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**GENERAL NOTICES**

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**NOTICE 613 OF 2012****ANNEX II****DEPARTMENT OF ENVIRONMENTAL AFFAIRS****NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT, 2008  
(ACT NO.59 OF 2008)****DRAFT STANDARD FOR ASSESSMENT OF WASTE FOR LANDFILL DISPOSAL**

I, Bomo Edith Edna Molewa, Minister of Water and Environmental Affairs, hereby give notice of my intention, under section 7(1)(c) read with section 73 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), to set a national standard for the assessment of waste for landfill disposal in the Schedule hereto.

Members of the public are invited to submit to the Minister, within 30 days of publication of this notice in the Gazette, written comments or objections to the following addresses:

By post to:     The Director-General: Department of Environmental Affairs  
                  Attention: Ms Nomphele Daniel  
                  Private Bag X447  
                  Pretoria  
                  0001

By fax to: (012) 310 0024,

By email to: [ndaniel@environment.gov.za](mailto:ndaniel@environment.gov.za)

Hand delivered at: 315 Pretorius Street, Pretoria, Fedsure Forum Building, North Tower, 2<sup>nd</sup> Floor (Reception),

The full document can also be accessed at [www.sawic.org.za](http://www.sawic.org.za)

Any inquiries in connection with the draft notice can be directed to Ms Nomphele Daniel at (012) 310 3904.



**BOMO EDITH EDNA MOLEWA  
MINISTER OF WATER AND ENVIRONMENTAL AFFAIRS**

**SCHEDULE****TABLE OF CONTENTS**

## PART 1: INTERPRETATION AND PURPOSE

1. Definitions
2. Purpose and Application

## PART 2: STANDARD ASSESSMENT METHODOLOGY

3. Approach
4. Total Concentration (TC) Analysis
5. Leachable Concentration (LC) Analysis
6. LCT and TCT Threshold Values
7. Waste Disposal Risk Rating

## PART 1: INTERPRETATION AND PURPOSE

### 1. Definitions

- (1) In this Standard any word or expression to which a meaning has been assigned in the Act has that same meaning, and unless the context indicates otherwise—

“**LC**” means the leachable concentration of a particular element or chemical substance in a waste, expressed as mg/l;

“**LCT**” means the leachable concentration threshold limits for particular elements and chemical substances in a waste, expressed as mg/l, prescribed in Section 6 of this Standard;

“**putrescible waste**” means waste that contains organic matter capable of being decomposed by microorganisms, or that will readily decay under normal conditions, giving rise to offensive odours, or which is capable of providing food for birds and animals, thereby attracting vermin or disease-causing vectors such as flies and rodents;

“**TC**” means the total concentration of a particular element or chemical substance in a waste, expressed as mg/kg;

“**TCT**” means the total concentration thresholds limits for particular elements or chemical substances in a waste, expressed as mg/kg, prescribed in Section 6 of this Standard;

“**the Act**” means the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008);

“**the Regulations**” means the Waste Classification and Management Regulations, 2012, in terms of section 69(1)(a), (b), (g), (h), (m), (q), (s), (dd) and (ee) of the Act.

### 2. Purpose and Application

- (1) This Standard prescribes the requirements for the assessment of waste prior to disposal to landfill in terms of regulation 8(1)(a) of the Regulations.

## PART 2: STANDARD ASSESSMENT METHODOLOGY

### 3. Approach

- (1) To assess waste for the purpose of disposal to landfill, the following are required—
  - (a) identification of chemical substances present in the waste; and
  - (b) sampling and analysis to determine the total concentrations (TC) and leachable concentrations (LC) for the elements and chemical substances that have been identified in the waste and that are specified in section 6 of this Standard .
- (2) The TC and LC values of the chemical substances in the waste must be compared to the threshold limits specified in section 6 of this Standard for total concentrations (TCT values) and leachable concentrations (LCT values) of specific elements and chemical substances.
- (3) Based on the TC and LC values of the elements and chemical substances in the waste exceeding the corresponding TCT and LCT values respectively, the specific type of waste for disposal to landfill must be determined in terms of section 7 of this Standard.

