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# A1 Preventive soil protection

This chapter draws the general outlines of soil protection. It's purpose is to guide the development and implementation of a soil protection strategy.

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## 1.1 Soil protection: why and where

The Netherlands Soil Protection Guideline for industrial activities has been developed to ensure that permit conditions are uniform and harmonised. Using the NRB the design of soil protection measures and facilities within establishments can be assessed and direction given to the decision-making on an optimal soil protection strategy.

The NRB Guideline confines itself to normal industrial operations and foreseeable incidents. Soil protection in the case of calamities is not dealt with as part of the NRB.

### 1.1.1 Why: negligible soil risk

Industrial activities referred to in the Establishments and Licences Decree of the Environmental Management Act are required to have an environmental permit. The competent authority may attach conditions to that permit based on the ALARA principle in Environmental Management Act. The ALARA principle entails that the measures and facilities on the one hand should offer the greatest possible protection for the environment but on the other hand these measures should be reasonable.

The permit-granting authority, by drawing up adequate conditions and supervising their enforcement, must prevent soil contamination for those industrial activities that threaten the soil. The NRB describes the soil risk of such activities and indicates what soil protection measures and facilities can be taken to restrict the risk. The point of departure of national soil policy is that soil risks deriving from industrial activities must be confined as much as possible to a negligible risk by means of effective measures and facilities (soil risk category A).

The duty of care principle of the Soil Protection Act and the Environmental Management Act entail that the permit holder is obliged to clean up the soil pollution (*duty to cleanup*) he has caused and is liable for the cost of restoring the soil quality.

Even in the case of a negligible soil risk soil contamination cannot be completely excluded. The soil quality consequently has to be established by means of a soil pollution investigation before the industrial activity commences<sup>1</sup>. Soil pollution might then emerge by comparing the data of the final soil investigation with the soil investigation made at the start.

In the case of a *negligible* soil risk, the cost of soil cleanup will usually be covered by an environmental liability insurance, provided that the effective operation of measures and facilities has been guaranteed. The situation is different in the case of an *acceptable, increased* or *high* soil risk<sup>2</sup>. In this case non-insurable costs for cleaning up the affected soil quality will have to be anticipated (for example by means of financial

guarantees). It is a precondition of an acceptable soil risk that the affected soil volume should be reduced as much as possible by means of effective monitoring of soil quality to reduce the risk and at the same time keep down the cost of cleanup.

The guarantee of negligible risk and the required soil investigation must be imposed in detail for each activity in the permit conditions.

### 1.1.2 Where: area of application

The NRB guideline applies to activities in establishments as referred to in the Establishments and Licences Decree of the Environmental Management Act. The NRB describes specific soil threatening activities and indicates for each of them the desired protective measures and facilities.

The NRB is concerned solely with the general level of protection that is to say no additional requirements for establishments in environmental protection areas are described.

Should an activity come under a general administrative order it depends on the space whether the soil protection regulations in the order apply or whether the NRB can be used as a basis for soil protection.

The NRB does not apply to:

landfills; these rules have been laid down in the Soil Protection Landfill Decree (Bulletin of Acts, Orders and Decrees 1993; 55).

<sup>1</sup> See part A2.2.2

<sup>2</sup> See for the note to soil risk Part A2.3.2



## 1.2 Limiting risk to the soil

### 1.2.1 Negligible soil risk

For every separate industrial activity a set of measures (software) and facilities (hardware) have to be decided on that will lead if possible to a negligible soil risk<sup>3</sup>.

Measures include activities which are geared to the checking and maintenance of facilities like individual parts of installations, floors, pavement and/or containment facilities (drip-pans), as well as supervising the correct performance of the activity and targeted intervention in the case of incidents.

Measures and facilities have to be coordinated. Less effective facilities require more demanding control measures and vice versa.

Assessment of the effectiveness of soil protection measures and facilities is done using a soil risk analysis. For this the so-called soil risk checklist (BRCL, see part A3.3) is used.

The nature and quantity of the substances involved is of subordinate importance in assessing soil risk. The soil risk is automatically negligible if it can be demonstrated categorically that released substances cannot penetrate the soil or that the quantity or composition cannot cause any noticeable change in soil quality.

