

# Principles for Specific Clearance used in Proposed NORM Regulations in Sweden

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# NORM in Sweden

## Existing NORM (known activity)

- ➔ Historical waste; burned alumshale, phosphogypsum
- ➔ Blue lightweight concrete
- ➔ Mining residues
- ➔ Soil and bedrock



## Enriched NORM

- ➔ Drinking water treatment
- ➔ Peat ashes
- ➔ Steel industry
- ➔ Cement industry
- ➔ Scale
  
- ➔ Zirkonsand and welding rods
  
- ➔ No occupational exposure > 1 mSv/a
- ➔ NORM residues

## Radiation Protection Act (SFS 1988:220)

- Not intended for NORM, but applicable on NORM
- Small NORM "facilities" need licencing; private houseowners removing U from drinking water or living in a house built of blue light weight concrete
- SSM has the mandate to issue binding regulation according to the Radiation Protection Ordinance
- Regulation on NORM residues is aiming at administrative relief for NORM sectors and the authority and a safe management of NORM residues



## European BSS Draft on NORM

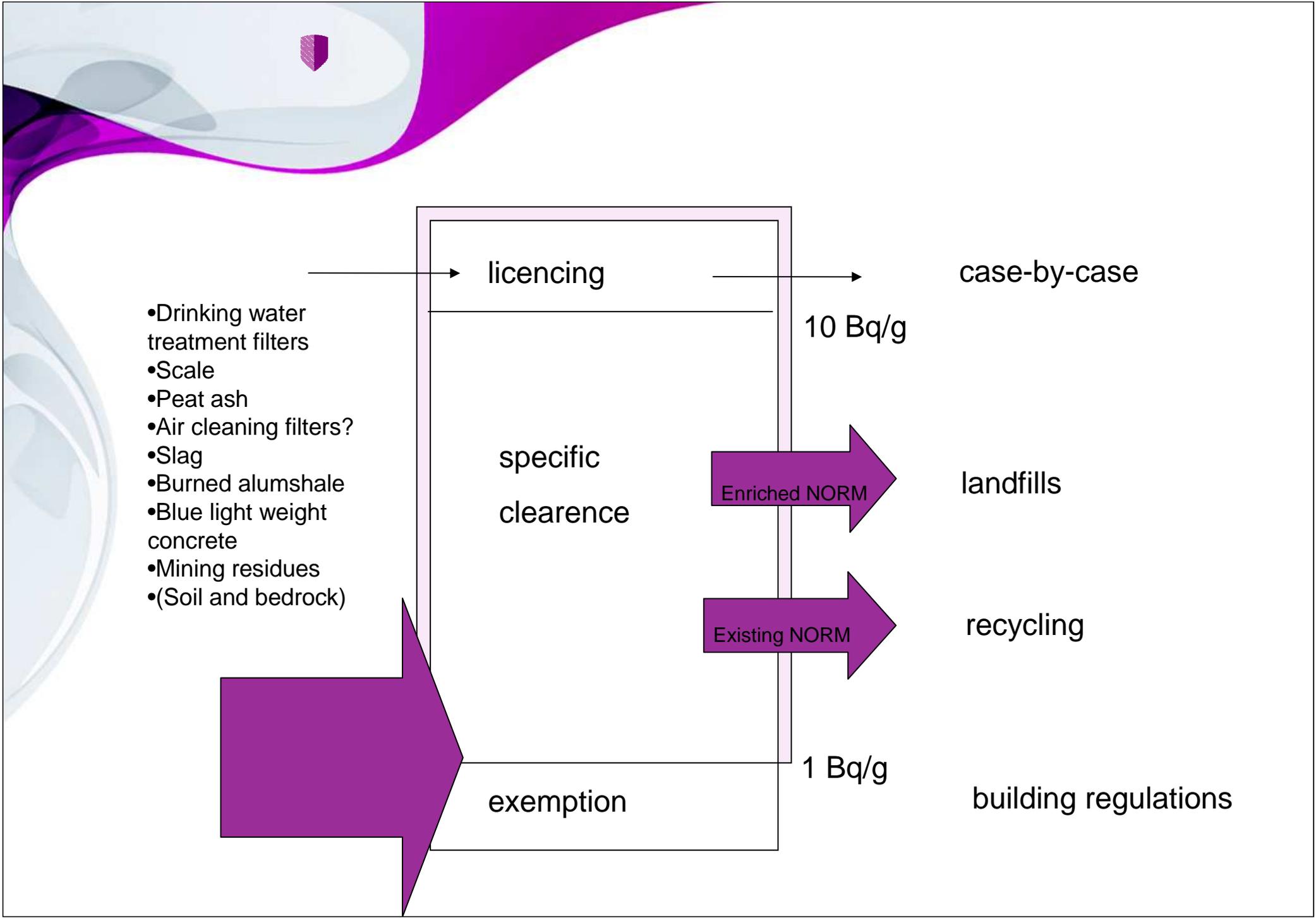
- Positive list of industrial sectors
- Exemption values and general clearance values
- Specific clearance = 0,3 mSv/a for members of the public
- Mixing of material is accepted in specific situations



