LANUV
Kompetenz für ein lebenswertes Land

North Rhine Westphalian
State Agency for Nature, Environment
and Consumer Protection

Limit values for odour in ambient air - A legal system applied all over Germany

Dr. Ralf Both

9th IWA Odour & VOC/Air Emission Conference

Bilbao, 26.10.2021

Introduction

Objectives of odour regulation

- In the Federal Immission Control Act (BImSchG) odours are treated as an air pollution (Immission), which is liable to cause a considerable nuisance (Article 3 BImSchG)

- What makes a nuisance a considerable / significant nuisance?
- The scientific challenge was to find a sound relationship between the odour exposure of residents and the related annoyance degree (odour exposure - odour impact relationship)

Development of methods

Methods in use

- Olfactometry
  VDI 3881:1986
  EN 13725:2003
- Dispersion modelling
  Gaussian model (till 2000)
  Lagrangian particle model AUSTAL2000 (VDI 3945 Part 3; Janicke and Janicke, 2007)
- Direct measurement of odour exposure with grid measurements
  VDI 3940 Part 1 1993/2006 “Determination of Odorants in Ambient Air by Field Inspections with grid measurements”
  since 2016: EN 16841 Part 1:2016

!

Only for scientific investigations

- Assessing odour annoyance of residents by face-to-face interviews
  VDI 3883 Part 1 2015 “Assessment of odour annoyance – Questionnaires”

!

Development of limit values

Odour exposure – odour impact relationship

- Investigations show …
  - a statistically significant correlation between odour exposure in terms of odour hour frequencies and odour annoyance
  - Therefore, it is not necessary to examine the annoyance degree directly by face-to-face interviews in every individual case

Limit values for different area utilizations

Residential and mixed areas	Commercial and industrial areas	Villages
0.10	0.15	0.15

Development of limit values

Odour exposure – odour impact relationship

- Investigations show …
  - that the annoyance potential of unpleasant/neutral industrial odours is significant higher than that of pleasant odours
  - that the annoyance potential of poultry odour is higher in comparison to industrial odours and that the annoyance potential of pig odour is lower and fewest for cattle odour

Weighting factors for odours with a different annoyance potential

Odour type	Weighting factor f
Pleasant industrial odour **(details see Kwiatkowski!)**	0.5
Fattening poultry (turkeys, broilers)	1.5
Fattening pigs, sows	0.75
Dairy cows, fattening bulls including young cattle	0.5

Odour regulation in Germany

German Guideline on Odour in Ambient Air (GOAA)

- Since 1993 the GOAA is applied by responsible authorities
  - in permitting (licensing)
  - in monitoring (surveillance) and
  - in urban land use planning
- Even if the GOAA is not binding for judges, the GOAA is the basis for the decisions in court cases all over Germany

German odour regulation in practice

Solar thermal sewage sludge drying plant

Luftbild (10/2020) © Team Vermessung / EGLV

German odour regulation in practice

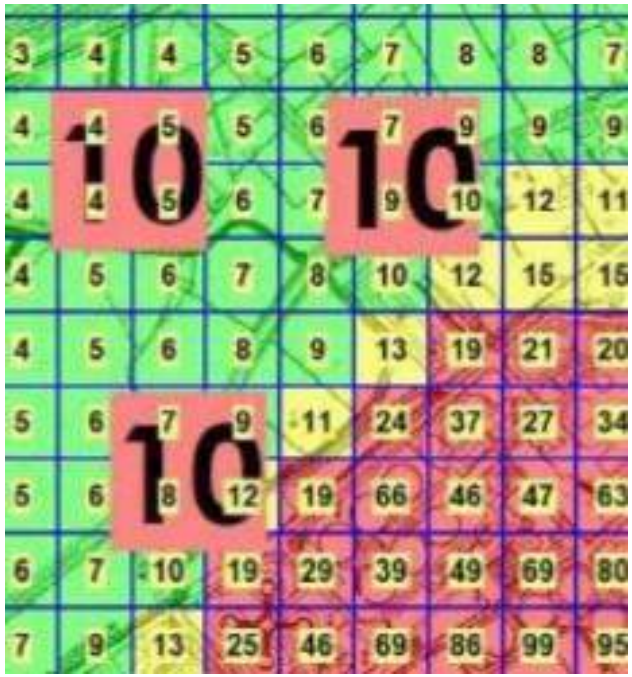
Solar thermal sewage sludge drying plant

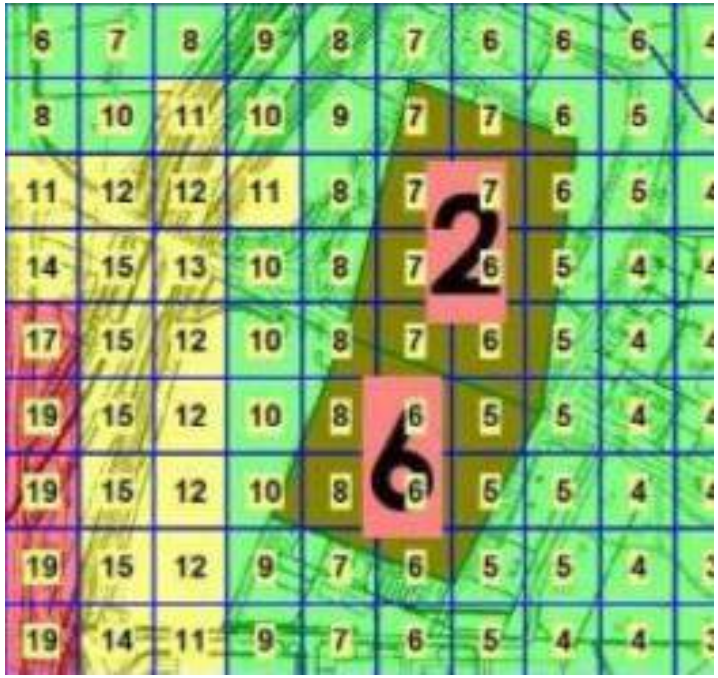
- The responsible authority decided that
  - the initial and the total odour exposure of residents needs to be addressed (dispersion modelling **and** grid measurement)
  - future odour emissions were negligible because of the decision of the plant operator to install an odour abatement system (biofilter) for the new plant and the distance to next relevant dwelling

