

# LANDFILLS AND THE WASTE ACT IMPLEMENTATION – WHAT HAS CHANGED?

SUZAN OELOFSE

Council for Scientific and Industrial Research, P.O. Box 395, Pretoria, 0001. [soelofse@csir.co.za](mailto:soelofse@csir.co.za)

## Summary

This paper reports on the latest developments in waste management regulation in South Africa. The focus is on the changes that impact landfilling.

## Abstract

The introduction of landfill permits by Section 20 of the Environment Conservation Act, 1989, resulted in the development of the Minimum Requirements series of documents to guide waste disposal to landfill. The promulgation of the National Environmental Management: Waste Act, 2008 (Act 59 of 2008) and the recent regulations and standards, has changed the way in which landfills will be regulated in future. This paper critically evaluates the impacts of the Waste Act and regulations on landfilling in South Africa.

## 1. Introduction

Available data indicates that domestic waste is disposed of on approximately 1203 general waste landfills in South Africa and hazardous waste on 77 hazardous waste landfills (DEAT, 2006). Historic problems with municipal landfills include sites that are poorly sited, designed and operated and thus impact negatively on both the environment and quality of life (DEAT, 2000). The main reason for the historic problems is the fact that many of these landfill sites were established before environmental legislation was in place. The first step to protect the environment and the public from the impacts of bad waste disposal practices was to implement a control system involving permits for landfill sites (DWAF, 1998b). Permits for landfill sites were first introduced into South African legislation in 1989 with the promulgation of Section 20 of the Environment Conservation Act, (Act 73 of 1989) (RSA, 1989). To be eligible for a permit, a landfill site requires meeting and maintaining certain standards (DWAF, 1998b). The second step that followed the implementation of a landfill permitting system was the development of a set of standards in the form of Minimum Requirements which are applicable nationwide (DWAF, 1998b).

The Minimum Requirements on its own did not have any legal standing but became legally binding once incorporated as conditions into disposal site permits. The Minimum Requirements could therefore only be enforced on permitted landfill sites. The consequence of this situation was that landfills that were not in line with the Minimum Requirements could not be permitted. This resulted in a total of 461 unauthorised landfills (as at October 2007) in South Africa (DEA, 2007). One hundred and two of these sites needed authorisation for closure (present environmental fatal flaws and have a life span of less than three years) and the remaining 244 needed to be authorised for continued use (do not present any

environmental fatal flaws or can be upgraded to conform to the objectives of the Minimum Requirements and have a life span of more than three years remaining) (DEA, 2007).

The promulgation of the Waste Act, (Act 59 of 2008) (RSA, 2009a) changed the legal landscape for waste management in South Africa quite significantly. It is the first South African law dedicated to waste management and provides a framework for effective waste management practices in South Africa. In addition, the shortcomings in the application of past legislation to South African landfills also needed to be addressed under the Waste Act. This paper will therefore specifically only focus on those changes in legislation that impact on landfilling in South Africa.

## **2. National Environmental Management: Waste Act and landfilling**

### **2.1 Landfill licences**

The Waste Act introduced licences for a range of listed waste management activities, including disposal of waste to landfill (RSA, 2009b). The licence application process will require a basic assessment or a full assessment in terms of the environmental impact assessment regulations, depending on the size and nature of the disposal activity. A basic assessment process is required in the following instances:

- Disposal of inert waste in excess of 25 tons and with a total capacity of 25 000 tons, excluding disposal of waste for levelling and building purposes which has been authorised by or under other legislation.
- The disposal of general waste to land covering an area of more than 50m<sup>2</sup> but less than 200 m<sup>2</sup> and with a total capacity not exceeding 25 000 tons.
- The disposal of domestic waste generated on premises in areas not serviced by the municipal services where the waste disposed does not exceed 500kg per month.

A full environmental impact assessment is required for the disposal of any quantity of hazardous waste and the disposal of general waste to land covering an area in excess of 200m<sup>2</sup> (RSA, 2009b).

It should be noted that the list of activities requiring a waste management licence is under review by the Department of Environmental Affairs.

