ENVIRONMENT AGENCY AUSTRIA umweltbundesamt

A NEW NATIONAL RISK ASSESSMENT FRAMEWORK IN AUSTRIA

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OUTLINE

- Introduction – Legal and financial background
- Risk Analysis – framed by 6 steps
- Land use classification
- Exposure scenarios
- Exposure parameters
- Trigger values

Legal background in Austria

- Water Act (WRG 1959)
- Contaminated Sites Remediation Act (ALSAG 1989)
- Waste Management Act (AWG 2002)

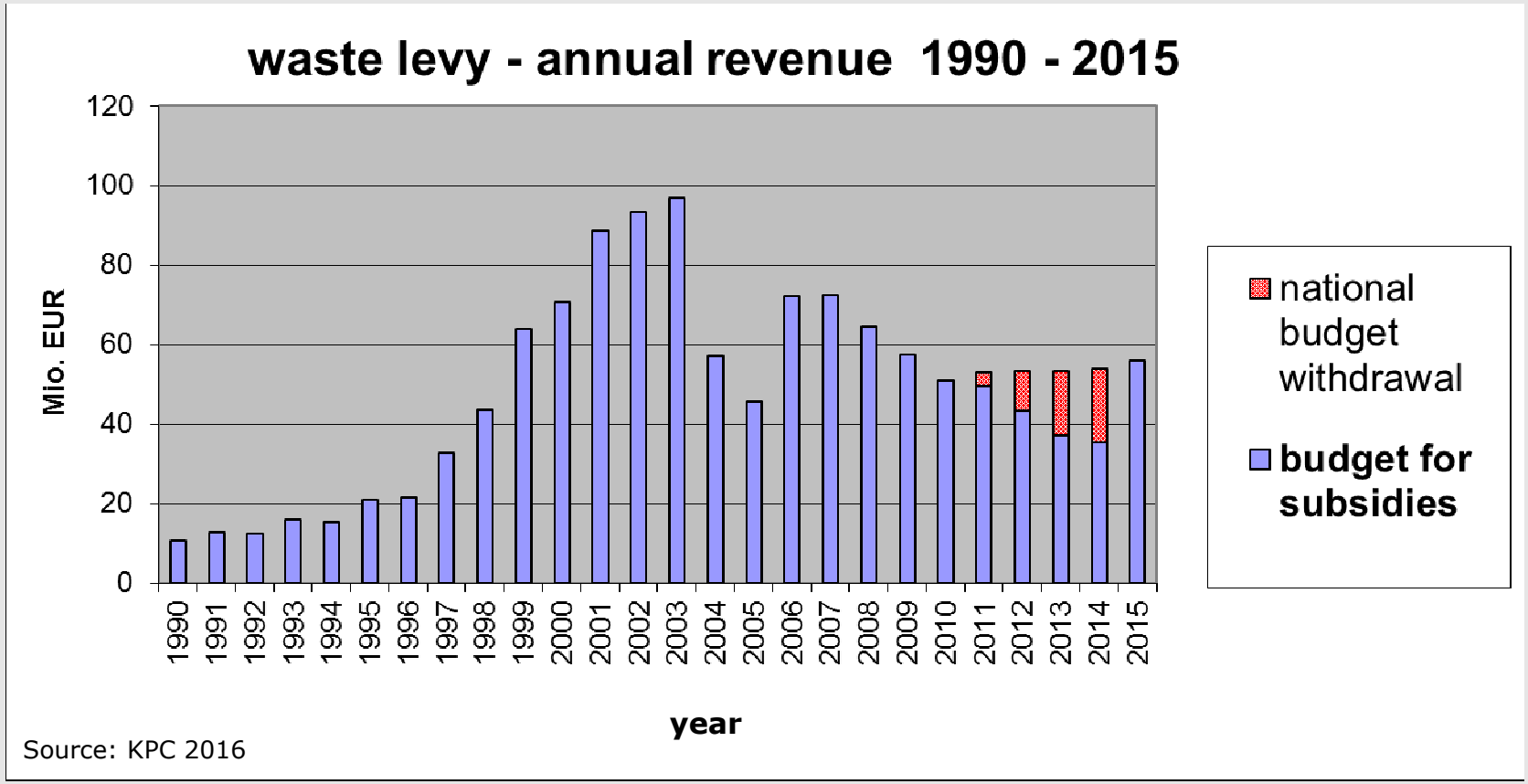
- Austrian Standard ÖNORM S 2088
  - part 1: Groundwater (2nd edition 2004; under revision)
  - part 2: Soil (2014; 2nd edition)
  - part 3: Air (2003; 1st edition)

