

KAM-rule 35

Requirements for discharge of hazardous substances and mixtures to sewers

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|-----|---------------------|---|----------------|------------------|
| 4 | November 7, 2022 | Regular update and and actualization app.3: Good sence power, Sanifris , Suma Star plus D1, Suma multi purpose D2, Suma total D2.4, Suma bac D10, Divosan etha plus, Suma Revoflow pristine pur0eco A18, Suma calc D5, Suma frit D9.1, Suma revoflow max P2 en Sure Floor Cleaner removed. Lubron-PCS-2, Excelsum C Passive, Assert Clean, MAXX Magic2, Sirfan Speed, Toprinse clean, Lime-a-way extra, Absorbit en Solid clean M added. Klercide Low Residue Quat specified. | Stichting-ALt | Management |
| 3.3 | July 8, 2021 | Appendix 35.3 Suma Revoflow Pristine Pur Eco A18, Suma Revoflow Max P2 and P3-Oxinia Active added, Suma Crystal A8 en Suma Revoflow Max P1 removed. | Stichting-ALt | Management |
| 3. | February 2 10, 2021 | Appendix 35.3 Suma Crystal A8 and SURE Floor cleaner added. In version 3 of Aug 13 2020, referring to KAM19 is removed, KAM19 is from Dec 20 2018 included in KAM07. | Stichting-ALt | Management |
| 3. | January 4, 2021 | Appendix 35.3 Klercide, MEIKOLON ÖkoClean KS, MEIKOLON ÖkoCleanFR, Rogypal AC-309 en Special kennel cleaner added | Stichting-ALt | Management |
| 3 | August 13, 2020 | Adjustment cleaning products used by cleaning companys and company canteen appendix 35.3 | Stichting-ALt | Management |
| 2 | May 29, 2017 | Adjustments and renewal of substances and preparations based on new 'general assessment methodology 2016' (NL: Algemene BeoordelingsMethodiek 2016 [ABM]) | Stichting-ALt | Management |
| 1. | October 1 11, 2016 | Appendix 35.3: Cosa CIP 92 added | Stichting-ALt | Management |
| 1 | October 13, 2015 | Adapting adjustments including introduction concept 'line manager' | Stichting-ALt | Management |
| 0 | June 23, | New format | St. AL-terrein | Management |
| Rev | Datum | Omschrijving | Auteur | Goedgekeurd door |

Changes compared to the previous version

Minor textual changes have been made.

Page 1: clarified waste water streams

Separate documents have been made for appendices 1, 2 and 3 in connection with frequent updating of appendix 3 “Assessed cleaning agents, disinfection agents and boiler water treatment agents, buffer fluids and other substances”

Introduction

According to the Environmental permit, waste from laboratories and production sites is considered hazardous waste. This hazardous waste has to be collected and is not be discharged to sewers. Other KAM-rules that are relevant to this KAM-rule (35) are displayed in Table 1:

Table 1: Other KAM-rules relevant to KAM-rule 35

| No. KAM-regulation and title | Relevance |
|--|---|
| 03 Hazardous substances | Working with hazardous substances, only if prescribed measures are followed |
| 07 Disposal of (hazardous) waste | Dispose of hazardous substance as hazardous waste |

The following waste water streams are generated at the USPB:

- Laboratory waste water and waste water from vaccine production;
- Domestic waste water and waste water from cleaning activities;
- Boiler flush water and waste water from the flush of cooling towers;
- Unpolluted and (possibly) polluted rainwater.

All waste water streams are discharged together into one waste water sewer, which means the entire discharge is subject to permit requirements and the waste water may only be discharged under certain conditions. This concerns waste water from biological production and waste water from a flow cytometer, when inactivated (e.g. in a autoclave or kill tank), as well as cleaning agents, disinfection agents and boiler water treatment agents as mentioned in appendix 3 (after positively evaluated according to the diagram in appendix 2).

For the waste water that only may be discharged under certain conditions, this KAM-rule offers the application framework. Insight into the aquatic hazard of the substance or mixture is necessary before discharge of the substance or mixture can take place. Based on these insights a so-called decontamination effort can be determined for these substances or mixtures. This is done by using the ‘general assessment methodology’ (NL: [Algemene BeoordelingsMethodiek \[ABM\]](#))¹. To determine the aquatic hazard of substances or mixtures, information is required on the properties of the substances and the composition of the mixtures.