### 4. Total Concentration (TC) Analysis

- (1) The TC of all the elements and chemical substances specified in section 6 of this Standard that are known to occur, likely to occur or can reasonably be expected to occur in the waste must be determined.
- (2) The TC of elements and chemical substances in waste must be determined using suitable national or international standard techniques and analysis methods that will provide reliable, accurate and repeatable results of the TC of elements and chemical substances specified in section 6 of this Standard.
- (3) Within three (3) years of this Standard coming into operation, all analyses of the TC of elements and chemical substances in waste must be conducted by laboratories accredited (by SANAS) to conduct the particular techniques and analysis methods required.

## 5. Leachable Concentration (LC) Analysis

- (1) The LC of elements and chemical substances must be determined using the Australian Standard Leaching Procedure (AS 4439.1, 4439.2 and 4439.3).
- (2) Within three (3) years of this Standard coming into operation, all analyses of the LC of elements and chemical substances in waste must be conducted by laboratories accredited (by SANAS) to conduct the particular techniques and analysis methods required.
- (3) The type of leaching fluid used in the leaching procedure will depend on the nature of the waste and/or the particular disposal practice, and must be determined as follows (from Table 2, Section 7.5 of AS 4439.3)—
  - (a) Waste to be disposed of with, or waste that contains, putrescible wastes: Use 0.1M acetic acid solution with altered pH 5.0 or pH 2.9 (refer to 7.5(a-e) of AS 4439.3);
  - (b) Waste to be disposed of with non-putrescible waste: Use a basic 0.1M sodium tetraborate decahydrate solution of pH  $9.2 \pm 0.1$ , as well as an acetic acid solution (pH 5.0 or 2.9); or
  - (c) Non-putrescible waste to be disposed of without any other wastes: Use reagent water.
- (4) Existing LC results for elements and chemical substances in wastes, which have been determined in terms of the Toxicity Characteristic Leaching Procedure (TCLP) leach test criteria of the Minimum Requirements for the Handling, Classification and Disposal of Hazardous Waste (2<sup>nd</sup> Edition, 1998; Department of Water Affairs and Forestry) prior to the Regulations taking effect, may be utilised for comparison with the LCT values in Section 6 of this Standard to assess waste for the purpose of disposal of the waste to landfill, for a period not exceeding three (3) years from the date of publication of this Notice.

## 6. LCT and TCT Threshold Values

(1) Total Concentration Limit (TCT) Thresholds (mg/kg):

Elements & Chemical Substances in Waste	TCT0	TCT1	TCT2
<b>Metal Ions</b>			
As, Arsenic	5.8	500	2000
B, Boron	150	15000	60000
Ba, Barium	62.5	6250	25000
Cd, Cadmium	7.5	260	1040
Co, Cobalt	50	5000	20000
Cr <sub>Total</sub> , Chromium Total	46000	800000	N/A
Cr(VI), Chromium (VI)	6.5	500	2000
Cu, Copper	16	19500	78000
Hg, Mercury	0.93	160	640
Mn, Manganese	1000	25000	100000
Mo, Molybdenum	40	1000	4000
Ni, Nickel	91	10600	42400
Pb, Lead	20	1900	7600
Sb, Antimony	10	75	300
Se, Selenium	10	50	200
V, Vanadium	150	2680	10720
Zn, Zinc	240	160000	640000
<b>Inorganic Anions</b>			
TDS			
Chloride			
Sulphate			
NO <sub>3</sub> as N, Nitrate-N			
F, Fluoride	100	10000	40000
CN <sup>-</sup> (total), Cyanide Total	14	10500	42000
<b>Organics</b>			
Benzene		10	40
Benzo(a)pyrene		1.7	6.8
Carbon tetrachloride		4	16
Chlorobenzene		8800	35200
Chloroform		700	2800
2-Chlorophenol		2100	8400
Di (2 ethylhexyl) phthalate		40	160
1,2-Dichlorobenzene		31900	127600
1,4-Dichlorobenzene		18400	73600
1,2-Dichloroethane		3.7	14.8
1,1-Dichloroethylene		150	600
1-2-Dichloroethylene		3750	15000
Dichloromethane		16	64
2,4-Dichlorophenol		800	3200
2,4-Dinitrotoluene		5.2	20.8

