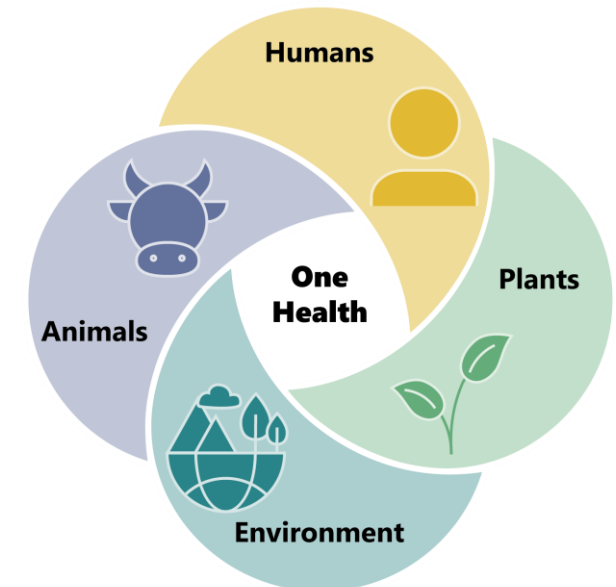


# Legal Framework and Practice: Clearance of Remediation Materials in Austria



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**Viktoria Herzner**, Christian Katzlberger and Fabian Rechberger

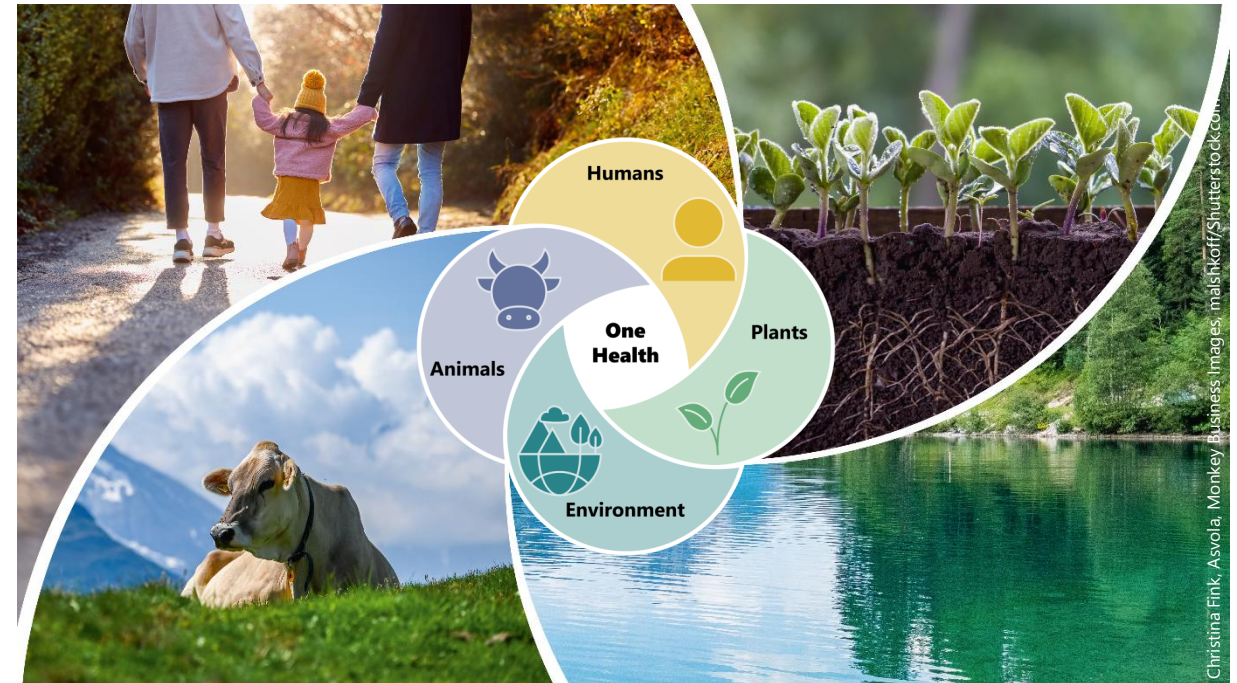
Division for Radiation Protection

# Our Agency

Austrian Agency for Health and Food Safety



- We
-  analyse,
  -  monitor,
  -  assess,
  -  research and
  -  communicate



365 days a year for the health of humans, animals, plants and the environment

# Division for Radiation Protection

Supporting national authorities in radiation protection matters



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Agriculture and Forestry, Climate  
and Environmental Protection,  
Regions and Water Management  
Republic of Austria