### **2.2 Contaminated land**

The Waste Act provides a legal mechanism for remediation activities at contaminated sites to be instigated and controlled (RSA, 2008). In 2010 the DEA produced a draft notice on “high risk activities” in terms of Section 36(1) of the Waste Act (DEA, 2010). The owner of land on which hazardous waste was disposed without a licence would in terms of this notice have to conduct a site assessment, within a period of two years of the date of the notice. The owners of the unauthorised hazardous waste landfills identified in the 2007 census (DEA, 2007) are implied here.

Goal seven of the National Waste Management Strategy, established in terms of the Act is to provide measures to remediate contaminated land sites (DEA, 2011). Assessment of 80% of the sites reported to the contaminated land register must be completed by 2016. It should however be noted that Sections 35-41 of the Waste Act, dealing with contaminated land, is not yet in force (RSA, 2009a).

## **2.3 Waste Management Hierarchy**

Including the internationally accepted waste management hierarchy (Sakai *et al.*, 1996) as one of the objectives in the Waste Act (RSA, 2008) promote alternatives to landfilling. The result of this inclusion in the Act is that landfilling is no longer the preferred waste management option in South Africa. Therefore disposal should only be considered after all other waste management options have been exhausted, including waste minimisation, re-use, reduce, recycling or treatment to reduce the volumes and risk associated with waste going to landfill. Implementation of the waste management hierarchy should therefore translate into smaller volumes of low hazard, non-recyclable waste being disposed of at landfills.

## **3. Waste Regulations**

Section 69 of the Waste Act (RSA, 2008) lists a number of regulations that could have an impact on landfilling in South Africa, if developed. The possibility of regulations that can prescribe the manner in which particular waste streams, or priority waste streams, must be dealt with and managed is of particular interest to this discussion. To date the choice of technology applied to the approved treatment and disposal of a particular hazardous waste stream, has not been prescribed (DWAF, 1998a). Prof Asmal has however stated that: 'Certain wastes may, with the development of new technologies, pose either a lesser or greater risk in the future' (DWAF, 1998a:iv). Therefore it will be interesting to see if this approach will continue to be applied in the development of these regulations.

The Waste Classification and Management Regulations and the Waste Information Regulations have been passed and must be implemented. These regulations are discussed in more detail below.

### **3.1 Waste Classification and Management Regulations**

Waste Classification and Management Regulations, 2013 (RSA, 2013a) have been developed under Section 69 of the Waste Act. The purpose of these regulations includes the introduction of a new waste classification system and requirements for the disposal of waste to landfill. Including requirements for disposal of waste in regulations, automatically gives it legal standing unlike the Minimum Requirements that first needed to be incorporated into permits to gain legal standing. The regulations that came into effect on 23 August 2013 are therefore also applicable to unlicensed sites as opposed to the Minimum Requirements (DWAF, 1998a; 1998b) that could only be enforced on permitted sites.

In terms of the Waste Classification and Management Regulations, 2013, waste must be classified following the Globally Harmonized System of Classification and Labelling of Chemicals (SANS 10234) (RSA, 2013a). All waste streams except a few pre-classified waste streams have to be classified within 180 days of generation and re-classified every five years or within 30 days of modification to the process that generate the waste. This classification is required to inform labelling and the preparation of safety data sheets for the transport of the waste. Waste transporters and waste managers are not allowed to accept waste that has not been classified (RSA, 2013a). The obligation is therefore on the landfill operator to ensure that the waste is classified before it is accepted for disposal.

The assessment of waste for disposal to landfill must be done in accordance with the National Norms and Standards for the Assessment of Waste for Landfill Disposal (2013b). The assessment methodology is significantly different from what was prescribed in the Minimum Requirements for the handling, classification and disposal of hazardous waste (DWAF, 1998a). It entails an entirely different analytical protocol that is based on the

Australian Standard Leaching Procedure (RSA, 2013b). The assessment protocol of waste for disposal following the Minimum Requirements (DWAF, 1998a) was based on the leachable concentration analysis only. The new approved protocol considers the total concentration analysis, in addition to the leachable concentration analysis and prescribes different leaching solutions depending on the type of waste. The result of the changed protocol is that more tests per sample are required as compared to what was required in terms of the Minimum Requirements. Furthermore, the new standards require that within three years, all analyses must be conducted by laboratories accredited by the South African National Accreditation System (SANAS) (RSA, 2013b).