<u>Not existing in Austria (federal level):</u>

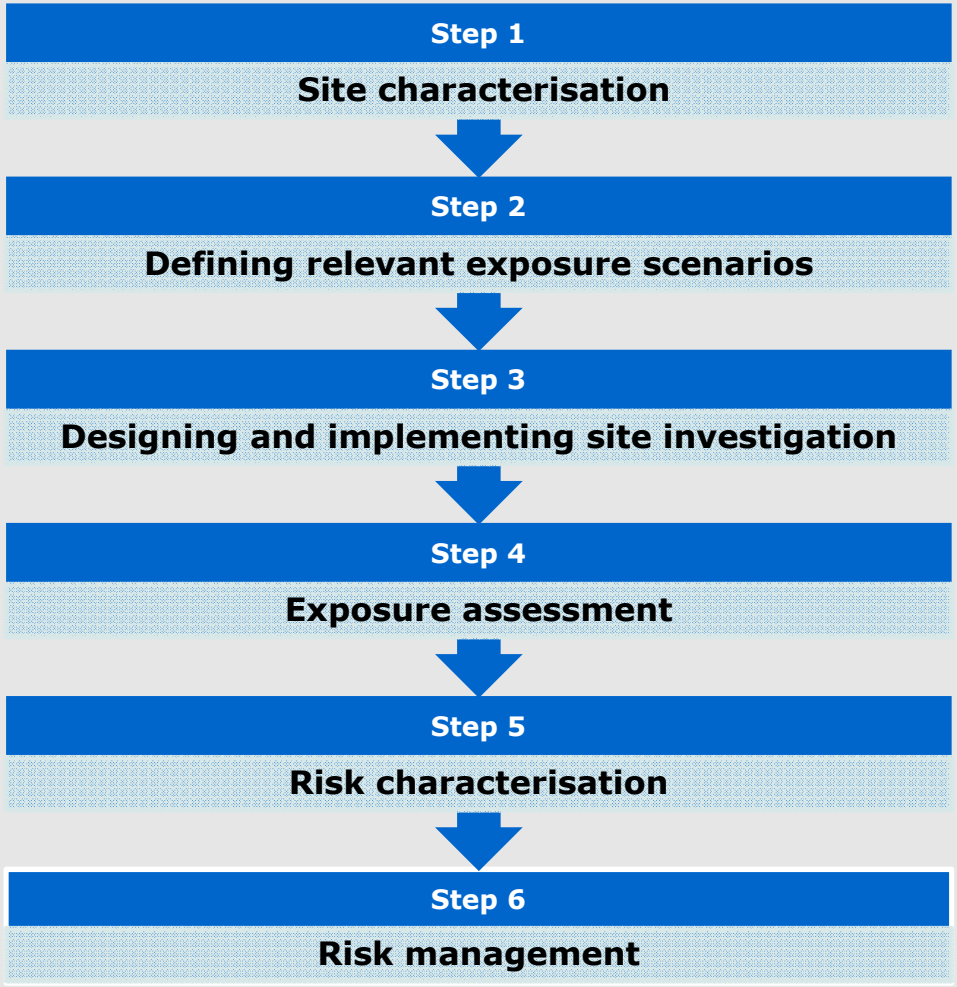
- Soil Protection Act

Public remedation budget

total (1990 – 2015): ~ 1,24 bio. EURO



