New Landfill Classifications

Richard Emery, Jeffares & Green
emeryr@jgi.co.za
Waste Management Hierarchy

- Included in objectives of the NEMWA
- Promote alternatives to landfilling
- Landfill no longer the preferred waste management option in SA
- What can be expected?
  - Smaller volumes of low hazard waste disposed at landfills
  - Mostly non-recyclable waste disposed at landfills

(CSIR, 2013)
Waste Stream Classification

Must be based on the “Globally Harmonised System of Classification and Labelling of Chemicals (SANS 10234).

(key focus is on transportation)

- all waste needs to be classified and re-done every 5 years – cannot transport or dispose without it (except for a few pre-classified waste streams).
- This system deals with chemical concentrations and leachable concentrations using accredited laboratories.
- Australian-based (leaching) system.

Past system used was from Minimum Requirements for Disposal by Landfill, 1998 and Minimum requirements for the Handling, Classification and Disposal of Hazardous Waste, 1998.

(there is a time lag of 18 months to 3 years of phasing this out- depending on )
New regulations came into affect:

**GNR 634 (23 August 2013): Waste Classification and Management Regulations** – *talks to* SANS 10234 and “*talks to*” the requirements for disposal, record keeping, etc.

**GNR 635 (23 August 2013): National Norms and Standards for the assessment of Waste for Landfill Disposal** – *Assessment of waste prior to landfilling*. *Prescribes limits relating to chemical composition of wastes from lab testing such as LCT (Leachable Concentration Threshold), etc.*
GNR 636 (23 August 2013): National Norms and Standards for Disposal of Waste to Landfill – aligns waste classification and character to default “simplified” basal lining systems (containment) being “Class A, B, C and D” versus “Type 0 to 4”. Also refer to “Leakage rates” to be estimated.

GNR 921 (29 Aug 2013): List of Waste Management activities that have, or are likely to have, a detrimental effect on the environment – divides activities into categories (A, B and C) giving thresholds and “transitional provisions”. (assessment of waste for disposal to landfill is assessed as above and aligned with classification under SANS10234)

• Only four classes of landfills listed,
• No allowance for exemptions
• Certain waste items are not allowed to be disposed of with immediate effect (certain batteries, whole tyres, infectious animal wastes, etc).
• Certain waste items are not allowed to be disposed of after 3 to 5 years (WEEE, oils, certain solvents, PCB containing wastes, etc),
GNR 926 (29 November 2013) : National Norms and Standards for the Storage of Waste

Relates to the management of storage facilities, best practice, refers to minimum standards for design and operation of new and existing waste storage facilities.

Specifically on “disposal”:

• Must have documentation verifying authorised collector(s)

Note:

NEM:WA on contaminated land (with respect to “disposal” or engineered landfill site (Section 35-41) is not yet in force.
Where has classification changed?

Landfill classification was based on:
- Type of waste
- Size of waste stream
- Potential for leachate generation (climate, etc)

New Landfill Classification focusses on barrier design (GNR 635) and chemical characteristics of the waste (SANS 10234, GNR 636, etc)

Implications:
- Far more chemical analysis and laboratory testing of waste sample,
- More cautious (simplified) approach to basal lining systems – increased cost,
- Improved record keeping and controls on sites,
- No delisting of waste streams generally accepted.
Waste Classification - example

Sample – ash waste from a metals processing facility

Waste Classification (2nd edition, 1998)

- Sample Analysis detected Contaminants of Concern (CoCs) in concentrations higher than Acceptable Risk Levels (ARLs).
- CoCs identified are Li; Mg; Mn; Sr (Strontium) and Sb (Antimony)

The majority of the waste characteristics have a HR2 or HR1 hazard rating, these wastes have to be disposed on a H:H landfill site. The Char, Shredder Waste and Limestone – Bed waste can be disposed on a H:h landfill because it has a HR4 hazard rating.

Waste Classification WCMR

- The blended Char waste streams are classified as Type 3 which can be disposed on a landfill site with a Class C barrier system (G:L:B+ landfill)
Liner Requirements

Class C Landfill Liner for the disposal of Type 3 Waste
Thickness above excavation level=approx. 800mm

Legge (DWAF):
- preference to composite lining systems (GCL + geomem)
  -- heat of hydration of deposit.
  -- opportunity for research on existing pile?

Total Cost of Liner/m² = R300
Class A Landfill Liner for the disposal of Type 1 Waste.

Thickness above excavation level = approx. 1500mm

Total Cost of Liner/m² = R500
Possible Alternative Basal Liner Designs

**OPTION 4**

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost per m²</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage layer</strong></td>
<td>R 37.50</td>
</tr>
<tr>
<td>150mm 38mm stone drainage layer</td>
<td></td>
</tr>
<tr>
<td><strong>Separation layer</strong></td>
<td>R 10.00</td>
</tr>
<tr>
<td>separation geotextile</td>
<td></td>
</tr>
<tr>
<td><strong>Sand Protection Layer</strong></td>
<td>R 10.50</td>
</tr>
<tr>
<td>300mm In-situ Sand</td>
<td></td>
</tr>
<tr>
<td>Protection geotextile</td>
<td>R 20.00</td>
</tr>
<tr>
<td><strong>Hydraulic Barrier</strong>: 2.0mm HDPE</td>
<td>R 45.00</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hydraulic Barrier</strong> 70 mm Trisoplast</td>
<td>R 80.00</td>
</tr>
<tr>
<td><strong>Detection Layer</strong>: Cusped Drain with sand</td>
<td>R 31.00</td>
</tr>
<tr>
<td>1.0mm LLDPE Geomembrane</td>
<td></td>
</tr>
<tr>
<td><strong>Sand Leveling / Protection Layer</strong></td>
<td>R 23.00</td>
</tr>
<tr>
<td>150mm base prep (in-situ) Rip &amp; Recomp</td>
<td>R 6.75</td>
</tr>
<tr>
<td>In situ Sand</td>
<td>R 0.00</td>
</tr>
</tbody>
</table>

**TOTAL COST OF LINER/m²** = R 264

Excluding earthworks and infrastructure

Thickness above excavation level = approx. 550mm
Thank you

Richard Emery, Jeffares & Green
emeryr@jgi.co.za