2016

PRACTICAL INFORMATION ABOUT FACILITIES AND MEASURES

SIKB

INSTRUMENTS FOR SIMPLER AND BETTER SOIL MANAGEMENT

SOIL PROTECTION

COLOPHON

This guide has been published by SIKB. It contains practical information about soil-protection facilities and measures for institutions and underground tanks.

SIKB
Postbus 420
2800 AK Gouda
T 085 - 48 62 450
E info@sikb.nl
I www.sikb.nl

Photographs and illustrations
AECOM Netherlands B.V.
Geofoxx B.V.
Contrall Inspectie B.V.
Texplor Benelux B.V.

Editors
Jordi Verkade, AECOM Netherlands B.V.
Robert Luinge, Juridische Raadgeving LNG B.V.

Final editing
Theo van Oeffelt, Bussum

Translation
The translation has been prepared in collaboration with the Ministry of Infrastructure and Environment

Design
Van Lint in vorm, Burgh-Haamstede

Printing
Quantes, Rijswijk

Third, modified and updated edition

Spring 2016

SOIL PROTECTION

Introduction

Industrial activities, such as waste storage, can release substances into the soil that poses risks to the soil. This contamination can be prevented using a combination of soil-protection facilities and measures.

The combination of soil-protection facilities and measures that are required to protect the soil is determined by the nature and the scope of the activities that pose risks to the soil.

The following facilities are available:
- liquid-proof facility (see page 9);
- liquid-repellent facility (see page 11);
- leak collector.

The measures need to be geared to the individual facility installed. In the case of liquid-proof floors regular inspections to check for faults as well as periodic inspections are required. In the case of liquid-repellent facilities or leak collectors there need to be effective organisational or control measures (incident management).

The facilities and measures that a company has to put in place are laid down in legislation and regulations. The next page covers these.

LEGAL FRAMEWORK

The requirements relating to soil protection are set out in:
- environmental permits as part of the Environmental Law (General Provisions) Act (WABO);
- the Environmental Management Activities Decree, the Environmental Management Activities Regulations, and various PGS directives.

Environmental permits

Soil regulations included in environmental permits are often based on the Dutch guidelines on soil protection for industrial activities (NRB 2012). The NRB 2012 sets out the best available techniques (BAT). In principle the competent authority is obliged to prescribe the best available techniques in the environmental permit. Permit regulations that are based on the NRB 2012 are legally binding requirements. The basic principle of the NRB 2012 is that the organisation must use a combination of facilities and measures to ensure that the risk to the soil represented by any activities that poses threat to the soil is negligible.

Activities Decree and Activities Regulations

The soil regulations set out in this decree and these regulations are based on the NRB 2012. They prescribe, among other things, the combination of facilities and measures that result in a negligible soil risk for the following activities that pose a threat to the soil:
- refuelling/delivery of fuels;
- external washing of motor vehicles, railway vehicles or (agricultural) implements;
- storage of liquid fuel or waste oil in underground and surface storage tanks;
- storage of other substances that pose a threat to the soil in underground and surface storage tanks;
- storage of agricultural industrial substances;
- storage of hazardous liquid substances;
- treatment of the surface of metals;
- internal cleaning of lorries and other transport vehicles;
- cleaning using PER.

(See also the page 'Soil protection requirements', page 14.)

COMBINATION OF FACILITIES AND MEASURES

NRB 2012

In the case of industrial activities companies have to protect their soil from any substances that could possibly leak into the soil. The NRB 2012 sets out whether and, if applicable, how a company should do this. The NRB 2012 describes suitable combinations of facilities and measures for industrial activities that pose a threat to the soil. These are based on the latest technology, which is set out in knowledge documents and assessment directives. Central to the NRB 2012 is the term 'negligible soil risk'. The combination of facilities and measures should effect a negligible soil risk. This means a situation in which the combination of facilities and measures prevents the development of or an increase in soil contamination as much as possible, as measured by testing the 'before and after' situation, and in which remediation of the soil is reasonably possible.

Phased plan

The phased plan included in the NRB 2012 can determine whether there is an activity that poses a threat to the soil. The phased plan is based on a soil risk analysis and uses a substance list and schedule. If it transpires from the soil risk analysis that an activity poses threat to the soil, the soil risk checklist can be used to ascertain what combination of facilities and measures is required to achieve a negligible soil risk.

Source-oriented and effect-oriented

The combination of facilities and measures can consist of source-oriented facilities and measures to enable the organisation to prevent the release of substances. Examples are flangeless connections on pipes and double-walled systems fitted with leak detectors. The combination of facilities and measures can also be effect-oriented in order to prevent released substances spreading to and into the soil. Examples are liquid-proof floors, liquid-repellent facilities and leak collectors. A source-oriented combination of facilities and measures is preferred to an effect-oriented combination of facilities and measures.

Individual cases

In certain cases the competent authority may permit an alternative, custom-made combination of facilities and measures as long as these result in a negligible soil risk.

PHASED PLAN NRB 2012

STEP 1 Make a list of the activities that are carried out in the organisation/company and what substances are involved.

→ 1.1 List of activities and substances involved.

STEP 2 Draw up the threats to the soil posed by the substance concerned using the substance diagram.

→ 2.1 Substance does not (intrinsically) pose a threat to the soil, Exit NRB. No soil-protection facilities and measures need to be selected based on the NRB.

→ 2.2 Substance poses a threat to the soil.

STEP 3 For the listed activity select a category from the soil risk checklist which is the best match for the situation.

→ 3.1 Table containing a combination of facilities and measures for the activity category is known.