Source: KPC 2016



Source: Environment Agency Austria, 2011

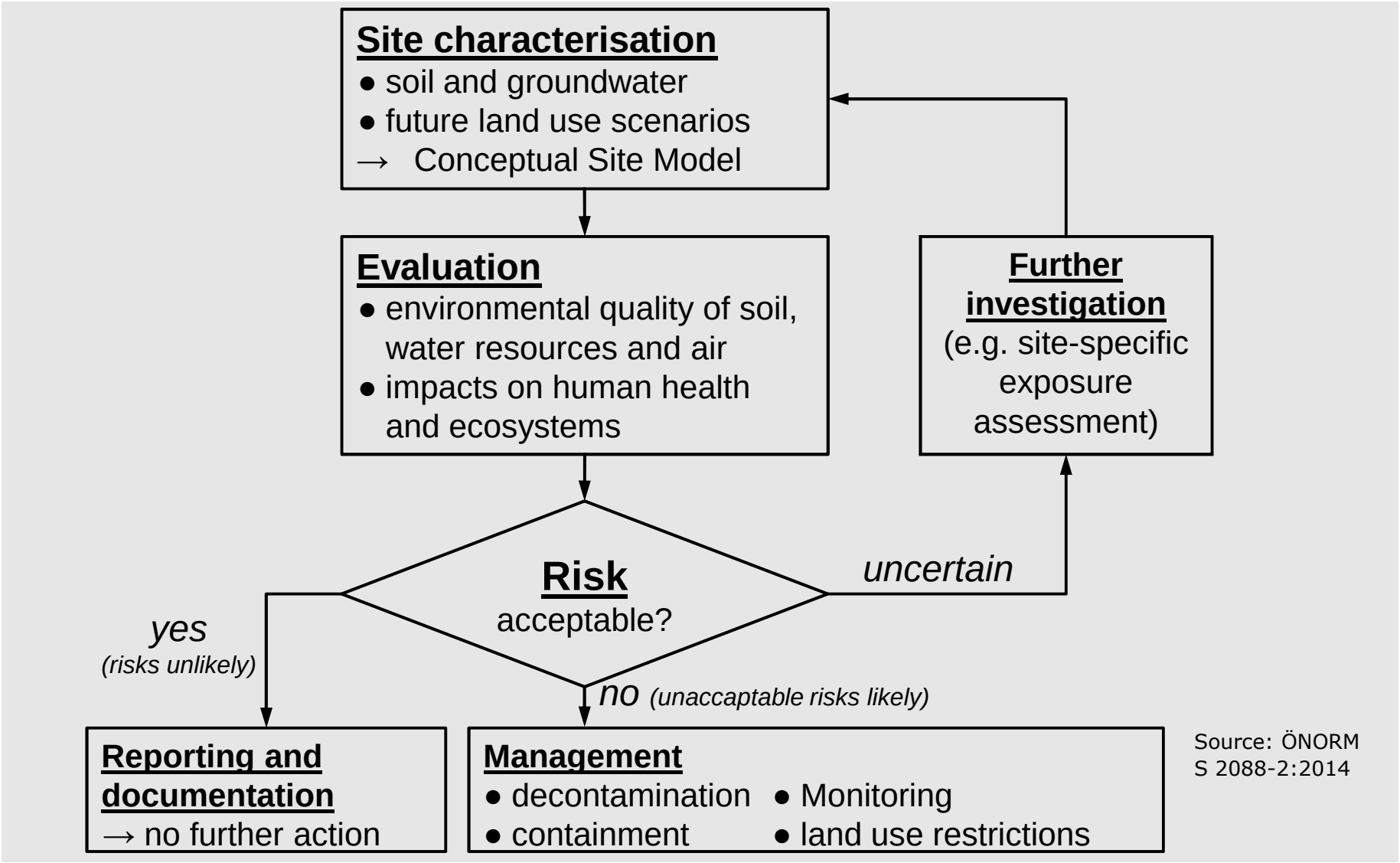
Risk Analysis - General framing to the process