The following requirements in the environmental permit (VOH) of the site determine the admissibility of substances and mixtures for discharge:

- Requirements for discharge regarding various substances (see also appendix 1). This concerns aqueous waste streams from samples of e.g. ground and/or drinking water that have been acidified. It is allowed to discharge these acidified samples to sewers, provided that, they do not contain SVHCs or other aquatic hazardous substances and provided that, apart from the acid, no other hazardous substances are contained by / added to the samples;

¹ ‘Algemene Beoordelingsmethodiek (ABM), Methode ter bepaling van de benodigde saneringsinspanning bij lozingen op basis van stoffeigenschaften’, Ministerie van Infrastructuur en Milieu.

- Substances that are being discharged in significant quantities (e.g. cleaning agents, disinfection agents and boiler water treatment agents) have to be subjected to an ABM-assessment. Cleaning and disinfection agents for example, are being used in washing machines in the laboratory (for the cleaning of glassware) as well as being used for cleaning laboratories, production rooms and other types of rooms.

No hazardous substances may be discharged, except for cleaning agents, disinfection agents and boiler water treatment agents that sufficiently degrade in or are removed by the municipal waste water treatment plant and therefore are listed in Appendix 3 of this KAM rule.

The criteria for classification and the appropriate decontamination efforts are given in the ABM. The decontamination effort (measures at the source by substitution, reuse and process modification, followed by further minimisation by purification of the waste water stream) has to be executed before a discharge of cleaning agent, disinfection agent or boiler water treatment agent takes place. The application of the criteria is explained in the chapter 'Method'.

In the environmental permit and in the Activity Decree (NL: Activiteitenbesluit) the criteria for the site regarding laboratories, production locations and several hazardous substances are laid down. This KAM-rule explains the given restrictions (see appendix 1) and the measures to comply with the requirements for discharge.

Objective

The objective of this KAM-rule is, that the method for the assessment of environmentally hazardous substances regarding the collection of waste and potential discharge hereof to sewers is known and followed.

Responsibilities

The following applies to this KAM-rule:

- The line manager is responsible for the implementation of and compliance with this KAM-rule within his own organisational unit.
- The employee is demonstrably familiar with this KAM-rule and follows the method as described.

Method

The ABM-assessment discriminates in the categories Z, A, B or C, which results in the decontamination effort for the substance to be discharged.

| | |
|---|--|
| Z | Substances of Very High Concern (SVHC): set of substances that are most hazardous to humans and the environment; |
| A | Not readily biodegradable aquatic harmful substances; |
| B | Readily biodegradable aquatic harmful substances; |
| C | Substances that occur naturally in local surface water. |

This classification is based on the physical, chemical and toxicological properties (in the ABM, the biodegradability is the starting point of the assessment). The requirements for determining the category of a substance are given in appendix 2, as well as the required information and the flowchart for classification.

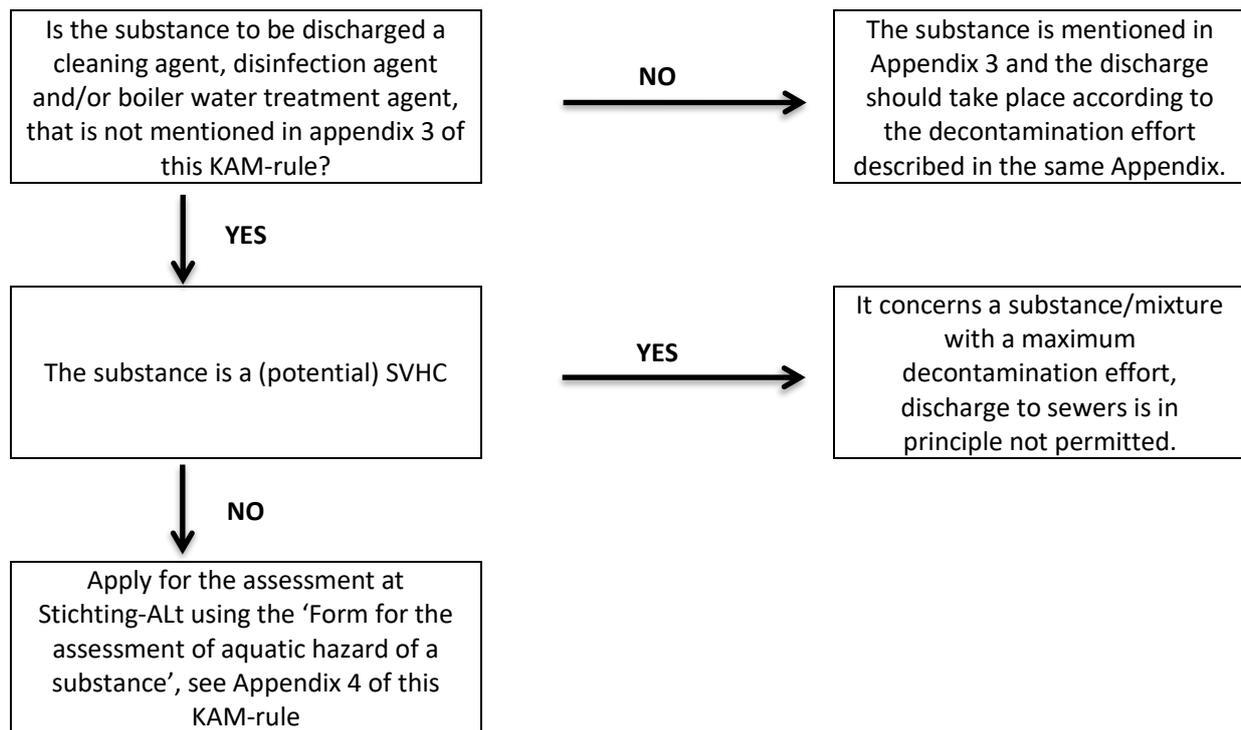
Before cleaning agents, disinfection agents and boiler water treatment agents are allowed to be discharged to the sewer, an ABM-assessment has to be carried out by a waste water expert.

