

# REMEDIATION OF CONTAMINATED LAND IN SOUTH AFRICA

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National Department of Environmental Affairs



Chemicals and Waste Management



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# PRESENTATION OUTLINE

- ❖ Land Remediation Directorate
- ❖ Legislative background
- ❖ Historical Practices
- ❖ Current Management of Contaminated Land in the country
- ❖ Norms and Standards for Remediation of Contaminated Land and Soil Quality
- ❖ Conclusion



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# FUNCTIONS OF THE DIRECTORATE

- ❖ To manage implementation of Part 8 of Waste Act and ; Norms and Standards for Remediation of Contaminated Land and Soil Quality
- ❖ To manage projects addressing the remediation of contaminated land
- ❖ Implement systems for effective implementation of Part 8 of NEM: Waste Act



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# FUNCTIONS OF THE DIRECTORATE

- ❖ Ensure that systems are in place that will make sure that adequate mitigation measures are applied where there is a site contamination.
- ❖ To support role players in management of contaminated land in the country.



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# LEGISLATIVE BACKGROUND

- ❖ **RSA Constitution Bill of Rights** states that ‘Everyone has a right to an environment that is not harmful to their health and well being’
- ❖ **Environment Conservation Act, 1989**: RSA first environmental legislation in the country that provided measure to control activities that may result in pollution.
- ❖ **National Environmental Management Act (NEMA) (1998)**- framework legislation for environmental management and provide all environmental principles that inform all environmental legislation in the country
- ❖ **National Water Act (NWA) (1998)** – Section 19 deals with the prevention and remedying effects of pollution
- ❖ **National Environmental Management: Waste Act (2008)** – Part 8 of the of the Waste Act provide a detailed approach for the management of contaminated land in the country.



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## LEGISLATIVE BACKGROUND CONT...

- ❖ **National Norms and Standards for the Remediation of Contaminated land and Soil Quality (2014):**
  - provide uniform national approach to determine the contamination status of an investigation area;
  - limit uncertainties about the most appropriate criteria and method to apply in the assessment of contaminated land; and
  - provide minimum standards for assessing necessary environmental protection measures for remediation activities.



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# HISTORICAL PRACTICES

- ❖ Remediation of contaminated land was informed by a need to protect water resources
- ❖ Department of Water and Sanitation (DWS) was the previous custodian of the management of contaminated land.
- ❖ DWS set requirements through National Water Act - Section 19(1) and (2) to ensure that person who caused pollution of water resource to take reasonable measures to prevent any such pollution from occurring, continuing or recurring and measures include to:
  - Cease, modify or control any act " causing the pollution
  - Comply with any prescribed waste standard or management practice;



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# HISTORICAL PRACTICES

- Contain or prevent movement of pollutants;
- Eliminate any source of the pollution; and
- Remedy the effects of the pollution
- ❖ NEM:WA came into effect on March 2009
- Remediation activities were listed in Waste Management list
- It was subjected to basic assessment processes and Waste Management Licence was required



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# CURRENT MANAGEMENT OF A LAND IN THE COUNTRY: PART 8 OF WASTE ACT

- ❖ Part 8 of NEM:WA came into effect on 2 of May 2014
- Provide a clear set of approaches in Identification of investigation areas
- It outlines the processes that must be followed in management of contaminated land in the country
- It also sets out information required in tools for management of contaminated land



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# CURRENT MANAGEMENT OF A LAND IN THE COUNTRY

- It is aligned to the Norms and Standards for the Remediation of Contaminated Land and Soil Quality that provide uniform approach which defines the significant contamination level that provide a basis for the remediation of contaminated land
- It applies Source-Pathway-Receptor Relationship in management of contaminated land.
- It applies to historic and current contaminated land
- Governed by Polluter-Pay (Polluters remediate at own cost ); Duty of Care and Sustainability Principles



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# APPROACHES FOR IDENTIFICATION AND NOTIFICATION OF INVESTIGATION AREA (SECTION 36 OF NEM:WA)

- High risk activities
- An owner of the land contaminating notify department
- The department may issue written notice to person who is suspected of contaminating the land

Note: DEA and Provincial Environmental Affairs are responsible for implementation of Part 8 of Waste Act.



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# CONSEQUENCE OF IDENTIFICATION AND NOTIFICATION OF INVESTIGATION AREA

Implication of identification and notification of investigation area result in site assessment being conducted and Where the findings of the site assessment report are that the investigation area is contaminated, the site assessment report must at least contain information on whether—

- (i) the contamination has already impacted on health or the environment;
- (ii) the substances present in or on the land are toxic, persistent or bioaccumulative or are present in large quantities or high concentrations or occur in combinations;
- (iii) there are exposure pathways available to the substances;



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# CONSEQUENCE OF IDENTIFICATION AND NOTIFICATION OF INVESTIGATION AREA

Implication of identification and notification of investigation area result in site assessment being conducted and if the findings of the site assessment report are that the investigation area is contaminated, the site assessment report must at least contain information on whether—

(vi) the acceptable exposure for human and environmental receptors in that environment have been exceeded;

(vii) any applicable standards have been exceeded; and

(viii) the area should be remediated or any other measures should be taken to manage or neutralise the risk.



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# CONSIDERATION OF SITE ASSESSMENT REPORT

1. On receipt of a site assessment report the department may, after consultation with the Water and Sanitation Department and any other organ of state concerned, decide that—

- (a) the investigation area is contaminated, presents a risk to health or the environment, and must be remediated urgently;
- (b) the investigation area is contaminated, presents a risk to health or the environment, and must be remediated within a specified period;
- (c) the investigation area is contaminated and does not present an immediate risk, but that measures are required to address the monitoring and management of that risk; or
- (d) the investigation area is not contaminated.



