Nepean Geotechnics

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Acid Sulfate Soils Assessment Report

Proposed New Dwelling

1130 Pittwater Road, Collaroy NSW

Report No. R24136. Rev0

Prepared for:

Azzwic Pty Ltd

22 August 2024

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Appendices

1. Introduction

This report presents the findings of a preliminary acid sulfate soils assessment undertaken for proposed new dwelling at No. 1130 Pittwater Road, Collaroy NSW. The job was commissioned by Anthony Aziz of Azzwic Pty Ltd and was undertaken in accordance with Nepean Geotechnics general terms of engagement.

We understand that the proposed development comprises demolition of existing structures and construction of a two storey dwelling within the allotment. It is understood that the new dwelling will include a cellar level at the middle portion of the footprint. According to the provided design drawings, the finished floor level of proposed cellar will be at RL3.3 m and site preparation for the proposed cellar will involve excavations up to approximate depth of 3 m below the ground surface.

The investigation included a site walkover inspection by an experienced geotechnical engineer and drilling a borehole and laboratory analysis of subsurface material. The objective of investigation was to determine subsurface conditions and provide comments on the presence of acid sulfate soils at shallow depths within the allotment.

2. Site Description

The site is located at the eastern side of Pittwater Road and is bordered by residential properties to the north and south. The allotment occupies a rectangular shape area of approximately 385 m^2 and to the east is bounded by Collaroy Beach. The existing structures on site at the time of the field work comprised a one and two storey rendered and clad dwelling with timber deck at the rear. Site vegetation comprised grassed lawn at the front and rear yard.

The allotment had a fall of approximately 0.5 m to the east within the footprint of existing structures. We've been informed that due to severe surface erosion along the coastline in 2016, a sea wall has been constructed at the rear of the allotment and the approximate crest of the sea wall was 1.5 m above the existing ground surface across the allotment. The surface material across the sea wall consist of very loose beach sands.

3. Geology

According to the Sydney 1:100 000 Geological Series Sheet, the site is underlain by the Quaternary age alluvial consist of sands and sandy muds.

4. Field Work

The subsurface investigation comprised drilling of one borehole (BH101) to a depth of 3.0 m. The borehole was drilled at the front yard using hand portable augers. A site plan showing the approximate borehole location is provided in Appendix A.

Additional boreholes (BH1 and BH2) had been drilled in 2023 during a geotechnical investigation at the site. These were boreholes drilled using a utility mounted drilling rig equipped with solid flight augers and continued to a depth of 9 m.

An experienced geotechnical engineer attended site for a walkover assessment and borehole logging.

5. Subsurface Conditions

The subsurface material encountered in the boreholes comprised sands and silty sands in dry to moist conditions to the termination depth of boreholes. The subsurface sands included traces of shells fragments below approximate depth of 7 m in BH1 and BH2.

The surface material at the borehole location comprised topsoils (silty sand) to approximate depth of 0.3 m underlain by sands and silty sands which continued to the termination depth of 3.0 m within the borehole location. The subsurface material were in dry to moist conditions to the termination depth of 3 m in BH101 and to approximate depth of 8 m in BH1 and BH2. Groundwater seepage was present below this depth in BH1 and BH2.

6. Acid Sulfate Soils Assessment

According to the Northern Beaches Council's Local Environmental Plan (LEP) mapping, the site is located within the boundary of Class 4 acid sulfate soils. An extract from the Council's LEP is presented in Figure 1 below:

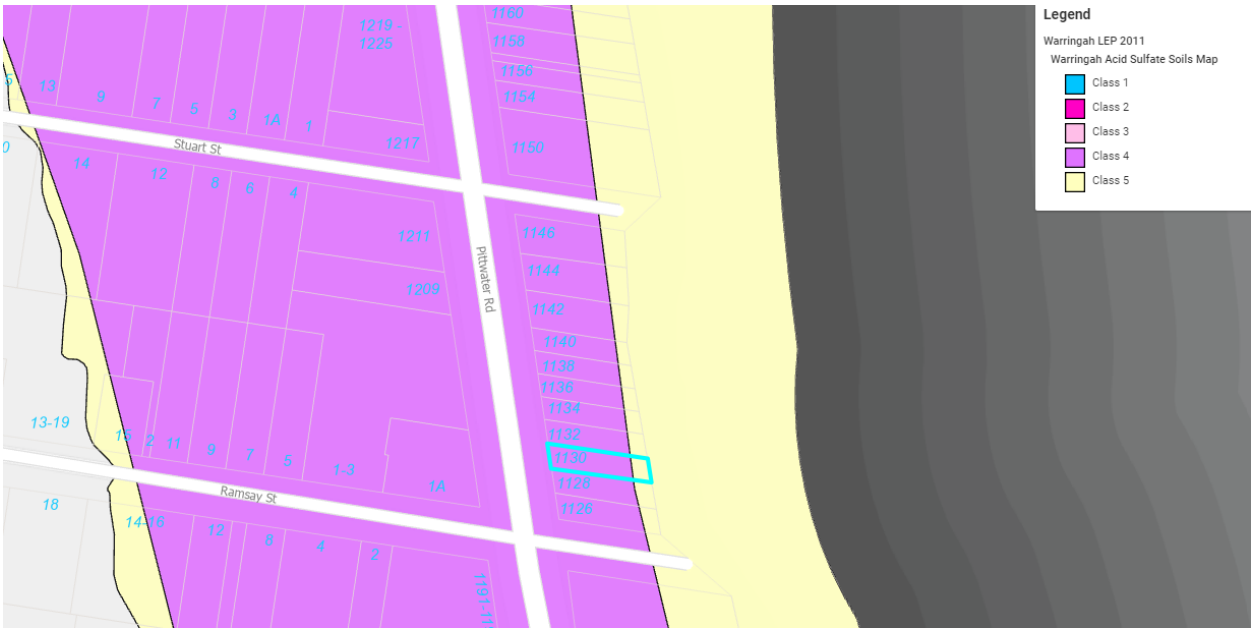


Figure 1 – Extract from Council LEP 2021

We have reviewed the Department of Land and Water Conservation Acid Sulfate Soils Risk Map and an extract from the map is presented in Figure 2 below:

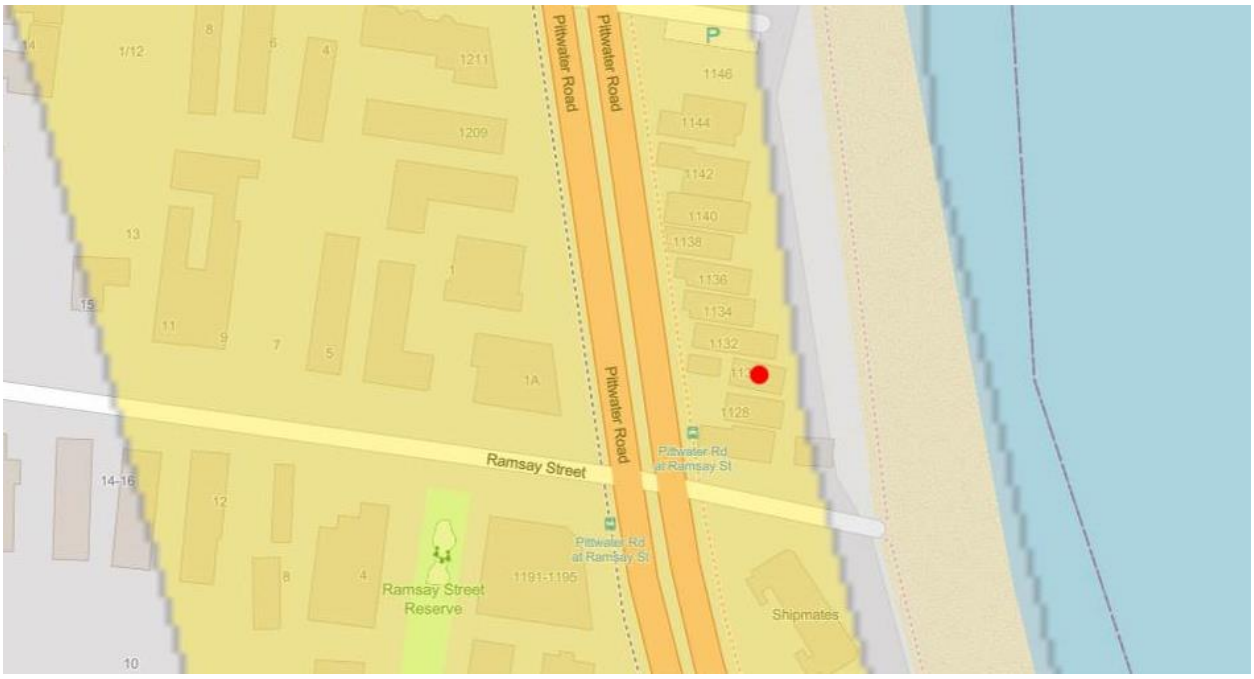


Figure 2 – Extract from Acid Sulfate Risk Map

According to the risk mapping, the site has been marked up as a landform with low probability of occurrence.

Further, the following site criteria are generally used to determine if acid sulfate materials are likely to be present:

- sediments of recent geological age (Quaternary/ Holocene);
- soil profile below RL 5 m AHD;
- marine or estuarine sediments and tidal lakes;
- coastal wetlands or back swamp areas;
- waterlogged or scalded areas;
- interdune swales or coastal sand dunes (if deep excavation or drainage proposed);
- areas where the dominant vegetation is mangroves, reeds, rushes and other.

Based on the available information, desktop assessment and review of publicly available aerial imagery, the site is located within area below RL 5 m AHD. Based on the site observations and subsurface investigation findings, the remaining listed criteria necessary for the presence of acid sulfate soils were not present.

Based on the site observations and investigation findings, the subsurface material consist of sands and no groundwater seepage was encountered in the boreholes. Hence, it is inferred that the proposed development will not result in lowering the groundwater table.

7. Laboratory Analysis

In order to assess whether acid sulfate soils are likely to be present, the SPOCAS analysis was carried out on three samples collected from BH101. The test results are summarized in Table 1 below:

Table 1 – SPOCAS Test Results Summary

Analysis	Unit	LOR (1)	BH1 @ 1.0 m	BH1 @ 2.0 m	BH1 @ 3.0 m
pH KCl	pH unit	0.1	9.4	9.6	9.6
pH after Oxidation	pH unit	0.1	7.4	7.4	7.4
TPA	Mole H^+/t	2	<5	<5	<5
TSA	Mole H^+/t	2	<0.01	<0.01	<0.01
S (POS)	%S	0.020	<0.005	<0.005	<0.005

(1) Limit of Reporting

The laboratory SPOCAS analysis results were compared to *Table 5.4: 'Action criteria based on the texture and volume of material disturbed' in National Acid Sulfate Soils Guidance*. A copy of the table is presented below:

Action Criteria based on the texture-and volume of material disturbed (extract from National Acid Sulfate Soils Guidance)

Type of material		*Net Acidity Existing + Potential Acidity*			
		1-1000 tonnes materials disturbed		*>1000 tonnes materials disturbed*	
Texture Range	*Approx. clay content (%)*	*Equivalent Sulfur (%S) (oven-dried basis)*	*(mol H^+/ tonne) (oven-dried basis)*	*Equivalent Sulfur (%S) (oven-dried basis)*	*(mol H^+/ tonne) (oven-dried basis)*
Coarse Texture *Sands to loamy sands*	*≤5*	*0.03*	*18*	*0.03*	*18*
Medium Texture *Sandy loams to light clays*	*5-40*	*0.06*	*36*	*0.03*	*18*
Fine Texture *Medium to heavy clays and silty clays*	*≥40*	*0.1*	*62*	*0.03*	*18*

Because the soils encountered on the site consisted of sands and loamy sands, the coarse texture grade criteria has been adopted for this assessment. The pH measurements and Acidity and Sulfur Trails (Titratable Peroxide Acidity, Titratable Sulfidic Acidity and Peroxide Oxidisable Sulfur) were compared to the action criteria for coarse grained soils to determine whether the acid sulfate soils would likely be present.