STEP 4 Make a list of the facilities and measures and check if these correspond to the combination of facilities and measures in the table in step 3.1.

→ 4.1 The facilities and measures listed correspond at least to the combination of facilities and measures in the table in step 3.1.

→ 4.2 The facilities and measures listed do not correspond to the combination of facilities and measures in the table in step 3.1.

STEP 5 Are you opting for the standard soil risk checklist or for an individual one?

A. STANDARD OPTION

STEP 6 6A.1 Decide what additional facilities and measures are required to achieve a negligible soil risk.

6A.2 Achieve the negligible soil risk using the additional combination of facilities and measures.

NO

B. INDIVIDUAL OPTION

6B.1 Establish whether the individual option is possible based on the results of the substances diagram or the soil risk factor.

6B.2 Achieve a negligible soil risk using the individual option and any necessary additional combination of facilities and measures.

STEP 7

7.1 Demonstrate, with proof, that a standard combination of facilities and measures is not reasonable for the following reason:

1 Standard combination of facilities and measures is not reasonable from an implementation point of view;

2 Standard combination of facilities and measures is not reasonable from an operational point of view.

→ 7.2 Achieve an acceptable soil risk with substantiation, carry out monitoring in accordance with appendix 3. **This is possible only in existing situations.**

ACTIVITIES THAT POSES THREAT TO THE SOIL

If activities that poses threat to the soil are carried out at an organisation, a combination of facilities and measures must be taken to render the risk of soil contamination negligible.
The soil risk checklist, which is included in the NRB 2012, contains the necessary combination of facilities and measures for the activities shown below.

1 Storage of bulk liquids
1.1 Underground or bunded tank
1.2 Storage in surface tank vertically with bottom plate
1.3 Storage in surface tank secured free of the subsoil
1.4 Storage in wells and basins

2 Transfer and internal transport of bulk liquids
2.1 Unloading and loading activities of liquids in bulk
2.2 Pipe transport
2.3 Pumping

3 Storage and loading of bulk goods and general cargo
3.1 Storage and transfer of bulk goods
3.2 Transport of bulk goods with a closed or open system
3.3 Storage and transfer of substances in packaging
3.4 Pouring, refuelling or filling
3.5 Drainage
3.6 Transport with open packaging

4 Process activities / process steps
4.1 Closed process or treatment
4.2 Half-open process or treatment
4.3 Open process or treatment

5 Other activities
5.1 Discharge of waste water into company waste-water system
5.2 Disaster measures
5.3 Activities in workplaces
5.4 Waste-water and sewage treatment
5.5 Laboratories

SOIL-PROTECTION FACILITIES

Soil-protection facilities are physical facilities that limit the chance of substances getting into the soil. Examples are:
- liquid-proof facilities;
- company waste-water system;
- closed process;
- geomembrane collector systems;
- liquid-repellent facilities;
- liquid-proof (leak) collectors;
- double-walled systems fitted with a leak detector;
- cathodic protection.

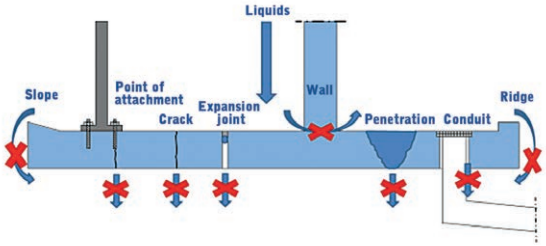
Requirements for facilities

- The facility should be designed in such a way that liquids are effectively collected, retained and/or cleared up.
- No rainwater should get onto or into the facility, unless regular drainage is guaranteed and it cannot escape from the facility.
- The facility must be resistant to the penetration of the substances and the conditions in which these substances are used or stored.
- The capacity of leak collectors must be at least 110% of the content of the largest packaging unit or storage tank and the collection capacity must be at least 10% of the content of all the stored substances.

Sometimes accreditation is required

Some facilities have to be constructed or installed by a recognised company in accordance with a specific standards document. (See page 'Work for which accreditation is mandatory', page 30.) This is the case, for example, for liquid-proof floors and surfaces at petrol stations, underground tanks and cathodic protection.

LIQUID-PROOF FACILITIES



Introduction

A liquid-proof facility is regarded the best effect-oriented measure to combat soil contamination. Liquid-proof facilities are constructions such as floors or surfaces, company waste-water systems and geomembrane collector systems.

A liquid-proof facility is a floor or surface laid directly on the soil and which guarantees that no liquid can get on to the non-liquid side of this facility.

Relevant documents

- CUR Report 196 - Design and detailed engineering of soil-protection facilities;
- CUR Recommendation 65 - Design, construction and repair of facilities made of concrete.

SOIL-PROTECTION MEASURES

Soil-protection facilities need to involve control measures. These measures have to be geared to the facilities used.

Measures for LIQUID-PROOF floors and surfaces

- Every six years an inspection must be carried out by a recognised inspection organisation. (See page 'Work for which accreditation is mandatory', page 30.)
  This inspection organisation will go through the following steps:
  - Assessment of the inspection site (establishing the situation at the site).
  - Inspection of the facility.
  - Implementation of further investigation (optional).
  - Inspection of repair work carried out (optional).
  - Testing of the inspection results against the requirements in AS 6700 and recording in an inspection report. See also the page 'Proof', page 38.
  - Registration of the inspection report and the facility with SIKB.
  - An internal company check on the condition of the facility must be carried out periodically (usually annually) by or on behalf of the owner of the facility.

