

## **PRELIMINARY ASSESSMENT: Acid Sulfate**

New House and Pool at **73 Wimbledon Avenue, North Narrabeen**

<b><i>Class of land as shown on Acid Sulfate Soils Planning Maps</i></b>		<b><i>Type of Works</i></b>
<input type="checkbox"/>	<b>1</b>	Any works
<input type="checkbox"/>	<b>2</b>	Works below the natural ground surface. Works by which the water table is likely to be lowered.
<input checked="" type="checkbox"/>	<b>3</b>	Works beyond 1m below the natural ground surface. Works by which the water table is likely to be lowered beyond 1m below the natural ground surface.
<input type="checkbox"/>	<b>4</b>	Works beyond 2m below the natural ground surface. Works by which the water table is likely to be lowered beyond 2m below the natural ground surface.
<input type="checkbox"/>	<b>5</b>	Works on land below 5m AHD and within 500m of adjacent Class1, 2, 3 or 4 land which are likely to lower the watertable below 1m AHD on adjacent Class 1, 2, 3 or 4 land.
<i>The class of the site is highlighted in red; it should be noted that the classification does not mean acid sulfate soils are present on site but that there is a risk they could be present.</i>		

### **1. Proposed Development**

- 1.1** Demolish the existing house and construct a new house.
- 1.2** Construct a new pool on the downhill side of the property by excavating to a maximum depth of ~1.9m.
- 1.3** Various other minor external alterations and additions.
- 1.4** Details of the proposed development are shown on 22 drawings prepared by Archisoul, job number 2110, drawings numbered DA00 to DA08, DA10 to DA12, and DA15 to DA21 dated 30/11/21, and DA09, DA13, and DA14, dated 3/12/21.

### **2. Site Description**

The site was inspected on the 16<sup>th</sup> March, 2022.

The block is located on the near level terrain adjacent to Narrabeen Lagoon. The surface varies between ~RL0.0 and ~RL2.2. The Sydney 1:100 000 Geological sheet indicates the site is underlain by silty to peaty quartz sand, silt and clay with ferruginous and humic cementation in places and common shell layers (Qha), which was encountered during testing.

The NSW Environment and Heritage mapping program (eSpade) maps the soil landscape of the property as 'Warriewood'. The ground tests indicate the upper ~1.5m of the soil is a light grey or dull yellow bleached massive sand (wa2). These are underlain by pale mottled sand (wa3) and brown soft iron pan (wa5). Their documentation indicates these soils range in pH from 5.5 to 7.0.

Ground testing indicates that sand sediments extend to a depth of at least ~1.9m. The sediments are Holocene in age (spanning in time from present to ~10 000 years ago).

No visible signs of acid sulfate soils such as corrosion on man-made surfaces, or unusually clear, milky, or iron-stained surface water were observed on the property.

### **3. Earthworks**

An excavation to a maximum depth of ~1.9m is required to install the pool on the downhill side of the property. This excavation will cover a total area of ~20m<sup>2</sup>. Other earthworks include footing excavations for the proposed house. The excavations are only a risk in regards to potential acid sulfate soils while they are open. On completion of the footings, they will be sealed with the foundation, preventing access of oxygen to the soil and therefore greatly reducing the potential for acid generation.

### **4. Watertable**

The watertable was encountered at an average depth of ~1.4m (~RL0.4 - RL0.6) below the current surface. The watertable fluctuates with the tide and climatic changes. It should be noted by the pool builders that the presence of the water table will likely cause the proposed pool excavation (which is through sand) to collapse if it is not shored. Our office can be contacted for further information.

## 5. Field Testing

Four hand Auger Holes (AH) were put down in the locations shown on the site plan attached. Field pH and peroxide testing was carried out on samples taken from the auger holes at regular intervals. The logs of the auger holes and the test results are as follows. The soil reaction rating scale for the pH<sub>FOX</sub> test is shown in Appendix 1.