Based on the test results, the pH values were at a range between 9.4 – 9.6 and showed a mild drop after oxidation. The laboratory analysis results show that the Titratable Peroxide Acidity and Titratable Sulfidic Acidity concentration analysed on the samples were well below the action criterion of 18 (mol H+/tonne).

Based on the investigation findings, the proposed works on the allotment are not expected to involve disturbance of any acid sulfate soils and/or lowering groundwater table. Therefore, it is concluded that the proposed development at the above site will not trigger any conditions that require the preparation of an acid sulfate soil management plan.

8. General Notes

Our professional services were performed, our findings obtained, and our recommendations prepared in accordance with generally accepted engineering principles and practices. This warranty is in lieu of all other warranties, either expressed or implied.

The geotechnical report was prepared for the use of the client in the design of the subject project and should be made available to potential contractors for information on factual data only. This report should not be used for contractual purposes as a warranty of interpreted subsurface conditions such as those indicated by the interpretive borehole logs, cross-sections, or discussion of subsurface conditions contained herein.

The analyses, conclusions and recommendations contained in the report are based on site conditions as they presently exist and assume that the boreholes are representative of the subsurface conditions of the site. If, during construction, subsurface conditions are found which are significantly different from those observed in the boreholes or assumed to exist in the excavations, Nepean Geotechnics should be advised immediately to review these conditions and review recommendations where necessary. If there is a substantial lapse of time between the submission of this report and the start of work at the site, or if conditions have changed due to natural causes or construction operations at or adjacent to the site, this report should be reviewed to determine the applicability of the conclusions and recommendations considering the changed conditions and time lapse.

The borehole logs are our opinion of the subsurface conditions revealed by periodic sampling of the ground as the field work progressed. The soil descriptions and interfaces between strata are interpretive and actual changes may be gradual.

The logs and related information depict subsurface conditions only at these specific locations and at the particular time designated on the logs. Soil conditions at other locations may differ from conditions occurring at these borehole locations. Also, the passage of time may result in a change in the soil conditions at these borehole locations.

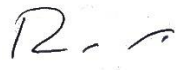
Groundwater levels often vary seasonally. Groundwater levels reported on the borehole logs or in the body of the report are factual data only for the dates shown.

Unanticipated soil conditions are commonly encountered on construction sites and cannot be fully anticipated by merely taking soil samples, boreholes. Such unexpected conditions frequently require that additional expenditures be made to attain a properly constructed project.

Nepean Geotechnics cannot be responsible for any deviation from the intent of this report including, but not restricted to, any changes to the scheduled time of construction, the nature of the project or the specific construction methods or means indicated in this report; nor can our firm be responsible for any construction activity on sites other than the specific site referred to in this report.

We trust the above is sufficient for your requirements. Please do not hesitate to contact the undersigned should you require further information or need to discuss any aspect of this report.