Measures in the case of LIQUID-REPELLENT facilities and leak collectors

The starting point is that liquids that get onto a repellent facility have to be cleared up immediately. This has to be done before the liquids can get into the soil. This requires that:

- the personnel be instructed in how to act in the case of disasters or spillages;
- there be sufficient tools for the personnel to use for clearing up spilled substances immediately;
- all the actions have been detailed in procedures and work instructions;
- responsibilities be clearly recorded.

For the control measures for petrol stations and underground tanks refer to the pages 'Requirements for petrol stations', page 18, and 'Requirements for storage in underground tanks', page 20.

LIQUID-REPELLENT FACILITIES

Introduction

In the case of minor liquid loads (such as a workplace with storage of liquids) a liquid-repellent facility is adequate.

Features:

- The materials and detailed engineering used can repel released substances long enough for them to be cleared up before any penetration into the soil occurs.
- Additional organisational and/or control measures are required for removing spillages and leaks of environmentally harmful substances in good time (see page 13).

Relevant documents

- Dutch guidelines on Soil Protection for Industrial Activities (NRB 2012).

SOIL RISK CHECKLIST

The soil risk checklist included in the NRB 2012 can be used to determine the combination of facilities and measures in order to achieve a negligible soil risk. For each activity that poses a threat to the soil the risk checklist provides one or more combinations of facilities and measures that will result in a negligible soil risk. Ultimately a combination of facilities and measures has to be carried out.

For example, the following table is included for the storage of bulk liquids in an underground tank:

No.*	Facilities	Measures
I	- single-walled tank, - cathodic protection, and - groundwater monitoring pipe	- periodic inspection of cathodic protection, and - periodic monitoring
II	- double-walled tank, and - leak detection	- periodic leak-detection checks
III	- single-walled tank in underground container, and - leak detection within the container	- periodic leak-detection checks

* No. of combination of facilities and measures.

In addition to the facilities and measures specified there may also be requirements based on the PGS 28, 29 and 30. Moreover, the requirements in the Environmental Activities Management Regulation have to be taken into account for the construction, inspection and testing of storage tanks.

There are conceivable situations in which it is not possible to achieve a negligible soil risk. In these cases an effective monitoring system should be used as an option for achieving an acceptable soil risk. See also the page 'Acceptable soil risk', page 28.

MEASURES FOR LIQUID-REPELLENT FACILITIES

Introduction

Effective organisational and/or control measures (incident management) are company-specific and are set out in procedures and work instructions:

- regular supervision must allow the quick indication of disasters and spillages;
- the instructions set out how employees should act at the business premises in the case of disasters and spillages;
- there must be adequate tools present for quickly cleaning up spilled substances (for example absorbent material - see photograph).

The measures have to be in keeping with the specific industrial activity. For this reason there is no uniformly recorded information available for determining which measures are effective.

Relevant documents

Further information is available at www.bodembescherming.nl.

REQUIREMENTS FOR SOIL PROTECTION (1)

The table below indicates for several activities which facilities the decision-maker at the organisation has to take on the basis of the Environmental Management Activities Regulations. Refer also to the pages 'Requirements for petrol stations', page 18, and 'Requirements for storage in underground tanks', page 20.

Explanation of abbreviations in the table

B.V.: soil-protection facility; there is freedom of choice, provided that the combination of these facilities and measures results in a negligible soil risk; a liquid-repellent facility is most usual in these cases.
V.V.: liquid-proof floor or surface.
GEO: geomembrane collector system (underground foil system).

Activity	Facilities	Article AR
Filling and emptying of a combustion plant	B.V.	3.7l
Refuelling of motor vehicles and railway vehicles	V.V. or GEO	3.25
Storage of scrap vehicles before they are dismantled and drainage of liquids	V.V.	3.27c
Washing of motor vehicles	V.V.	3.27
Storage of liquid hazardous substances that pose a threat to the soil and CMR substances in packaging	V.V. or leak container	4.10
Ditto but in closed packaging that complies with ADR	B.V.	4.10
Storage of liquid hazardous substances and substances that pose a threat to the soil in surface tanks	Leak container	4.18
Reduction of wood or cork using an installation with an oil circuit	B.V.	4.39a
Application of inorganic coatings to metals	B.V.	4.70
Processing of varnishes, thinners, adhesives during the cleaning, chemical stripping and washing of wood, plastic, metal	B.V.	4.43 4.49 4.67

(see next page)

MATERIALS

Introduction

Liquid-proof facilities can consist of various materials, such as concrete (photograph), asphalt, steel and/or plastic.

In addition to the material-specific properties the following features are important for a durable functioning of the facility:

- the design of the detailed engineering / joint details (the liquid must not be able to escape); good processing of the right materials (the liquid must not be able to pass through).

Relevant documents

- CUR Recommendation 51 - Environmental design criteria for company waste-water systems;
- CUR Recommendation 63 - Establishment of liquid penetration in concrete;
- CUR Recommendation 64 - Liquid-proof synthetic-resin-bonded protective layers;
- CUR Recommendation 78 - Liquid-proof joint constructions in soil-protection facilities;
- CUR-Recommendation 88 - Absorption test to determine liquid penetration in bituminous materials.

