Dublin SURGE Project – Soil Urban Geochemistry study for Dublin

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The Dublin SURGE (Soil Urban Geochemistry) Project aims to create a baseline dataset of persistent organic pollutants (POPs) and heavy metals in Dublin topsoils for the first time. This project provides information on soil chemistry in the urban environment relevant to the protection of human health, compliance with environmental legislation, land-use planning and urban regeneration.

A total of 1058 samples were taken in topsoil (0-10cm depth) from public lands in the greater Dublin area.

Results for heavy metals indicate that concentrations of lead, copper, zinc and mercury are strongly influenced by human activities in the docklands, the inner city and heavy industry areas. Sources of heavy metals in these areas include historic industrial activity such as metal and chemical works, coal burning in homes and industry, reuse of contaminated soil and modern traffic emissions. Lead concentrations are considered high in inner city locations, a trend which can be attributed to the historical use of leaded paint and petrol in vehicles in addition to the sources described above.

A subset of 194 samples were also analysed for polycyclic aromatic hydrocarbons (PAHs) and polychlorinated bipheyls (PCBs).

PAHs were detected across the city, with maximum concentrations occurring in the city centre zone. This trend reflects historical sources of domestic coal burning, industrial emissions and modern traffic emissions which are associated with city centre locations. PAH compositions indicate that most PAHs may be attributed to historical coal combustion. Other potential sources of PAH concentrations in Dublin soils include contaminated fill materials in reclaimed land, bonfire residues, creosote treated wood and recycled tyre products.

Results for PCBs in soil indicate isolated, low level detections of PCBs in Dublin, mainly in the city centre. The PCB compositions indicate that contamination is probably associated with historical industrial sources and old paint particles in soil rather than modern, active sources.

Advances in environmental protection have been

made in recent decades in Dublin with the introduction of the bituminous coal burning ban, the regulation and licensing of industry and remediation of many inner city previously contaminated sites through redevelopment. Although traffic volumes have increased over the years, vehicle engines are becoming cleaner. These factors are reducing heavy metal and PAHs emissions which can impact on topsoil quality.

Ireland does not yet have dedicated contaminated land guidance to help landowners assess the potential risks from contaminated land to human health and the environment. Other countries have successfully established guidance and regulation through collaboration of environmental experts, health authorities and regulators. It is recommended that a contaminated land guidance and regulatory regime is put in place for Ireland, in order to prevent further deterioration of Ireland's soil resource, especially in public areas where people can come into contact with urban soil.

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