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SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE

19 June 2012

Crown Project Services Pty Ltd
Level 15, 3 Spring Street
Sydney
NSW 2000

Attention: Josh Malin

Dear Josh

RE: Acid Sulfate Soil Risk; Netball Centre, Sydney Olympic Park, NSW

1 BACKGROUND

Crown Project Services Pty Ltd (CPS) engaged Coffey Environments Australia Pty Ltd (Coffey) to provide advice on the requirement for an Acid Sulphate Soil (ASS) Management Plan for the site associated with the proposed development of a Netball Centre of Excellence situated immediately to the east of Sydney Olympic Park Sports Centre at the southern end of Olympic Boulevard (Lot 201, DP 1041756).

Based on information previously supplied by CPS, Coffey understands that the proposed development will comprise a four storey building to house the following:

- Five indoor netball courts of international standard;
- One 'show court' with provision for approximately 800 spectators; and
- Amenities for players, officials and the public, a cafe and shop, medical rooms, storage and equipment areas.

In order to assess contamination risk to the proposed redevelopment, Coffey undertook a Phase 1 Environmental Assessment (ESA) in October 2011 consisting of a desk top study of historical on and offsite landuses and an intrusive ground investigation consisting of test pit excavation and drilling of boreholes.

Coffey subsequently prepared a Remediation Action Plan (RAP) for the site in June 2012 to address some of the contamination issues identified.

Assessment of ASS risk was outside the scope of the above mentioned reports.

2 OBJECTIVES AND SCOPE

The purpose of this letter is to provide a preliminary assessment of the likelihood of encountering acid sulphate soils during excavation and intrusive ground works associated with the proposed redevelopment of the site.

In order to assess acid sulphate soil occurrence, the following information sources were reviewed:

- Information (provided by CPS) relating to proposed development;
- Sydney 1:100,000 Soil Landscape Map (Soil Conservation Service of NSW);
- Sydney 1:100,000 Geological Series Sheet 9130;
- State Environmental Planning Policy (major development) amendment (Sydney Olympic Park) 2009 Acid Sulfate Soils Map; and
- Borehole and test pit observations (Coffey, 2011)

3 PROPOSED DEVELOPMENT

Based on the proposed development drawings provided by CPS, Coffey understands that minor surface earthworks will likely be required within the eastern part of the site to facilitate the construction of the roofed structure intended to house the netball courts on reduced levels (RL) ranging between 8.2m and 10.9m AHD (Figure 2 of Geotechnical Investigation Report).

Due to the site topography, some bulk excavation works will likely be required in the south-western part of the site to facilitate the construction of the proposed four storey amenity building. The excavation is likely to extend up to 6.4m AHD (Figure 3 of Geotechnical Investigation Report).

The piling methods and number of piles (if required) are subject to the final design of the structures and have not been provided to Coffey. However, a small volume of piling spoil could be generated.

4 ACID SULFATE SOIL ASSESSMENT

4.1 ASS Soil Map

The State Environmental Planning Policy (major development) amendment (Sydney Olympic Park) 2009 Acid Sulfate Soils Map indicates that the site is not known to have ASS occurrence. The south eastern corner of the site is classified as X4, i.e. disturbed terrain, comprising fill.

4.2 Site setting

4.2.1 Regional topography and Soils

The NSW department of Lands Spatial imagery Exchange (http://imagery.maps.nsw.gov.au) indicates that the northern portion of the site lies at an elevation of approximately 12m Australian Height Datum (AHD). The southern portion of the site is at an approximate elevation of 5m.

Based on the Sydney 1:100,000 Soil Landscape map, the general area is underlain by the Blacktown Soil Landscape Group whose landscape is gently undulating.

The map indicates that soils are shallow to moderately deep (less than 100cm) consisting of red and brown podzolic soils which occur in crests, upper slopes and well drained areas, and yellow podzolic soils and soloths which occur on lower slopes and areas of poor drainage. According to the map, the subsoil is considered to be moderately reactive, have high plasticity, low fertility and poor drainage.