## Specific Clearance for NORM residues

- Many small waste streams to landfills
- Can the NORM sector overview the consequences for landfills?
- Landfills for non hazardous waste
- The upper limit for the activity of uranium is the same as for uranium considering toxicity
- Can all material be put on landfills?

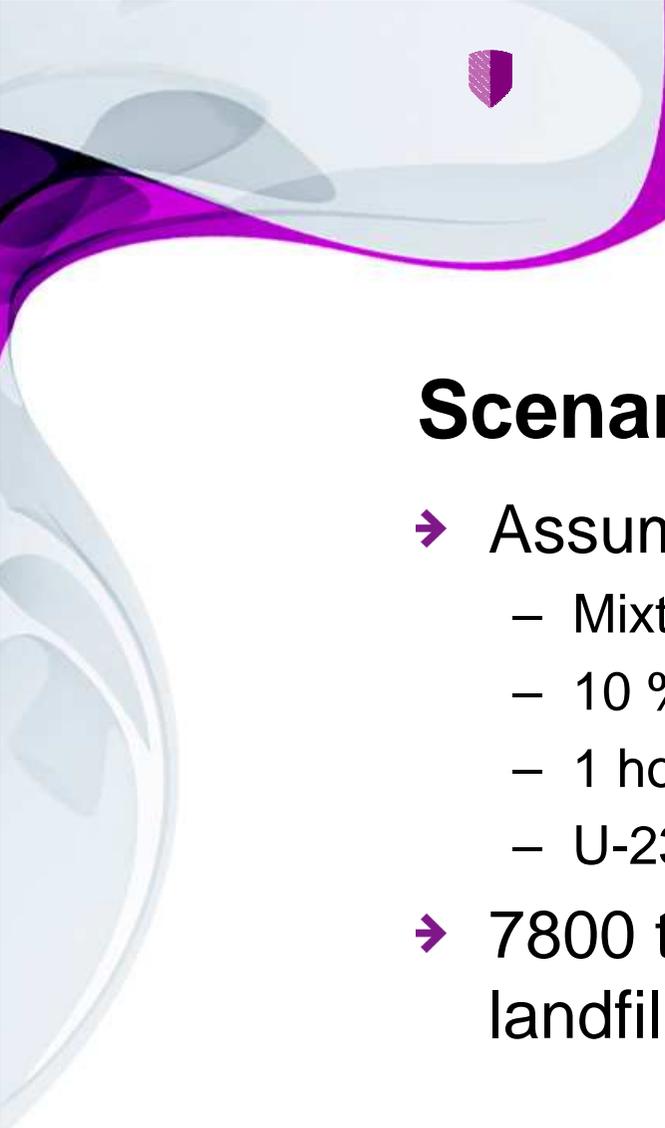






## Proposal on NORM Regulations

- Limit for licencing will be 10 Bq/g per nuclide
- 1 Bq/g per nuclide is used as exemption level
- Specific clearance for existing NORM with a known activity to landfills or recycling for road constructions, parking lots etc.
- Specific clearance for materials containing activities up to 10 Bq/g per nuclide to landfills
- No further requirements on control of the material
- Dilution accepted when it is the normal procedure
- > 100 tonnes/a above 1 Bq/g special regulation – environmental monitoring