Waste that was classified following the Minimum Requirements for disposal may continue to be accepted and disposed of for a maximum of three years. However, disposal must be done according to the National Norms and Standards for Disposal of Waste to Landfill (RSA, 2013c). Waste that was generated before these regulations came into effect, but not yet classified for disposal, must be assessed following the standards, within 18 months of publication of the regulations. The complexity of the new analytical protocol combined with the requirement that accredited laboratories must conduct the analyses, will result in increased analytical cost for the assessment of waste for disposal to landfill. The limited number of accredited laboratories combined with increased analytical complexity and increased frequency of analyses created by the regulations, may also result in longer turnaround times at laboratories.

The National Norms and Standards for Disposal of Waste to Landfill (RSA, 2013c) change the way landfills are classified, and the National Norms and Standards for Assessment of Waste for Landfill Disposal (RSA, 2013b) will align the type of waste to a suitable disposal facility, depending on its environmental risk. These new standards for disposal of waste to landfill (RSA, 2013c) include landfill classification, and minimum requirements for engineering design, waste acceptance and disposal. They distinguish between four classes of landfills based on the containment barrier design as opposed to the ten classes of landfills in the Minimum Requirements (the new regulations essentially do away with the communal, small and medium sites) (DWAF, 1998b). These new standards apply to all new landfill sites and new cells at existing landfills. Implementation of these new standards for containment barriers will result in increased construction costs for new cells and new landfills to be established.

The National Norms and Standards for Disposal to Landfill (RSA, 2013c) also introduce certain prohibitions and restrictions on the disposal of waste to landfill with compliance timeframes indicated from immediate to fifteen years. Prohibitions and restrictions applied with immediate effect include:

- Waste which, in the conditions of a landfill, is explosive corrosive, oxidizing (according to SANS 10234 or SANS 10228);
- Waste with a pH value of <6 or >12;
- Flammable with a closed cup flashpoint lower than 61°Celsius;
- Reactive waste that may react with water, air, acids or components of the waste, or that could generate unacceptable amounts of toxic gases within the landfill;
- Waste compressed gases (according to SANS 10234 or SANS 10228);
- Lead acid batteries;
- Whole waste tyres;
- Infectious animal carcasses and animal waste.

Other restrictions that will come into effect in the next five include:

- Hazardous waste electric and electronic equipment (WEEE) – Lamps (three years);

- Pesticides not listed under the Stockholm Convention (four years);
- Re-usable, recoverable or recyclable used lubricating mineral oils, as well as oil filters, but excluding other oil containing wastes (four years);
- Hazardous waste with a calorific value of > 25 MJ/kg (four years);
- Re-usable, recoverable or recyclable used or spent solvents (five years);
- PCB containing wastes (>50 mg/kg or 50 ppm) (five years);
- Quartered waste tyres (five years);
- 25% diversion from the baseline at a particular landfill of separated garden waste (five years).

Landfill operators will have to keep an eye on the dates and new restrictions to ensure continued compliance in the light of phased implementation of the regulations.

### **3.2 Waste Information Regulations**

The National Waste Information Regulations (RSA, 2012d) came into effect on 1 January 2013. Persons disposing of waste to landfill must register on the South African Waste Information System (SAWIS) if the waste is hazardous waste or in the case of general waste, if the disposal area is in excess of 200m<sup>2</sup>. Reporting of waste data to SAWIS commenced ninety days after the end of the registration process.

A person submitting information on hazardous waste must submit the information based on actual quantities while information on general waste may be submitted based on an estimation of quantities for a period of five years (Regulation 8(5)). Information submitted thereafter must be based on actual quantities. All information submitted to SAWIS must also be kept on record by the person submitting the information for a period of five years (Regulation 9(1)).

Implementation of the Waste Information Regulations resulted in compulsory registration of landfills on SAWIS. Record keeping of tonnages and waste types landfilled is now compulsory for all landfills with an area in excess of 200m<sup>2</sup> and reporting of waste data into a national system is a requirement.