Before discharge can take place the following steps have to be taken, in case the substance involved is not classified according to appendix 3:

- 1) The user fills out the complete form (appendix 4 'Form for the assessment of the aquatic hazard of the substance'). The form has to be sent to Stichting-ALt (secretaris@stichting-alt.nl) including the Safety Data Sheet (SDS);
- 2) Stichting-ALt evaluates if the form contains sufficient information. The user is informed if an ABM-assessment can be executed with the information provided for or if further information is needed.
- 3) If sufficient information has been received, the Stichting will send the information to a waste water expert who will evaluate the aquatic hazard of the substance using an ABM assessment;
- 4) The assessment and results of the ABM-assessment are communicated to the user. The substance is classified into one of the categories Z, A, B or C.

Depending on the result of the ABM-assessment the user takes measures and/or provisions corresponding with the category, as determined in appendix 2

Flow chart assessment aquatic hazard



Terms and abbreviations

| Subject | Elaboration | Explanation |
|---------------------|--|---|
| ABM | General assessment methodology i.e. an assessment for determining in which category (Z, A, B or C) a certain hazardous substance falls and which decontamination effort is required. | Method to evaluate substances and mixtures based on the aquatic hazard of the (mixtures of) substances. |
| Z-category | Substances of Very High Concern (SVHC): A set of substances that are most hazardous to humans and the environment (e.g. polycyclic aromatic hydrocarbons, dioxins, mercury and its compounds). | Use of these substances has to be terminated. https://rvs.rivm.nl/stoffenlijsten/Zeer-Zorgwekkende-Stoffen (Click on the diverse documents and links on this website for additional information. In Dutch) |
| A-category | Not readily biodegradable aquatic harmful substances. | Use of these substances has to be terminated. |
| B-category | Readily biodegradable aquatic harmful substances. | Discharge of these substances has to be prevented as much as possible. |
| C-category | Substances that occur naturally in local surface water. | For these substances the need for taking emission reducing measures has yet to be determined. |
| KAM-rules | Kwaliteit, Arbo- & Milieuregels (rule for Quality, Occupational Health and Safety and Environmental protection.). | |
| Line manager | The responsible supervisor. | |
| Site | USPB site at the Antonie van Leeuwenhoeklaan. | USPB: Utrecht Science Park Bilthoven. |
| VOH | Vergunning op Hoofdzaken (Permit on essentials), that is the environmental permit with conditions the entire USPB must meet. | Environmental Permit that includes the discharge rules and the ABM-test. |
| Wabo | Wet algemene bepalingen omgevingsrecht (Environmental Licensing (General Provisions) Act). | Legislation concerning the environmental permit. This permit is a single integrated permit for nature and environment, building, discharge to sewers, etc. |

Appendices

- Appendix 1: Requirements for discharge
- Appendix 2: ABM-assessment: evaluation of substances (Z, A, B or C)
- Appendix 3: Assessed cleaning agents, disinfection agents and boiler water treatment agents, buffer fluids and other substances
- Appendix 4: Form for the assessment of the aquatic hazard of the substance or mixture

Appendix 35.1: Requirements for discharge to sewers

The organizations on the USPB use a common sewer. Discharged waste water ultimately leaves the AL-site via three sample pits. These sample pits are located at the site borders. The environmental permit contains strict discharge requirements for these three sample pits, with regard to heavy metals², BTEX³ and VHCs⁴, see tables A and B below.