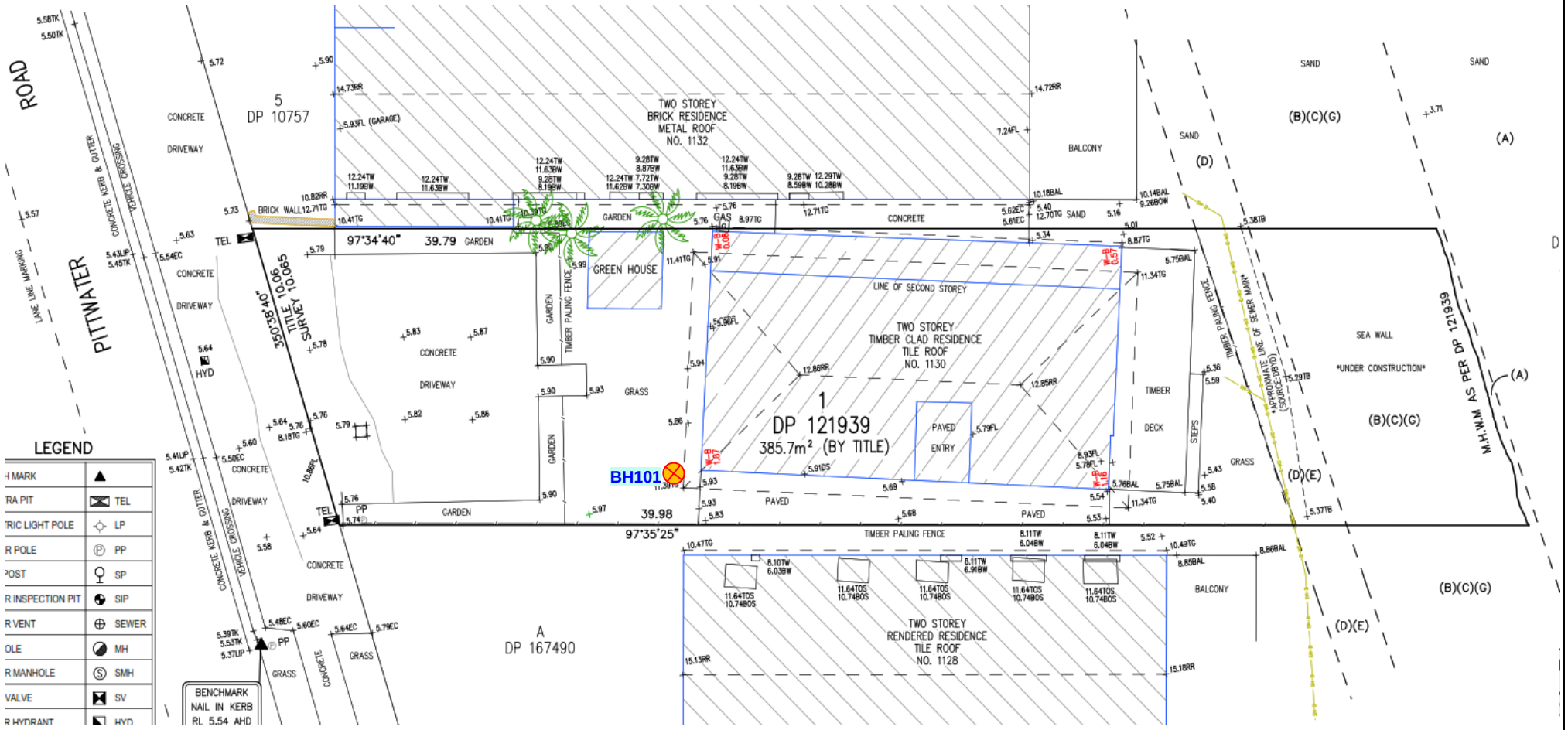
Yours sincerely,



Rasoul Machiani (MIEAust/CPEng/NER)
Senior Geotechnical Engineer
For and on behalf of Nepean Geotechnics

Appendix A

Approximate Borehole Location



Approximate Borehole Locations

Proposed Residential Dwelling		**Project No:**	**R24136**
1130 Pittwater ROAD, Collaroy NSW		**Date:**	**5 August 2024**

N

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Appendix B

Soil & Rock Descriptions Sheets

Borehole Log (BH101)

Photographs of subsurface material

Soil & Rock Descriptions

The methods of descriptions and classifications used by Nepean Geotechnics in this report are in general accordance with Australian Standard AS1726 - 2017 as detailed in the following tables:

Soil Classification

Grading

Term		Particle Size(mm)
Coarse Grained Soils (more than 50% of material is larger than 0.075mm)	Boulders	>200
	Cobbles	63 – 200
	Gravels	2.36 – 63
	Sand	0.075 – 2.36
Fine Grained Soils (more than 50% of material is smaller than 0.075mm)	Silt	0.002 – 0.075
	Clay	<0.002

Consistency (Cohesive Soils)

