

# Design and Construction of Anthroposols for Sydney's Barangaroo Development

Mr Simon Leake<sup>1</sup>

<sup>1</sup>*SESL Australia*

The concept design for the Barangaroo Headland Park development on Sydney harbour required a naturalistic treatment using endemic flora. The edaphology of such flora is Yellow Kandosols on Hawkesbury sandstone, the original geology. The project involved the engineering of a naturalistic hill or headland shape using fill then capped with facsimile Yellow Kandosols. A logical starting point for the reconstruction of such soils was to use crushed sandstone, an abundant waste material in Sydney. While this provided a physical basis for the soil designs what little is known about the chemical properties is that they are soils of very low fertility. Initial investigations of crushed sandstone and Yellow Kandosols from natural soil environments showed amongst the lowest total P levels in the literature, from 24 to 32mg/kg. A series of calculations based on the "ash bed" phenomenon that occurs in this fire-adapted vegetation using commercial garden waste compost to supply the limiting elements P and Ca were then used to inform pot trials using from 5 to 30% compost by volume in crushed sandstone to grow a range of known highly P sensitive plant species as well as less sensitive endemic species. The trials demonstrated good growth of the most sensitive species at 5% compost and at 10% compost for the bulk of the endemic, non P sensitive species, such amounts of compost providing close to the calculated ash bed return concentrations of P and Ca. 20% compost was chosen for the amenity turf areas.

Soil specifications for tender that included strict quality control requirements were then developed to ensure soil manufacturers supplied the correct materials for this unique landscape project. The research trial data and resulting soil performance specifications have resulted in a plant failure rate less than 0.5% for this multi-award winning project.