4.2.2 Regional Geology

The Sydney 1:100,000 Sydney Geological Series Sheet 9130 indicates that the foreshores of Homebush Bay and Parramatta River in the vicinity of Sydney Olympic Park are underlain by manmade fill overlying Quaternary aged stream sediments. The man-made fill in the region may comprise dredged estuarine sand and mud, demolition rubble, industrial and household wastes. The site is situated near the boundary of the above materials and Ashfield Shale.

4.3 Borehole Log and Test Pit observations

The intrusive ground investigation undertaken by Coffey in October 2011 consisted of the excavation of eight (8) test pits (TP1 to TP8) across the site and eight (8) boreholes (BH1 to BH8). Test pit and borehole locations are presented on Figure 2.

The site specific geology encountered during the investigation was as follows:

- The site is generally underlain with fill overlying residual clay and weathered shale bedrock.
- The residual clay and weathered shale were typically encountered below 5m AHD, generally below the base of the proposed development. Residual clay and shale do not generally contain acid sulphate soils.
- A thin layer of alluvium was encountered at three locations in the southern part of the site (BH2, BH3 and TP3, generally outside the footprints of the proposed structures. Based on borehole and test pit observations, acid sulphate soil indicators, such as presence of shell, pale yellow jarositic materials, and dark organic rich swampy materials were not observed. Therefore, acid sulphate soils are unlikely to be present in this thin alluvium layer.
- The majority of the fill material encountered on site consisted of sandy gravel (gravel derived from sandstone and shale), not estuarine sand or mud.
- No obvious visual evidence of ASS was encountered during the intrusive ground investigation.

5 CONCLUSIONS AND RECOMMENDATIONS

Coffey considers that the redevelopment will unlikely encounter and disturb ASS for the following reasons:

- The Soil Landscape Map and Geology Map indicate that the site is underlain with man-made fill overlying clayey soils likely of shale or stream origin, not of estuarine or marine origin.
- The eastern part of the proposed development comprising the netball courts will likely require limited surface excavations to remove fill to about 8.2m AHD. The fill was observed to comprise silty clays, sandy gravels and gravelly clays of shale origin to depths varying from 3.0m bgl (TP8).to 6.2m bgl (BH7). No obvious visual evidence of ASS was encountered in the fill.
- The south-western part of the proposed development comprising the amenity block which will likely require excavation of fill in the northern part to level the ground to about 6.4m AHD. The fill was observed to comprise gravelly sand, sandy gravel and clay with a trace of gravel likely of shale origin. No obvious visual evidence of ASS was encountered in the fill.
- A thin layer of alluvium was encountered at three locations in the southern part of the site (BH2, BH3 and TP3, generally outside the footprints of the proposed structures. Based on borehole and test pit observations, acid sulphate soil indicators, such as presence of shell, pale yellow jarositic materials, and dark organic rich swampy materials were not observed. Therefore, acid sulphate soils are unlikely to be present in this thin alluvium layer.
- Minor piling work may be required. Depending on the piling methods to be implemented, piling is unlikely to disturb significant volume of soil. No obvious visual evidence of ASS was encountered at the site.

- It is understood that no significant basement structure is proposed to significantly intercept the permanent groundwater table, thus groundwater table is unlikely to be significantly altered to impact ASS in the surrounding areas, if present.

Coffey recommends an unexpected finds protocol be implemented as follows:

- Monitor excavated materials.
- Works cease immediately if excavation uncovers material that differs from that previously encountered (e.g. estuarine sediments containing high organic matter and/or sea shell fragments).
- Assess the material with respect to ASS risk by Coffey.
- Following assessment of the results and an 'all clear' received from Coffey, works may proceed. Should the results indicate an ASS risk, as ASS Management Plan will be prepared and implemented.