Emergency Preparedness



Environmental Monitoring



Radiochemistry



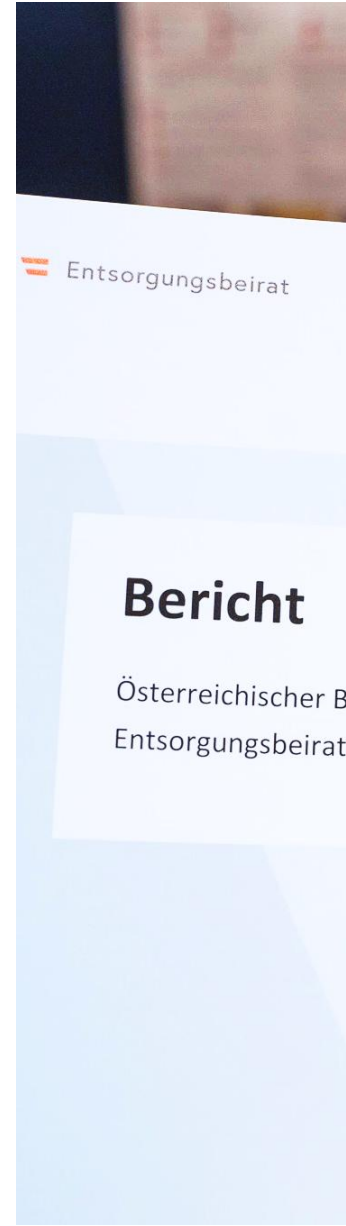
Protection against Radon



Breast Cancer: Quality Assurance



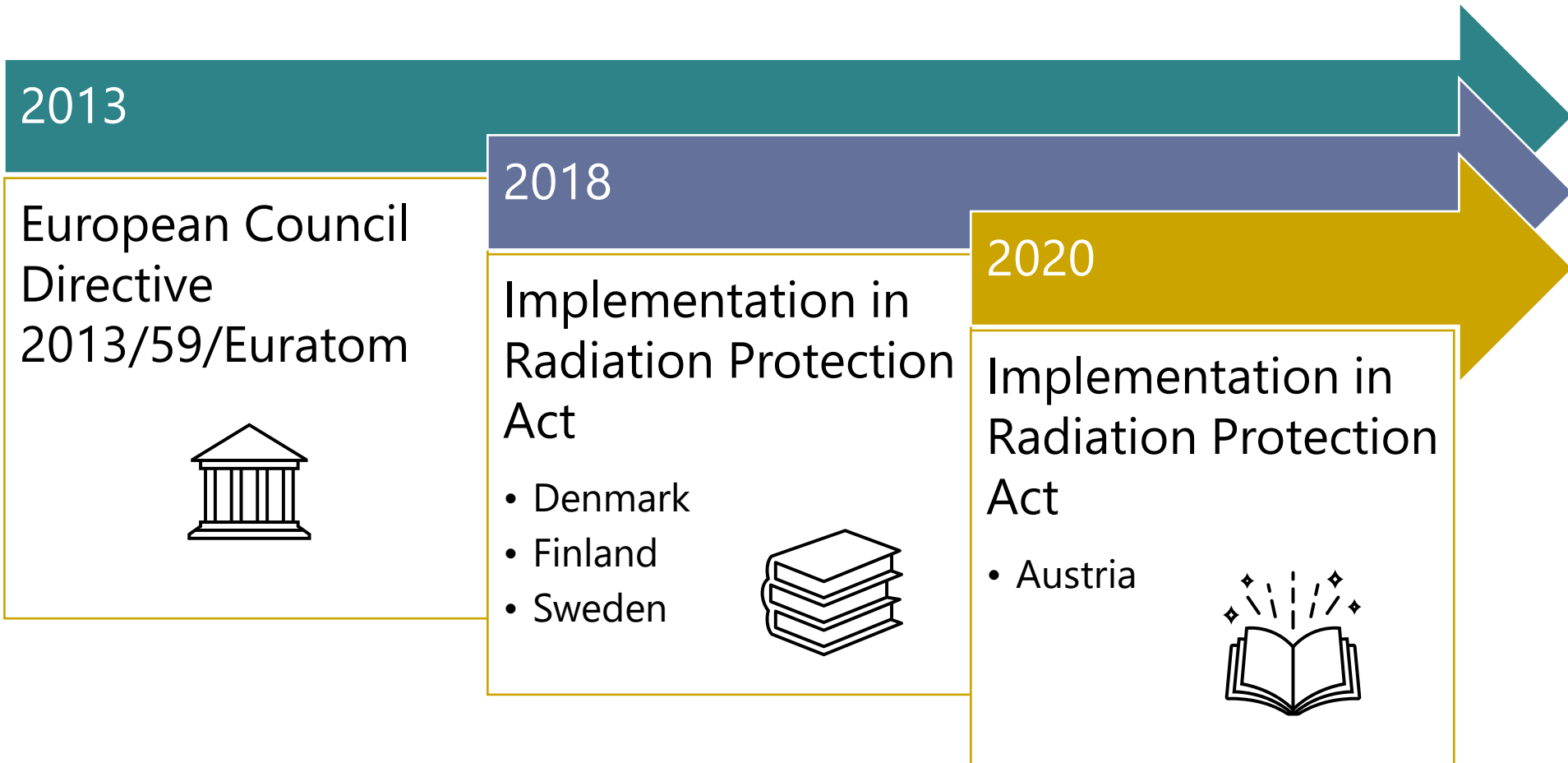
Independent Experts



Radioactive Waste Disposal

# National Regulations

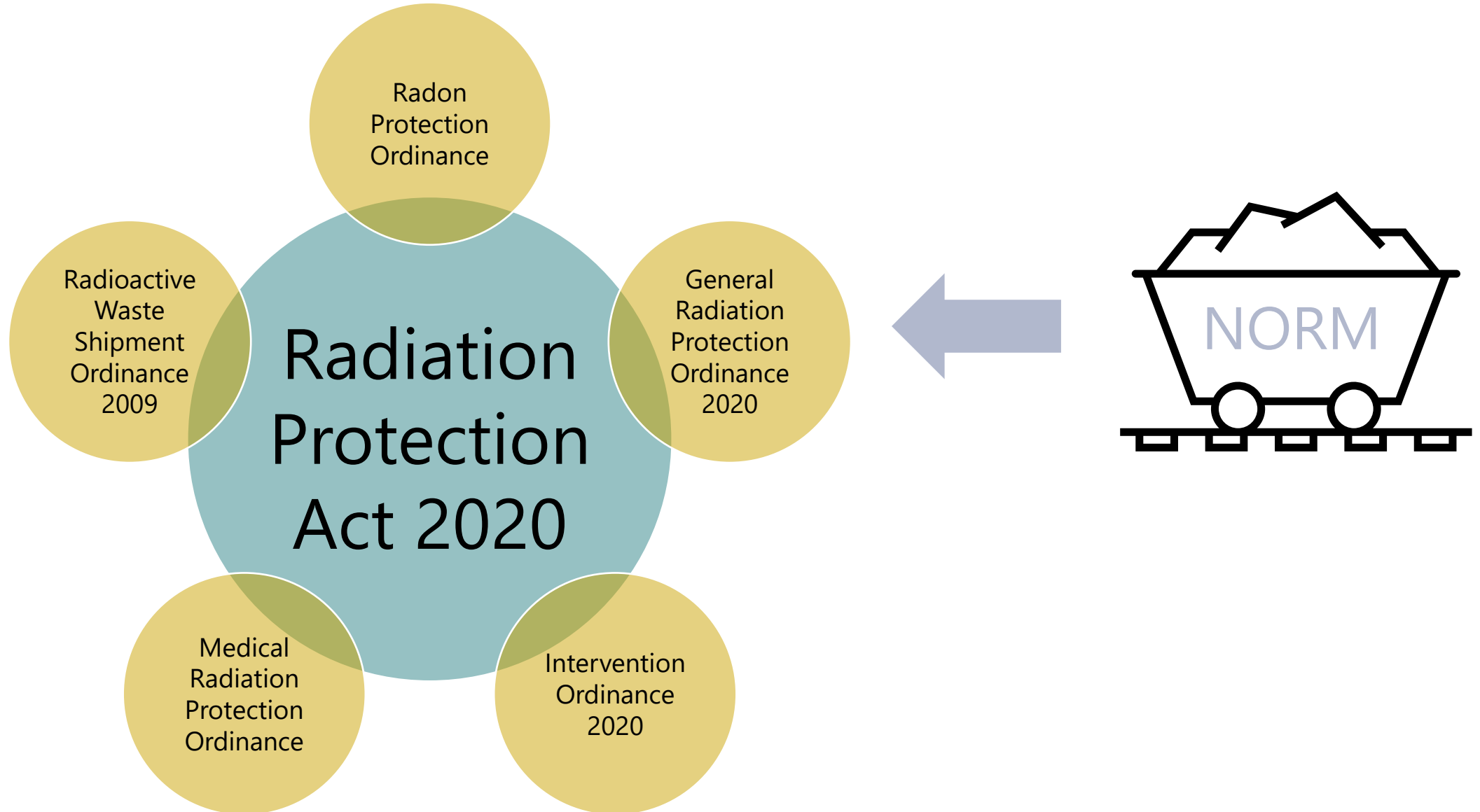
From EU directive to national radiation protection laws



Iceland and Norway (European Economic Area countries) have similar standards.

