight (dry)	----	0.01	g	608	662	591	687	544
APPROVED IDENTIFIER:	----	-	--	A. SMYLIE	A. SMYLIE	A. SMYLIE	A. SMYLIE	A. SMYLIE
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	5	<5	<5	5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	12	15	12	11	12
Copper	7440-50-8	5	mg/kg	16	19	18	13	20
Lead	7439-92-1	5	mg/kg	16	26	17	16	12
Nickel	7440-02-0	2	mg/kg	6	8	6	7	8
Zinc	7440-66-6	5	mg/kg	85	86	59	55	69
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	A11 0.05-0.15	A12 0.05-0.15	A13 0.05-0.15	A14 0.05-0.15	A15 0.05-0.15
				Sampling date / time	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		ES2328689-013	ES2328689-014	ES2328689-015	ES2328689-016	ES2328689-017
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ **Endosulfan (sum)**	115-29-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	A11 0.05-0.15	A12 0.05-0.15	A13 0.05-0.15	A14 0.05-0.15	A15 0.05-0.15
			Sampling date / time	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00
Compound	CAS Number	LOR	Unit	ES2328689-013	ES2328689-014	ES2328689-015	ES2328689-016	ES2328689-017
				Result	Result	Result	Result	Result
EP068B: Organophosphorus Pesticides (OP) - Continued								
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	**110**	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	**110**	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	**130**	<100	<100

