# Beneficial Use of Organic Waste Products on Land

## What is Changing?

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The New Zealand Water & Wastes Association Waiora Aotearoa

Nick Walmsley

# What will it do?

**Purpose**

- Develop a framework that deals consistently with organic materials
- Recognise commonalities of nutrients, contaminants and end use
- Take an integrated approach with quality criteria to protect both the environment and public health

**What Will it Supersede?**:

- 2003 Biosolids Guidelines
- References to 2003 Biosolids Guidelines in:
  - NZS 4454 – Composts, soil Conditioners and Mulches
  - Regional Plans, Bylaws, some agricultural guides, consent conditions?

# Steering Group

- ATLA; Paul Bruce
- CIBR and ESR Ltd; Jacqui Horswell
- MfE; Nigel Clarke
- MoH; John Harding
- MPI; Andrew Pearson
- NZLTC and LEI; Katie Beecroft
- WasteMINZ Organic Material Sector Group; George Fietje
- Watercare; Rob Tinholt
- Water New Zealand; Nick Walmsley

BACKGROUND

# NZ Biosolids Guidelines 2003

- Defined biosolids as any product that included WWTP sludge and met quality standards
- Included soil replacement quality standards
- Did not consider non-biosolids quality to land
- Tighter default limits from 2013
- Expected to be reviewed within 5 years i.e. by 2008

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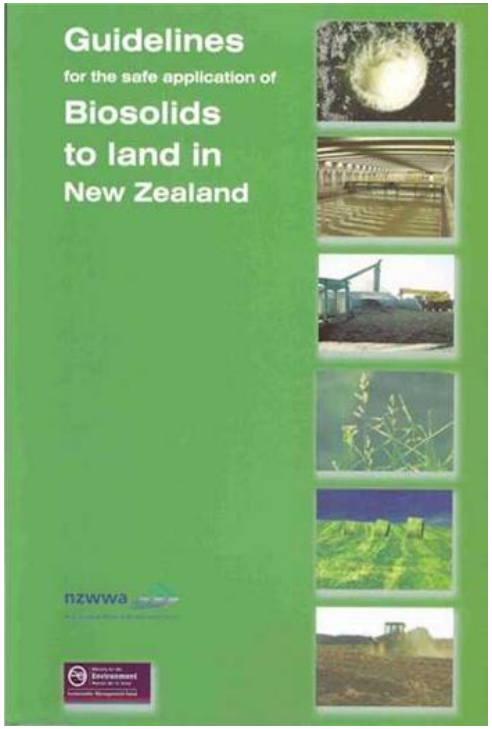
BACKGROUND

# NZ Biosolids Guidelines 2003

- Unrestricted Use = Aa
- Restricted Use = Ab, Ba, Bb
- Multiple contaminant grades
- 10 yr transition due to difficulty
- 200 kg N/ha.yr + soil limit loading criteria

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ISSUES

# The Benefits

- Unlike other waste materials, good prospects exist for alternative, beneficial end-use options for organic material if well managed
- To fit the criteria of “beneficial re-use” specified in the Guide the organic material must benefit soil biological, chemical or physical properties
- There has been substantial increase in scientific knowledge in recent years and communities are increasingly interested in sustainable waste management

Note: all organic wastes contain pathogens and other contaminants

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SCOPE

# What Raw Organic Materials are Covered?

- Household organics (food waste, green waste)
- Paper and cardboard
- Primary sector related organic waste (e.g. agricultural wastes, meat wastes)
- Manures
- Sewage sludge
- Pulp and paper waste
- Biodegradable nappies and sanitary items

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SCOPE

# What has changed?

- Simpler, less grades to comply with
- No soil limits or mass load calculation
- Nitrogen loading as primary control
- Pathogens;
  - Same list with *enteric virus* replaced by *human adenovirus*
  - Less verification samples required
- Inorganics;
  - Same contaminants and old ‘b’ grade limits as minimum
- Organics;
  - No old historical compounds e.g. dioxins
  - New compounds representing EOCs

QUALITY CRITERIA

# Product Standards

| Type | Stabilisation Grade | Contaminant Grade |
|---|---|---|
| 1A | A | Compliant |
| 1B | B | Compliant |
| 2A | A | Non-compliant |
| 2B | B | Non-compliant |

CONTROLS

# Nitrogen Loadings

- For continual application ≤ average of 200 Kg N/Ha/year over up to two years,
  - based on evidence that the organic nitrogen is eventually mineralised.
  - additional applications should be based on a site specific site and crop assessment (e.g. nutrient management plan)

- Applications to rebuild degraded soil or to refurbish contaminated land should be limited to an application of 150 kg mineral N/Ha.