REQUIREMENTS FOR SOIL PROTECTION (2)

Activity	Facilities	Article AR
Metal-processing in which liquid substances that pose a threat to the soil can escape	B.V.	4.54
Metal blasting	V.V.	4.62
Immersion bath in which: - metal layers are attached to metals electrolytically or currentlessly; - conversion layers are attached to metals; - metal layers are attached to metals thermally.	V.V. or leak container	4.76 4.80 4.83
Refuelling of vehicles and filling of jerry cans	V.V. or leak container	4.87
Refuelling of motor vehicles for own use, fewer than 25,000 litres per year	B.V.	4.94
Refuelling motor vehicles for own use, over 25,000 litres per year	V.V.	4.94
Repairs, surface treatment, antirust treatment, removal of the protective coating from motor vehicles	B.V.	4.97
Repairs, maintenance etc. of pleasure boats	B.V.	4.99
High-pressure hosing of pleasure boats below the water line	B.V.	4.99
Silk-screen printing and removal of ink from printing frames	B.V.	4.102
Textile cleaning using PER	V.V. or leak container	4.104
Creation of mixtures or solvents of pesticides, biocides or foliar fertilisers	B.V.	3.92
Immersion bath or shower installation in which pesticides or biocides are used	V.V. or leak container	3.94
Fermentation of animal fertilisers	B.V.	3.102c
Salting of animal by-products	B.V.	3.105
Shooting at an indoor shooting range	B.V.	3.111

CONSTRUCTION OF FACILITIES

Introduction

A durable liquid-proof facility requires careful design and implementation. A recognised, certified contractor may be chosen for the professional construction and repair of a liquid-proof facility. These contractors can also provide a Proof of Construction Certificate (BAOC). The repair of a floor can also be certified. For petrol stations it is compulsory for the construction of the liquid-proof floor or surface to be carried out by a recognised/certified contractor.

Relevant documents

- BRL SIKB 7700 - Construction or repair of a liquid tight facility;
- Protocol 7701 - Construction or repair of a liquid tight facility with prefab concrete elements;
- Protocol 7702 - Construction or repair of a liquid tight facility made of concrete;
- Protocol 7703 - Construction or repair of a liquid tight facility with bituminous material;
- Protocol 7704 - Construction or repair of a liquid tight facility with resin bound protective layer;
- Protocol 7711 - Construction or repair of a liquid tight joint seal.

The criteria for liquid tight company waste-water systems are set out in Protocol 7701, 7702 and 7703.

REQUIREMENTS FOR PETROL STATIONS

Several additional and deviating requirements apply to petrol stations for road traffic.

Construction of floors and surfaces

In the case of petrol stations it is compulsory to have the liquid-proof facility constructed by a recognised company (see page 'Work for which accreditation is mandatory', page 30).

Geomembrane collector systems

In addition to liquid-proof facilities, so-called geomembrane collector systems - systems that are made liquid-proof by the use of geomembranes (usually plastics) - are also permitted as a soil-protection facility. These systems must meet various requirements, depending on the date on which they are constructed (see the table below).

Construction	Requirements
after 1/1/2007 between	- Installed by a recognised company - Inspected every six years
1/12/2001 and 1/1/2007	- Installed by a recognised company - Inspected every six years
before 1/12/2001	Six-yearly inspection not compulsory on condition that: - the film (HDPE or equivalent) is at least 1 mm thick and is certified in accordance with BRL K537; - documents (layout plan, rolling test data report, welding and welding-test reports) are present, and - visual checks are carried out every six months.

Groundwater monitoring pipes

The presence of single-walled underground requires the installation of groundwater monitoring pipes by a recognised company to indicate soil contamination caused by liquid fuels. A recognised laboratory must analyse the groundwater samples for mineral oil, volatile aromatics, MTBE and ETBE. (See also page 'Work for which accreditation is mandatory', page 30).

LIQUID-PROOF FACILITIES

Introduction

Liquid-proof facilities must prevent liquids from getting into the soil. The following aspects are of particular importance for the assessment of the design, the choice of the materials to be used and the facility implemented:

- construction / material used (resistant to loads);
- resistance to chemicals (linked to industrial activity);
- penetration of contaminants into the facility (stains); ducts and attachment points (leaks);
- incline and liquid retention (must not run off the facility);
- joint sealants and sealing profiles.

Relevant documents

CUR Recommendation 65 - Design, construction and repair of facilities in concrete.

REQUIREMENTS FOR STORAGE IN UNDERGROUND STORAGE TANKS

The following requirements, among others, apply to the storage of liquid fuel, waste oil, certain organic solvents or liquid substances that poses threat to the soil in underground storage tanks:

- The owner of the organisation has to provide a financial security of € 225,000 for each underground tank in which liquid fuel or waste oil is stored (max. approximately 1.4 million), for example via insurance or a bank guarantee.

- Soil inspection at the start and end of the storage is mandatory (see page 'Soil inspection', page 24).

- For each single-walled storage tank (or for each group of three single-walled storage tanks that are positioned within 10 metres of each other) a groundwater monitoring pipe has to be installed by a recognised company.

- The construction, installation, repair and removal have to be carried out by a recognised company.

- A soil resistivity measurement is mandatory if the tank, pipes or fittings are made of steel. If the measurement shows that the specific electrical resistivity of the soil is less than 100 ohmmeter, a cathodic protection is mandatory. The cathodic protection must be inspected every year. If a cathodic inspection is not compulsory, a soil resistivity measurement has to be carried out every fifteen years and an insulation resistance test has to be carried out every year. Only recognised companies and organisations may carry out the measurements and tests as well as the construction and inspection of the cathodic protection.

- The tank should be inspected periodically by a recognised inspection body in accordance with AS6800. The inspection frequency is given in the table relating to the 'Inspection frequency of underground storage tanks', page 22.

COMPANY WASTE-WATER SYSTEM

Introduction

Various requirements apply to the assessment of the design and the facility for the various parts of a liquid-proof company waste-water system:

- a slight leakage loss is permitted for pipes - free fall;
- there must be no leakage loss ascertained at receiver points, separation installations or other components;
- company waste-water systems with overpressure (high-pressure waste-water pipes), including all the associated components: no leakage loss or pressure loss.