... as a prerequisite to risk characterisation the focus needs to defined:

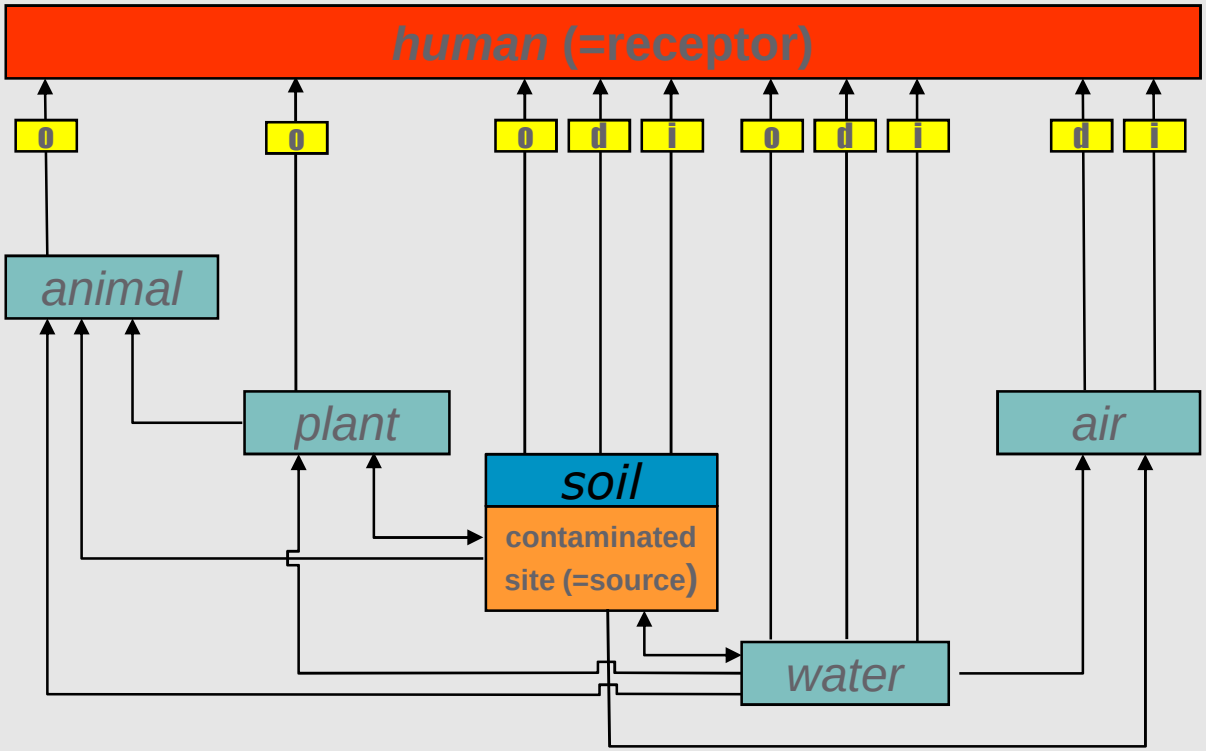
- specific activities (e.g.gardening)
- specific real estates
- entire site

ÖNORM S 2088-2

- Austrian Standard adopted by 1. September 2014
- land-use-specific evaluation of soil contamination
- Risk Characterisation
  - 5 different types of land uses
  - Oral, inhalative and dermal scenarios
  - Toxicologically derived trigger values