### AUGER HOLE 1 (~RL1.6) – AH1 (Photo 1)

Depth (m)	Material Encountered
0.0 to 0.1	<b>TOPSOIL</b> , dark brown sandy soil, dry, fine to medium grained with fine trace organic matter.
0.1 to 0.7	<b>SAND</b> , light brown and grey, dry, medium grained.
0.7 to 1.3	<b>SAND</b> , yellow and grey, damp, medium grained.
1.3 to 1.9	<b>SAND</b> , white and grey, wet, medium grained.

End of Hole @ 1.9m in sand. Water table encountered at ~1.2m.

TEST: AH1	FIELD pH & PEROXIDE RESULTS				
Sample depth (m)	pH <sub>F</sub>	30% Peroxide reaction	pH <sub>FOX</sub>	pH <sub>F</sub> - pH <sub>FOX</sub>	SS=Shell J=Jarosite R=Roots
0.3	7.2	-	7.2	0	R
0.7	7.2	L	7.4	-0.2	-
1.3	7.4	L	7.5	-0.1	-
1.9	7.4	L	7.5	-0.1	-

**AUGER 2 ON THE NEXT PAGE**

## AUGER HOLE 2 (~RL1.7) – AH2 (Photo 2)

Depth (m)	Material Encountered
0.0 to 0.4	<b>TOPSOIL</b> , dark brown, sandy, dry, fine to medium grained with fine trace organic matter.
0.4 to 0.9	<b>SAND</b> , grey and brown, dry, medium grained.
0.9 to 1.3	<b>SAND</b> , yellow and grey, damp, medium grained.
1.3 to 1.8	<b>SAND</b> , white, grey, and yellow, wet, medium to coarse grained.

End of Hole @ 1.8m in sand. Water table encountered at ~1.3m.

TEST: AH2	FIELD pH & PEROXIDE RESULTS				
Sample depth (m)	pH <sub>F</sub>	30% Peroxide reaction	pH <sub>FOX</sub>	pH <sub>F</sub> - pH <sub>FOX</sub>	SS=Shell J=Jarosite R=Roots
0.3	6.3	-	6.3	0	R
0.7	7.4	-	7.5	-0.1	-
1.3	7.3	-	7.4	-0.1	-
1.8	7.3	-	7.4	-0.1	-

## AUGER HOLE 3 (~RL2.0) – AH3 (Photo 3)

Depth (m)	Material Encountered
0.0 to 0.4	<b>TOPSOIL</b> , dark brown and grey, sandy, dry, fine to medium grained with fine trace organic matter.
0.4 to 0.8	<b>SAND</b> , white and grey, dry, medium grained.
0.8 to 1.5	<b>SAND</b> , yellow and brown, dry, fine to coarse grained.
1.5 to 1.8	<b>SAND</b> , grey, wet, medium grained.

End of hole @ 1.8m in sand. Water table encountered at ~1.5m.

**AUGER 3 CONTINUES ON THE NEXT PAGE**

TEST: AH3	FIELD pH & PEROXIDE RESULTS				
Sample depth (m)	pH <sub>F</sub>	30% Peroxide reaction	pH <sub>FOX</sub>	pH <sub>F</sub> - pH <sub>FOX</sub>	SS=Shell J=Jarosite R=Roots
0.3	6.3	-	6.4	-0.1	R
0.9	7.7	-	7.7	0	-
1.3	7.9	-	7.8	0.1	-
1.8	7.3	-	7.5	-0.2	-

## AUGER HOLE 4 (~RL2.2) – AH4 (Photo 4)

Depth (m)	Material Encountered
0.0 to 0.2	<b>TOPSOIL</b> , dark brown, sandy, dry, fine to medium grained with fine trace organic matter.
0.2 to 1.5	<b>SAND</b> , light brown and orange, dry, medium grained.
1.5 to 1.8	<b>SAND</b> , light brown and orange, wet, medium grained.