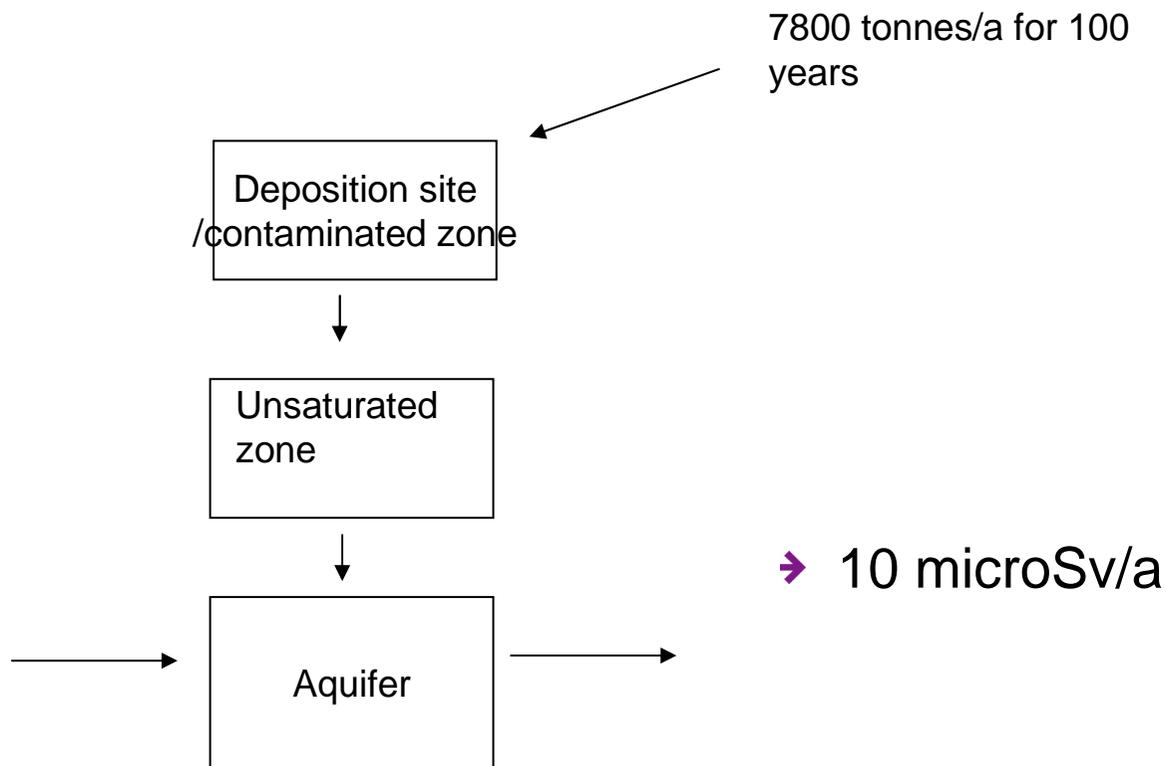


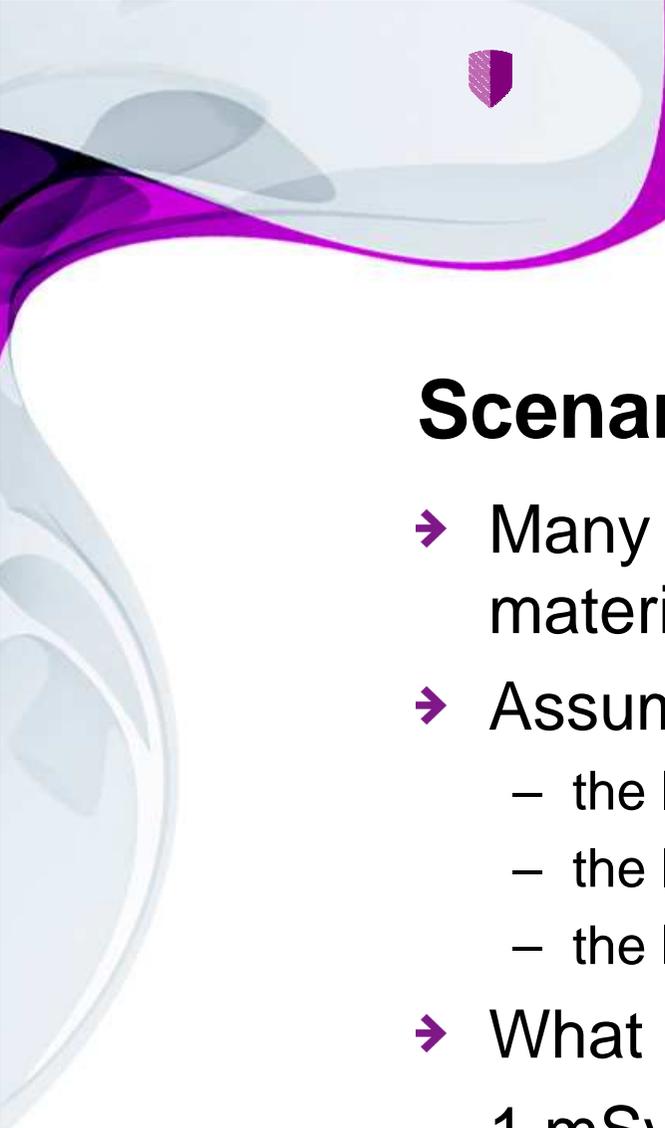
## Scenarios for landfills

- Assumptions:
  - Mixture of other materials, 10 % NORM
  - 10 % of intake from crops graded on the landfill