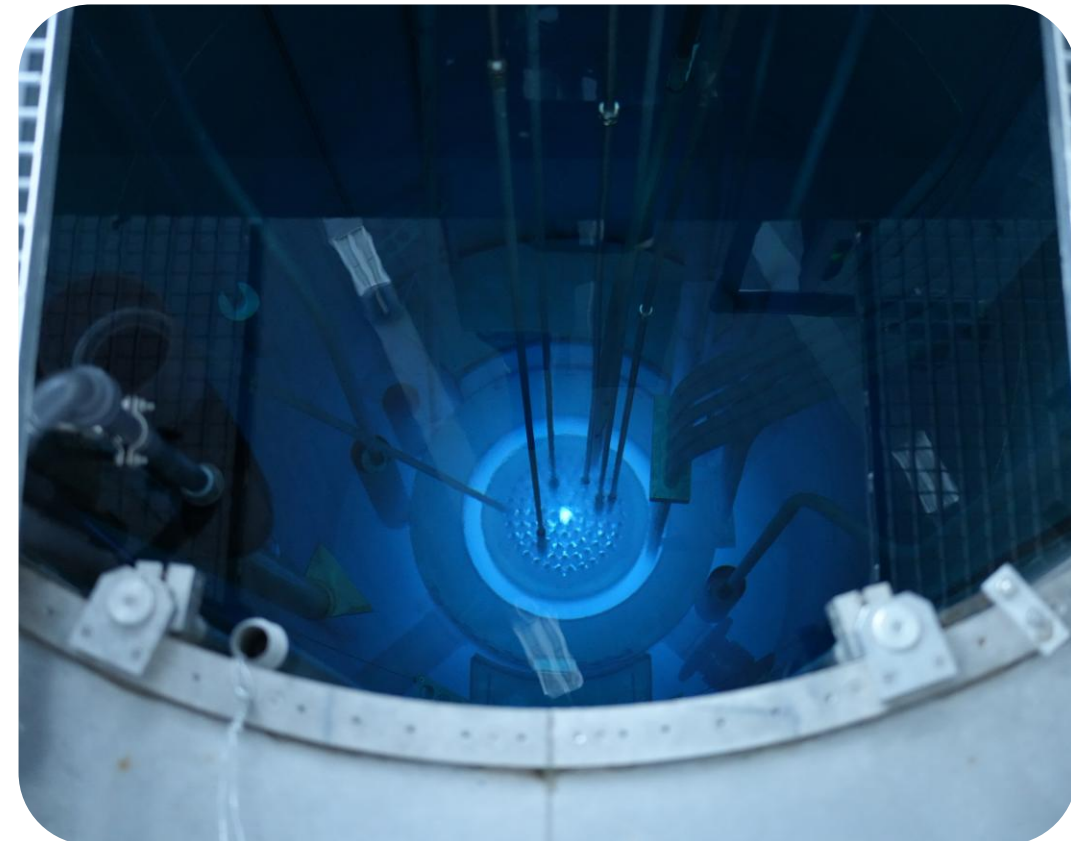
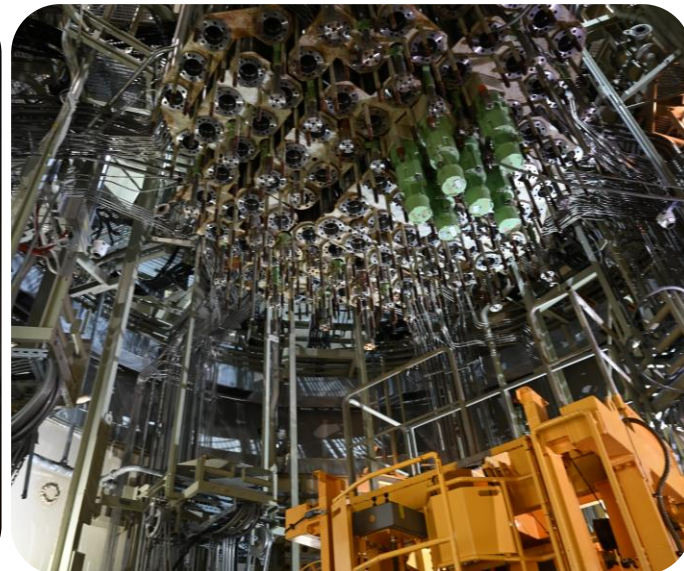
# Legal Framework for Radiation Protection in Austria

## Austria's five ordinances



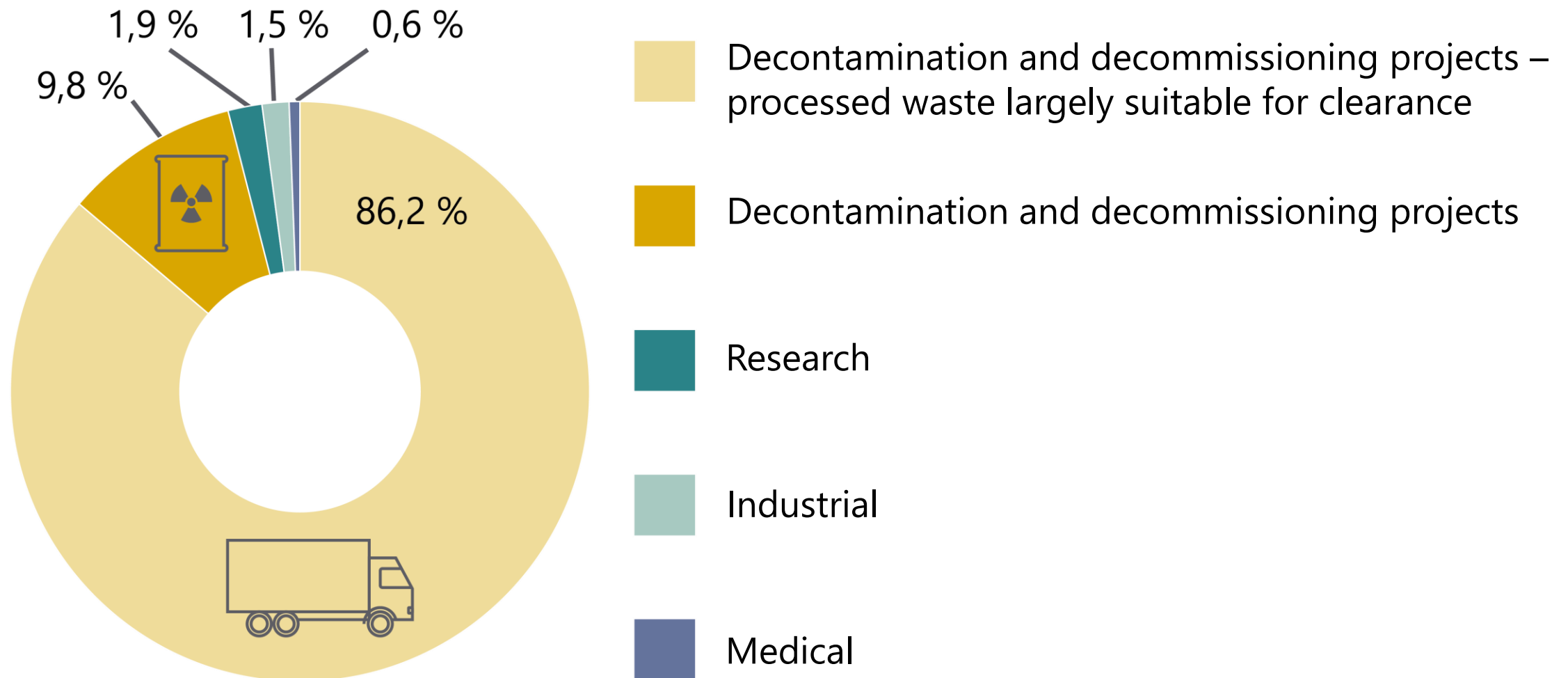
# Neither HLW nor Spent Fuel for Disposal