## **4. National Waste Management Strategy**

The National Waste Management Strategy (NWMS) was established in terms of Section 6 of the Waste Act (RSA, 2008). The problem statement in the NWMS identifies a shortage of compliant landfills and hazardous waste management facilities as a hindrance to the safe disposal of all waste streams (DEA, 2011). A target of 80% of waste disposal sites with permits by 2016, have been set by the strategy (DEA, 2011).

The NWMS also set targets for amongst other, diversion of recyclable waste away from landfill. In addition, it notes that the National Norms and Standards for Disposal of Waste to Landfill provides for diversion of particular waste streams from landfill within prescribed time frames (DEA, 2011). In this regard, municipalities are given the responsibility for diversion of organic waste from landfill (DEA, 2011) but the strategy does not set targets or time frames relating to organic waste diversion. Such targets are now set in the National Norms and Standards for Disposal of Waste to Landfill notably a 25% diversion of garden waste from baseline at a particular landfill in 5 years and a 50% diversion in 10 years (RSA, 2013c).

## 5. Conclusions

The most important changes as a result of the implementation of the Waste Act, and subsequent development of regulations, norms and standards, is stricter regulation of waste management activities including disposal of waste to landfill. The fact that the waste management hierarchy is included in the Waste Act and will be implemented through various mechanisms including norms, standards and regulations (Section 69(1)(i)) (RSA, 2008) should result in less recyclable waste finding its way to landfill. It is also expected that the introduction of new technologies may result in a change in composition and characteristics of waste streams being disposed of at landfill.

The most drastic change is expected to come with the implementation of the Waste Classification and Management Regulations, 2013. The approved new approach for assessment of waste for landfill disposal requires more, and more complex, analytical processes which in turn is more costly than the previous system. The fact that analyses will in future have to be done at accredited laboratories is another complicating factor. There are a limited number of accredited laboratories available that are equipped to analyse waste samples. Establishing more of these laboratories will be costly as the required equipment does not come cheap. Accreditation of a new laboratory is also not a trivial thing and may take a year or longer to obtain.

The results of the analyses under the new regulations may also have a different outcome as compared to the classification system contained in the Minimum Requirements (DWAf, 1998a) i.e. wastes that were previously classified as hazardous may no longer fall into this category and *vice versa*. A change from a previously hazardous waste category to a non-hazardous waste category and *vice versa*, may have serious implications for landfill operators now having to accept and manage waste streams that were previously not disposed of at their landfills. The magnitude of the change in waste categories will only become evident with the implementation of the regulations. Therefore it can only be speculated what the impacts on available landfill airspace, operations, cost and income generation potential of landfills will be.

Standards for waste disposal are nationally applicable and enforceable irrespective of whether it is incorporated as conditions in landfill licences or not because all regulations issued in terms of the act have legal standing. This approach is significantly different to the Minimum Requirements that made provision for defensible deviation where site specific factors are such that the rule cannot or need not be applied (DWAf, 1998b). In addition delisting of hazardous waste streams and exemptions are practices of the past which are not allowed under the Waste Act and its regulations. This is a significant difference as compared to what was in place under the Environment Conservation Act.

The classification system for landfills has also changed with the new regulations. Following the Minimum Requirements, landfills were classified based on type of waste disposed, size of site and potential for leachate generation (DWAf, 1998b). The new approach classifies landfills based on containment barrier design. Waste accepted by the different classes of landfills is now determined by the waste acceptance criteria outlined in the National Norms and Standards for Disposal of Waste to Landfill (RSA, 2013c). The costs of landfill design and construction in line with the new approved design requirements is in comparison, significantly higher. This situation may further limit the development of new landfills and consequently increase the pressure on existing landfills. This is especially a concern for municipalities where available landfill airspace is limited, but it may provide the required stimulus for diverting waste away from landfill for re-use and recycling.

Successful implementation of policy and strategy should, over time, result in a change in the characteristics of waste being disposed of at landfills. It can reasonably be expected that less recyclable waste will find its way to landfill. It is also likely that the waste sent to landfills in future will have undergone some form of pre-treatment i.e. extraction of useful components, which is likely to change the nature and appearance of the waste. If waste-to-energy is actively pursued, large volumes of potentially hazardous ash may find its way to landfill. Therefore, landfill operators may have to adjust the operations at the site to ensure continued safe handling and disposal of all waste.