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	A11 0.05-0.15	A12 0.05-0.15	A13 0.05-0.15	A14 0.05-0.15	A15 0.05-0.15
				Sampling date / time	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		ES2328689-013	ES2328689-014	ES2328689-015	ES2328689-016	ES2328689-017
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	**130**	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		**93.3**	**95.1**	**95.2**	**96.3**	**91.1**
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**73.4**	**77.9**	**75.6**	**77.3**	**76.9**
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**85.2**	**86.8**	**82.2**	**88.8**	**89.3**
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**80.5**	**82.3**	**80.2**	**84.4**	**80.4**
2-Chlorophenol-D4	93951-73-6	0.5	%		**82.2**	**89.8**	**90.9**	**82.7**	**82.6**
2.4.6-Tribromophenol	118-79-6	0.5	%		**70.2**	**79.6**	**87.8**	**61.5**	**71.9**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**97.8**	**101**	**96.4**	**99.6**	**102**
Anthracene-d10	1719-06-8	0.5	%		**99.4**	**104**	**108**	**83.6**	**98.8**
4-Terphenyl-d14	1718-51-0	0.5	%		**106**	**108**	**105**	**109**	**110**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**65.8**	**99.1**	**112**	**124**	**122**
Toluene-D8	2037-26-5	0.2	%		**71.2**	**116**	**121**	**102**	**82.8**
4-Bromofluorobenzene	460-00-4	0.2	%		**88.8**	**104**	**113**	**126**	**93.9**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	D1 0.05-0.15	D2 0.05-0.15	----	----	----
			Sampling date / time	24-Aug-2023 00:00	24-Aug-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit	ES2328689-018	ES2328689-019	--------	--------	--------
				Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**15.6**	**5.0**	**----**	**----**	**----**
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	**----**	**----**	**----**
Cadmium	7440-43-9	1	mg/kg	<1	<1	**----**	**----**	**----**
Chromium	7440-47-3	2	mg/kg	**13**	**11**	**----**	**----**	**----**
Copper	7440-50-8	5	mg/kg	**14**	**18**	**----**	**----**	**----**
Lead	7439-92-1	5	mg/kg	**14**	**11**	**----**	**----**	**----**
Nickel	7440-02-0	2	mg/kg	**6**	**7**	**----**	**----**	**----**
Zinc	7440-66-6	5	mg/kg	**52**	**62**	**----**	**----**	**----**
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	**----**	**----**	**----**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BH101	DW1 D1	----	----	----
				Sampling date / time	24-Aug-2023 00:00	24-Aug-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES2328689-001	ES2328689-002	--------	--------	--------
					Result	Result	----	----	----
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		<0.001	**0.001**	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		**0.0004**	**0.0004**	----	----	----
Chromium	7440-47-3	0.001	mg/L		<0.001	<0.001	----	----	----
Copper	7440-50-8	0.001	mg/L		**0.003**	**0.002**	----	----	----
Nickel	7440-02-0	0.001	mg/L		**0.045**	**0.045**	----	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	----	----	----
Zinc	7440-66-6	0.005	mg/L		**0.136**	**0.132**	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	----	----	----
EP066: Polychlorinated Biphenyls (PCB)									
^ **Total Polychlorinated biphenyls**	----	1	µg/L		<1	----	----	----	----
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.5	µg/L		<0.5	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L		<0.5	----	----	----	----
beta-BHC	319-85-7	0.5	µg/L		<0.5	----	----	----	----
gamma-BHC	58-89-9	0.5	µg/L		<0.5	----	----	----	----
delta-BHC	319-86-8	0.5	µg/L		<0.5	----	----	----	----
Heptachlor	76-44-8	0.5	µg/L		<0.5	----	----	----	----
Aldrin	309-00-2	0.5	µg/L		<0.5	----	----	----	----
Heptachlor epoxide	1024-57-3	0.5	µg/L		<0.5	----	----	----	----
trans-Chlordane	5103-74-2	0.5	µg/L		<0.5	----	----	----	----
alpha-Endosulfan	959-98-8	0.5	µg/L		<0.5	----	----	----	----
cis-Chlordane	5103-71-9	0.5	µg/L		<0.5	----	----	----	----
Dieldrin	60-57-1	0.5	µg/L		<0.5	----	----	----	----
4.4`-DDE	72-55-9	0.5	µg/L		<0.5	----	----	----	----
Endrin	72-20-8	0.5	µg/L		<0.5	----	----	----	----
beta-Endosulfan	33213-65-9	0.5	µg/L		<0.5	----	----	----	----
4.4`-DDD	72-54-8	0.5	µg/L		<0.5	----	----	----	----
Endrin aldehyde	7421-93-4	0.5	µg/L		<0.5	----	----	----	----
Endosulfan sulfate	1031-07-8	0.5	µg/L		<0.5	----	----	----	----
4.4`-DDT	50-29-3	2.0	µg/L		<2.0	----	----	----	----
Endrin ketone	53494-70-5	0.5	µg/L		<0.5	----	----	----	----
Methoxychlor	72-43-5	2.0	µg/L		<2.0	----	----	----	----
^ **Total Chlordane (sum)**	----	0.5	µg/L		<0.5	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BH101	DW1 D1	----	----	----
				Sampling date / time	24-Aug-2023 00:00	24-Aug-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES2328689-001	ES2328689-002	--------	--------	--------
					Result	Result	----	----	----
EP068A: Organochlorine Pesticides (OC) - Continued									