No nuclear power plant and only one research reactor



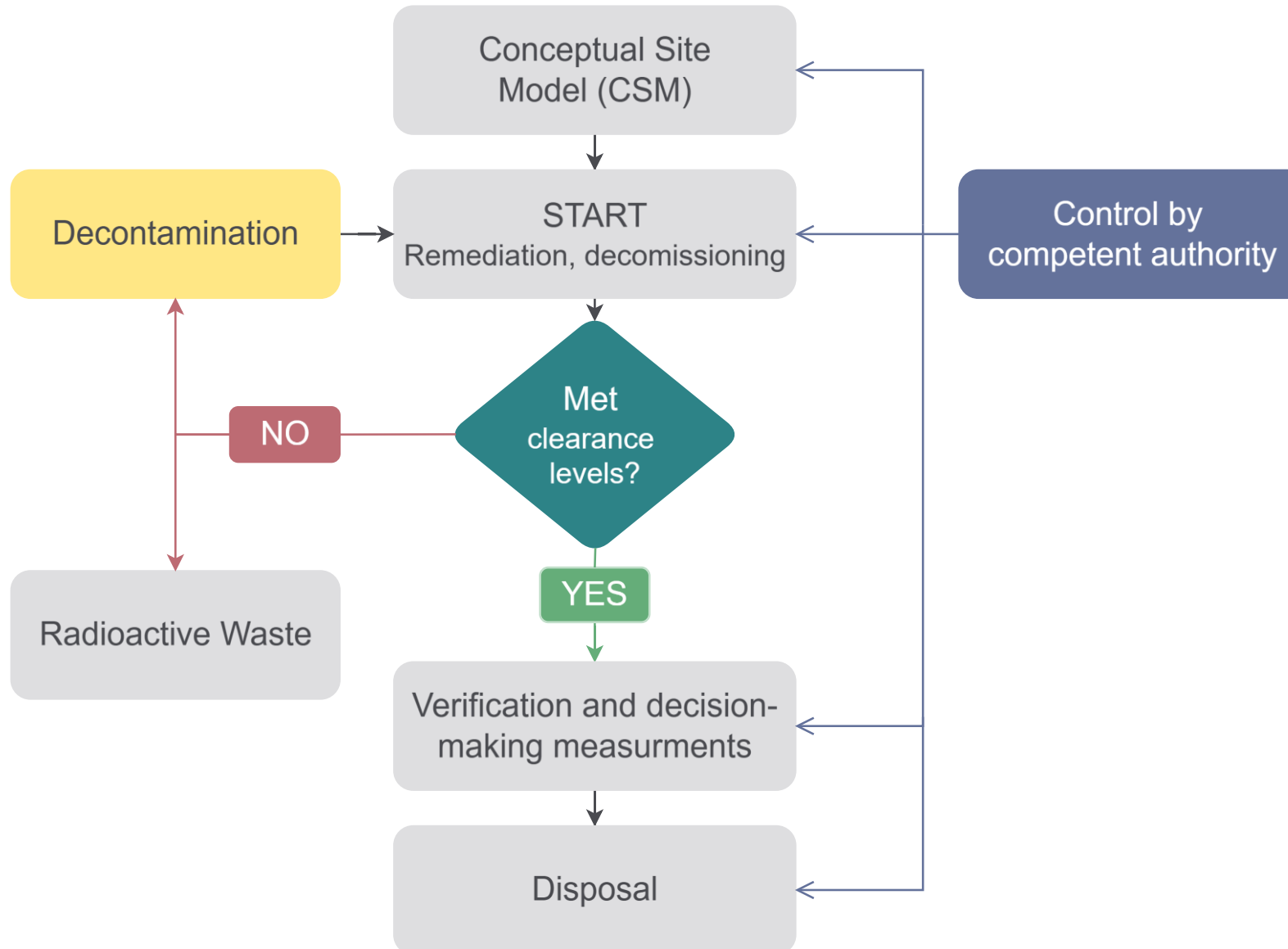
# Origin of Raw Waste

Average value for the years 2014–2023: approximately 460 tons per year



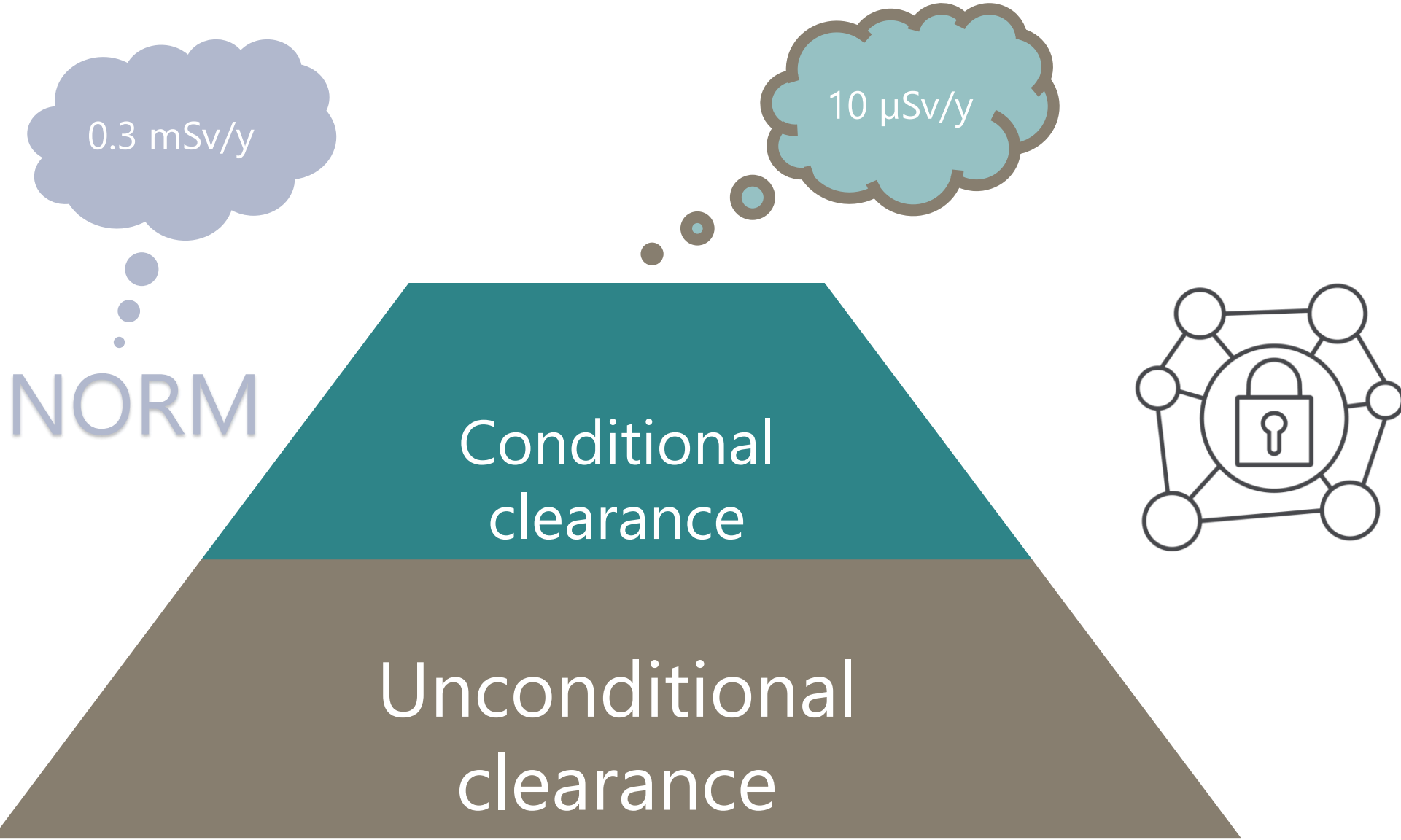
# Clearance Pathway in Decommissioning Projects