Site characterisation
● soil and groundwater
● future land use scenarios
→ Conceptual Site Model
Evaluation
● environmental quality of soil, water resources and air
● impacts on human health and ecosystems
Further investigation
(e.g. site-specific exposure assessment)
Risk
acceptable?
uncertain
yes
(risks unlikely)
no (unaccaptable risks likely)
Reporting and documentation
→ no further action
Management
● decontamination
● containment
● Monitoring
● land use restrictions
Source: ÖNORM S 2088-2:2014

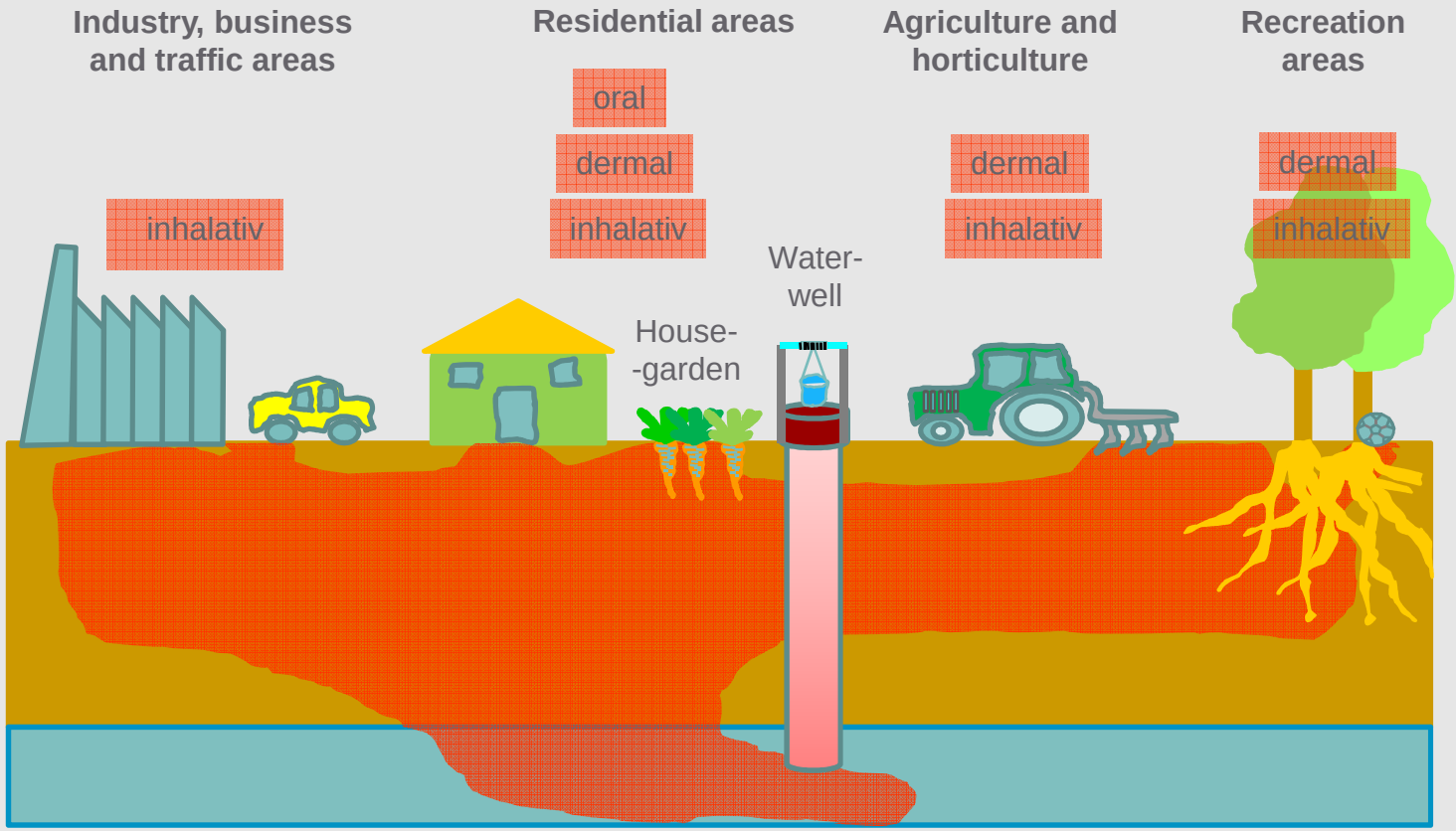
Potential pathways of exposure…



Source: Environment Agency Austria, 2011

…but which are relevant for my site?