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.5	µg/L		<0.5	----	----	----	----
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.5	µg/L		<0.5	----	----	----	----
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.5	µg/L		<0.5	----	----	----	----
Demeton-S-methyl	919-86-8	0.5	µg/L		<0.5	----	----	----	----
Monocrotophos	6923-22-4	2.0	µg/L		<2.0	----	----	----	----
Dimethoate	60-51-5	0.5	µg/L		<0.5	----	----	----	----
Diazinon	333-41-5	0.5	µg/L		<0.5	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.5	µg/L		<0.5	----	----	----	----
Parathion-methyl	298-00-0	2.0	µg/L		<2.0	----	----	----	----
Malathion	121-75-5	0.5	µg/L		<0.5	----	----	----	----
Fenthion	55-38-9	0.5	µg/L		<0.5	----	----	----	----
Chlorpyrifos	2921-88-2	0.5	µg/L		<0.5	----	----	----	----
Parathion	56-38-2	2.0	µg/L		<2.0	----	----	----	----
Pirimphos-ethyl	23505-41-1	0.5	µg/L		<0.5	----	----	----	----
Chlorfenvinphos	470-90-6	0.5	µg/L		<0.5	----	----	----	----
Bromophos-ethyl	4824-78-6	0.5	µg/L		<0.5	----	----	----	----
Fenamiphos	22224-92-6	0.5	µg/L		<0.5	----	----	----	----
Prothiofos	34643-46-4	0.5	µg/L		<0.5	----	----	----	----
Ethion	563-12-2	0.5	µg/L		<0.5	----	----	----	----
Carbophenothion	786-19-6	0.5	µg/L		<0.5	----	----	----	----
Azinphos Methyl	86-50-0	0.5	µg/L		<0.5	----	----	----	----
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	1.0	µg/L		<1.0	----	----	----	----
2-Chlorophenol	95-57-8	1.0	µg/L		<1.0	----	----	----	----
2-Methylphenol	95-48-7	1.0	µg/L		<1.0	----	----	----	----
3- & 4-Methylphenol	1319-77-3	2.0	µg/L		<2.0	----	----	----	----
2-Nitrophenol	88-75-5	1.0	µg/L		<1.0	----	----	----	----
2.4-Dimethylphenol	105-67-9	1.0	µg/L		<1.0	----	----	----	----
2.4-Dichlorophenol	120-83-2	1.0	µg/L		<1.0	----	----	----	----
2.6-Dichlorophenol	87-65-0	1.0	µg/L		<1.0	----	----	----	----
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L		<1.0	----	----	----	----
2.4.6-Trichlorophenol	88-06-2	1.0	µg/L		<1.0	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BH101	DW1 D1	----	----	----
				Sampling date / time	24-Aug-2023 00:00	24-Aug-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES2328689-001	ES2328689-002	--------	--------	--------
					Result	Result	----	----	----
EP075(SIM)A: Phenolic Compounds - Continued									
2.4.5-Trichlorophenol	95-95-4	1.0	µg/L		<1.0	----	----	----	----
Pentachlorophenol	87-86-5	2.0	µg/L		<2.0	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L		<1.0	----	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L		<1.0	----	----	----	----
Acenaphthene	83-32-9	1.0	µg/L		<1.0	----	----	----	----
Fluorene	86-73-7	1.0	µg/L		<1.0	----	----	----	----
Phenanthrene	85-01-8	1.0	µg/L		<1.0	----	----	----	----
Anthracene	120-12-7	1.0	µg/L		<1.0	----	----	----	----
Fluoranthene	206-44-0	1.0	µg/L		<1.0	----	----	----	----
Pyrene	129-00-0	1.0	µg/L		<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L		<1.0	----	----	----	----
Chrysene	218-01-9	1.0	µg/L		<1.0	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L		<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L		<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L		<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L		<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L		<1.0	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L		<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L		<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L		<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	BH101	DW1 D1	----	----	----
			Sampling date / time	24-Aug-2023 00:00	24-Aug-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit	ES2328689-001	ES2328689-002	--------	--------	--------
				Result	Result	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued								
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	----	----	----	----
Toluene	108-88-3	2	µg/L	<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----
^ Total Xylenes	----	2	µg/L	<2	----	----	----	----
^ Sum of BTEX	----	1	µg/L	<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	1	%	**115**	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.5	%	**95.9**	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.5	%	**87.3**	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	1.0	%	**30.2**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	1.0	%	**66.0**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	1.0	%	**68.6**	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	1.0	%	**79.2**	----	----	----	----
Anthracene-d10	1719-06-8	1.0	%	**88.2**	----	----	----	----
4-Terphenyl-d14	1718-51-0	1.0	%	**85.1**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**111**	----	----	----	----
Toluene-D8	2037-26-5	2	%	**104**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%	**103**	----	----	----	----

