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HUNTINGDALE DEVELOPMENTS Pty Ltd

&

SOUTHBANK LAND Pty Ltd

PROPOSED RESIDENTIAL SUBDIVISION

LOT 24 DP 714096

WARRAH ROAD,

BANGALEE

STAGE 1 CONTAMINATION ASSESSMENT

REPORT W07/2335-A NOVEMBER 2013



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W07/2335-A MA:ma
19 November, 2013

Huntingdale Developments Pty Ltd
& Southbank Land Pty Ltd
PO Box 315
WOLLONGONG NSW 2520

Attention: Alex Papovac

Dear Sir

**Re: Proposed Residential Subdivision, Lot 24 DP 714096 Warrah Road, Nowra: Stage 1
Contamination Assessment.**

This report presents the findings of a Stage 1 Site Contamination Assessment for a proposed residential subdivision at the above project.

This report should be read in conjunction with the attached General Notes. Please contact the undersigned should you have any queries.

For and on behalf of
Network Geotechnics Pty Ltd

V W de Silva *BScEng, MEng, SMIE Aust, CPEng, NPER*
Principal Geotechnical Engineer

EXECUTIVE SUMMARY

Network Geotechnics Pty Ltd (NG) was commissioned by Huntingdale Developments Pty Ltd and Southbank Land Pty Ltd to undertake a Stage 1 Contamination Assessment for a proposed residential subdivision at Lot 24 in DP 714096 Warrah Road, Bangalee. The investigation was carried out in accordance with NG Proposal dated 21 June, 2013.

The Stage 1 Contamination Assessment for the site was based on walk over inspection, review of Council's historical notices/orders, historical title search and review of historical aerial photographs.

Based on the site history, aerial photographs and walkover inspection the following comments were noted:

- The aerial photographs and other records reviewed, indicated a low to medium potential for site contamination.
- The site contained a crushed sandstone stockpile, old shed, scrap metal and concrete that could have potential for soil contamination. At the time of the investigation no odours were present nor any discoloration observed in any of the stockpiles.
- Two small creeks were flowing through the site. One flowing from north east to south west corner of the site and the other flowing along the southern boundary from east to west. There is a potential for contamination migration from the catchment area located to the south, east and north east. However historical photographs indicated low potential for contamination in the adjoining land. The gully surface soils at invert level did not show signs contamination nor the water show any discoloration.
- Council records indicate that no clean up notices or orders were served on the owners, however there were a number of Penalty Infringements Notices served on individuals found illegally dumping waste on the land.
- It is not likely the land would be subject to flooding in accordance with Shoalhaven LEP Zoning maps. The nearest major surface water body is Shoalhaven River located about 200m from the south west corner of the site. The site also contains several creeks.

In general, there is assessed to be a medium risk of potential contamination over the identified areas in (refer to NG Drawing W07/2335-1) where rubbish has been dumped over years, however most of the site is assessed to be 'Green Field' Site. It is assessed that a targeted Stage 2 Contamination Assessment is required for the proposed subdivision at DA stage.

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GENERAL NOTES

DRAWING No. W07/2335-1 Site Plan

DRAWING No. W07/2335-2 Locality Plan

1.0 INTRODUCTION

1.1 General

Network Geotechnics Pty Ltd (NG) was commissioned by Huntingdale Developments Pty Ltd and Southbank Land Pty Ltd to undertake a Stage 1 Contamination Assessment for a proposed residential subdivisional at Lot 24 in DP 714096 Warrah Road, Bangalee. The investigation was carried out in accordance with NG Proposal dated 21 June, 2013.

A site plan is shown on the attached Drawing No W07/2335-1.

1.2 Scope of Work

The following scope of work was agreed to with the client:

- Desk study involving review of historical land titles and aerial photographs to facilitate identification of potential site contamination.
- A walkover assessment to identify site features affecting potential site contamination.
- Evaluation of findings and preparation of a Stage 1 Contamination Assessment.

2.0 SITE IDENTIFICATION

The site is located to the west of Coconut Drive, Bangalee. The site is described as Lot 24 in DP714096 and has an approximate area of 73ha. The site is located in Shoalhaven Local Government Area (LGA) and is bounded by:

- Bushlands to the west (DP 804611).
- Residences along Coconut Drive to the east.
- Existing Residences to the north.
- DP 394995 and Crams Road to the south.

