

Biosolids and Soil Testing

Raw sewage is made up of solids, commonly known as biosolids, and liquid, known as effluent. Biosolids are rich in essential nutrients such as phosphorous, nitrogen and organic matter. There has been an increased interest in finding ways to reuse these components of raw sewage in a manner that is safe in respect to public health. Biosolids can be liquid, semi-dried or dried solids, chemically treated and/or composted with other products such as soil.

The analysis of soils and biosolids is designed to enable the beneficial use and disposal of these products to land. The NSW EPA (1997) document, "Environmental Guidelines: Use and Disposal of Biosolids Products", is also applied in Queensland. Other Australian states and territories have their own guidelines or follow the National Australian guidelines, "NWQMS (2004) Guidelines for Sewerage Systems Sludge (Biosolids) Management". The guidelines focus on biosolids from human raw sewage, though the principles outlined could apply equally to animal wastes, if the material were to be properly characterised. The guidelines include an outline of the statutory requirements throughout NSW for reusing biosolids.

The guidelines for beneficial use of biosolids have been developed for a number of reasons. These include the utilisation of the useful resources such as organic matter and nutrient contents; the protection of land so that no deterioration of quality shall occur; the protection from groundwater and surface waters through contamination; and that the application of biosolids and the disposal system location, design and operation does not reasonably interfere with the general community.

Biosolids are classified into classes which relate to the manner in which they can be used. These are, 'Unrestricted Use', 'Restricted Use' and 'Not Suitable For Use'. To determine which classification can be applied it is necessary to determine the concentration of the various contaminants (contaminant grade) and to determine the quality which is based on the level of pathogen reduction (stabilisation grade). Classification as 'Unrestricted Use' or 'Restricted Use' can only be made if both these grades are determined.

Contaminant grading involves the testing for a selection of chemical compounds including metals and pesticides. Stabilisation grading involves the testing for selected micro-organisms and may involve parasite and enteric virus evaluation in addition to testing for bacteria such as *E. coli*, Faecal Coliforms and Salmonella.

Reference: NSW EPA (1997) Environmental Guidelines: Use and Disposal of Biosolids Products

Post Flooding and Raw Sewage Contamination

Soil, playgrounds and internal house surfaces can become contaminated with raw sewage following flooding or an accident resulting in the release of raw sewage. To evaluate the efficiency of cleaning and/or disinfection, laboratory testing of solid or swab samples for the presence of Enterococci, *E. coli* and Faecal Coliforms can be made. Although there are no stated guidelines for evaluation, the use of control samples of non-affected areas should assist in result interpretation.