Term	Undrained Shear Strength (kPa)	Field Guide to Consistency
Very soft	≤ 12	Exudes between the fingers when squeezed in hand
Soft	>12 ≤25	Can be moulded by light finger pressure
Firm	>25 ≤50	Can be moulded by strong finger pressure
Stiff	>50 ≤100	Can not be moulded by fingers/can be indented by thumb
Very stiff	>100 ≤200	Can be indented by thumb nail
Hard	>200	Can be indented with difficulty by thumb nail

Consistency (Non-Cohesive Soils)

Term	Density Index (%)
Very loose	≤ 15
Loose	>15 ≤35
Medium dense	>35 ≤65
Dense	>65 ≤85
Very dense	>85

Rock Classification

Strength of Rock Material

Term	Letter Symbol	Point Load Index, Is_{50} (MPa)	Filed Guide to Strength
Extremely low	EL	≤0.03	Easily remoulded by hand to a material with soil properties
Very low	VL	>0.03 ≤0.1	Material crumbles under firm blows with sharp end of pick; can be peeled with knife; pieces up to 3 cm thick can be broken by finger pressure
Low	L	>0.1 ≤0.3	Easily scored with a knife; indentations 1 – 3 mm show in the specimen with firm blows of the pick point; a piece of core 150 mm long may be broken by hand
Medium	M	>0. 3 ≤1.0	Readily scored with a knife; a piece of core 150 mm long can be broken by hand with difficulty
High	H	>1 ≤3	A piece of core 150 mm long cannot be broken by hand but can be broken by a pick with a single firm blow; rock rings under hammer
Very high	VH	>3 ≤10	Hand specimen breaks with pick after more than one blow; rock rings under hammer

Rock Material Weathering Classification

Term	Letter Symbol	Filed Guide to Strength
Residual soil	RS	Soil developed on extremely weathered rock; the mass structure and substance fabric are no longer evident; there is a large change in volume but the soil has not been significantly transported
Extremely weathered	XW	Rock is weathered to such an extent that has 'soil' properties (i.e. either disintegrated or can be remoulded in water)
Highly weathered	HW	Rock strength usually changed by weathering. The rock may be highly discoloured, usually be ironstaining. Porosity may be increased by leaching, or may be decreased due to deposition of weathering in pores
Slightly weathered	SW	Rock is slightly discoloured but shows little or no change of strength from fresh rock
Fresh rock	FR	Rock shows no sign of decomposition or staining

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Borehole Log

Client:	Azzwic Holdings Pty Ltd	**Surface Level:**	(Approx.) RL 7 m	**Job No. :**	R24136
Project:	Proposed Residential Development	**South:**	Refer to	**Borehole:**	BH101
Location:	1130 Pittwater Road, Collaroy	**Easting:**	site plan	**Date:**	05-August-2024
		Logged/Checked by:	RM	**Sheet:**	1 of 1

Method	Groundwater	Sample	PSP	SPT	RL	Depth (m)	Classification Symbol	Material Description	Moisture Content	Consistency	Pocket Penetrometer (kPa)	Origin
Hand Auger						0.0	SM	Silty SAND grey, dry, very loose	D/M			Topsoil
						0.3	SP	Gravelly Silty SAND grey, dry, loose, with medium coarse gravels	D			Fill
						0.5	SP	SAND light brown, dry, medium coarse grained sands	D			Natural
		S1				1.0	SP	SAND light brown, dry, with shell fragments fine to medium coarse grained sands	D			Natural
		S2				2.0						
		S3				3.0		End of Borehole				
						3.5						
						4.0						
						4.5						
						5.0						

Equipment: Hand Augers

Water Observations: N/A

Subsurface Material - BH101

Appendix C

SPOCAS Analysis Report

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 358347

Client Details

Client	Nepean Geotechnics
Attention	info
Address	15 Henry Place, Narellan Vale, NSW, 2567

Sample Details

Your Reference	**24136, 1130 Pittwater Road, Collaroy**
Number of Samples	3 Soil
Date samples received	05/08/2024
Date completed instructions received	05/08/2024