Analytical Results

Descriptive Results

Sub-Matrix: **SOIL**

Method: Compound	Sample ID - Sampling date / time	Analytical Results
EA200: AS 4964 - 2004 Identification of Asbestos in Soils		
EA200: Description	A10.05-0.15 - 24-Aug-2023 00:00	Soil sample.
EA200: Description	A20.05-0.15 - 24-Aug-2023 00:00	Soil sample.
EA200: Description	A30.05-0.15 - 24-Aug-2023 00:00	Soil sample.
EA200: Description	A40.05-0.15 - 24-Aug-2023 00:00	Soil sample.
EA200: Description	A50.05-0.15 - 24-Aug-2023 00:00	Soil sample.
EA200: Description	A60.05-0.15 - 24-Aug-2023 00:00	Soil sample.
EA200: Description	A70.05-0.15 - 24-Aug-2023 00:00	Soil sample.
EA200: Description	A80.05-0.15 - 24-Aug-2023 00:00	Soil sample.
EA200: Description	A90.05-0.15 - 24-Aug-2023 00:00	Soil sample.
EA200: Description	A100.05-0.15 - 24-Aug-2023 00:00	Soil sample.
EA200: Description	A110.05-0.15 - 24-Aug-2023 00:00	Soil sample.
EA200: Description	A120.05-0.15 - 24-Aug-2023 00:00	Soil sample.
EA200: Description	A130.05-0.15 - 24-Aug-2023 00:00	Soil sample.
EA200: Description	A140.05-0.15 - 24-Aug-2023 00:00	Soil sample.
EA200: Description	A150.05-0.15 - 24-Aug-2023 00:00	Soil sample.

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	39	149
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	63	125
Toluene-D8	2037-26-5	67	124
4-Bromofluorobenzene	460-00-4	66	131

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	45	134
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	50	150
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	50	150
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2.4.6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72	143
Toluene-D8	2037-26-5	75	131

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP080S: TPH(V)/BTEX Surrogates - Continued			
4-Bromofluorobenzene	460-00-4	73	137

Inter-Laboratory Testing

Analysis conducted by ALS Newcastle, NATA accreditation no. 825, site no. 1656 (Chemistry) 9854 (Biology).

(SOIL) EA200: AS 4964 - 2004 Identification of Asbestos in Soils

(SOIL) EA150: Soil Classification based on Particle Size

(SOIL) EA152: Soil Particle Density

Appendix C

Report Review by Certifie4d Environmental Practitioner Site Contamination Specialist

Contaminated Land Solutions

12 September 2023

Ref: CLS0288.L02

Regional Geotechnical Solutions Pty Ltd
Unit 14
25-27 Hurley Drive
Coffs Harbour
NSW 2450

For the attention of Simon Keen

Dear Simon,

RE: Report Review: Stage 2 Site Contamination Assessment Report – Former Grafton Correctional Centre, 170 Hoof Street Grafton

I, Dr David Tully of Contaminated Land Solutions Pty Ltd, am a Certified Environmental Practitioner Site Contamination Specialist (General Certified Environmental Practitioner certification no. 1138 and Site Contamination Specialist certification no. SC40084).

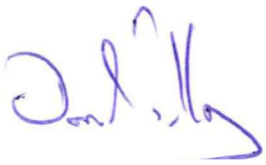
I confirm I have reviewed the Regional Geotechnical Solutions report entitled "*Stage 2 Site Contamination Assessment Report – Former Grafton Correctional Centre, 170 Hoof Street Grafton*" (Ref: RGS33320.2-AC(Rev1)), dated 12 September 2023 and a copy of which I have retained.

I can confirm that on the basis of the information contained within the report, I support the conclusions and recommendations provided therein.

Should the client, regulator or local authority have any queries regarding the report review, I can be contacted by e-mail via david.tully@contaminatedlandsolutions.com.au. Specific queries regarding the content of the report should be addressed to Simon Keen at Regional Geotechnical Solutions.

For and on behalf of

Contaminated Land Solutions Pty Ltd



Dr David Tully CEnvP SC
Director
Contaminated Land Solutions Pty Ltd

Contaminated Land Solutions Pty Ltd
10 Heath Road
Crafers West SA 5152
0410 012 292
david.tully@contaminatedlandsolutions.com.au