Based on Satellite photographs, the approximate site co-ordinates at the north east corner near Burrandool Avenue are given below:

Easting	277983 m E
Northing	6141193 m S

Reference to Cadastral Records Enquiry Report indicates the site is within the Parish of Illaroo, County of Camden.

3.0 SITE HISTORY

3.1 Zoning

Council zoning plans identifies the land Lot 24 in DP 714096 Warrah Road, Bangalee with ***Rural (General Rural) Zone*** based on Shoalhaven LEP 1985. The objective of the zone is to provide opportunities for a range of rural land uses and other development, including those which by virtue of their character require sitting away from urban areas.

3.2 Land Use

At present the land is vacant and is mainly covered with heavy grassland and timbered area and partly occupied by soil stockpiles and other construction waste. The land to the south adjoining Crams Road is rural residential. The land to the north and east are new residential subdivisions and residences.

3.3 Council Rezoning

No records were available on rezoning of the site. The site is proposed to be re-zoned as part Residential Zone & part Environmental Zone.

3.4 Title Records

A record of ownership/leasing as can be inferred from title records is given in Table 3.5.1 below.

Table 3.4.1 Historical Ownership/Leasing

<i>Date</i>	<i>Lot /DP Number</i>	<i>Volume /Folio</i>	<i>Remarks</i>
13 July, 1943		6201/136	The Commercial Banking Company of Sydney Limited is now the proprietor of estate under the provisions of the Crown Lands Consolidation act 1913
1 February, 1951		No. F401071	The Commercial Banking of Sydney Limited transfer to Andrew John Hodges, farmer.
29 April, 1954		NO. G36693	By the way of application by transmission Fredrick Hodges is now the proprietor of estate.
33 March, 1955		No. G255266	Frederick Hodges, contractor to Gunner Otlo Thulin, carpenter
26 September, 1956		No. G643738	Transfer to Reginald Raymons Simpson
20 May, 1958		7483/239	Darrell Richard Riles, Frederick Ramon Riles & Frederick Riles as one third shares (butchers) mortgaged to The Commercial Banking Company of Sydney Limited.
25 November, 1974		12634/239	Shoalhaven Meat CO Pty Ltd is now the proprietor of the estate.
12 January, 2007	24/714096		Shoalhaven Meat CO Pty Ltd (transferor) transferred to Southbank Land Pty Ltd & Huntingdale Developments Pty Ltd

3.5 Aerial Photographs

Aerial photographs for Lot 24 DP 714096 Warrah Road, Bangalee were purchased from NSW Department of Lands. A summary of findings are presented in Table 3.5.1

Table 3.5.1 Summary of Aerial Photograph Review

<i>Year of Photo</i>	<i>Scale</i>	<i>Colour</i>	<i>Site Description</i>
1961	1:30000	Black & White	The site is covered by trees.
1974	1:38000	Black & White	Trees removed from the eastern boundary and parts of the northern corner. North eastern corner trees removed and a new warehouse built (possible abattoir & cool room for SHOALHAVEN Meat CO Pty Ltd). The remainder of the site still contained trees. New residential buildings and roads east of the site and rural residences north of the site.
1984	1:40000	Black & White	Same, no visible changes, asides for new residential development and internal roads outside the northern boundary.
1993	1:40000	Black & White	The eastern and south eastern corners appear to have some scrap metal, possible containers, shed or machinery parts (hard to tell object in photograph, however it could be possible construction waste from the recent residential developments east and south east of the site). New residences outside the northern boundary of the site. The north eastern warehouse (abattoir) removed.
1997	1:25000	Colour	Same, no visible changes.
2013	Ref: Google Earth	Colour	No other obvious changes, asides from the objects on the eastern corner seem to have been removed. The south eastern corner still has some small objects on site.

3.6 Historical Site Usage

Based on title records and aerial photographs, the following historical uses could be identified:

Table 3.6.1 – Historical Land Use

1943 – 1958	Probably remained vacant.
1958 - 1993	Possible abattoir usage for only part of the land
1993 - Present	mostly remained vacant, however minor construction works is possible.

Based on historical aerial photographs it is assessed that part of the central and western portion of the land was predominately bushlands.

3.7 Council Records

A request was made to Shoalhaven City Council provide information on any possible Notices or Orders against the subject property for contamination and/or possible contamination activities.