Overview of key steps from site preparation to final material release



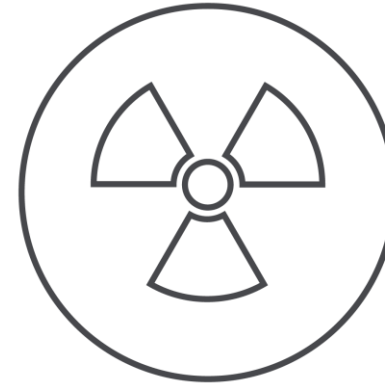
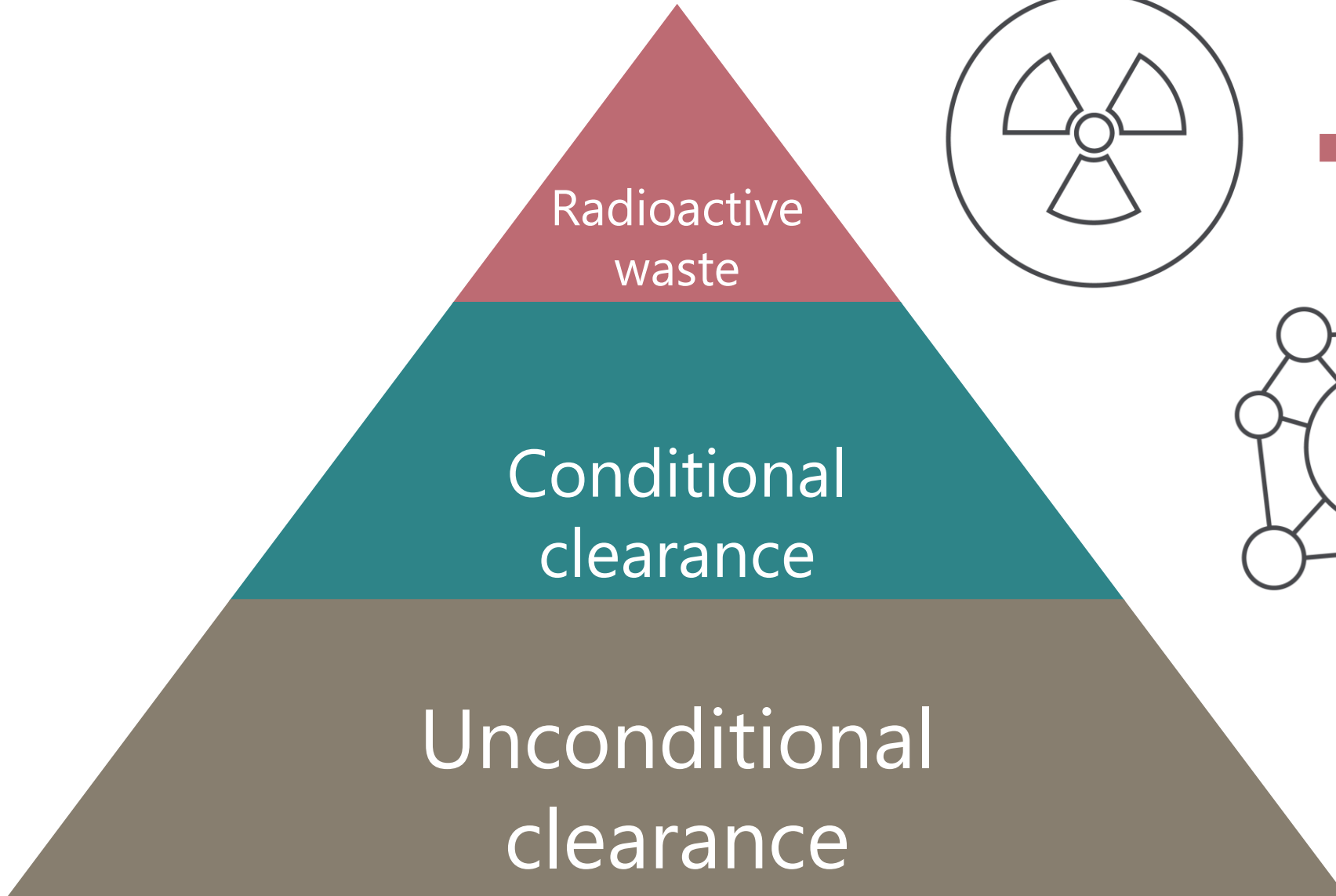
# Clearance Levels

Special landfill sites are used in Austria.