The inspection body inspects the different parts of the company waste-water system by putting them under pressure using water and then determines both the leak loss that occurs and the leak loss that is permitted.

Relevant documents

- CUR/PBV Recommendation 51 - Environmental design criteria for company wastewater system;
- Protocol 6703 - Hydrological measurement of liquid-tightness;
- CUR report 2001-3 - Management of company waste-water system for soil protection.

INSPECTION FREQUENCY OF UNDERGROUND STORAGE TANKS

The following table sets out the inspection frequency of underground storage tanks.

Steel storage tank single-walled	Steel storage tank single-walled	Next inspection
Without coating or not fully coated	15 years	15 years
Fully coated not in accordance with BRL K 790 or BRL K779	15 years	20 years
Fully coated in accordance with BRL K 790 or BRL K779	20 years	20 years
Steel storage tank double-walled with leak detector in accordance with BRL K910		
Regardless of coating	20 years	20 years
Plastic storage tank single-walled or double-walled		
Plastic storage tank single-walled or double-walled (GRP)	15 years	15 years

Comments

- an underground storage tank in a groundwater protection area is reinspected every ten years;
- an underground storage tank in which waste oil is stored is assessed and inspected (internally) at least every five years and emptied every year;
- the water/sludge check in the case of steel tanks with an internal coating in accordance with BRL K779 may be carried out every three years instead of every year;
- the water/sludge measurement may be carried out every year by the entrepreneur him/herself in accordance with protocol SIKB 6802;
- the annual water/sludge check is not necessary in the case of liquids of PGS class 4 and waste oil.

GEOMEMBRANE TANK SYSTEMS

Introduction

Geomembrane tank systems are used, among other things, at petrol stations in built-up areas and for the storage of waste substances. It is important, as regards the liquid-tightness of geomembrane tank systems, that the seams of the overlapping strips be properly welded.

The requirements for the construction of this type of facility are set out in BRL-K908/02. A geomembrane tank system is liquid-proof if:

- no leak is found when a geoelectric measurement of the geomembrane in the tank construction is carried out;
- no defects are found when an assessment of the visible parts of the system (throughputs, drainage and separation installation) is carried out.

Relevant documents

- BRL-K908/02 - Construction of plastic geomembrane tank systems.
- Protocol 6702 - Geoelectric measurement of liquid-tightness.

SOIL INSPECTION

A soil inspection that is carried out as part of soil-protection measures draws a distinction between benchmark situation, final situation and interim soil inspection.

Benchmark soil inspection

The purpose of this inspection is to establish the soil quality at the start of an activity that poses a threat to the soil. The Activities Decree prescribes that this inspection be carried out within three months of the inception of the activity. Only a recognised company may carry out the inspection.
This inspection should comply with NEN 5740.

Final-situation soil inspection

This inspection establishes the soil quality at the end of the activity that poses a threat to the soil. A comparison between these results and those of the benchmark situation will show whether the soil quality has changed. The results of the soil inspection should be reported to the competent authority in accordance with the Activities Decree at the latest six months after the end of the installation. The report should contain several details, such as the name of the soil inspection organisation (which has to be a recognised institution), the inspection procedure and the nature and extent of the contamination found.

Interim soil inspection

In some cases the competent authority can request that the owner of the organisation establish the soil quality (in the interim) via an individual regulation. This will be the case if a change has taken place at the organisation that could have consequences for future contamination, such as:

- changes to the production process;
- an extension to the organisation;
- the movement of a machine on which activities are carried out that poses threat to the soil or from which substances could leak;
- a change to the location at which containers are filled and emptied or where liquids are stored.

INSPECTION OF LIQUID-PROOF FACILITIES

Introduction

The liquid-tightness of liquid-proof facilities can be adversely affected over time (see photograph). In order to establish whether the facility is still liquid-proof under the mechanical, chemical and physical stresses placed on it in the industrial situation, the companies themselves have to carry out, or have carried out, annual internal checks.

In addition, a recognised inspection body has to inspect the facility periodically. The inspection can be carried out using several inspection techniques. A visual inspection is the most usual type of inspection. The facilities have to be properly accessible (inspectable) before an inspection can be carried out. If necessary, the inspection can be supported by techniques for more detailed inspection (see page 'More detailed inspection / repair', page 27).

Relevant documents

- AS SIKB 6700 - Inspection of soil-protection facilities;
- Protocol 6701 - Visual inspection of liquid-tightness;
- Protocol 6702 - Geoelectrical measurement of liquid-tightness;
- Protocol 6703 - Hydrological measurement of liquid-tightness;
- Protocol 6704 - Measurement of liquid-tightness using an air test system;
- Protocol 6711 - Visual inspection of and checks on mineral layers.

REMEDIATION OBLIGATION REGARDING SOIL QUALITY

If a comparison of the benchmark situation and the final situation shows that the soil has been contaminated or polluted, the owner of the organisation has an obligation to restore the soil quality.

To what extent

If the benchmark situation has been recorded, the remediation should return the soil quality to the benchmark situation. If the benchmark situation has not been recorded, remediation should ensure that the soil quality complies with the background values set out in the Soil Quality Decree.

The Activities Decree further prescribes that soil remediation does not have to go further than what is reasonably feasible with the best available techniques. Financial, economic and environmental interests play a role in determining what is reasonably feasible. The competent authority should make a decision on a case-by-case basis.

Remediation activities

Only recognised companies can carry out soil remediation activities (see also the page 'Work for which accreditation is mandatory', page 30).

