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14th October 2020

Mr & Mrs Ian Woods
5 Kunari Place
Mona Vale NSW 2103

Re : Potential Acid Sulfate Soil Problem
Proposed In-ground Pool
5 Kunari Place , Mona Vale

Dear Mr & Mrs Woods,

At your request I have carried out a site visit to your property , inspected the immediate surrounds and reviewed an existing Acid Sulfate Testing Report (ASCENT Geotechnical Consulting Report dated 16.0420) relating to your immediate neighbour to the north with a view to advising whether or not you need to have a similar assessment of your site.

Proposed Development

I understand that you propose to have an in-ground pool installed at the rear of your property.

The proposed pool will have overall dimensions of 7m x 3m x 1- 1.6m deep.

At this stage I understand that you propose to develop an artificial turf surface over a compacted soil base around the immediate perimeter of the pool.

At some future date you may elect to replace the artificial turf surface with pavers over a reinforced concrete base.

The location of your property (No. 5) is to the immediate south of your neighbour (No. 7) as shown on the attached Image 1 extracted form the ASCENT Report. The distance between your proposed pool and the neighbour's pool and soil tests is about 30m.

Topographical and Geological Setting

The rear yards are both properties are quite flat and. are located on the edge of a large flood plain.

The formation of this geomorphological flood plain occurred over many centuries through the deposition of fine grained soils (sand , silt and clay) and is essentially identical on both sites.

The front yards of both properties also slope upwards to the east onto Kunari Place and beyond as part of a ridge feature composed of the Hawkesbury Sandstone whose surface has weathered and decomposed to form a residual (weathered in place rock) soil profile.

Surface water runoff onto and from both sites is essentially the same , flowing in a westerly direction.

Soil Profile

The auger holes carried out on the adjoining property (No.7) essentially encountered a clayey sand profile to the full depth of exploration , 1.8m. No organic material was identified in either test hole.

A copy of the Test Hole logs are attached.

Acid Sulfate Test Results

The acid sulfate test results taken at 250mm intervals in each auger hole are provided in the attached Tables.

The field pH of all 14 tests were in excess of 6 with 4 in excess of 7.

The Hydrogen Peroxide pH test results ranged from 5.8 to 7.1.

Neither of these sets of results indicated the presence of potential or actual Acid Sulfate Soils.

Summary

I conclude fro the above that:

1. the installation of the proposed pool and associated works on this site will have a minimal impact on the site

2. the proposed excavation required and its length of time of exposure for its installation will be minor

3. the proposed works should have a minimal impact on ground water movement or on the water table in this area

4. the field pH and Hydrogen Peroxide pH results in the immediate vicinity of the proposed pool confirm that the soil profile in this area is neither a potentially or actually an acid sulfate soil type.

5. as a further precaution the excavated soil should be placed on and covered by a plastic sheet prior to removal or for use as controlled filling on site.

If you have any questions , please call me.

Yours faithfully,

Robert h. Amaral
(CV enclosed for your information and files)

Image 1: Site location. 7 Kunari Place, Mona Vale NSW – Red Polygon (© NBC Maps)

Preliminary Field Acid Sulfate Soils Test Results

TEST: BH1	FIELD pH & PEROXIDE RESULTS				
Sample depth m	pH_F	30% Peroxide reaction	pH_{FOX}	pH_{FOX} - pH_F	SS=Shell J=Jarosite R=Roots
0.25	6.0	Weak Fizz	5.9	-0.1	R<5%
0.50	6.1	Very Weak Fizz	5.8	-0.3	
0.75	6.2	No Reaction	6.1	-0.1	
1.00	6.3	No Reaction	6.2	-0.1	
1.25	6.4	No Reaction	6.1	-0.3	
1.50	6.3	No Reaction	6.5	0.2	
1.75	6.6	Very Weak Fizz	6.5	-0.1	SS ~40%

TEST: BH2	FIELD pH & PEROXIDE RESULTS				
Sample depth m	pH_F	30% Peroxide reaction	pH_{FOX}	pH_{FOX} - pH_F	SS=Shell J=Jarosite R=Roots
0.25	6.8	Weak Fizz	6.8	0	R<5%
0.50	6.8	Very Weak Fizz	6.7	0	
0.75	7.1	Very Weak Fizz	7.0	-0.1	
1.00	7.1	No Reaction	7.1	0	
1.25	7.0	No Reaction	7.0	0	
1.50	7.0	Very Weak Fizz	6.9	-0.1	
1.75	6.9	Very Weak Fizz	6.3	-0.6	

NOTE: The equipment chosen to undertake ground investigations provides the most cost-effective method for understanding the subsurface conditions. Our interpretation of the subsurface conditions is limited to the results of testing undertaken and the known geology in the area. While every care is taken to accurately identify the subsurface conditions on-site, variation between the interpreted model presented herein, and the actual conditions onsite may occur. Should actual ground conditions vary from those anticipated, we would recommend the geotechnical engineer be informed as soon as possible to advise if modifications to our recommendations are required.