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# ORDERS TO REMEDIATE CONTAMINATED LAND

Contents of Order or Remediation Order:

- (a) the person who is responsible for undertaking the remediation;
- (b) the land to which the order applies;
- (c) the nature of the contamination;
- (d) the measures that must be taken to remediate the land or the standards that must be complied with when remediating the land;
- (e) the period within which the order must be complied with;
- (f) whether any limitations in respect of the use of the land are imposed;
- (g) the measures that must be taken to monitor or manage the risk; and
- (h) any other prescribed matter.



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# TRANSFER OF REMEDIATION SITE

No person may transfer contaminated land without informing the person to whom that land is to be transferred that the land is contaminated and; in the case of a **remediation site**, without **notifying the Department** and complying with any conditions that are specified by the Department, as the case may be.



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# NATIONAL CONTAMINATED REGISTER

1. The **National Department** must keep a national contaminated land register of investigation

areas that includes information on—

- (a) the owners and any users of investigation areas;
- (b) the location of investigation areas;
- (c) the nature and origin of the contamination;
- (d) whether an investigation area—
  - (i) is contaminated, presents a risk to health or the environment, and must be remediated urgently;
  - (ii) is contaminated, presents a risk to health or the environment, and must be remediated within a specified period;
  - (iii) is contaminated and does not present an immediate risk, but measures are required to address the monitoring and management of that risk; or
  - (iv) is not contaminated;



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# NATIONAL CONTAMINATED REGISTER

- (1) (e) the status of any remediation activities on investigation areas; and  
(f) restrictions of use that have been imposed on investigation areas.
  
- (2) The National department may change the status of an investigation area , remediation order or an Order if has been complied with or other circumstances eventuate that justify such a change.
  
- (3) An Provincial department who has identified an investigation area must furnish the relevant information to the for recording in the national contaminated land register.



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# PROCESS FLOW OF PART 8 OF WASTE ACT



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# **NORMS AND STANDARDS FOR REMEDIATION OF CONTAMINATED LAND AND SOIL QUALITY**

- ❖ Has Table 1 (**Soil Screening Values for Metals and Organics**) and 2 (**Soil Screening Values for Anions**)
- ❖ Where a contaminant is not listed in Table 1 or Table 2, International guidelines are being used for screening and development of remediation objectives.
- ❖ The standards do not apply in circumstances where natural background concentration exceeds the values provided in the standards

## Table 1: Soil Screening Values for Metals and Organics

Parameter	Units	SSV1 All Land-Uses Protective of the Water Resource	SSV2 Informal Residential	SSV2 Standard Residential	SSV2 Commercial/ Industrial
<i>Metals and metalloids</i>					
Arsenic	mg/kg	5,8	23	48	150
Cadmium	mg/kg	7,5	15	32	260
Chromium (III)	mg/kg	46 000	46 000	96 000	790 000
Chromium (VI)	mg/kg	6,5	6,5	13	40
Cobalt	mg/kg	300	300	630	5 000
Copper	mg/kg	16	1 100	2 300	19 000
Lead	mg/kg	20	110	230	1 900
Manganese	mg/kg	740	740	1 500	12 000
Mercury	mg/kg	0,93	0,93	1,0	6,5
Nickel	mg/kg	91	620	1 200	10 000
Vanadium	mg/kg	150	150	320	2 600
Zinc	mg/kg	240	9 200	19 000	150 000
<i>Alkanes</i>					
C7-C9	mg/kg	2 300	2 300	2 400	23 000
C10-C14	mg/kg	440	440	500	4 400
C15-C36	mg/kg	45 000	45 000	91 000	740 000

## Table 1: Soil Screening Values for Metals and Organics

Parameter	Units	SSV1 All Land-Uses Protective of the Water Resource	SSV2 Informal Residential	SSV2 Standard Residential	SSV2 Commercial/ Industrial
Benzo(a)pyrene	mg/kg	0,34	0,34	0,71	1,7
MTBE	mg/kg	0,0036	360	370	5 800
<b>Organics</b>					
Carbon Tetrachloride	mg/kg	0,25	0,27	0,26	4
Chlorobenzene	mg/kg	620	620	1 200	10 000
Chloroform	mg/kg	0,11	0,11	0,11	1,7
2 Chlorophenol	mg/kg	140	150	320	2 600
1,2 Dichlorobenzene	mg/kg	89	2 700	5 800	47 000
1,4-Dichlorobenzene	mg/kg	26	1 100	1 200	19 000
1,2-Dichloroethane	mg/kg	0,23	0,23	0,24	3,7
1,1 Dichloroethene	mg/kg	10	10	10	150
1,2,3-Trimethylbenzene	mg/kg	0,28	53	55	860
1,2 Dichloroethene	mg/kg	0.4	620	1,200	10,000
Trichlorobenzenes (total)	mg/kg	0,069	310	650	5 300
Nitrobenzene	mg/kg	2,8	2,8	2,9	45
1,1,2,2 Tetrachloroethane	mg/kg	0,32	0,32	0,34	5
2,4,6-Trichlorophenol	mg/kg	4	210	320	1 800
Vinyl Chloride	mg/kg	0,0037	0,10	0,11	1,5
PCBs	mg/kg	0,61	1,7	3,6	11
Cyanide	mg/kg	14	620	1 200	10 000

## Table 2: Soil Screening Values for Anions

Anions	Soil Screening Level (mg/kg)
Chlorides	12 000
Fluorides	30
Nitrates-nitrite	120
Sulphates	4 000



# CONCLUSION

- ✓ Management of contaminated site contributes towards conservation of greenfield
- ✓ Management of contaminated site is more sustainable approach to address challenges in relation to population growth
- ✓ Maximise opportunities to minimise use of resources
- ✓ Improve quality of life of people



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