German odour regulation in practice

Solar thermal sewage sludge drying plant

- The result of the grid measurement is the truth !
- The results of the dispersion modelling needed to be modified by varying the emission factors of the sources



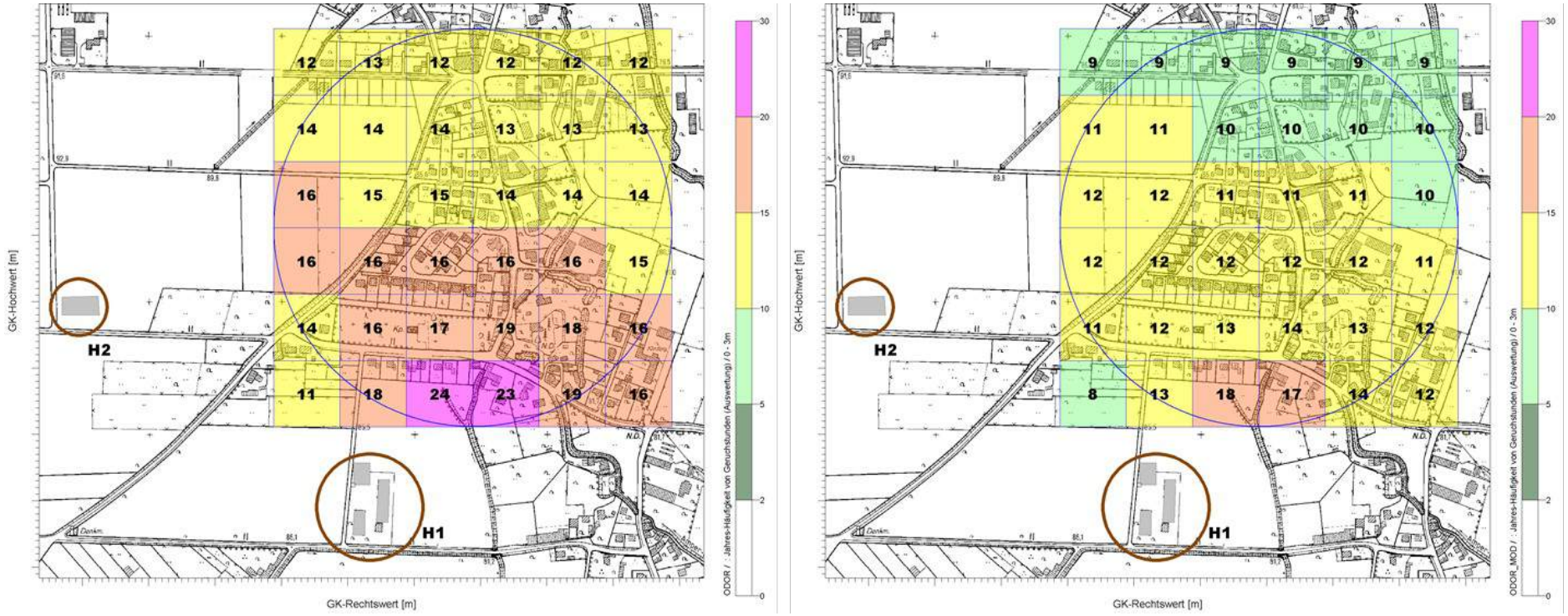


Odour frequencies [%] calculated by dispersion modelling and results of the grid measurement as odour frequencies [%]

German odour regulation in practice

Livestock farming

- Depending on the animal species, the weighting factors are considered for the calculation of the odour frequencies



Odour immission frequencies [%] calculated by dispersion modelling for two pig farms without (left) and with a weighting factor of 0.75

Summary: Odour regulation in Germany

- A wide range of experience with the determination and assessment of odours, including
- different types of sources (point, active, fugitive),
- different meteorological conditions (e.g. valley locations, cold air drainage),
- combinations of different methods (e.g. dispersion modelling versus grid measurement),
- different kinds of area utilization and
- the application of different limits values

Summary: Odour regulation in Germany

First General Administrative Regulation pertaining the Federal Immission Control Act (Technical Instructions on Air Quality Control – **TA Luft**)

- The scientific basis of the regulation (GOAA), its proven value in expert practice and in court proceedings has led to a broad acceptance of these regulations and ultimately to their inclusion in the TA Luft.
- For the first time, TA Luft 2021 includes the protection from harmful environmental effects due to odours in ambient air (No. 4.3.2)
- The GOAA is in detail incorporated as Annex 7
- Valid from 01.12.2021

Thank you for your attention

Any Questions?

Dr. Ralf Both
Landesamtes für Natur, Umwelt und Verbraucherschutz des Landes Nordrhein-Westfalen
Leibnizstraße 10
45659 Recklinghausen
Office: Wallneyerstr. 6, 45133 Essen

ralf.both@lanuv.nrw.de
www.lanuv.nrw.de