Geology and Geological Interpretation

The Sydney 1:100,000 Geological Sheet 9130 (NSW Dept. Mineral Resources, 1983) indicates that the site is underlain by combined man-made fill (mf) and the Quaternary silty to peaty quartz sand, silt and clay (Qha). The man-made fill (mf) is comprised of dredged estuarine sand and mud, demolition

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ASCENT GEOTECHNICAL CONSULTING

GEOTECHNICAL LOG - BORE HOLE

Client:	Caroline Birch	Job No:	AG 20072
Project:	New Pool	Date:	8/4/20
Location:	7 Kunari Place, Mona Vale NSW	Operator:	MSK

BOREHOLE NO.: BH01

Sheet 1 of 1

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
		0	Topsoil/Fill. **SANDY SILT**. Organic. Fine to medium grained, dark brown to black, grass roots.	OL	L	M
		0.2	**SILTY CLAY.** Dark brown to black, mottled red/orange, fine grained, low plasticity.	OL	F	M
		0.75	**CLAYEY SAND.** Pale grey to light brown, coarse quartz grains.	SC	MD	M
		1.1	**CLAYEY SAND.** Pale grey to light brown, mottled dark brown, coarse quartz grains.	SC	MD	W
		1.6	**CLAYEY SAND.** Brown, medium to coarse grained, abundant white/orange angular shell fragments, 10-15mm in size.	SC	MD	W
		1.8	**Borehole terminated at 1.80m at reach of equipment. Groundwater encountered from ~1.1m to ~1.8m.**			

NOTE: D - disturbed sample U - undisturbed tube sample B - bulk sample
WT - level of water table or free water N - Standard Penetration Test (SPT)

See explanation sheets for meaning of all descriptive terms and symbols

Contractor: N/A
Equipment: Hand Auger
Hole width (mm):
Angle from Vertical (°):

ASCENT
GEOTECHNICAL CONSULTING

GEOTECHNICAL LOG - BORE HOLE

Client:	Caroline Birch	Job No:	AG 20072
Project:	New Pool	Date:	8/4/20
Location:	7 Kunari Place, Mona Vale NSW	Operator:	MSK

BOREHOLE NO.: BH02

Sheet 1 of 1

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
		0	Topsoil. **SANDY SILT**. Organic. Fine to medium grained, dark brown to black, grass roots.	OL	L	M
		0.3	**SILTY CLAY.** Dark brown to black, mottled red/orange, fine grained, low plasticity. Pocket of CLAYEY SAND 100mm thick.	OL	F	M
		0.9	**CLAYEY SAND.** Pale grey to light brown, coarse quartz grains. Wet from ~1.20m.	SC	MD	W
		1.65	**CLAYEY SAND.** Brown, medium to coarse grained.	SC	MD	W
		1.8	**Borehole terminated at 1.80m at reach of equipment.** **Groundwater encountered from ~1.2m to ~1.8m.**			

NOTE: D - disturbed sample U - undisturbed tube sample B - bulk sample
WT - level of water table or free water N - Standard Penetration Test (SPT)

See explanation sheets for meaning of all descriptive terms and symbols

Contractor: N/A
Equipment: Hand Auger
Hole width (mm):
Angle from Vertical (°):

RELEVANT GEOTECHNICAL PUBLICATIONS

1965 "Triaxial Compression Testing with High Cell Pressures", M.A.Sc. Thesis, University of Toronto. Amaral.

1973 "The Bearing Capacity of Building Foundations on the Hawkesbury Sandstone in Sydney", Contracting and Construction Engineers, May, 1973. Amaral.

1974 "Does the Developer Have a Responsibility in Landslip Areas?", Property Weekly, Volume 1, No. 6. Amaral.

1974 "Instability: Its Assessment and Corrective Measures", Instability and Land Development in the Illawarra District Seminar, Wollongong University, September, 1974. Amaral.