Elements & Chemical Substances in Waste	TCT0	TCT1	TCT2
Ethylbenzene		540	2160
Formaldehyde		2000	8000
Hexachlorobutadiene		2.8	5.4
Methyl ethyl ketone		8000	32000
MTBE (Methyl t-butyl ether)		1435	5740
Nitrobenzene		45	180
PAHs (total)		50	200
Petroleum H/Cs, C6 to C9		650	2600
Petroleum H/Cs, C10 to C36		10000	40000
Phenols (total, non-halogenated)		560	2240
Polychlorinated biphenyls		12	48
Styrene		120	480
1,1,1,2-Tetrachloroethane		400	1600
1,1,2,2-Tetrachloroethane		5.0	20
Tetrachloroethylene		200	800
Toluene		1150	4600
Trichlorobenzenes (total)		3300	13200
1,1,1-Trichloroethane		1200	4800
1,1,2-Trichloroethane		48	192
Trichloroethylene		11600	46400
2,4,6-Trichlorophenol		1770	7080
Vinyl chloride		1.5	6.0
Xylenes (total)		890	3560
<b>Pesticides</b>			
Aldrin + Dieldrin	0.05	1.2	4.8
DDT + DDD + DDE	0.05	50	200
2,4-D	0.05	120	480
Chlordane	0.05	4	16
Heptachlor	0.05	1.2	4.8

(2) Leachable Concentration Limit (LCT) Thresholds (mg/l):

Elements & Chemical Substances in Waste	LCT0	LCT1	LCT2	LCT3
<b>Metal Ions</b>				
As, Arsenic	0.01	0.5	1	4
B, Boron	0.5	25	50	200
Ba, Barium	0.7	35	70	280
Cd, Cadmium	0.003	0.15	0.3	1.2
Co, Cobalt	0.5	25	50	200
Cr <sub>Total</sub> , Chromium Total	0.05	2.5	5	20
Cr(VI), Chromium (VI)	0.05	2.5	5	20
Cu, Copper	2.0	100	200	800
Hg, Mercury	0.006	0.3	0.6	2.4

Elements & Chemical Substances in Waste	LCT0	LCT1	LCT2	LCT3
Mn, Manganese	0.5	25	50	200
Mo, Molybdenum	0.07	3.5	7	28
Ni, Nickel	0.07	3.5	7	28
Pb, Lead	0.01	0.5	1	4
Sb, Antimony	0.02	1.0	2	8
Se, Selenium	0.01	0.5	1	4
V, Vanadium	0.2	10	20	80
Zn, Zinc	5.0	250	500	2000
<b>Inorganic Anions</b>				
TDS	1000	12500	25000	100000
Chloride	300	15000	30 000	120 000
Sulphate	250	12 500	25000	100000
NO <sub>3</sub> as N, Nitrate-N	11	550	1100	4400
F, Fluoride	1.5	75	150	600
CN <sup>-</sup> (total), Cyanide Total	0.07	3.5	7	28
<b>Organics</b>				
Benzene		0.01	0.02	0.08
Benzo(a)pyrene		0.035	0.07	0.28
Carbon tetrachloride		0.20	0.40	1.6
Chlorobenzene		5.0	10	40
Chloroform		15	30	120
2-Chlorophenol		15	30	120
Di (2 ethylhexyl) phthalate		0.50	1	4
1,2-Dichlorobenzene		50	10	40
1,4-Dichlorobenzene		15	30	120
1,2-Dichloroethane		1.5	3	12
1,1-Dichloroethylene		0.35	0.7	2.8
1-2-Dichloroethylene		2.5	5	20
Dichloromethane		0.25	0.5	2
2,4-Dichlorophenol		10	20	80
2,4-Dinitrotoluene		0.065	0.13	0.52
Ethylbenzene		3.5	7	28
Formaldehyde		25	50	200
Hexachlorobutadiene		0.03	0.06	0.24
Methyl ethyl ketone		100	200	800
MTBE (Methyl t-butyl ether)		2.5	5.0	20.0
Nitrobenzene		1	2	8
PAHs (total)		N/A	N/A	N/A
Petroleum H/Cs, C6 to C9		N/A	N/A	N/A
Petroleum H/Cs, C10 to C36		N/A	N/A	N/A
Phenols (total, non-halogenated)		7	14	56
Polychlorinated biphenyls		0.025	0.05	0.2