The remediation work should start at the latest within six months of the date on which the soil report (containing the final situation) was sent to the competent authority.

If there is an unusual incident, soil remediation repair should be carried out immediately. This is set out article 13 of the Soil Protection Act. In such cases a six-month wait is not permitted; the remediation work should start immediately.

MORE DETAILED INSPECTION / REMEDIATION OF FLOOR

Introduction

If, during the inspection, there is any doubt about the liquid-tightness, the owner of the facility can decide to carry out a more detailed inspection or to have the facility repaired. A more detailed inspection can range from non-destructive testing, such as a more detailed file inspection, to destructive testing, such as the excavation of part of the facility or the assessment of a core drilled from the facility (see photograph). If defects are found, repairs must always be carried out. The inspection body will provide a professional opinion on the repair that will consist of:

- an advisory repair recommendation for the facility and/or;
- (a) suggestion(s) involving measures or changes to the operation that will achieve a negligible soil risk, on condition that this is permissible for the activities in question with regard to legislation.

Relevant documents

- AS SIKB 6700 - AS SIKB 6700 Inspection of soil-protection facilities;
- CUR-Recommendation 63 - Establishment of liquid penetration in concrete;
- CUR-Recommendation 88 - Absorption test to determine liquid penetration.

ACCEPTABLE SOIL RISK

The starting point is that a negligible soil risk be achieved. However, sometimes an acceptable soil risk is permitted.

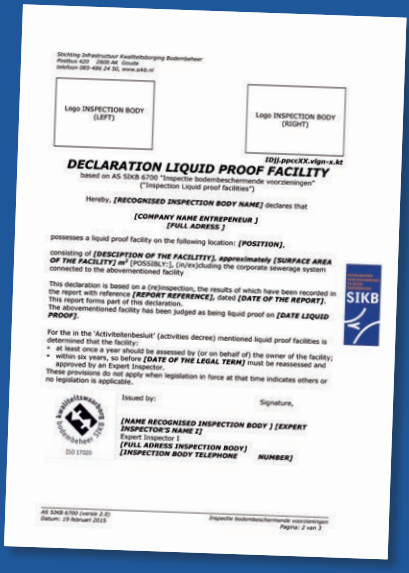
Conditions

- An acceptable soil risk is permissible only for activities that pose a threat to the soil that were started before 1 January 2008 and for activities at an organisation that had already been given permission on the date on which Activities Decree became applicable to this organisation.
- The feasibility of an acceptable soil risk can be considered only once it has been adequately demonstrated that a negligible soil risk is not reasonable.
- The choice between negligible and acceptable soil risk is thus not a commercial consideration.
- This means that the option of an acceptable soil risk cannot be chosen simply because this is less expensive than a negligible soil risk.
- The acceptable soil risk option can therefore be chosen only if the achievement of a negligible soil risk requires unreasonably high investment by an organisation that is not sustainable from a commercial point of view.

Procedure

- An acceptable soil risk has to be recorded by the competent authority on request in the environmental permit or via an individual regulation.
- The action plan that is submitted with the request should set out:
  - how the risk-mitigating soil inspection will be carried out;
  - the soil quality at that time;
  - the way in which and the period within which remediation work or possible contamination or pollution of the soil will take place, the estimated costs of remediation;
  - and the method of financial security.

DECLARATION THAT A FACILITY IS LIQUID-PROOF



Stichting Infrastructuur Kwaliteitsborging Bodembeheer
Postbus 420 2800 AK Gouda
telefoon 085-488 24 36, www.sikb.nl

Logo INSPECTION BODY (LEFT)

Logo INSPECTION BODY (RIGHT)

[0]j.ppccXX.vlgn+x.kt

DECLARATION LIQUID PROOF FACILITY

based on AS SIKB 6700 "Inspectie bodembeschermende voorzieningen" ("Inspection Liquid proof facilities")

Hereby, **[RECOGNISED INSPECTION BODY NAME]** declares that

[COMPANY NAME ENTREPENEUR]
[FULL ADRESS]

possesses a liquid proof facility on the following location: **[POSITION]**,

consisting of **[DESCIPTION OF THE FACILITY]**, **approximately [SURFACE AREA OF THE FACILITY] m²** [POSSIBLY:], (in/ex)cluding the corporate sewerage system connected to the abovementioned facility

This declaration is based on a (re)inspection, the results of which have been recorded in the report with reference **[REPORT REFERENCE]**, dated **[DATE OF THE REPORT]**. This report forms part of this declaration.
The abovementioned facility has been judged as being liquid proof on **[DATE LIQUID PROOF]**.

For the in the 'Activiteitenbesluit' (activities decree) mentioned liquid proof facilities is determined that the facility:

- at least once a year should be assessed by (or on behalf of) the owner of the facility;
- within six years, so before **[DATE OF THE LEGAL TERM]** must be reassessed and approved by an Expert Inspector.

These provisions do not apply when legislation in force at that time indicates others or no legislation is applicable.

Issued by:

Signature,

[NAME RECOGNISED INSPECTION BODY] [EXPERT INSPECTOR'S NAME 1]
Expert Inspector 1
[FULL ADRESS INSPECTION BODY]
[INSPECTION BODY TELEPHONE NUMBER]

ISO 17020

AS SIKB 6700 (versie 2.0)
Datum: 19 februari 2015

Inspectie bodembeschermende voorzieningen
Pagina: 2 van 3

Introduction

The inspection results are recorded in an inspection report provided with the SIKB certification. The inspection body indicates the facility as being liquid-proof if no defects have been found. If a facility is indicated as being liquid-proof, the inspection body issues a 'Declaration that a Facility is Liquid-proof' and this is included in the inspection report.