1975 "Special Instability Problems in the Illawarra and Warringah Shire Areas of New South Wales", Proceedings Second Australia-New Zealand Conference on Geomechanics, Brisbane. Amaral.

1976 "Geotechnical Engineering, Landslips and Planning Development", Queensland Division Technical Papers, Vol. 17, No. 16. Amaral and Peck.

1978 "Remedial Stabilization Works in Developed Areas", Symposium on Soil Reinforcing and Stabilizing Techniques, Sydney, Australia. Amaral and Sullivan.

1978 "Some Hazards Associated with the Construction of Buildings on Landfill Sites", Institution of Engineers Queensland Division Technical Papers, February, 1978. Amaral.

1979 "Re-use of Waste Disposal Areas". Speciality Conference on Waste Disposal, Wollongong University. Amaral.

1979 "The Development of Buildings on Sanitary Landfill Sites", Queensland Quarrying Institute. Amaral.

1987 "Slope Instability in the Coledale Area of the Illawarra Escarpment", Special Stability Conference, Sydney. Walker, Amaral and MacGregor.

1990 "Rehabilitation of Contaminated Sites", Landscape Australia, February, 1990. Amaral and Mulvey.

1993 "Landfills and the Greenhouse Effect - Let's Put it into Perspective", 10th WWM National Conference on Waste Management, Perth, W.A. Amaral.

1993 "Landfills - Putting Recycling, Lining and Gas Production/Usage into Perspective", Drill '93 Conference, Hamilton Island, Qld. Amaral.

1995 "Greenwaste Recycling - Benefits for Landfill Management", 11th WWM National Conference on Waste Management, Sydney, N.S.W. Amaral.

1996 "Retro-fitting Leachate Collectors to Existing Landfills", Amaral and Lowry ASWA '97 World Conference, Wellington, New Zealand

2003 "Darwin's New Landfill Cell - Protecting the Environment", September 2003, Amaral, Cramer and McEvoy, NT Environmental Workshop 2003, Darwin

2004 "Retro-fitting Landfills for Longer Life", Waste 2004 Conference, Coffs Harbour, September 2004

2008 "Minimising Leachate Production at Landfills", National Managers & Operators Conference, Gold Coast, November 2008

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BORN:	Wollongong, NSW, 1939.
HIGH SCHOOL:	Wollongong High School/Manly Boys High School
TERTIARY EDUCATION:	Royal Military College, Kingston, Ontario, Canada (1958-1962). Laurentian University of Sudbury, Ontario, Canada (B.A. 1963). University of Toronto, Canada (B.A.Sc. 1964). University of Toronto, Canada (M.A.Sc. 1965).
RETIRED FROM MEMBERSHIP IN:	Association of Professional Engineers, Ontario (Canada). American Society of Civil Engineers. Institution of Engineers, Australia. Professional Engineer, Queensland (Civil Division), Cert.No.854. Association of Consulting Engineers, Australia.
PROFESSIONAL EXPERIENCE:	Geotechnical Engineer with Golder Associates, Toronto, Canada.
1964-1969:	Investigation and reporting on all aspects of foundation engineering including dewatering, underpinning, piled foundations, landslide assessment/rectification, earthworks, earth dams and coastal works (dredging/rock mound breakwaters).
1969-1972:	Associate, Golder Associates, Boston, Mass. USA. Investigations and reporting on foundations for major buildings, filling on soft ground, development of buildings on old landfill, gas control methods and piled foundations.
1972-1988:	Associate, Director, Co-Managing Director, Golder Associates, Sydney, Australia. Assessment and reporting on landslides in coastal NSW, south-east Queensland and Fiji. Leachate and gas control advice on landfill sites in Sydney, Melbourne, Gold Coast, Hong Kong and Wollongong.
1988-Present	Sole Proprietor. Assessments, designs, supervision, investigations relating to foundation engineering, landfills and stability problems. Preparation of management plans, reviews, geotechnical/ hydrogeological aspects of EIS submissions, leachate collection/disposal, landfill gas collection/disposal and rehabilitation of landfill sites in Sydney, regional NSW, Hong Kong, Gold Coast, regional Queensland, Melbourne , Perth , Hobart, Darwin, Tonga, Fiji and Papua New Guinea. Expert witness in legal cases involving landfills, landslides, drainage and dredging .Selected as external Commissioner (Christchurch, NZ) to hear / assess application for regional landfill.