6 LIMITATIONS

Attention is drawn to the following limitations associated with the assessment:

- The assessment has been based on limited information gained from the geotechnical and environmental intrusive investigation undertaken by Coffey in October 2011.
- Design drawings were not available at the time of this assessment and type of foundations to be used during the construction of the foundation building are not known.

This report has been based on the current proposed design as outlined in section 1.0 above, as understood form geotechnical investigation report GEOTLCOV24420AA-AC, October 2011. Should design plans subsequently change from those covered during this assessment (i.e. building location change/excavation to greater depth). a reassessment of the potential ASS risk may be required.

For and on behalf of Coffey Environments Pty Ltd

Kat Spruth
Environmental Scientist

Edward Wu
Associate

Attachments:

Fig 1: State environmental Planning Policy (Major development) Amendment (Sydney Olympic Park) 2009 Acid Sulfate Soils Map
Fig 2: Borehole Location Plan

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Important information about your **Coffey** Environmental Report

Uncertainties as to what lies below the ground on potentially contaminated sites can lead to remediation costs blow outs, reduction in the value of the land and to delays in the redevelopment of land. These uncertainties are an inherent part of dealing with land contamination. The following notes have been prepared by Coffey to help you interpret and understand the limitations of your report.

Your report has been written for a specific purpose

Your report has been developed on the basis of a specific purpose as understood by Coffey and applies only to the site or area investigated. For example, the purpose of your report may be:

- To assess the environmental effects of an on-going operation.
- To provide due diligence on behalf of a property vendor.
- To provide due diligence on behalf of a property purchaser.
- To provide information related to redevelopment of the site due to a proposed change in use, for example, industrial use to a residential use.
- To assess the existing baseline environmental, and sometimes geological and hydrological conditions or constraints of a site prior to an activity which may alter the sites environmental, geological or hydrological condition.

For each purpose, a specific approach to the assessment of potential soil and groundwater contamination is required. In most cases, a key objective is to identify, and if possible, quantify risks that both recognised and unrecognised contamination pose to the proposed activity. Such risks may be both financial (for example, clean up costs or limitations to the site use) and physical (for example, potential health risks to users of the site or the general public).

Scope of Investigations

The work was conducted, and the report has been prepared, in response to specific instructions from the client to whom this report is addressed, within practical time and budgetary constraints, and in reliance on certain data and information made available to Coffey.

The analyses, evaluations, opinions and conclusions presented in this report are based on those instructions, requirements, data or information, and they could change if such instructions etc. are in fact inaccurate or incomplete.

Subsurface conditions can change

Subsurface conditions are created by natural processes and the activity of man and may change with time.

For example, groundwater levels can vary with time, fill may be placed on a site and pollutants may migrate with time.

Because a report is based on conditions which existed at the time of the subsurface exploration, decisions should not be based on a report whose adequacy may have been affected by time.

Consult Coffey to be advised how time may have impacted on the project and/or on the property.

Interpretation of factual data

Environmental site assessments identify actual subsurface conditions only at those points where samples are taken and when they are taken. Data derived from indirect field measurements and sometimes other reports on the site are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact with respect to the report purpose and recommended actions.

Actual conditions may differ from those inferred to exist, because no professional, no matter how well qualified, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions.

For this reason, parties involved with land acquisition, management and/or redevelopment should retain the services of Coffey through the development and use of the site to identify variances, conduct additional tests if required, and recommend solutions to unexpected conditions or other problems encountered on site.

Your report will only give preliminary recommendations

Your report is based on the assumption that the site conditions as revealed through selective point sampling are indicative of actual conditions throughout an area.

This assumption cannot be substantiated until project implementation has commenced and therefore your report recommendations can only be regarded as preliminary. Only Coffey, who prepared the report, is fully familiar with the background information needed to assess whether or not the report's recommendations are valid and whether or not changes should be considered with redevelopment or on-going use of the site. If another party undertakes the implementation of the recommendations of this report there is a risk that the report will be misinterpreted and Coffey cannot be held responsible for such misinterpretation.

