

Soil Contamination

The potential for, and some actual site contamination has been identified in preliminary site investigations by Coffee Geosciences in 2000 and 2002. These reports have been followed with additional works by W Ryall of Contamination Land Management and later in 2007 by Ryall now of HLA ENSR, and also reviewed by Environmental and Earth Sciences in 2002, the Coffee reports in fact set out the likely major areas of potential contamination constraints. These are-

- Areas of significant fill and refuse disposal.
- Likely scattered areas of largely boiler ash disposal.
- the presence of underground storage tanks and actual hydrocarbon contamination associated with those.
- Potential groundwater contamination in the northern areas of filling for the Lower Glover and Repatriation ovals.
- Unquantified potential for the presence of asbestos in the significant fill areas and also the potential for more widespread scattering of asbestos cement and fibres.

Ryall Environmental Pty Ltd was engaged by Sydney Harbour Foreshore to complete a focused Environmental Assessment (ESA) at eight locations identified within Callan Park which were judged to be the areas of principle environmental concern identified in earlier environmental investigations.

All parties would appear to agree that the occurrence of significant fill will greatly increase the constraints and hence costs of any development on such areas. Further, that the least cost option for remediating such areas would be to not develop them for building purposes but to “cap and contain” and devote to open space uses with appropriate management layers to monitor attenuation. Further, that an opportunity exists to use these areas to dispose of and safely contain contaminated fill from other locations on the site.

From the information available it is our view that a rational plan of priorities for further investigation and for remediation of known sources of contamination can be formulated. Current advice to the master planning process would be:

1. Short term:
 - a. Decommissioning of the UST.
2. Medium Term:
 - a. Avoid as far as possible concepts for development within fill areas as identified by Ryall, 2010 Figure 1;
 - b. Cover areas identified with surface contamination issues to prevent public exposure; and
 - c. Development of a long term environmental management plan.
3. Long Term:
 - a. Providing guidance for works relating to development and maintenance of areas identified as contaminated and uncontaminated to prevent cross contamination;
 - b. Ensure that the requirement to conduct intensive contamination investigations around heritage buildings and development areas is clearly communicated.

Acid Sulfate Soils

The potential for actual Acid Sulfate Soil (ASS) and Potential Acid Sulfate Soils (PASS) do not appear in the background papers to our knowledge. Acid sulfate soil is the common name given to naturally occurring sediments and soils containing iron sulfides (principally iron sulfide or iron disulfide or their precursors). The exposure of the sulfide in these soils to oxygen by drainage or excavation leads to the generation of sulfuric acid that may impact the marine water environment and develop soil conditions that are aggressive to infrastructure and terrestrial vegetation.

ASS and PASS are often found in the same profile, with actual ASS generally overlying PASS horizons. Actual ASS are soils containing highly acidic soil layers caused by the oxidation of soils that are rich in iron sulfides. This oxidation produces acidity in excess of the soil's capacity to neutralise it and results in soils of pH of 4 or less. The presence of pale yellow mottles and coatings of jarosite can usually identify these soils.

PASS are soils that contain iron sulfides that have not been exposed to air and oxidised. The field pH of these soils in the undisturbed state are 4 or more and are commonly neutral or slightly alkaline. However, they pose a considerable environmental risk when disturbed, as they will become more acidic when exposed to air and oxidised.

The Prospect/Parramatta Acid Sulfate Soil Risk Map indicates that the water front areas of Callan Park are in a region of disturbed terrain in an area of known acid sulfate soil occurrence. The Coffee (2002) report identified land reclamation occurring in the areas associated with seawalls around Lower Glover Street Oval and Repatriation Oval to contain fill layers ranging from 0.5m to 2.4m. The bore logs mention that a residual soil occurs beneath the fill layers. This is likely to occur along the lines of the original bay lines and tidal zones.

Planning for works engaging the soil in these water front areas, sea walls and other reclaimed land zones will require a soil survey conducted in accordance with the *Acid Sulfate Soil Planning Guidelines (NSW Acid Sulfate Soils Management Advisory Committee, 1998)* to determine a acid sulfate soil risk category for a proposed development design.

Horticultural/Landscape Value of Soils

Site disturbance and contamination may or may not degrade horticultural values. Plants are relatively insensitive to a range of contaminants of human concern and are more influenced by factors such as soil depth, chemical and physical fertility. The horticultural value of soils can be significantly improved by human activity. The outstanding growth of *Ficus hillii* on the known fill site NW of the nurses quarters and convalescent cottages 86 to 88 illustrates this point.

A survey of the soil resources at Rozelle is largely non-existent. There are geophysical and exploratory contamination surveys but virtually no soil information of any use to a landscape planner. While the area is mapped as sandstone occurrence human activity has likely greatly altered large areas.

While soils can be improved to support an intended landscaping purpose, significant establishment and potential maintenance costs can be avoided if gardening or landscaping aims take into account the

distribution of soil quality across a site. Ideally landscape planners should have access to soil capability information in order to take best advantage of the existing soil assets.

Immediate concerns have been identified during site walk-over with regard to the preservation of tree rootzone soils and potentially undesirable activities in and changes to the heritage garden and landscape areas.

Current advice to the master planning process team with regard to soil horticultural values would be-

1. Recommend that soil quality investigations, at least in areas identified for landscape enhancement be conducted as soon as possible in the planning process.
2. Ensure that the master planning process includes recommendations on restrictions to activities within and preservation of the root zones of heritage listed and otherwise valuable trees and vegetation.

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References:

Rozelle Hospital, Stage 1 Preliminary Geotechnical and Contamination Study. Issues Paper on Geotechnical & Environmental Constraints” by Coffey dated 30 August 2000;

Rozelle Hospital, Preliminary Contamination Assessment, by Coffey dated 14 March 2002; and

Review of contamination and geotechnical conditions at Rozelle hospital site by EES dated 29 August 2002.

Sydney Harbour Foreshore Authority - Focused Environmental Site Assessment, Callan Park Rozelle NSW. Ryall Environmental Pty Ltd (January 2010)

Management of Contamination in the Proposed Development of Callan Park. HLA Envirosiences Pty. Ltd. 25 Oct 2007 Appendix E In: Hassell Draft Land Use Plan Oct 2007.)

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