Records indicate that no clean up notices or orders were served on the owners, however there were a number of Penalty Infringements Notices served on individuals found illegally dumping waste on the land. The Potentially Contaminated Land layer was checked on the GIS system, which showed 'no known contamination shown on land'. A Subdivision Application was lodged with Council in March 1990, number SF6809. The Subdivision was refused on the ground that Council was not satisfied that the application was with the consent of the owner of the land (the intent of that proposal was to create a two lot subdivision).

On 3 February 2010 Southbank Land Pty Ltd & Huntingdale Developments were issued with letter from Council (Council ref: 4549E MERIT125863), which stated "A recent inspection by Council's District Environmental Health Officer has confirmed that the property has become overgrown such as to be a harbourage area for rubbish and vermin".

3.8 Potential Contamination

Based on the review of aerial photographs, title records and a walk over assessment, the site appears to have a medium risk of potential contamination in isolated areas.

4.0 SITE CONDITION & SURROUNDING ENVIRONMENT

4.1 Topography

The site is located at the western corner Coconut Drive, Bangalee with a gentle 4°-5° south west facing slope, as observed from the centre of the site. The site is mostly covered with trees and partly grasslands. A 2m wide and approximately 1.0m deep gully which runs from north to north west and connects to another gully which runs east to west. Both gullies connect near the south west corner and flow into Shoalhaven River. There were numerous stockpiles north east of the site, from which a few had vegetation growing on them. A small dry dam was located near the centre of the site which collected stormwater runoff via gully from north east to the centre of the site.

4.2 Visible Signs of Contamination

During the site visit on 22 October, 2013 the following observations were made:

- The site consisted of partly grassland and treed areas.
- 3 gullies which carried stormwater runoff, flowing south west of the site to Shoalhaven River.
- Numerous sandstone stockpiles were observed on-site, some were covered with vegetation, the stockpile which was not covered with vegetation contained only sandstone and no odours or stains were visible to suggest any contamination.
- Bike ramps, an old burnt shed and scrap metal pieces were observed near the eastern boundary.
- Construction waste such as, concrete, rubber, scrap metal & other deleterious materials were observed in and around the north western area of the site.
- It is likely that all run-off would flow to the south west and south of the proposed construction.

There was no visible staining of soils or gravel surfaces. Additionally there were no visible signs of contamination such as bare soil patches and plant stress. Approximately 5 to 6 years ago the site experienced a bush fire and there were a number trees partially burnt.

The surface soils mainly contained silty CLAY/ CLAY topsoil with some rock outcrop.

4.3 Flood Potential

It is not likely the land would be subject to flooding in accordance with Shoalhaven LEP Zoning maps. The nearest surface water body is Shoalhaven River located about 200m from the south west corner of the site.

4.4 Geology & Hydrogeology

Reference Geological Series Sheets of the area indicate the site to be situated within Nowra Depositional Landscape underlain by Shoalhaven Group, Berry Formation (Psb) comprising siltstone shale and sandstone.

4.5 Contamination Migration

The creeks located within the site have a catchment area extending possibly up to Illaroo Road to the north, Coconut Drive to the east and Crams Road to the south. Aerial photographs inspected did not show any historical contamination activities. Therefore it is unlikely that contaminant migration in to the site.

4.6 Sensitive Environment

Shoalhaven River located about 200m south west and its associated creeks would be sensitive environments which need to be protected from contamination sources. Any contamination on-site would likely leach out to the land and consequently to the south west including Shoalhaven River.

4.7 Acid Sulphate Soils

Shoalhaven River flood plain is known to contain acid sulphate soils. Such soils may also be possible along creek lines and other low lying areas.

5.0 DISCUSSION

5.1 Summary of Desk Study

Based on the desktop study and the walk over assessment, the following observations are made:

- The aerial photographs and other records reviewed, indicated a low to medium potential for site contamination.
- The Site may have been used as an abattoir, which has a potential for contaminants such as pesticides.
- The site contained a crushed sandstone stockpile, old shed, scrap metal and concrete that could have potential for soil contamination. At the time of the investigation no odours were present nor any discoloration observed in any of the stockpiles.
- Two small creeks were flowing through the site. One flowing from north east to south west corner of the site and the other flowing along the southern boundary from east to west. There is a potential for migration of contaminants from the higher land to the east and north east to the subject site. However historical photographs indicated low potential for contamination in the adjoining land. The gully surface soils at invert level did not show signs contamination nor the water show any discoloration.
- Council records indicate that no clean up notices or orders were served on the owners, however there were a number of Penalty Infringements Notices served on individuals found illegally dumping waste on the land.
- It is not likely the land would be subject to flooding in accordance with Shoalhaven LEP Zoning maps. The nearest major surface water body is Shoalhaven River located about 200m from the south west corner of the site. The site also contains several creeks.