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Important information about your **Coffey** Environmental Report

Your report is prepared for specific purposes and persons

To avoid misuse of the information contained in your report it is recommended that you confer with Coffey before passing your report on to another party who may not be familiar with the background and the purpose of the report. In particular, a due diligence report for a property vendor may not be suitable for satisfying the needs of a purchaser. Your report should not be applied for any purpose other than that originally specified at the time the report was issued.

Interpretation by other professionals

Costly problems can occur when other professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, retain Coffey to work with other professionals who are affected by the report. Have Coffey explain the report implications to professionals affected by them and then review plans and specifications produced to see how they have incorporated the report findings.

Data should not be separated from the report

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way. Logs, figures, laboratory data, drawings, etc. are customarily included in our reports and are developed by scientists, engineers or geologists based on their interpretation of field logs (assembled by field personnel), field testing and laboratory evaluation of field samples. This information should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

Contact Coffey for additional assistance

Coffey is familiar with a variety of techniques and approaches that can be used to help reduce risks for all parties to land development and land use. It is common that not all approaches will be necessarily dealt with in your environmental site assessment report due to concepts proposed at that time. As a project progresses through planning and design toward construction and/or maintenance, speak with Coffey to develop alternative approaches to problems that may be of genuine benefit both in time and cost.

Responsibility

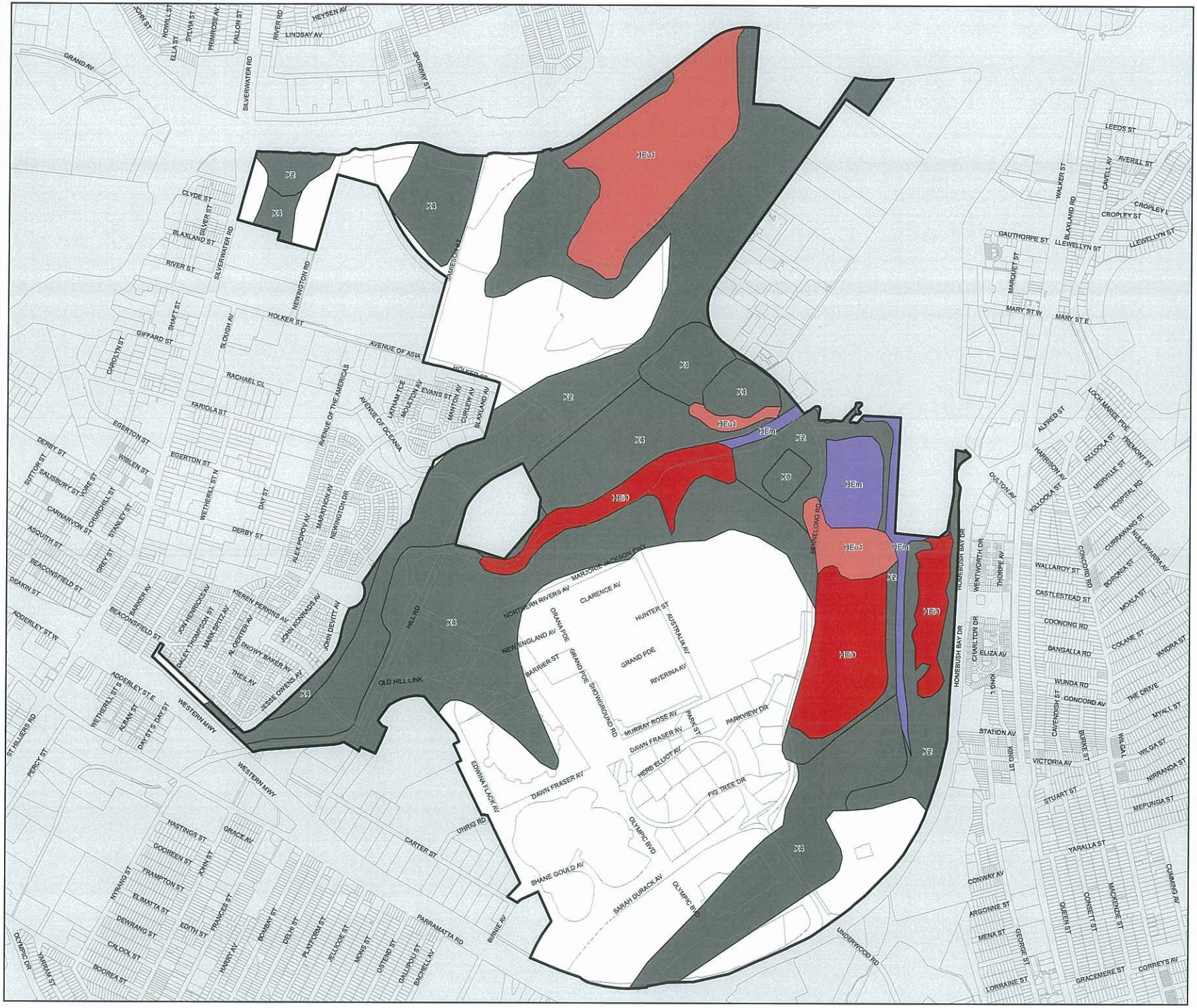
Environmental reporting relies on interpretation of factual information based on judgement and opinion and has a level of uncertainty attached to it, which is far less exact than other design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. To help prevent this problem, a number of clauses have been developed for use in contracts, reports and other documents.

