PRELIMINARY ASSESSMENT: Acid Sulfate

For Proposed Works at **15 Gondola Road, North Narrabeen**

Class of land as shown on Acid Sulfate Soils Planning Maps		*Type of Works*
☐	**1**	Any works
☐	**2**	Works below the natural ground surface. Works by which the water table is likely to be lowered.
☐	**3**	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.
☐	**4**	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.
☐	**5**	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.
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.		

1. Proposed Development

1.1 Install a new pool by excavating to a maximum depth of ~1.7m.

1.2 Details of the proposed development are shown on 3 drawings provided by Jamie King Landscape Architect, project number 21011, drawings numbered Sht-101 to Sht-103, Issue B, dated 13/08/20.

2. Site Description

The site was inspected on the 14th October, 2020.

The block is located on the near level terrain W of South Creek and SW of a creek which runs from the Nareen Wetlands Reserve. The surface varies between RL2.0 and ~RL2.3. The Sydney 1:100 000 Geological sheet indicates the site is underlain by Alluvial Stream and Estuarine Sediment (Qha). This is described as silty to peaty quartz sand, silt and clay with ferruginous and humic cementation in places and common shell layers.

The NSW Environment and Heritage mapping program (eSpade) maps the soil landscape of the property as 'Warriewood'. The ground tests indicate the upper ~0.5m of soil is a loose speckled grey-brown loamy sand (wa1) that overlies bleached massive sand (wa2). Their documentation indicates these soils range in pH from 4.5 to 7.0.

Ground testing indicates that sand sediments extend to a depth of at least ~2.0m. The sand 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 maximum depth of ~1.7m is required for the proposed pool. It will cover an area of ~30m^2. The excavation is only a risk in regards to potential acid sulfate soils while it is 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 ~1.8m (~RL0.3) below the current surface. It should be noted the watertable fluctuates with the tide and climatic changes.

5. Field Testing

Four hand auger holes 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_{FOX} test is shown in Appendix 1.

AUGER HOLE 1 (~RL2.1) **–** AH1

Depth (m)	Material Encountered
0.0 to 0.6	**SILTY SAND**, with rock fragments, grey, dry, fine to course grained.
0.6 to 0.8	**SAND**, with rock fragments, brown grey, dry, medium grained.

Refusal @ 0.8m. No watertable encountered.

TEST: AH1	FIELD pH & PEROXIDE RESULTS				
Sample depth (m)	pH_F	30% Peroxide reaction	pH_{FOX}	pH_F - pH_{FOX}	SS=Shell J=Jarosite R=Roots
0.3	7.8	H	7.4	0.4	-
0.7	8.1	H	7.8	0.3	-

AUGER HOLE 2 (~RL2.1) **–** AH2

Depth (m)	Material Encountered
0.0 to 0.5	**SILTY SAND**, with concrete fragments, grey, dry, fine to course grained.
0.5 to 0.8	**SAND**, grey, dry, medium grained.

Refusal @ 0.8m. No watertable encountered.

TEST: AH2	FIELD pH & PEROXIDE RESULTS				
Sample depth (m)	pH_F	30% Peroxide reaction	pH_{FOX}	pH_F - pH_{FOX}	SS=Shell J=Jarosite R=Roots
0.3	7.8	H	7.5	0.3	-
0.7	8.2	H	7.8	0.4	-

AUGER HOLE 3 (~RL2.1) **–** AH3

Depth (m)	Material Encountered
0.0 to 0.3	**SILTY SAND**, with concrete fragments, grey, dry, fine to course grained.
0.3 to 1.3	**SAND**, brown grey and light grey, dry, medium grained.
1.3 to 2.0	**SAND**, dark grey, wet, medium grained.

End of hole @ 2.0m in wet sand. Watertable encountered at 1.8m.

TEST: AH3	FIELD pH & PEROXIDE RESULTS				
Sample depth (m)	**pH_F**	**30% Peroxide reaction**	**pH_{FOX}**	**pH_F - pH_{FOX}**	**SS=Shell J=Jarosite R=Roots**
0.3	8.0	H	7.9	0.1	-
0.8	8.3	H	7.9	0.4	-
1.3	8.0	H	7.7	0.3	-
1.8	7.6	M	6.9	0.7	-

AUGER HOLE 4 (~RL2.1) **–** AH4

Depth (m)	Material Encountered
0.0 to 0.5	**SILTY SAND**, with concrete fragments, grey, dry, fine to course grained.
0.5 to 1.3	**SAND**, brown grey and light grey, dry, medium grained.
1.3 to 1.9	**SAND**, dark grey, wet, medium grained.

End of hole @ 1.9m in wet sand. Watertable encountered at 1.9m.