In general, there is assessed to be a medium risk of potential contamination over the areas with rubbish being dumped over years, however most of the site is assessed to be 'Green Field' Site (refer to NG Site Plan W07/2335-1, a copy of which has been attached).

5.2 Visual Assessment

There was neither visible discoloration nor any odours that would raise concern for contamination onsite.

6.0 CONCLUSIONS

Based on the desk study and field investigation the site is assessed to be of medium risk of contamination in certain areas within the site where illegal rubbish dumping was observed. The rest of the site is assessed to be a Greenfield site and there would be low potential for contamination, however it is assessed that a targeted Stage 2 Contamination Assessment is required for the proposed subdivision.

The targeted stage 2 assessment should include forty (40) test pits excavated depths ranging from 1.5m to 3.0m depth and sampling of soils at the surface and at 0.5m depth intervals. Laboratory testing should include Petroleum hydrocarbons (TPH)/ BTEX, Polynuclear Aromatic Hydrocarbons (PAH), Metals, Pesticides and Asbestos. In the event contamination is in deep soil samples, further drilling to assess groundwater contamination may be required. NG will be targeting the areas with soil stockpiles and areas where construction waste/illegal dumping was observed.

This report should be read in conjunction with the attached General Notes. Please contact the undersigned if you require further assistance.

For and on behalf of
Network Geotechnics Pty Ltd



Mehran Asadabadi *B.Eng (Civil)*
Geotechnical Engineer

Reviewed by



V W de Silva *BScEng, MEng, SMIE Aust, CPEng NPER*
Principal Geotechnical Engineer

GENERAL

Geotechnical reports present the results of investigations carried out for a specific project and usually for a specific phase of the project (e.g. preliminary design). The report may not be relevant for other phases of the project (e.g. construction), or where project details change.

SOIL AND ROCK DESCRIPTIONS

Soil and rock descriptions are based on AS 1726 – 1993, using visual and tactile assessment except at discrete locations where field and / or laboratory tests have been carried out. Refer to the terms and symbols sheet for definitions.

GROUNDWATER

The water levels indicated on the logs are taken at the time of measurement and depending on material permeability may not reflect the actual groundwater level at those specific locations. Also, groundwater levels can vary with time due to seasonal or tidal fluctuations and construction activities.

INTERPRETATION OF RESULTS

The discussion and recommendations in the accompanying report are based on extrapolation / interpolation from data obtained at discrete locations. The actual interface between the materials may be far more gradual or abrupt than indicated. Also, actual conditions in areas not sampled may differ from those predicted.

CHANGE IN CONDITIONS

Subsurface conditions can change with time and can vary between test locations. Construction operations at or adjacent to the site and natural events such as floods, earthquakes or groundwater fluctuations can also affect subsurface conditions.

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This report is the subject of copyright and shall not be reproduced either totally or in part without the express permission of this firm. Where information from the accompanying report is to be included in contract documents or engineering specification for the project, the entire report should be included in order to minimise the likelihood of misinterpretation from logs.

FURTHER ADVICE

Network Geotechnics would be pleased to further discuss how any of the above issues could affect your specific project. We would also be pleased to provide further advice or assistance including:

- assessment of suitability of designs and construction techniques;
- contract documentation and specification;
- construction control testing (earthworks, pavement materials, concrete);
- construction advice (foundation assessments, excavation support).



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Scale: A4 - NOT TO SCALE

Date: 31/10/13

Drawing: MA

Drawing No.: W07/2335-2

Client: HUNTINGDALE DEVELOPMENTS PTY LTD &
SOUTHBANK LAND PTY LTD

Project: PROPOSED RESIDENTIAL SUBDIVISION

Location: LOT 24 WARRAH ROAD, BANGALEE

LOCALITY PLAN