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	12/08/2024
Date of Issue	09/08/2024

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Results Approved By
Jenny He, Senior Chemist

Authorised By
Nancy Zhang, Laboratory Manager

sPOCAS + %S w/w				
Our Reference		358347-1	358347-2	358347-3
Your Reference	UNITS	S2	S3	S4
Depth		BH101/1.0m	BH101/2.0m	BH101/3.0m
Type of sample		Soil	Soil	Soil
Date Sampled		05/08/2024	05/08/2024	05/08/2024
Date prepared	-	05/08/2024	05/08/2024	05/08/2024
Date analysed	-	06/08/2024	06/08/2024	06/08/2024
pH $_{kcl}$	pH units	9.4	9.6	9.6
TAA pH 6.5	moles H^+ /t	<5	<5	<5
s-TAA pH 6.5	%w/w S	<0.01	<0.01	<0.01
pH $_{Ox}$	pH units	7.4	7.4	7.3
TPA pH 6.5	moles H^+ /t	<5	<5	<5
s-TPA pH 6.5	%w/w S	<0.01	<0.01	<0.01
TSA pH 6.5	moles H^+ /t	<5	<5	<5
s-TSA pH 6.5	%w/w S	<0.01	<0.01	<0.01
ANC_E	% $CaCO_3$	0.38	0.38	0.38
a-ANC_E	moles H^+ /t	75	75	75
s-ANC_E	%w/w S	0.12	0.12	0.12
S_{KCl}	%w/w S	<0.005	<0.005	<0.005
S_P	%w/w	0.005	0.005	0.006
S_{POS}	%w/w	<0.005	<0.005	0.005
a-S_{POS}	moles H^+ /t	<5	<5	<5
Ca_{KCl}	%w/w	0.12	0.13	0.12
Ca_P	%w/w	0.83	0.88	0.94
Ca_A	%w/w	0.71	0.76	0.82
Mg_{KCl}	%w/w	0.009	0.007	0.007
Mg_P	%w/w	0.043	0.048	0.055
Mg_A	%w/w	0.035	0.041	0.048
S_{HCl}	%w/w S	[NT]	[NT]	[NT]
S_{NAS}	%w/w S	[NT]	[NT]	[NT]
a-S_{NAS}	moles H^+ /t	[NT]	[NT]	[NT]
s-S_{NAS}	%w/w S	[NT]	[NT]	[NT]
Fineness Factor	-	1.5	1.5	1.5
a-Net Acidity	moles H^+ /t	<5	<5	<5
s-Net Acidity	%w/w S	<0.01	<0.01	<0.01
Liming rate	kg $CaCO_3$ /t	<0.75	<0.75	<0.75
s-Net Acidity without -ANCE	%w/w S	<0.01	<0.01	<0.01
a-Net Acidity without ANCE	moles H^+ /t	<5	<5	<5
Liming rate without ANCE	kg $CaCO_3$ /t	<0.75	<0.75	<0.75

Method ID	Methodology Summary
Inorg-064	sPOCAS determined using titrimetric and ICP-AES techniques. Ideally samples should be received in the laboratory at <6oC. Please refer to SRA for sample temperature on receipt. Net acidity including ANC has a safety factor of 1.5 applied. Neutralising value (NV) of 100% is assumed for liming rate The recommendation that the SHCL concentration be multiplied by a factor of 2 to ensure retained acidity is not underestimated, has not been applied in the SHCL result. However, it has been applied in the SNAS calculation: SNAS % = (SHCL-SKCL)x2