Responsibility clauses do not transfer appropriate liabilities from Coffey to other parties but are included to identify where Coffey's responsibilities begin and end. Their use is intended to help all parties involved to recognise their individual responsibilities. Read all documents from Coffey closely and do not hesitate to ask any questions you may have.

NSW GOVERNMENT
Department of Planning

State Environmental Planning Policy (Major Development) Amendment (Sydney Olympic Park) 2009 Acid Sulfate Soils Map

sheet ASS 001



Subject Land

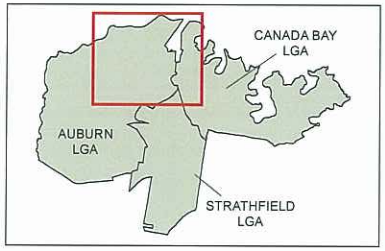
Map Class Description and Depth to ASS Materials

- High probability at or near the ground surface
- High probability within 1 m of the ground surface
- High probability of bottom sediments below water level
- Disturbed terrain

Cadastre

Cadastre 08/07/2009 © Dept of Lands

Source: Acid sulfate soils risk data 01/07/1994 © Department of Environment and Climate Change



N

0 150 300 450 m

Projection: MGA Zone 56
Datum: GDA94

Scale: 1:15,000 @ A3

Map Identification Number
SEPP_MD_SOP_ASS_001_20090709

LEGEND

TP — APPROXIMATE TESTPIT LOCATION

BH — APPROXIMATE BOREHOLE LOCATION

PROPOSED NETBALL CENTRAL DEVELOPMENT

AERIAL IMAGE SOURCE: GOOGLE EARTH PRO 6.0.1

AERIAL IMAGE ©: SINCLAIR KNIGHT MERZ 2010

Coffey Environments Australia Pty Ltd

10 0 20 40 60

Scale (metres) 1:1250

drawn	MV
approved	CC
date	16/12/11
scale	AS SHOWN
original size	A4

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client: CROWN PROJECT SERVICES PTY LTD

project: NETBALL CENTRAL PHASE 1 PRELIMINARY SITE INVESTIGATION, OLYMPIC BOULEVARD, SYDNEY OLYMPIC PARK, NSW

title: BOREHOLE AND TESTPIT LOCATIONS

project no: GEOTLCOV24420AA-D01

figure no: FIGURE 2

DWG FILE: F:\PROJECTS\OTHER OFFICES\GEOTLCOV\GEOTLCOV24420AA\ENAURHOD04234AA PHASE 1\DRAWINGS\GEOTLCOV24420AA-D01.DWG