# Clearance Levels

Principle of optimization

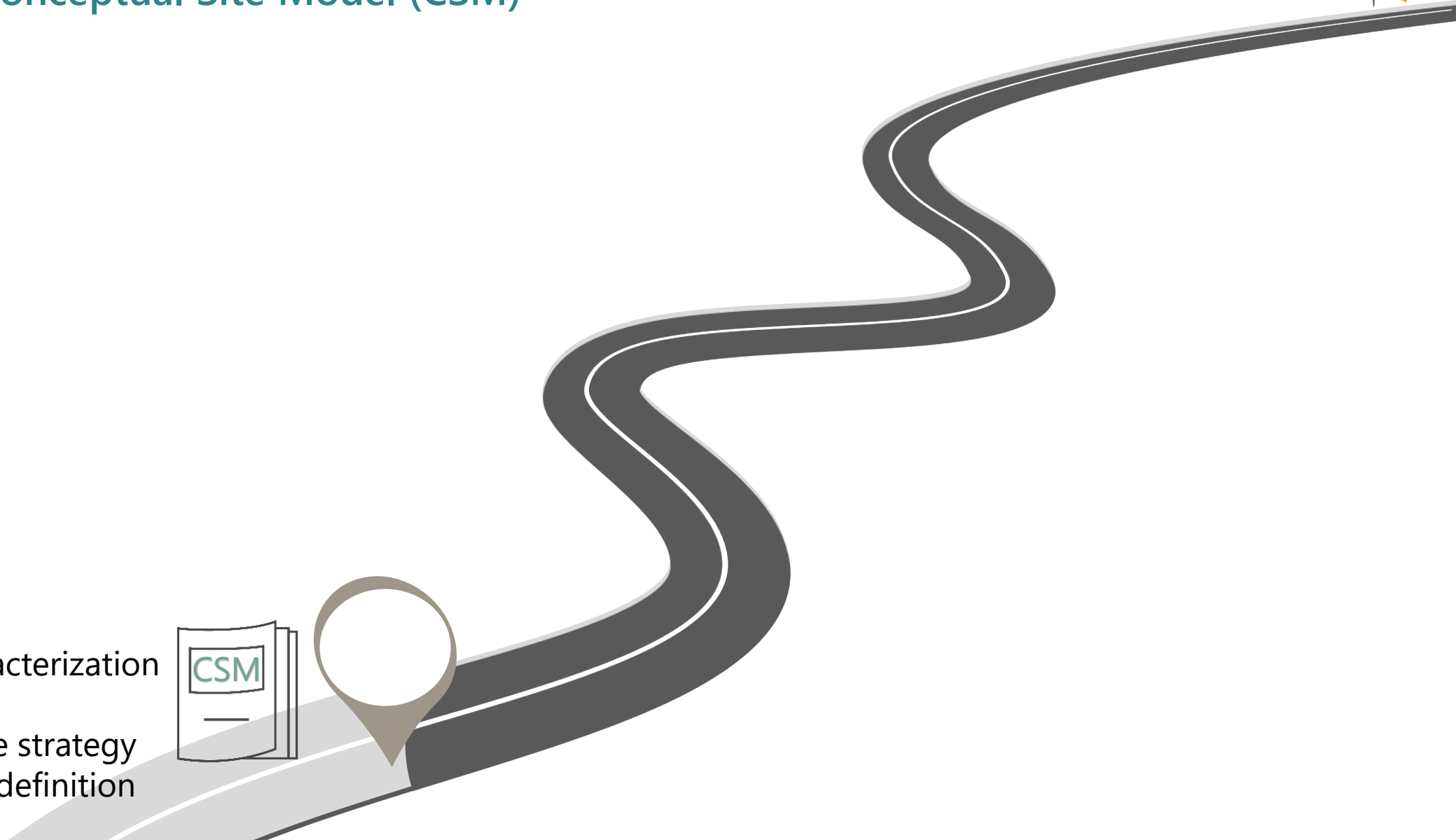


# Decontamination and Decommissioning Projects

## Operator's Conceptual Site Model (CSM)



- Radiological characterization
- Operation plan
- Clearance & waste strategy
- End-state criteria definition



# Operator's Conceptual Site Model

From data to decisions: preparing the site for decommissioning



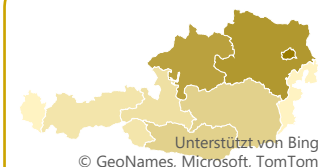
# Contaminated Sites in Austria

Decommissioning waste mainly from Seibersdorf.

## Legacy sites



NORM



Legacy sites catalogue

## Seibersdorf



~ 45 years  
nuclear  
research



Interim storage facility

# Decontamination and Decommissioning Projects

## Regulatory review of application documents



- ✓ Radiological characterization
- ✓ Operation plan
- ✓ Clearance & waste strategy
- ✓ End-state criteria definition



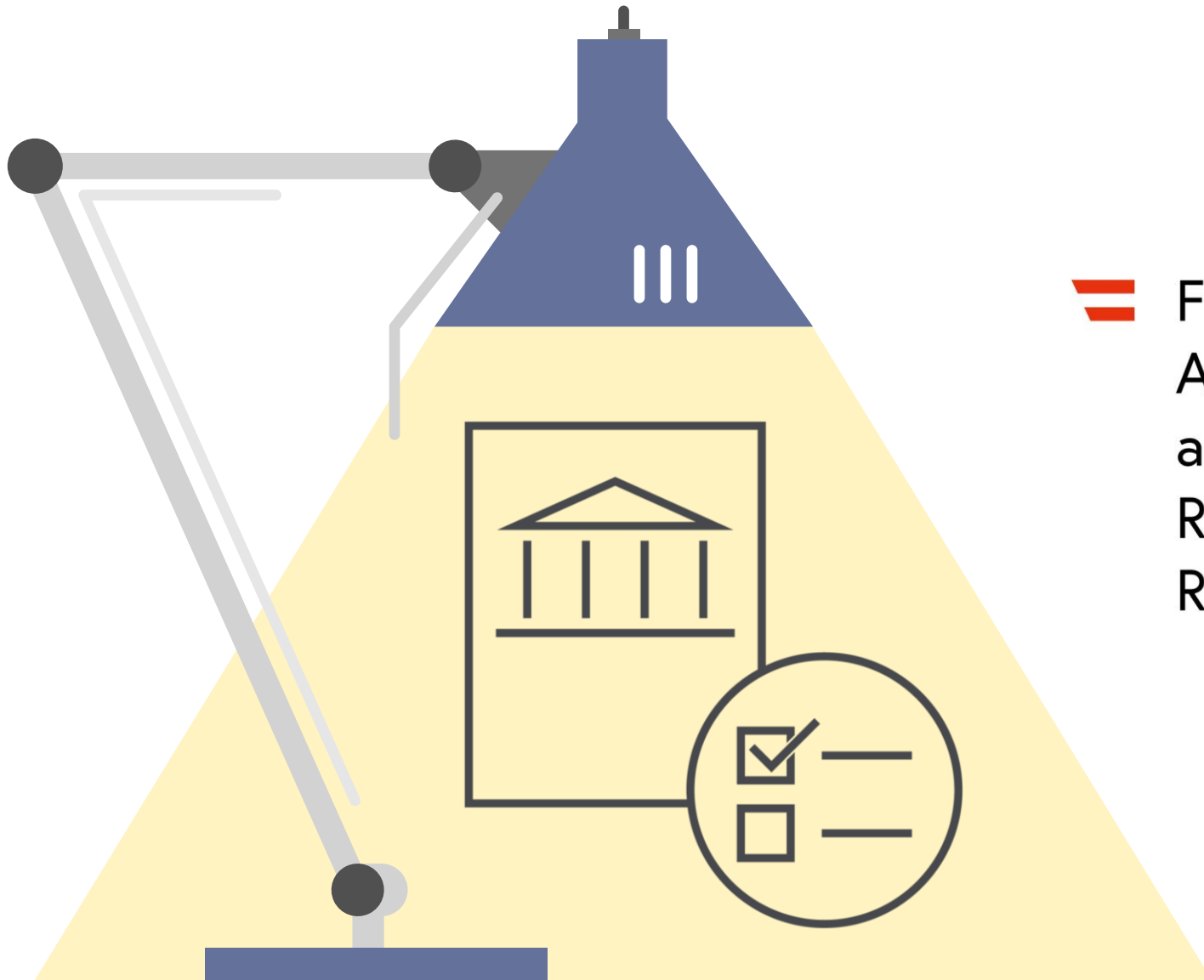
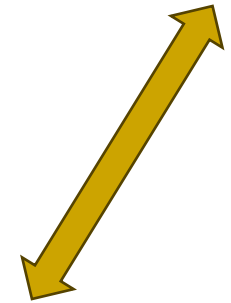
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Agriculture and Forestry, Climate  
and Environmental Protection,  
Regions and Water Management  
Republic of Austria