End of Hole @ 1.8m in sand. Water table encountered at 1.6m.

TEST: AH4	FIELD pH & PEROXIDE RESULTS				
Sample depth (m)	pH <sub>F</sub>	30% Peroxide reaction	pH <sub>FOX</sub>	pH <sub>F</sub> - pH <sub>FOX</sub>	SS=Shell J=Jarosite R=Roots
0.3	7.0	-	7.0	0	R
1.0	7.3	-	7.2	0.1	-
1.5	7.5	-	7.6	-0.1	-
1.8	7.4	-	7.5	-0.1	-

## 6. Conclusions

This report was carried out in accordance with the Field pH and Peroxide Test guidelines (ASSMAC, 1998).

No Acid Sulfate Soils were identified in the test holes. The  $pH_F$  levels tested in all auger holes did not fall lower than 6.3. This is above a PH of 4.0 that is an indicator of acid sulfate soils. No Potential Acid Sulfate Soils were identified in the test holes. The measured  $pH_F$  levels varied up to 0.2 from the measured  $pH_{FOX}$  levels. A movement of 1 unit or more is an indicator of potential acid sulfate soils. In addition, the measured  $pH_{FOX}$  for all tests did not fall lower than 6.3. A  $pH_{FOX} < 3$  is a strong indicator of potential acid sulfate soils. No observable colour change or sulphurous odours were identified during the peroxide testing. It is likely the varying weak reactions to peroxide testing were due to inclusions in the soil other than sulphides as, where the reaction was strongest,  $pH_{FOX}$  changed little from  $pH_F$  as it did in most tests.

This preliminary assessment indicates that an Acid Sulfate Soils management plan is not required for the proposed works.

White Geotechnical Group Pty Ltd.



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## Appendix 1: Soil Reaction Rating Scale

Rate of Reaction	Reaction Scale
Low	L
Medium	M
High	H
Extreme	X
Volcanic	V

Source: DER (2015a)



Photo 1: AH1 – Downhole is from bottom to top.



Photo 2: AH2 – Downhole is from top to bottom.