- Plus soil incorporation and similar management controls to NZ Biosolids Guidelines and existing farm guides

QUALITY CRITERIA

# Pathogens – Grade A limits

| Pathogen | Standard |
|---|---|
| Verification Sampling: | |
| E. Coli | less than 100 MPN/g |
| Campylobacter | less than 1/25g |
| Salmonella | less than <2 MPN/g (< 1/25g) |
| human adenovirus | less than 1 PFU/0.25g (enteric viruses < 1 PFU/4g) |
| helminth ova | less than 1/4g |
| Routine Sampling: | |
| E. coli | less than 100 MPN/g |

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QUALITY CRITERIA

# Stabilisation Grade Sampling Frequencies

| Grade | Monitoring type | Sampling regime | Parameters to be monitored |
|---|---|---|---|
| **A** | Product verification | ≥ 7 evenly dispersed grab samples per month for a 3-month period with ≤ 3 failures. If > 3 failures then the 7 following consecutive grab samples must comply. | E. coli<br>Salmonella<br>Campylobacter<br>human adenovirus<br>helminth ova<br>VAR |
| | Routine sampling | ≥ 1 grab sample per week | E. coli<br>VAR |
| **B** | Product verification | N/A for pathogen testing | VAR |
| | Routine sampling | N/A for pathogen testing | VAR |

QUALITY CRITERIA

# Inorganic Contaminant Limits

| Parameter | Concentration limit (mg/kg dry weight) |
|---|---|
| Arsenic | 30 |
| Cadmium | 10 |
| Chromium | 1500 |
| Copper | 1250 |
| Lead | 300 |
| Mercury | 7.5 |
| Nickel | 135 |
| Zinc | 1500 |

QUALITY CRITERIA

# Organic Contaminant Limits

| Parameter | Concentration limit (mg/kg dry weight) |
|---|---|
| Perfluoro compounds (PFOS and PFOA) | 0.01 |
| Absorbable organic halogens (AOX) | 450 |
| Polycyclic aromatic hydrocarbons (PAH sum) | 5 |
| Nonyl phenol and ethoxylates (NP/NPE) | 25 |
| Phthalate (DEHP) | 75 |
| Linear alkydbenzene sulphonates (LAS) | 1500 |
| Musks – Tonalide | 15 |
| Musks – Galaxolid | 10 |

## Volume 1 – the *Guide*

- Nitrogen loading limits as control
- Similar management controls to existing guides
- Similar pathogen and inorganic contaminants
- Totally new organic contaminants to be measured;
  - No longer measure banned substances e.g. Dioxins
  - Measures compounds representative of emerging organics e.g. Herbicides, antibacterials, fungicides,
- No soil replacement standards

## Volume 2 – Technical Support Information

- Technical reports supporting proposed limits, consultation advice, legislation summary,

PROGRAMME

# Timing to Completion

- Public draft available pre Christmas ✓
- Open workshops late February ✓
- Meetings with specific stakeholders, particularly those for agricultural industry groups ✓
- Open invitation for comments to nick.walmsley@waternz.org.nz ✓
- Comments close end March 2017
- Consider what we have learnt and find solutions
- Publish

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# Questions Raised

- Should the word ‘waste’ be included in the title and descriptive text? Should it just refer to ‘Organic Products’ or ‘Organic Materials’?
- Should the proposed ‘Type’ 1A, 1B etc be used or revert back to the previous Aa, Ab etc nomenclature used in the 2003 Biosolids Guidelines?
- Should measurement of emerging organic contaminant limits be mandatory for all biosolids applied to land so that a New Zealand database can be established more quickly, giving a greater ability for evidence based review?
- Volume 1 The Guide is intended to give practical guidance. Is the information clear enough, in the correct format, split adequately between background/supporting information (Technical Manual) and the *Guide*? How could it be improved?

# Questions Raised

- Are there any concerns over the proposed changes? What are they?
- What positive or negative impacts will the proposed changes have on your business?
- Are the changes to the guidelines able to be aligned with current regional and district plans?
- Is using the NES for Assessing and Managing Contaminants in Soil to Protect Human Health, April 2012 an acceptable means of protecting human health in the urban environment? If not, what do you suggest as an alternative?

# Comments Received

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Please discuss and let us know what you think?

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