- Check of required documents
- Formal completeness review
- Notification to experts



# Regulatory Review of Application Documents

Formal check of submitted documents before expert review



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and Environmental Protection,  
Regions and Water Management  
Republic of Austria

# Decontamination and Decommissioning Projects

## Independent expert evaluation



- Professional evaluation
- Technical assessment
- Site inspection
- Expert opinion

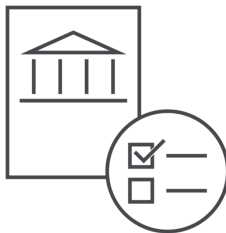


- Radiological characterization
- Operation plan
- Clearance & waste strategy
- End-state criteria definition



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- Check of required documents
- Formal completeness review
- Notification to experts



# Independent Expert Evaluation

Evaluation of documents, site conditions and clearance strategy

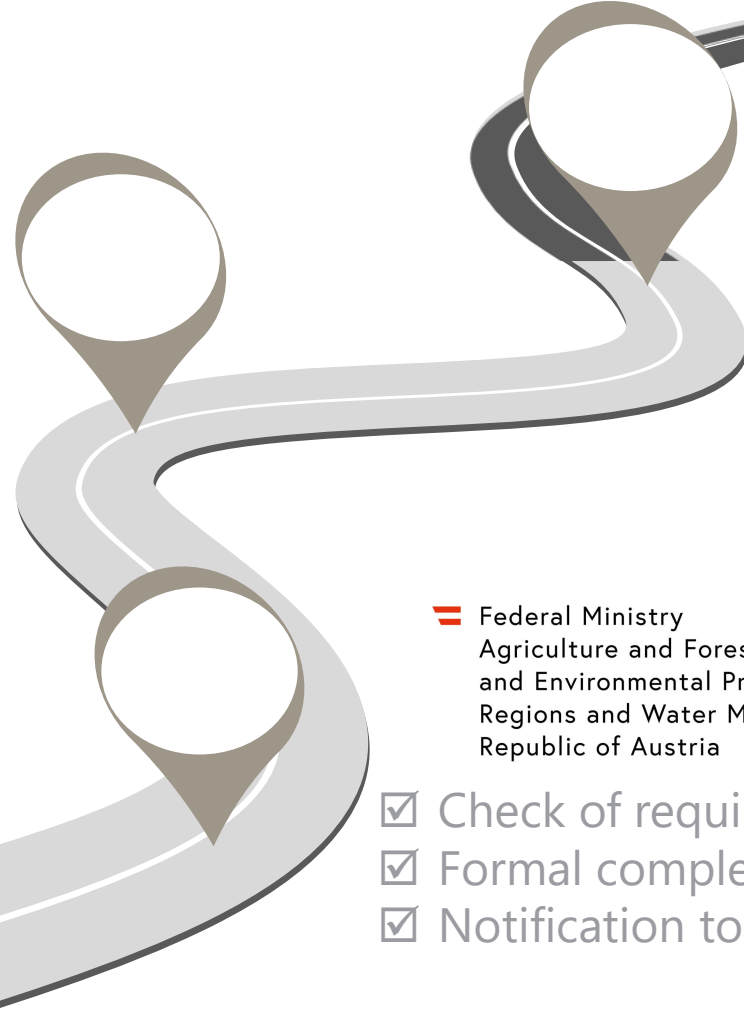


# Decontamination and Decommissioning Projects

## Final approval to start project



- ✓ Professional evaluation
- ✓ Technical assessment
- ✓ Site inspection
- ✓ Expert opinion



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- Licence issued
- Start of permitted activities



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and Environmental Protection,  
Regions and Water Management  
Republic of Austria

- ✓ Check of required documents
- ✓ Formal completeness review
- ✓ Notification to experts

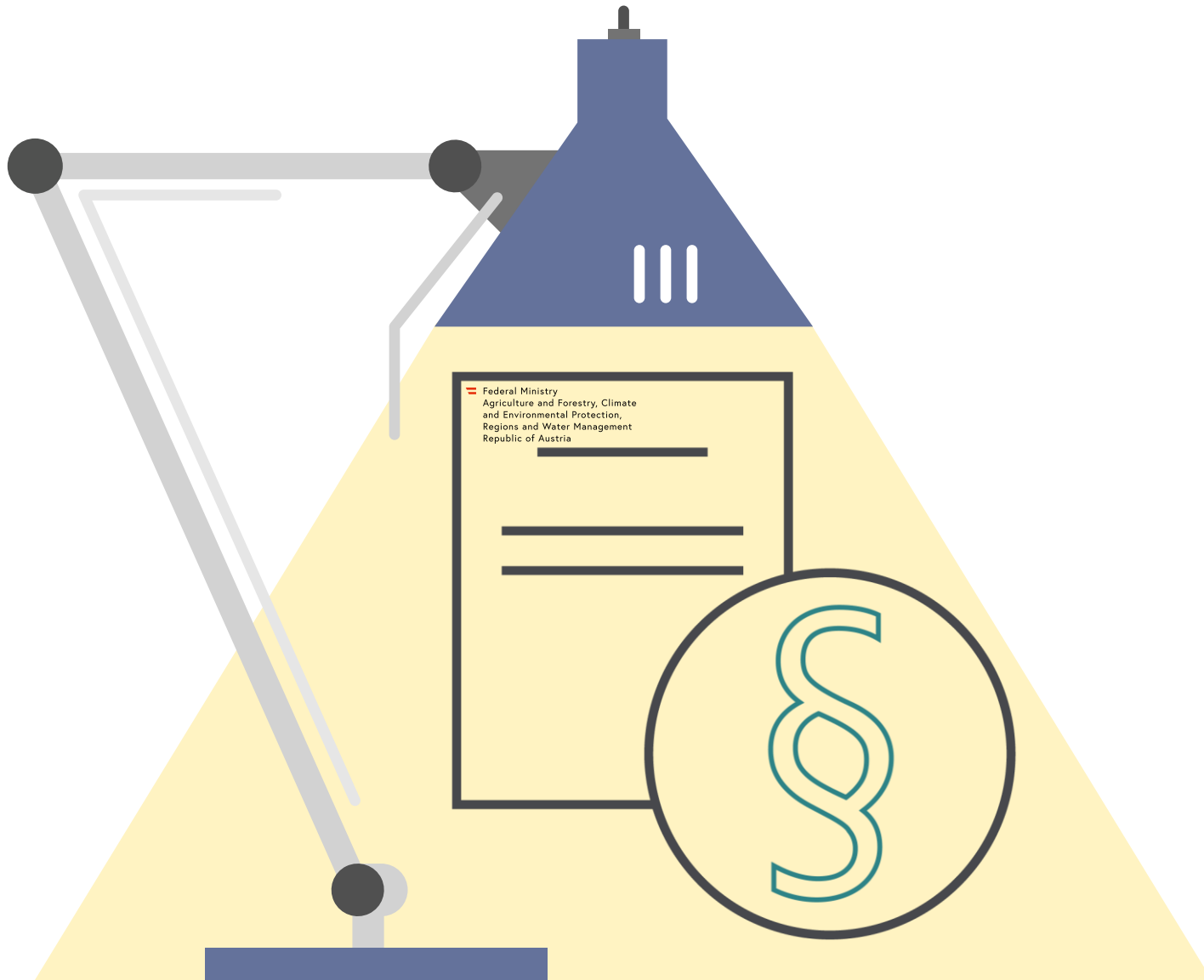


- ✓ Radiological characterization
- ✓ Operation plan
- ✓ Clearance & waste strategy
- ✓ End-state criteria definition