Table A. Maximum content in any sample

| Measuring point | Parameter | Maximum (in µg/l) |
|-----------------------------|---|-------------------|
| M01, M02 & M03 ⁵ | Heavy metals | 1 000 |
| | BTEX | 10 |
| | Sum of halogenated aliphatic hydrocarbons (NL: VGK) | 10 |
| | Sum of mineral, plant and animal fats and oils | 200 000 |

Table B. Maximum content in a volume-proportional day sample

| Measuring point | Parameter | Maximum (in µg/l) |
|-----------------|---|-------------------|
| M01, M02 & M03 | Heavy metals | 500 |
| | BTEX | 5 |
| | Sum of halogenated aliphatic hydrocarbons (NL: VGK) | 5 |

In order to comply with these discharge requirements for the mentioned substances, the following measures are taken:

- Use of alternative substances (that are less hazardous to the environment) where possible;
- If no alternatives are available, quantities used are reduced to a minimum;
- When used, discharge of these substances to sewers should be prevented as much as possible. This also applies to residues and to the cleaning of (auxiliary) materials (e.g. glassware).

² Heavy metals: Chromium, Copper, Lead, Nickel, Silver, Zinc.

³ BTEX: Benzene, Toluene, Ethylbenzene en Xylene.

⁴ VGK (Volatile Halogenated Hydrocarbons: Sum of Dichloromethane; 1,1-dichloroethane; trichloromethane (chloroform); 1,2-dichloroethane; 1,1,1-trichloroethane; tetrachloromethane; trichloroethylene; 1,1,2-trichloroethane; tetrachloroethylene; cis-1,2-dichloroethylene; trans-1,2-dichloroethylene.

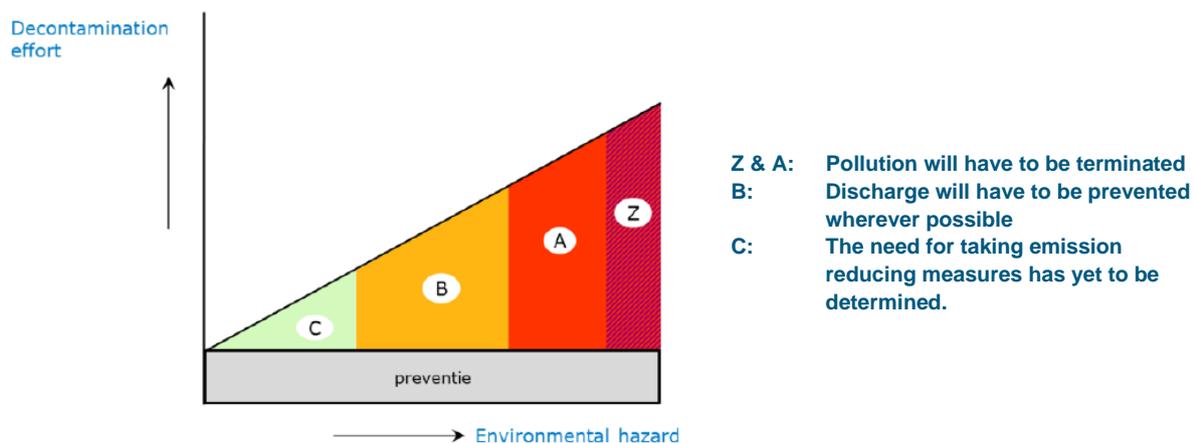
⁵ M01: sample pit Antonie van Leeuwenhoeklaan, M02: sample pit Brandenburgerweg, M03: sample pit main entrance.

Appendix 35.2: ABM-assessment: evaluation of substances (Z, A, B or C)

ABM-assessment

To ensure proper implementation of the water quality policy it is considered necessary to have insight into the aquatic hazard of substances and/or mixtures to be discharged. The more hazardous a substance or mixture the more effort to decontaminate the discharge is required. This is schematically indicated in figure 1.