TEST: AH4	FIELD pH & PEROXIDE RESULTS				
Sample depth (m)	**pH_F**	**30% Peroxide reaction**	**pH_{FOX}**	**pH_F - pH_{FOX}**	**SS=Shell J=Jarosite R=Roots**
0.3	8.0	H	7.7	0.3	-
0.8	8.2	H	8.0	0.2	-
1.2	8.1	H	7.7	0.4	-
1.8	7.7	M	6.8	0.9	-

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 7. This is above a PH of 4 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 0.9 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 6.8. 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 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.

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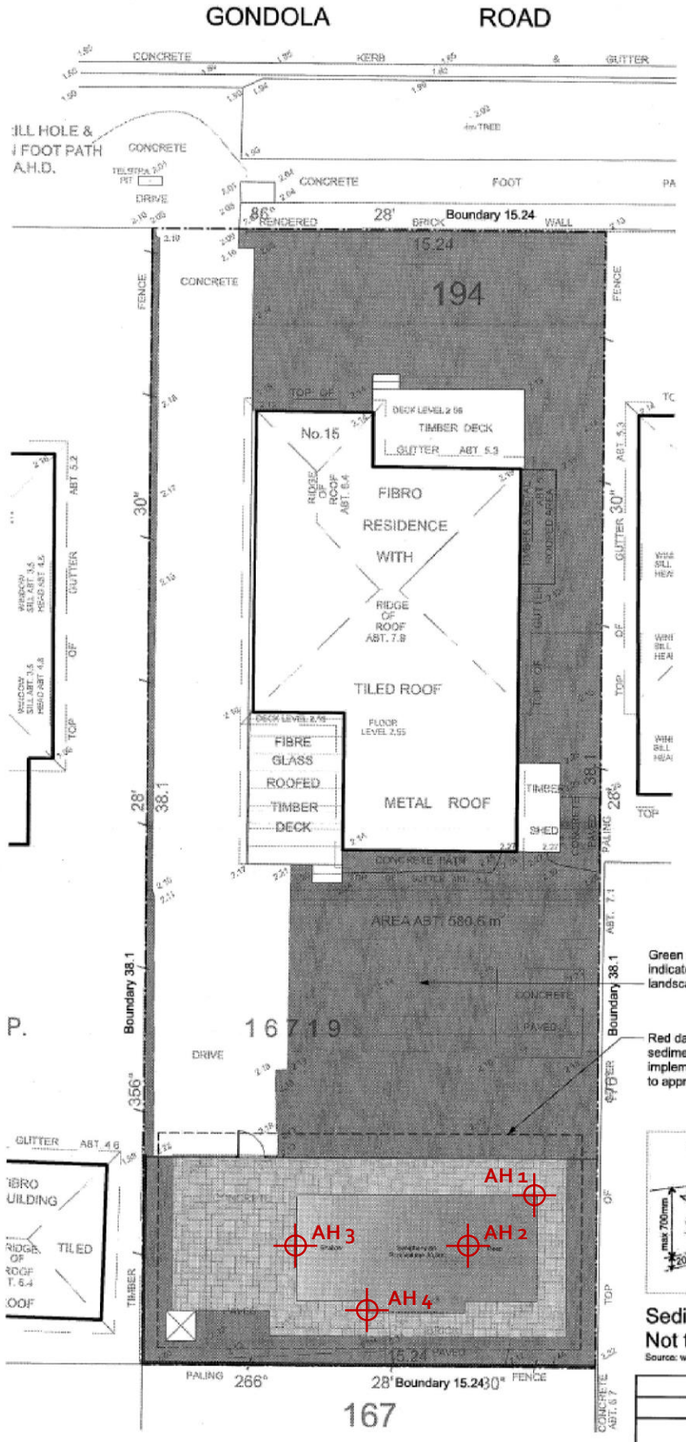
Appendix 1: Soil Reaction Rating Scale

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

Source: DER (2015a)

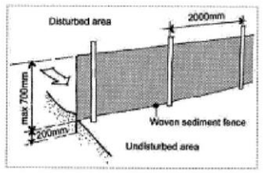
SITE PLAN – showing test locations

Site Plan
1:100@A1 1:200@A3. Do not scale off plan



Green shaded area indicates compliant landscape area

Red dashed line indicates sedimentation control fence to be implemented throughout construction to appropriate standard