Elements & Chemical Substances in Waste	LCT0	LCT1	LCT2	LCT3
Styrene		1.0	2	8
1,1,1,2-Tetrachloroethane		5	10	40
1,1,2,2-Tetrachloroethane		0.65	1.3	5.3
Tetrachloroethylene		0.25	0.5	2
Toluene		35	70	280
Trichlorobenzenes (total)		3.5	7	28
1,1,1-Trichloroethane		15	30	120
1,1,2-Trichloroethane		0.6	1	4
Trichloroethylene		0.25	2	8
2,4,6-Trichlorophenol		10.0	20	80
Vinyl chloride		0.015	0.03	0.12
Xylenes (total)		25	50	200
<b>Pesticides</b>				
Aldrin + Dieldrin		0.015	0.03	0.03
DDT + DDD + DDE		1	2	2
2,4-D		1.5	3	3
Chlordane		0.05	0.1	0.1
Heptachlor		0.015	0.03	0.03

## 7. Determining Waste Types for Landfill Disposal

- (1) The specific type of waste for disposal to landfill must be determined by comparing the TC and LC of the elements and chemical substances in the waste with the TCT and LCT values specified in section 6 of this Standard.
- (2) Based on the assessment of the particular waste destined for disposal to landfill, the type of waste is determined as follows—
  - (a) Wastes with any element or chemical substance concentration above the LCT3 or TCT2 values ( $LC > LCT3$  or  $TC > TCT2$ ) are Type 0 Wastes;
  - (b) Wastes with any element or chemical substance concentration above the LCT2 but below LCT3 values, or above the TCT1 but below TCT2 values ( $LCT2 < LC \leq LCT3$  or  $TCT1 < TC \leq TCT2$ ), are Type 1 Wastes;
  - (c) Wastes with any element or chemical substance concentration above the LCT1 but below the LCT2 values and all concentrations below the TCT1 values ( $LCT1 < LC \leq LCT2$  and  $TC \leq TCT1$ ) are Type 2 Wastes;

- (d) Wastes with any element or chemical substance concentration above the LCT0 but below LCT1 values ( ) and all concentrations below the TCT1 values ( $LCT0 < LC \leq LCT1$  and  $TC \leq TCT1$ ) are Type 3 Wastes;
- (e) Wastes with all element and chemical substance concentration levels for metal ions and inorganic anions below the LCT0 and TCT0 values ( $LC \leq LCT0$  and  $TC \leq TCT0$ ), as well as below the following limits for organics and pesticides, are Type 4 Wastes—

Chemical Substances in Waste	Total Concentration (mg/kg)
<b>Organics</b>	
TOC	30 000 (= 3%)
BTEX	6
PCBs	1
Mineral Oil (C10 to C40)	500
<b>Pesticides</b>	
Aldrin + Dieldrin	0.05
DDT + DDD + DDE	0.05
2,4-D	0.05
Chlordane	0.05
Heptachlor	0.05

- (3) If a particular chemical substance in a waste is not listed with corresponding LCT and TCT thresholds in Section 6 of this Standard, and the waste has been classified as hazardous in terms of SANS 10234 health or environmental hazards due to the hazard characteristics of the particular substance, the waste is considered to be Type 1 Waste.
- (4) If a representative sample of a hazardous waste cannot be taken or obtained that would enable accurate LC and TC analyses due to the nature of the waste, the waste is considered to be Type 1 Waste.
- (5) If the TC of a chemical substance is  $> TCT2$ , and the concentration cannot be reduced by waste avoidance, re-use, recycling or recovery, or it is not economically feasible e.g. due to very small quantities, the waste must be stabilised to a minimum of  $LC < LCT2$ , and will then be considered Type 1 Waste.

- (6) Laboratory wastes listed in item (2)(b) of Annexure 1 to the Regulations are considered to be Type 1 Waste, unless assessed and determined otherwise in terms of this Standard.