An example of this is shown above.

Relevant documents

- AS SIKB 6700

WORK FOR WHICH ACCREDITATION IS MANDATORY

Some work involves stipulations stating that only recognised companies or organisations can carry out this work. These are companies or organisations that have been awarded accreditation based on the Soil Quality Decree.

Work for which accreditation is mandatory

Accreditation is mandatory for, among other things, work that is listed in the table on the next page. The full list can be found in appendix C of the Soil Quality Regulations at www.wetten.nl.

Recognised companies and organisations

In order to be awarded accreditation the company or institution has to be certified or accredited. Recognised companies and organisations are listed on the Bodem+ website (www.bodemplus.nl>zoekmenu>erkende soil intermediairs).

Standards documents

In addition to an overview of work for which accreditation is mandatory appendix C of the Soil Quality Regulation also contains an overview of standards documents that must be applied for by operators. These are assessment guidelines, protocols, test criteria, etc.

Overview of articles, work and standards documents

The table on the next page contains an overview that includes:

- work for which accreditation is mandatory;
- standards documents to be used by operators;
- articles of the Activities Decree and the Activities Regulations that stipulate that only recognised people and organisations are entitled to carry out the work.

UNDERGROUND STORAGE TANKS

Introduction

Underground storage tanks in which liquid fuel or waste oil is stored have to be installed, maintained and repaired in accordance with BRL K903.

The removal or disabling of an underground storage tank and its filling with inert filling has to be carried out in accordance with BRL K904.

The internal cleaning of an underground storage tank has to be carried out in accordance with BRL K905.

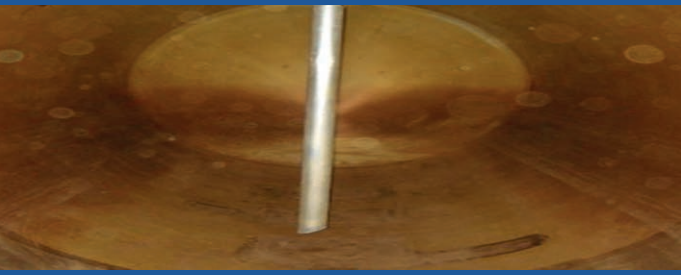
Relevant documents

- BRL K903 - Manufacture, installation and repair of underground storage tanks;
- BRL K904 - Removal and disabling of underground storage tanks;
- BRL K905 - Internal cleaning of underground storage tanks.

WORK AND STANDARDS DOCUMENTS

Efficacy	Standards documents to be used	Article AB
Benchmark, final and interim inspection	BRL SIKB 2000, AS SIKB 2000, AS 3000	2.11
Soil remediation	BRL SIKB 7000	2.11
		Article AR
Inspection of liquid-proof floor or surface	AS 6700	2.1
Installation of groundwater monitoring pipes	BRL SIKB 2000, AS SIKB 2000 and prot. 2001	2.2
Sampling of groundwater monitoring pipes	BRL SIKB 2000, AS SIKB 2000 and prot. 2002	2.2
Analysis of groundwater monitoring pipes	AS 3000 and protocols	2.2
Construction of liquid-proof floor or surface	BRL 7700 en prot. 7701/02/03/04/05	3.25
Construction of geomembrane tank system	BRL K908	3.26
Manufacture, installation and repair of underground storage tanks	BRL K903	3.34
Implementation of soil resistance measurement	BRL K903	3.34
Fitting and repair of cathodic protection	BRL K903	3.34 3.36
Testing of underground storage tanks	AS 6800 and prot. 6811	3.35 3.38
Checks on water and sediment and assessment of electrical conductivity and acidity	AS 6800 and prot. 6802	3.35
Internal assessment of underground storage tank	AS 6800 and prot. 6811	3.35
Checks on liquid-tightness of underground storage tank	AS 6800 and prot. 6811	3.35
Checks of cathodic protection	AS 6800 and prot. 6801	3.36
Implementation of insulation resistance test	AS 6800 and prot. 6811	3.36
Removal and disabling of an underground storage tank and filling with inert filling	BRL K902 and BRL K904	3.37
Internal cleaning of an underground storage tank	BRL K905	3.37

INSPECTION OF TANKS



Introduction

The liquid-tightness of an underground tank can be adversely affected over time. For example, because the tank is deformed by mechanical stresses or is affected by chemicals. This is why an inspection has to be carried out periodically.

AS SIKB 6800 has been drawn up for the periodic checking and inspection of underground tanks. Inspection companies have to be accredited in accordance with this AS and have to apply the protocols listed below when carrying out inspections and checks.

Relevant documents

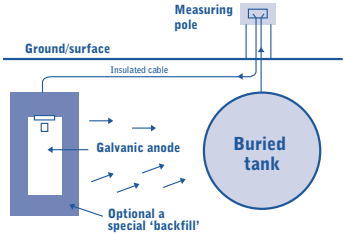
- AS SIKB 6800 Checks on and inspection of tank (storage) installations;
- Protocol 6801 Cathodic protection;
- Protocol 6802 WBM checks;
- Protocol 6803 Earthing and potential equalisation;
- Protocol 6811 Inspection of tank (storage) installations.

WORK FOR WHICH ACCREDITATION IS NOT MANDATORY

Accreditation is not always mandatory for an operator (contractor or inspection company). The table below provides an overview of work and associated documents for which accreditation is not mandatory.