Land use, activities & exposure pathways



Source: Environment Agency Austria, 2011

Discussions on exposure scenarios

- It was decided not to use modelling approaches and complex scenarios combining different exposure pathways, but to derive land-use-specific trigger values according to a sensitivity test for identifying a most relevant activity and exposure pathway.
- To recognize exposure by multiple contaminant sources the additional contaminant exposure by soil contamination is limited by 20 % of the acceptable daily intake (ADI).
- The process of deriving trigger values needs to be transparent and reproducible by a documentation of any algorithm or exposure parameter

  ➔ see Annexes of ÖNORM S 2088-2:2014
- Accordingly referring to new scientific data any knowledge based amendment for the generic reference scenarios is feasible in using the standard on the mid-term.

5 different classes of land use

… and simplifying exposure scenarios:

- Playground – oral ingestion (and conservative approach due its to social sensitivity)
- Residential use – inhalative ingestion
- Agricultural and horticultural– inhalative ingestion
- Recreational use (generic characterisation or trigger values not possible)
- Industry, commerce and infrastructure (generic characterisation or trigger values not meaningful)

Defining and selecting exposure parameters

- Biometric parameters
- ingestion rates
- Soil-plant transfer rates

&

- Toxicological reference values

Plausibility testing

- control and comparison against background values (national data on agricultural and urban soils),
- trigger values from other European countries (Carlon C., (ed.); 2007),
- complementary national legislative documents (e.g. BAWP; "Federal waste management plan", 2011),
- bioavailability data, and
- data on carcinogenic potentials for different metals species.

Parameter	Dimension	Trigger value		
		playground	residential*	agriculture**
Antimony	mg/kg	5	60	2
Arsenic	mg/kg	20	50	20
Lead	mg/kg	100	500	100
Cadmium	mg/kg	2	2	0,5
Chromium	mg/kg	100	75	100
Cobalt	mg/kg	-	-	50
Copper	mg/kg	100	500	100
Molybdenum	mg/kg	-	-	2,5
Nickel	mg/kg	70	-	100
Mercury	mg/kg	1	10	0,5
Selenium	mg/kg	-	-	1
Thallium	mg/kg	-	-	1
Vanadium	mg/kg	-	-	100
Zinc	mg/kg	-	-	300
Fluoride	mg/kg	-	-	200
Cyanide	mg/kg	5	-	5
TPH	mg/kg	50	-	200
PCDD/F	ng TE/kg	50	600	10
PCB	mg/kg	0,2	2	0,1
PAH	mg/kg	4	10	2
Benz(a)pyren	mg/kg	0,1	0,5	-

Trigger values according to ÖNORM S 2088-2 (2014) – comparative summary (tables 1, 2 and 3)

- * residential (e.g. gardening) or agricultural use: site-specific risk analysis
- ** further investigation of contaminant uptake by plant
- TPH … Total Petroleum Hydrocarbons
- PCDD/F … dioxins and furans
- PAH … polycyclic aromatic hydrocarbons (16 reference substances)
- PCB … polychlorinated biphenyls (7 reference substances)

Source: ÖNORM S 2088-2:2014

A GENERAL QUESTION

- How clean is clean & risk acceptability?
  - Can´t be answered by a standard
  - Open stakeholder dialogue

CONCLUDING REMARKS

- Citizens usually not only want a “safe” place but a “good” place worth living to!
  - ➔ ÖNORM S 2088-2 aims on good soil quality

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Thank you for your attention!

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