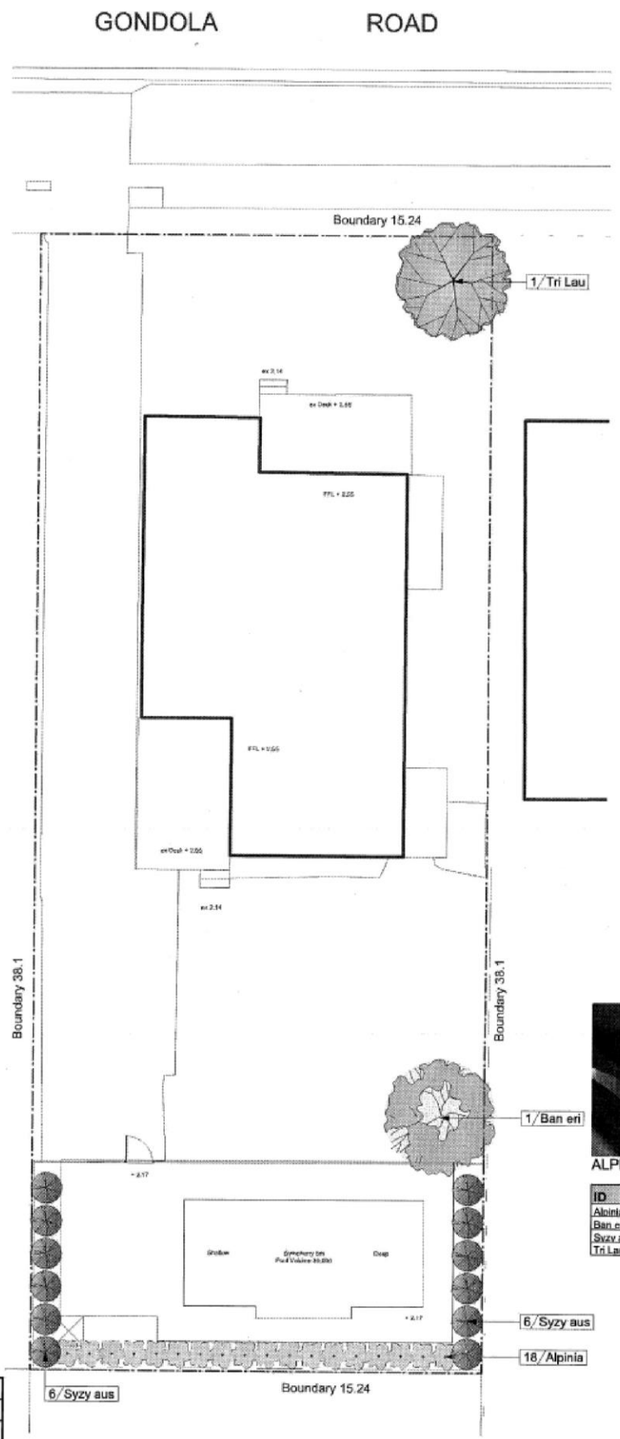


Sedimentation Control Fence
Not to scale.
Source: www.yourhome.gov.au

AREA CALCULATION

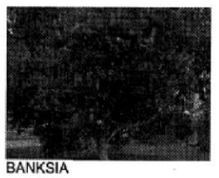
	AREA (m2)	PERCENTAGE
Site	580,60	
Landscape total as per DCP	248,95	42,88%
Area of outdoor recreation	34,84	6,00%
TOTAL AREA	283,79	48,88%

Planting Plan
1:100@A1 1:200@A3. Do not scale off plan

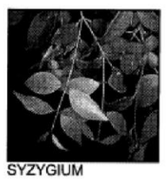


Legend
- MULCH AREA
- TURF AREA
- TIMBER DECKING
- CONCRETE PAVING
- UNIT PAVING
- STAIRS
- PEBBLE
- GRAVEL
- COBBLESTONE
- TIMBER
- WATER
- MASONRY RETAINING WALL
- STONE RETAINING WALL
- TIMBER RETAINING WALL
- BOULDER RETAINING WALL
- SITE OR WORKS BOUNDARY
- + 88.88 PROPOSED LEVEL
- +TW 88.88 TOP OF WALL LEVEL
- Paving 1 MATERIAL NAME
- Fall SURFACE FALL DIRECTION
- SURFACE DRAINS
- SURVEY (50% GREY LINES)
- EXISTING TREE TO RETAIN
- EXISTING TREE TO REMOVE
- EXISTING ROCK OUTCROP


ALPINIA


BANKSIA


TRISTANIOPSIS


SYZYGIUM

ID	Quantity	Latin Name	Common Name	Scheduled Size	Mature Height	Mature Spread
Alpinia	18	Alpinia caerulea	Native Ginger	200mm	0.9 - 1.5m	0.9 - 1.2m
Ban eri	1	Banksia ericifolia	Banksia 'Giant Candles'	25lt	3 - 6m	3 - 6m
Syzy aus	12	syzygium resilience	Lilly pilly	200mm	5 - 10m	3.5 - 6m
Tri Lau	1	Tristaniopsis laurina 'Luscious'	Kanooka, Water Gum	25lt	12 - 15m	3.5 - 6m

Notes:
- Do not scale off plan.
- Contractors to check all measurements onsite before quoting or commencing work.
- If discrepancies arise, contact the Landscape Architect.
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ISSUE	DATE	REVISION
B	13/08/20	Issue B
A	12/08/20	DRAFT Issue for review

PROJECT: 15 Gondola Road North Narrabeen — PROJECT # 21011
CLIENT: Phillip Marcellino — DATE # See above — DWG # Sht-101
DWG: Master Landscape Plan — SCALE @ A1 See Plan — DRAWN SA — CHKD JK — REVISION

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