Work	Documents
Construction of and repair of liquid-proof floors and surfaces, with the exception of a fuel tank station, for which accreditation is mandatory.	BRL 7700
Construction and use of air test systems for testing liquid-tightness of soil-protection facilities	AS 6700
Application of joint fillers in liquid-proof surface constructions	BRL 7700
Processing of concrete in liquid-proof surface constructions	BRL 7700
Installation of oil or fat separators, sludge traps and pipes	BRL 5261
The installation and assembly of prefab elements made of concrete to be used as collector tanks	BRL 7700
Bentonite mats in soil-protection facilities	CUR A-50
Establishment of the liquid-tightness of bituminous materials	CUR A-52
Establishment of liquid penetration	CUR A-63
Liquid-proof synthetic-resin-bonded protective layers	CUR A-64
Design, construction and repair of liquid-proof facilities made of concrete	CUR A-65
Liquid-proof joint constructions in soil-protection facilities	CUR A-78
Absorption test for assessing liquid penetration in bituminous materials	CUR A-88

CATHODIC PROTECTION OF TANKS



Introduction

Steel underground tanks are usually given a corrosion-resistant coating. This protective layer cannot completely prevent corrosion in the long term. This results in leaks and thus contamination of the soil and groundwater. This corrosion can be prevented by the application of cathodic protection (KB) to steel underground tanks and pipes.

An annual inspection of a cathodic-protection system by a recognised inspection body in accordance with AS SIKB 6800 and protocol 6801 is compulsory.

Relevant documents

- BRL K903 - Manufacture, installation and repair of underground storage tanks;
- AS SIKB 6800 - Checks on and inspection of tank (storage) installations;
- Protocol 6801 - Cathodic protection.

VOLUNTARY CERTIFICATION OF FLOORS

If there is no accreditation obligation, there is no need to be certified. Nevertheless certification to BRL 7700 can have advantages for principals and for companies that manufacture and repair liquid-proof floors.

Advantages for principals

- The work is carried out in accordance with the latest technology.
- Principals can be sure that the manufacture is in accordance with the stipulated quality directives.
- If a liquid-proof floor or surface is installed or repaired by a certified contractor, the owner is given a Proof of Construction Certificate (BAOC) or a Proof of Repair Certificate (BHOC). This is a useful proof for demonstrating to the competent authority that thefacility meets the requirements.
- A further advantage of a BAOC for the owner is that the first inspection of the floor or surface does not have to be carried out for six years. Without a BAOC the floor or surface has to be inspected as soon as it has been installed.

Advantages for operators

- Certified operators are distinguished in the market by their demonstrable concern for quality. The quality is periodically assessed by a certification body.
- Certified operators can use the SIKB logo.

MONITORING

Introduction

If the competent authority has stated that an acceptable soil risk is sufficient for soil protection, the monitoring option can be chosen (risk-mitigating soil inspection). If this monitoring reveals that the soil is contaminated, the soil quality has to be restored (remediation).

Monitoring means checking, with an effective frequency, whether any soil contamination has occurred near a source. Monitoring pipes (see photograph) are used to take samples of the groundwater, which are then analysed. This procedure limits the extent of any soil contamination.

Relevant documents

- Dutch guidelines on Soil Protection for industrial activities 2012

PROOF

Inspection report on liquid-proof floor or surface

An inspection report contains the following details:
- SIKB certification;
- the conclusion as to whether the facility is or is not liquid-proof;
- when the facility is liquid-proof: Declaration that a Facility is Liquid-proof (see below);
- if the facility is not liquid-proof: repair advice for the facility or suggestions on how to achieve a negligible soil risk (professional opinion).

Declaration that a Facility is Liquid-proof

This declaration states:
- the facility/ies to which the declaration applies;
- any liquid-proof area included in the facility;
- whether the company waste-water system is part of the declaration;
- the issue date and the validity period;
- the frequency of in-house checks;
- the SIKB number.

Proof of Construction Certificate (BAOC)

The BAOC indicates that a floor has been installed by a certified contractor. The initial inspection does not have to take place until six 6 years from the construction date. The certification body issues this declaration.

Inspection report on underground tanks and quality assurance

An inspection report contains the following information, among other things:
- identification number;
- name and address of inspection body;
- identification of inspected object;
- elements assessed;
- name of inspector;
- conclusions (approved or rejected).

In the case of approval in accordance with AS SIKB 6800 the inspection body issues an inspection certificate.

LEGEND

AB	Environmental Management Activities Decree
AR	Environmental Management Activities Regulations
PGS	Hazardous Substances Publication Series
AS	Accreditation scheme
BAOC	Proof of Construction Certificate
BHOC	Proof of Repair Certificate
BRCL	Soil risk checklist
BRL	Assessment directive
KB	Cathodic protection
KWALIBO	Quality Assurance in soil management
NRB 2012	Dutch guidelines on Soil Protection for Industrial Activities 2012
Facilities and measures	Combination of Facilities and Measures
B.V.	Soil-protection facility
V.V.	Liquid-proof floor or surface
GEO	Geomembrane tank system

INFORMATION POINTS

www.sikb.nl
- Up-to-date versions of standards documents;
- Practical information for operators, principals and authorities;
- Overview of recognised contractors and inspection bodies and of voluntarily certified contractors.

www.bodembescherming.nl
- Information for entrepreneurs about facilities and measures relating to soil protection.

SIKB
T 085 - 48 62 450
E info@sikb.nl

---

www.bodemplus.nl
- Overview of recognised contractors and inspection bodies;
- General and specific information about the Activities Decree, the Activities Regulation, the Decree on Soil Quality and the NRB 2012.

Bodem+
T 088 - 797 71 02

---

www.rva.nl

Accreditation Board
T 030 - 23 94 500