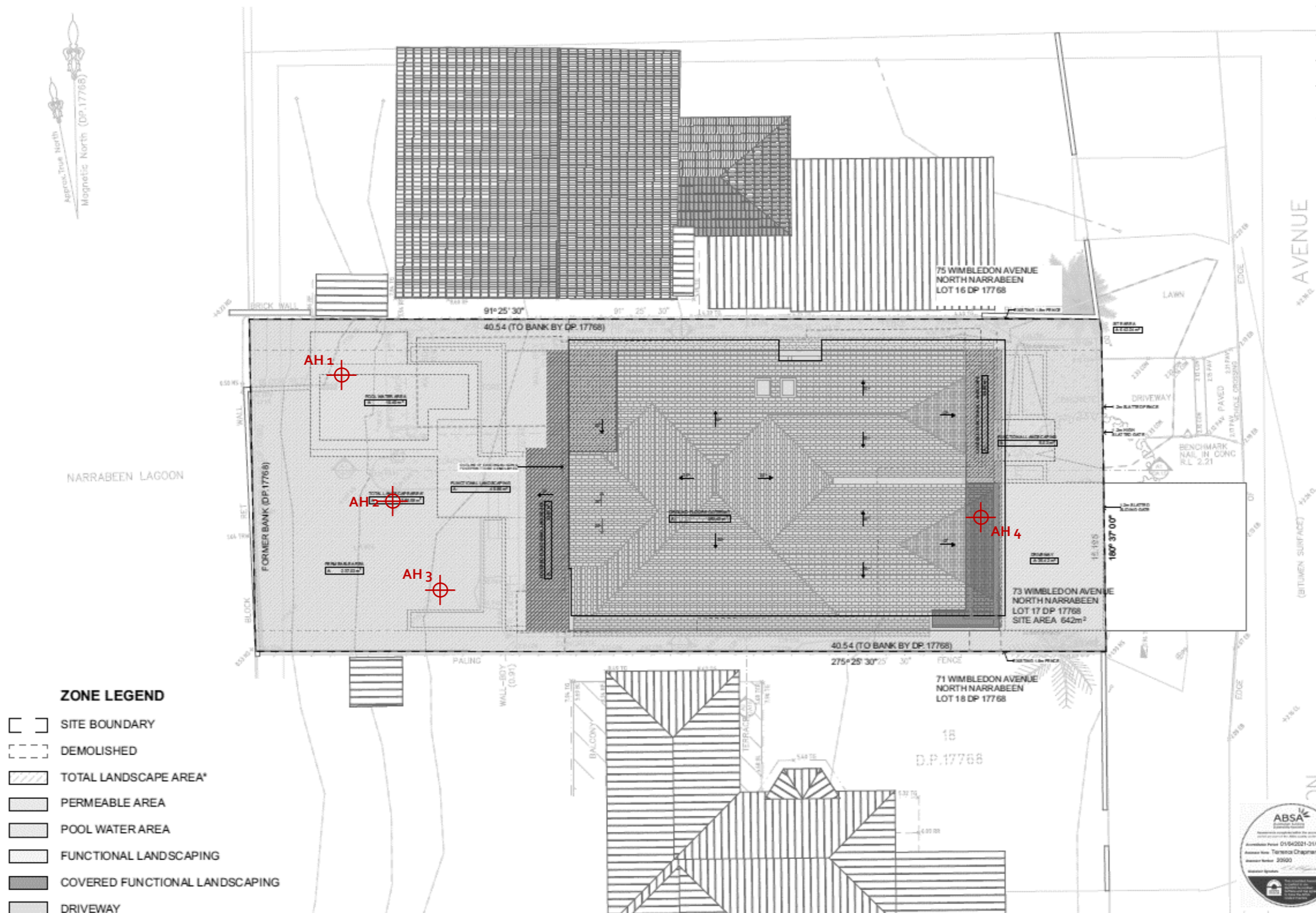


Photo 3: AH3 – Downhole is from top to bottom.



Photo 4: AH4 – Downhole is from bottom to top.

### SITE PLAN – showing test locations



SITE ANALYSIS (Site Area 642m2)	
LEVEL	FLOOR AREA (m2)
GROUND FLOOR FOOTPRINT	252.4
TOTAL LANDSCAPE AREA*	389.6 (60.7%)

* Includes Driveway, pool, deck and terraces	
Driveway	35.4m <sup>2</sup>
Soft Landscape	237.0m <sup>2</sup>



**ABSA**  
Accredited Assessor

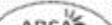
Assessor's completion of the accreditation course is subject to ABSA audit and approval.


Accreditation Period: 01/04/2021 - 31/03/2022

Assessor Name: Tamiela Chapman

Assessor Number: 20920

Assessor Signature: *Tamiela Chapman*

Assessor Stamp: 



**6.4**

**NATIONWIDE HOUSE**

Energy Rating, 10/10/2019

**45.3**

MUW

[www.nathers.gov.au](http://www.nathers.gov.au)


**0006801849 18 Nov 2021**

Assessor Terry Chapman

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NOTES

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REV	DATE	DESCRIPTION
01 - WIP	Work in Progress	STAGE 2 - DEVELOPEMENT APPLICATION

PROJECT DETAILS

Drawn | Checked RR - JG

Plot Date: 3/12/21

Project Status DA SUBMISSION

Client: PETER & JACKIE LOVEDAY

Project 2110


DRAWING TITLE :  
PROPOSED SITE PLAN

PROJECT NAME :  
73 WIMBLEDON AVENUE,  
NORTH NARRABEEN

REVISION NO.  
01 - WIP

DRAWING NO.  
DA09

N



SCALE:  
1:200 @ A3