  - 1 hour stay at the landfill a day
  - U-238 sec
- 7800 tonnes of waterfilter/a in 100 years to one landfill

# Scenarios for landfills - aquifer

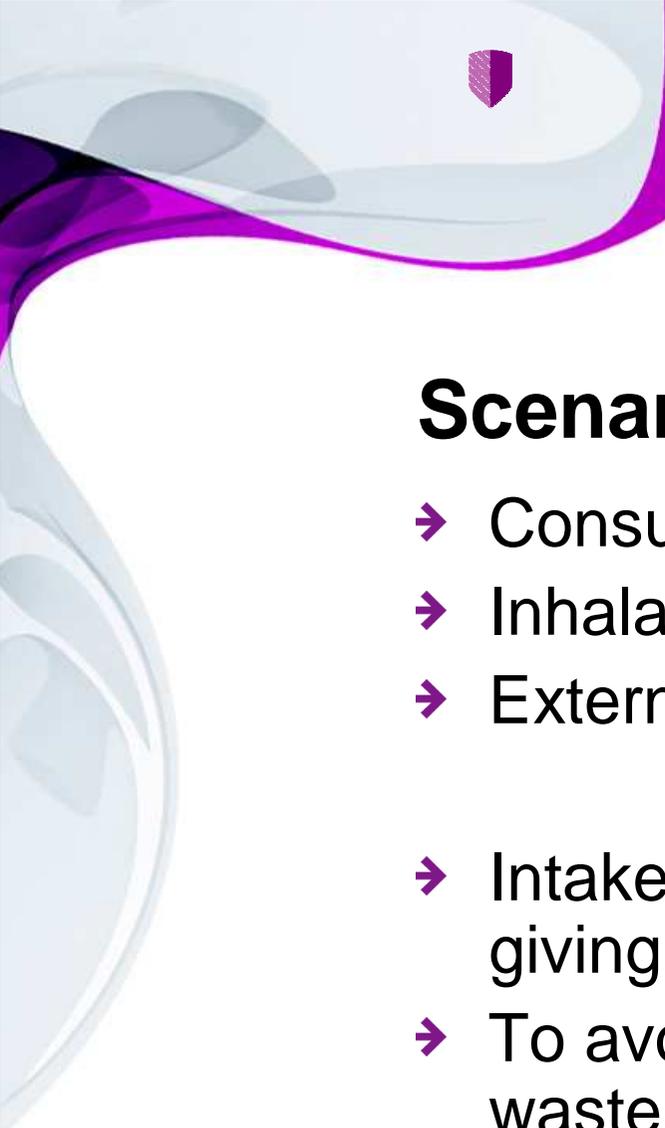
IAEA Safety Report Series no 44.