Advantages of the expected changes in waste characteristics entering landfills in the future include that landfills may become less attractive to informal pickers and the expected life span of municipal landfills will be extended.

Although record keeping of waste volumes disposed of at landfills was a requirement in terms of the Minimum Requirements, at the majority of larger general waste and all hazardous waste landfills, the implementation of the Waste Information Regulations (RSA, 2012d) has added a registration and reporting requirement on all landfills. In addition, estimations of waste quantities have to be phased out over a five year period. Therefore, landfill operators have to introduce measures that will result in the capturing of accurate data of tonnages and waste types landfilled at all sites in order to comply with these regulations.

The environmental impacts associated with high impact, unpermitted landfills and dumpsites, which will never qualify for waste disposal licences, can be addressed through the provisions on contaminated land in the Act. The fact that the relevant sections of the Act dealing with contaminated land are not yet in force, is a concern especially in light of the target set in the NWMS.

## **6. References**

DEA (Department of Environmental Affairs) (2007) Disposal site census report of unauthorised disposal sites in South Africa. Report No: 227870/PW0 Volume 1, October 2007.

DEA (Department of Environmental Affairs) (2010) Framework for the management of contaminated land. (Pretoria: Department of Environmental Affairs)

DEA (Department of Environmental Affairs) (2011) National Waste Management Strategy (Pretoria: Department of Environmental Affairs).

DEAT (Department of Environmental Affairs and Tourism) (2000) White Paper on Integrated Pollution and Waste Management for South Africa: A Policy on pollution prevention, waste minimisation and, impact management and remediation (Pretoria: Department of Environmental Affairs and Tourism).

DEAT (Department of Environmental Affairs and Tourism) (2006) Implementation plan for the transfer of the waste permitting function (Pretoria: Department of Environmental Affairs and Tourism).

DWAF (Department of Water Affairs and Forestry) (1998a) Waste management series, second edition: Minimum requirements for the handling, classification and disposal of hazardous waste.

DWAF (Department of Water Affairs and Forestry) (1998b) Waste management series, second edition: Minimum Requirements for Waste Disposal by Landfill.

RSA (Republic of South Africa)(1989) Environment Conservation Act, No 73 of 1989

RSA (Republic of South Africa) (1998) National Water Act, No 36 of 1998.

RSA (Republic of South Africa) (2008) National Environmental Management: Waste Act, No 59 of 2008.

RSA (Republic of South Africa) (2009a) National Environmental Management: Waste Act (59/2008): Commencement of the Act except section 28(7)(a), Part 8 of the Act (sections 35-41) and section 46. *Government Gazette 32189 Proclamation 34, 2009, 30 April 2009.*

RSA (Republic of South Africa) (2009b) National Environmental Management: Waste Act (59/2008): List of waste management activities that have, or are likely to have a detrimental impact on the environment. *Government Gazette 32368 Government Notice 718 of 3 July 2009.*

RSA (Republic of South Africa) (2013a) National Environmental Management: Waste Act (59/2008): Waste Classification and Management Regulations. *Government Gazette 36784 No. R. 634 of 23 August 2013.*

RSA (Republic of South Africa) (2013b) National Environmental Management: Waste Act (59/2008): National norms and standards for the assessment of waste for landfill disposal. *Government Gazette 36784 No.R.635 of 23 August 2013.*

RSA (Republic of South Africa) (2013c) National Environmental Management: Waste Act (59/2008): National norms and standards for disposal of waste to landfill. *Government Gazette 36784 No.R. 636 of 23 August 2013.*

RSA (Republic of South Africa) (2012d) National Environmental Management: Waste Act (59/2008): National waste information regulations. *Government Gazette 35583 Government No. R. 625 of 10 August 2012.*

Sakai S. Sawell S.E. Chandler A.J. Eighmy T.T. Kosson D.S. Vehlow J. Van der Sloot H.A. and Hjelmar O. (1996) World trends in municipal solid waste management. *Waste Management* 16, pp. 341-350.