QUALITY CONTROL: sPOCAS + %S w/w						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			05/08/2024	1	05/08/2024	05/08/2024		05/08/2024	[NT]
Date analysed	-			06/08/2024	1	06/08/2024	06/08/2024		06/08/2024	[NT]
pH $_{kcl}$	pH units		Inorg-064	[NT]	1	9.4	9.5	1	98	[NT]
TAA pH 6.5	moles H^+ /t	5	Inorg-064	<5	1	<5	<5	0	96	[NT]
s-TAA pH 6.5	%w/w S	0.01	Inorg-064	<0.01	1	<0.01	<0.01	0	[NT]	[NT]
pH $_{Ox}$	pH units		Inorg-064	[NT]	1	7.4	7.5	1	96	[NT]
TPA pH 6.5	moles H^+ /t	5	Inorg-064	<5	1	<5	<5	0	91	[NT]
s-TPA pH 6.5	%w/w S	0.01	Inorg-064	<0.01	1	<0.01	<0.01	0	[NT]	[NT]
TSA pH 6.5	moles H^+ /t	5	Inorg-064	<5	1	<5	<5	0	[NT]	[NT]
s-TSA pH 6.5	%w/w S	0.01	Inorg-064	<0.01	1	<0.01	<0.01	0	[NT]	[NT]
ANC_E	% $CaCO_3$	0.05	Inorg-064	<0.05	1	0.38	0.38	0	[NT]	[NT]
a-ANC_E	moles H^+ /t	5	Inorg-064	<5	1	75	75	0	[NT]	[NT]
s-ANC_E	%w/w S	0.05	Inorg-064	<0.05	1	0.12	0.12	0	[NT]	[NT]
S_{KCl}	%w/w S	0.005	Inorg-064	<0.005	1	<0.005	<0.005	0	[NT]	[NT]
S_P	%w/w	0.005	Inorg-064	<0.005	1	0.005	0.005	0	[NT]	[NT]
S_{POS}	%w/w	0.005	Inorg-064	<0.005	1	<0.005	<0.005	0	[NT]	[NT]
a-S_{POS}	moles H^+ /t	5	Inorg-064	<5	1	<5	<5	0	[NT]	[NT]
Ca_{KCl}	%w/w	0.005	Inorg-064	<0.005	1	0.12	0.14	15	[NT]	[NT]
Ca_P	%w/w	0.005	Inorg-064	<0.005	1	0.83	0.85	2	[NT]	[NT]
Ca_A	%w/w	0.005	Inorg-064	<0.005	1	0.71	0.71	0	[NT]	[NT]
Mg_{KCl}	%w/w	0.005	Inorg-064	<0.005	1	0.009	0.010	11	[NT]	[NT]
Mg_P	%w/w	0.005	Inorg-064	<0.005	1	0.043	0.044	2	[NT]	[NT]
Mg_A	%w/w	0.005	Inorg-064	<0.005	1	0.035	0.034	3	[NT]	[NT]
S_{HCl}	%w/w S	0.005	Inorg-064	<0.005	1	[NT]	[NT]		[NT]	[NT]
S_{NAS}	%w/w S	0.005	Inorg-064	<0.005	1	[NT]	[NT]		[NT]	[NT]
a-S_{NAS}	moles H^+ /t	5	Inorg-064	<5	1	[NT]	[NT]		[NT]	[NT]
s-S_{NAS}	%w/w S	0.01	Inorg-064	<0.01	1	[NT]	[NT]		[NT]	[NT]
Fineness Factor	-	1.5	Inorg-064	<1.5	1	1.5	1.5	0	[NT]	[NT]
a-Net Acidity	moles H^+ /t	5	Inorg-064	<5	1	<5	<5	0	[NT]	[NT]
s-Net Acidity	%w/w S	0.01	Inorg-064	<0.01	1	<0.01	<0.01	0	[NT]	[NT]
Liming rate	kg $CaCO_3$ /t	0.75	Inorg-064	<0.75	1	<0.75	<0.75	0	[NT]	[NT]
s-Net Acidity without -ANCE	%w/w S	0.01	Inorg-064	<0.01	1	<0.01	<0.01	0	[NT]	[NT]

QUALITY CONTROL: sPOCAS + %S w/w						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
a-Net Acidity without ANCE	moles H^+ /t	5	Inorg-064	<5	1	<5	<5	0	[NT]	[NT]
Liming rate without ANCE	kg $CaCO_3$ /t	0.75	Inorg-064	<0.75	1	<0.75	<0.75	0	[NT]	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.