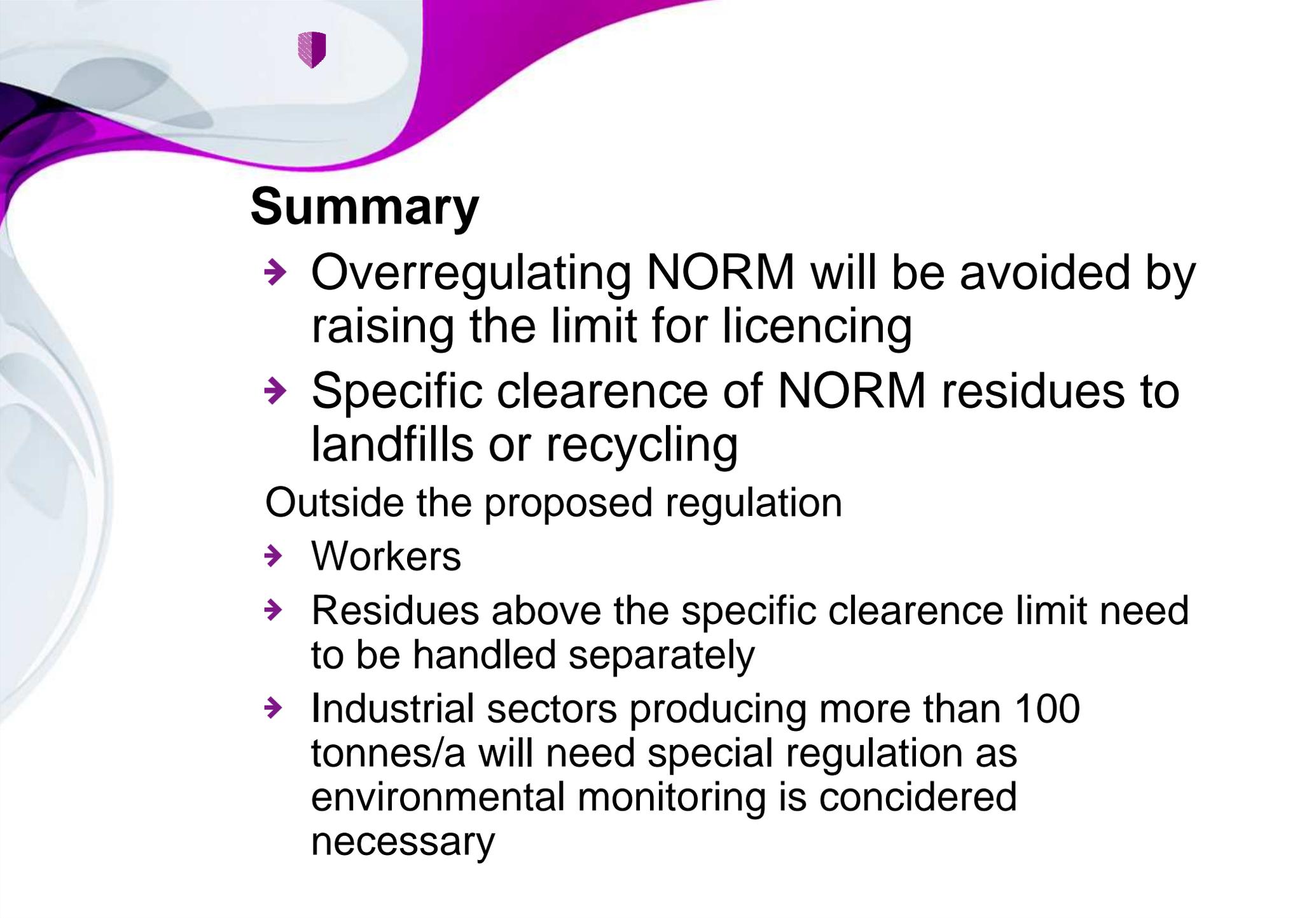
## Scenario landfill – future intrusion

- Many uncertainties; not only concerning the material itself but also sociogeographical factors
- Assumptions:
  - the location of the landfill is forgotten by society
  - the landfill is degraded and there is no covering layer
  - the landfill is used by members of the public
- What is the accepted dose?  
1 mSv, 10 mSv or 100 mSv?



## Scenario landfills – future intrusion

- Consumption of crops graded on the landfill
- Inhalation of dust from the landfill
- External exposure from the landfill
  
- Intake of crops seem to be the critical scenario giving 1,5 mSv/a per 10 Bq/g U-238
- To avoid that landfills are forgotten radioactive waste archives could be established



## Summary

- ➔ Overregulating NORM will be avoided by raising the limit for licencing
- ➔ Specific clearance of NORM residues to landfills or recycling

Outside the proposed regulation

- ➔ Workers
- ➔ Residues above the specific clearance limit need to be handled separately
- ➔ Industrial sectors producing more than 100 tonnes/a will need special regulation as environmental monitoring is concidered necessary



**Thank you for your attention.**

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