Specific soil risk assessment systems have been developed for certain branches of industry or plant. The final result of these methods can be used within the NRB system.

### 1.2.2 Measures and facilities

The effectiveness of measures and facilities is expressed in an emission score. The emission score shows the chance of soil contaminants being released and thus entering the soil. A major role is played here by the nature of the activity, the execution of the plant and soil protection facilities and maintenance and control measures.

A rule of thumb is that soil protection is technically sound if

- there is double protection, for example the enclosing casing in combination with an impermeable underlying surface or
- casing and liquid retaining underlying surface together with effective measures for clearing away any spills before they penetrate the soil.

Furthermore, the checkability of the spills determines the severity of the measures and facilities required. Whether an underlying surface can be regarded as being retaining depends on the nature and quantity of the substances in question in combination with the measure.

The NRB groups industrial activities together. An indicative overview of the five groups of hazardous activities in the checklist is given below.

The soil protection measures and facilities leading to a negligible soil risk are indicated for each group.

#### a Bulk liquid storage

A sound overfill safety device is essential in the case of the storage of bulk liquids. An impermeable containment facility must be in place below the filling point and any overflow.

Above-ground storage in tanks or reservoirs must be located in or on an impermeable containment facility. If the storage is off the ground (thus allowing for visual inspection under the storage) and the clearing away of leaked substances is guaranteed, a liquid-retaining containment facility will suffice. This is also the case for storage tanks located directly on the ground provided a leak detection system has been installed under those tanks.

Underground tanks in impermeable containers or with double walls and an effective leak detection system offer adequate soil protection as do cathodically protected tanks which are periodically checked. Underground storage of liquid fuels and/or waste oil usually come under the Storage in Underground Tanks Decree (BOOT).

<sup>3</sup> Facilities and measures imposed in orders in council pursuant to section 8.40 of the Environmental Management Act (as of 1 October 2000) result in a negligible soil risk.



### **b Transshipment and internal transport of bulk liquids**

Loading and unloading points must be above an impermeable containment facility of sufficient capacity. The size of the containment facility has to be chosen in such a way that the filling and delivery lines do not come outside the facility.

A containment facility does not need to be impermeable if there is an effective overflow device installed.

Above-ground pipelines and process water sewers have to be inspected frequently. An incident control plan must be drawn up in anticipation of unexpected incidents. Underground pipelines must be double-walled and provided with a leak detection device. Corrosion protection and a pipeline inspection programme are not sufficient for achieving a negligible soil risk. Underground process water sewers must be impermeable, subject to a sewers inspection programme and provided with an emergency plan in the case of incidents.

Pumps should preferably be leak free otherwise pumps have to be located on top of an impermeable containment facility.

Transport in open barrels is only allowed above an impermeable underlying surface and in combination with an effective inspection programme.

### **c Storage and transfer of bulk and packed goods**

A storage facility for bulk goods has to be covered or roofed over to prevent leaching through rainwater. A liquid-retaining containment facility suffices for the storing of (dry) bulk goods.

Forwarding of bulk goods should preferably take place in or using enclosed systems. In the case of transfer in open systems this has to be done above an impermeable containment facility.

Storage and transfer of (viscous) liquids in packaging may be carried out above a liquid retaining containment facility provided the packaging suitable for this storage is frequently inspected and any leaks are immediately cleared up.

### **d Processing / treatment**

Industrial processes must be carried out above an impermeable containment facility. The impermeable containment facility must be installed under and around the installation or activity and should be provided with raised edges so that a container with sufficient capacity is created. Released liquids/substances must be regularly removed from the drip pan.

If a process or treatment is completely enclosed – that is to say it cannot be opened during normal operation – a liquid-retaining containment facility, underground or above-ground, suffices. In addition there have to be targeted emergency procedures in place to prevent soil contamination in the case of incidents.

### **e Other industrial activities**

Most industrial activities fall under the headings listed above.

An exception to these are the various actions that take place in workshops and equipment that is used there. A workshop floor must in any event be liquid retaining. Equipment and machines which use or process substances hazardous to the soil must have an impermeable containment facility (drip pan) or must be placed above an impermeable floor. Effective facilities and procedures must be in place for clearing away spills and leaks.





