**Waste 2017 Abstract Submission**

**Landfill Monitoring – Why is it important?**

*My presentation is relevant to the following topic area(s).*

🞎 Circular economy 🞎 Overseas experiences

🞎 Collection (inc MUD’s, transient population areas) 🞎 Problem/Hazardous waste (inc asbestos, clinical &

🞎 Container Deposit Schemes medical, ocean plastics, paint, tyres etc)

🞎 Economics (inc business cases, data gathering, 🞎 Product Stewardship

monitoring performance) 🞎 Regional issues

🞎 Education (inc community engagement) 🞎 Recycling (inc CRC’s, collection)

🞎 E-Waste 🞎 Regulations and levies

🞎 Grants (outcomes and processes) 🞎 Social enterprise

🞎 Infrastructure (inc major waste grants, EfW, organics) 🞎 State based issues (eg. Fit for the Future NSW)

🞎 Innovative projects (case studies preferred) 🞎 Technology

X Landfill (inc operations, regulations) 🞎 Tenders and contracts

🞎 Litter and/or illegal dumping (inc litter initiatives) 🞎 Other 🞎 Organics (inc collection, processing)

**Presenter information**

**Presenter name:** Dr Santo Ragusa

**Presenter position:** Senior Associate/Discipline Leader Environment

**Presenter organisation:** Meinhardt Infrastructure and Environment

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**Biography**

Santo is Discipline Leader of Environmental Science at Meinhardt and has extensive experience in soil and groundwater investigations, remediation and risk assessments of contaminated sites and landfills. He has a broad science background in academia and industry with over 25 years of experience. Santo has specialist technical expertise in remediation of contaminated land and groundwater using biological and chemical techniques having developed innovative methods in mine site rehabilitation and remediation of contaminated soil and water. He has provided technical direction on a large number of environmental site assessments for petrochemical, mining, waste processor and developer clients both in Australia and in the Middle East. Santo has been active in the contaminated site and landfill scientific communities having authored a number of papers on soil and groundwater remediation for International and Australian Journals and Conferences.

In the landfill space, he has been involved in environmental compliance monitoring and reporting for groundwater, landfill gas, surface water and leachate at landfills across NSW and Victoria. This has included the design and installation of monitoring infrastructure, Landfill risk assessments and development of landfill monitoring plans.

**Abstract Summary**

Historically, landfills have been the most common method of organised waste disposal and are often the most cost-efficient way to dispose of waste.

Many problems associated with waste disposal to land make it a significant environmental issue. Primary among those are the environmental consequences of disposing waste in the natural environment. Waste that is disposed of in landfills has the potential to contaminate soil and groundwater and emit greenhouse and toxic gases into the atmosphere.

The presentation will discuss the following topics in relation to the importance of landfill monitoring:

* Landfills – History, siting, activities
* The importance of landfill monitoring
* Regulatory Obligations of landfill owners; and
* How monitoring assists in better landfill management.

As an example of a significant monitoring program the presentation will discuss the Netwaste sampling program as a case study to highlight issues, solutions and adding value. The sampling and reporting requirements for a group of councils located in central western NSW including Blayney, Dubbo, Forbes, Lithgow, Narrowmine and Parkes was undertaken by Meinhardt over a 5 year period. During this time Meinhardt was able to use the accumulated data to reduce the frequency of sampling and better target monitoring resources by installing new monitoring bores in better downgradient positions.

**Abstract**

Waste generation accompanies all human activities in the form of solid, liquid and gaseous waste and comes from households, building and demolition sites and industry. Waste is expensive to deal with and can have a damaging impact on the environment and people's health.

Historically, landfills have been the most common method of organised waste disposal and remain so in many places around the world. Landfills are often the most cost-efficient way to dispose of waste.

The environmental consequences of disposing waste in the natural environment can cause many problems associated with waste and make it a significant environmental issue. Waste that is disposed of in landfills has the potential to contaminate soil and groundwater and emit greenhouse and toxic gases into the atmosphere.

Australians now recycle approximately 58% of all the waste we generate and landfill the rest. This represents 19 million tonnes to landfill per annum and equates to 880 kg per person per year (ABS, 2011).

The volume is concentrated in NSW, Victoria and Queensland, which collectively represent 72% of the volume. While the total number of active landfills in Australia is unknown, Commonwealth Government data indicates there are at least 600, while there could be as many as 1,000.

However, while there are many small landfill sites scattered across the country, by far most landfill volume in Australia is concentrated into a small group of large sites. In the 2013 Commonwealth survey data indicated there are only 116 sites in Australia accepting more than 20,000 tonnes per year. Collectively, these sites accept 95% of the total mass sent to landfill.

As the waste is broken down, a mixture of carbon dioxide and methane– called landfill gas is given off. In some cases, this gas is extracted and used to generate electricity. Any water that was in the putrescible waste or is formed during breakdown is squeezed out of the waste and leaches (or percolates) through the layers of rubbish and sand or soil to the bottom of the landfill (or sumps) where it is collected in special pipes and pumped to leachate storage ponds. The leachate, which can be made up of many different chemicals, is either treated or disposed to sewer.

Landfill monitoring targets the products of waste degradation (e.g. Methane, Ammonia, Nitrate, metals) in air, surface water and groundwater.

Advantages of having a specific location for disposal include;

* that monitoring can be targeted around the landfill;
* waste can be processed to remove recyclable materials before tipping; and
* landfill gas can be utilised to produce energy.

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