Figure 1: General relationship between decontamination effort and the aquatic hazard level of substances



The aquatic hazard of a substance depends on a large number of intrinsic properties, such as toxicity (acute or chronic), biological degradability and bioaccumulative potential (also based on the n-octanol/water partition coefficient (log K_{ow})), carcinogenicity, mutagenicity and reprotoxicity. According to the General Assessment Method (ABM) the substance is classified into one of the following four categories based on these data:

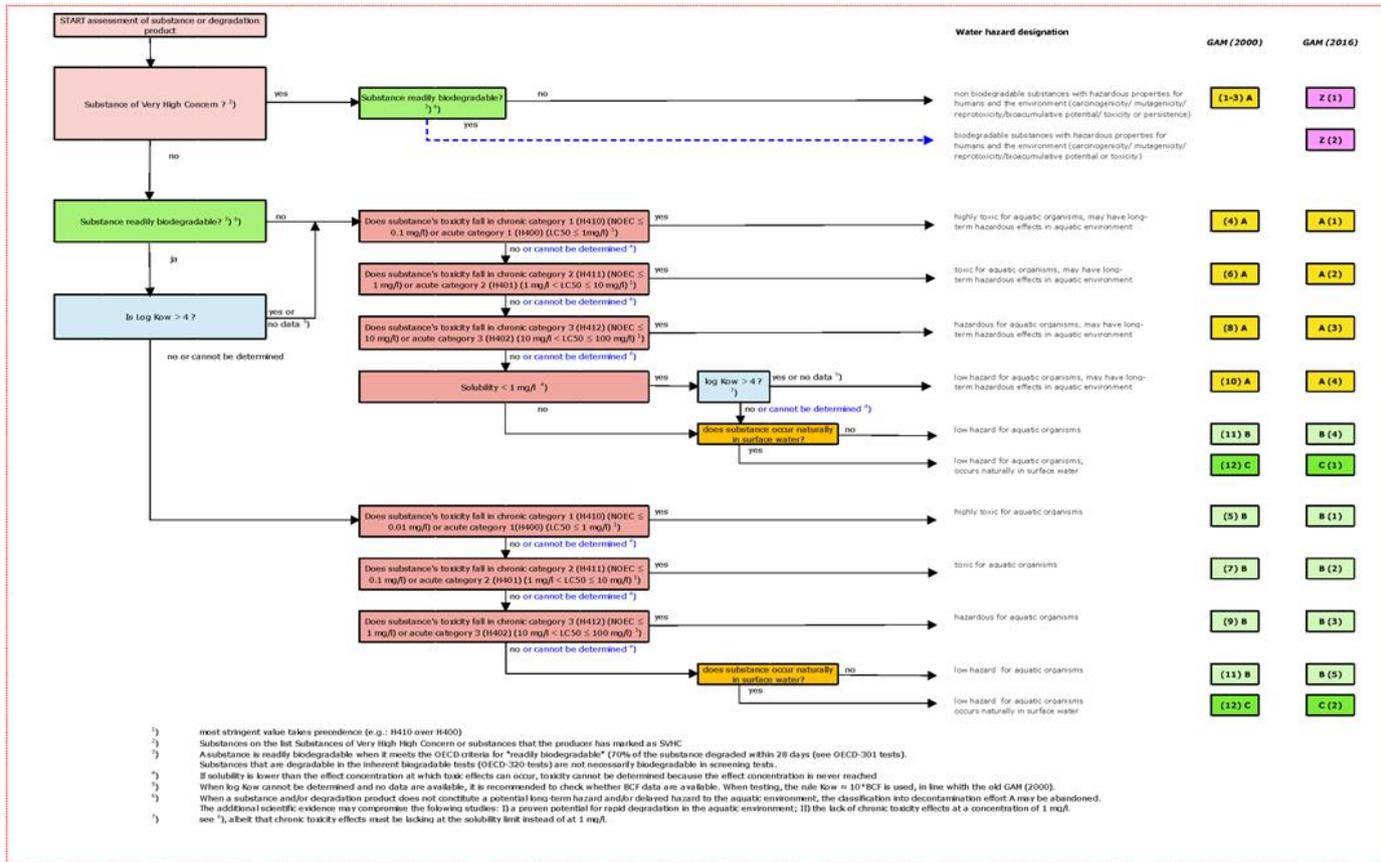
- Z: Substances of Very High Concern, SVHC, set of substances that are most hazardous for humans and the environment);
- A: not readily biodegradable aquatic harmful substances;
- B: readily biodegradable aquatic harmful substances;
- C: substances that occur naturally in local surface water.

Figure 2 indicates the assessment scheme used for the ABM.

Carcinogenicity, mutagenicity and reprotoxicity (among others by hormone disrupting effects) are not indicated in this scheme as a separate assessment criterion, but are classified into the category SVHC.

For the ABM a worst case approach is followed. If no data on specific properties is available, the worst case classification is used: either the most toxic category, or the property not readily biodegradable or log K_{ow} > 4.

Figure 2 : General assessment method for substances



²⁾The GAN uses a worst case approach. If no information on specific substance properties is available, a worst case scenario is applied: either the most toxic class or NOT readily biodegradable or log Kow > 4.