# Final Approval to Start Project

Regulatory approval completed – authorized activities may begin on site



# Ongoing Clearance and Oversight Process

Repeated steps of submission, review and approval



## Request of clearance

- Measurement results



## Regulatory coordination

- Formal completeness review
- Notification to experts

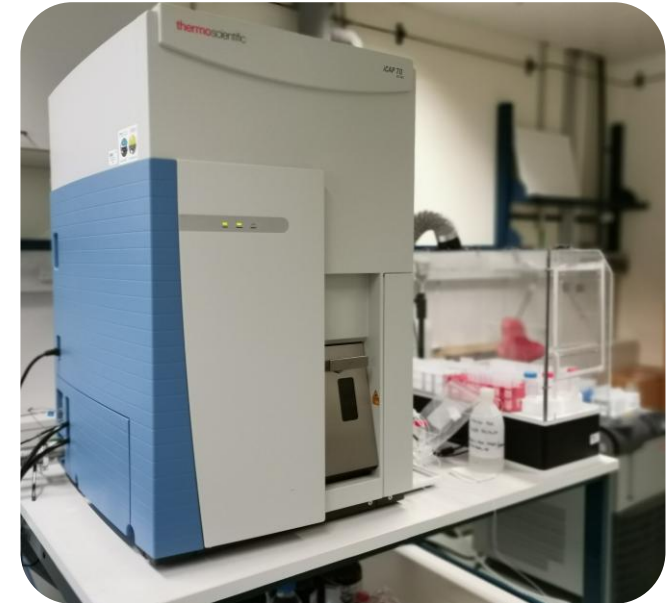


## Expert opinion

- Reviewing
- Sampling → Measurements
- Comparing

# Verification and Decision-Making Measurements

Gamma spectrometry, alpha counting, LSC and ICP-MS



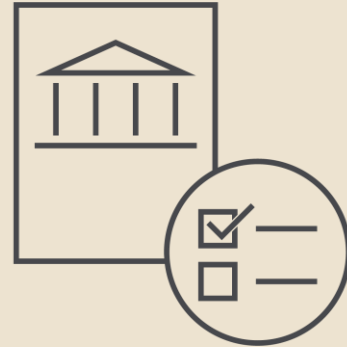
# Ongoing Clearance and Oversight Process

Repeated steps of submission, review and approval



## Request of clearance

- Measurement results



## Regulatory coordination

- Formal completeness review
- Notification to experts



## Expert opinion

- Reviewing
- Sampling → Measurements
- Comparing



## Licence

- Licence for disposal
- Further remediation & decontamination

# Optimized Process with Framework Licence

Defined conditions enable faster and more efficient project execution



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# Remediation and Decommissioning

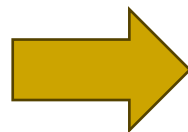
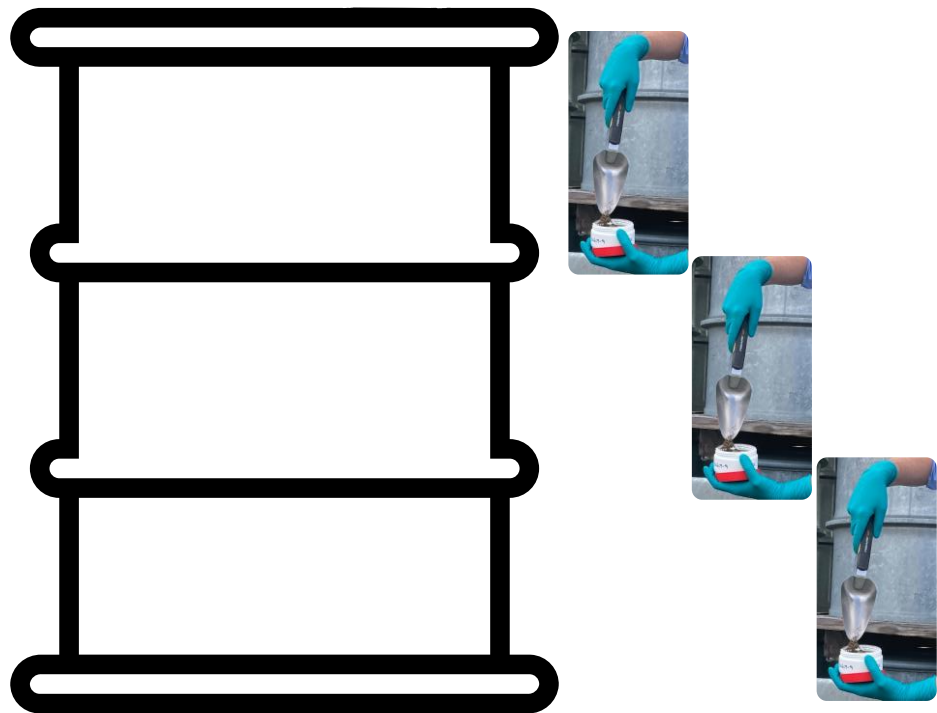
## Sampling under all weather conditions



# Optimization: Soil Sorting Facility

From 3 to 1 sample per drum

 Am-241



# Sampling Process after Soil Sorting Facility

One minute per barrel



Die Messergebnisse der AGES bestätigen die Messergebnisse der NES. Die Messergebnisse der AGES sind im Anhang in Tabelle X dargestellt. Die Messergebnisse der AGES sind im Anhang in Tabelle X dargestellt. Die Messergebnisse der AGES sind im Anhang in Tabelle X dargestellt.

Die Materialproben erfüllen die Kriterien zur eingeschränkten Freigabe (Quotientensumme ≤ Eins) gemäß der Studie von Brenk Systemplanung GmbH.

Zur Berücksichtigung der Plutoniumisotope wurden die seitens NES ermittelten Isotopenverhältnisse von Pu-238/Am-241 mit 0,49, Pu-239/Am-241 mit 0,26, Pu-240/Am-241 mit 0,26 und mit Pu-241/Am-241 5,37 (Standortvektor) angewendet.

Für die Bewertung von Sr-90 wurde der von NES mittels EMA bzw. der von AGES mittels radiochemischer Analyse ermittelte Wert herangezogen.

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AGES – Österreichische Agentur für Gesundheit und Ernährungssicherheit GmbH  
 Spargelfeldstraße 191 | 1220 Wien | Österreich | [www.ages.at](http://www.ages.at)  
 DVR: 0014541 | Registergericht: Handelsgericht Wien | Firmenbuch: FN 223056z | UID: ATU 54088605

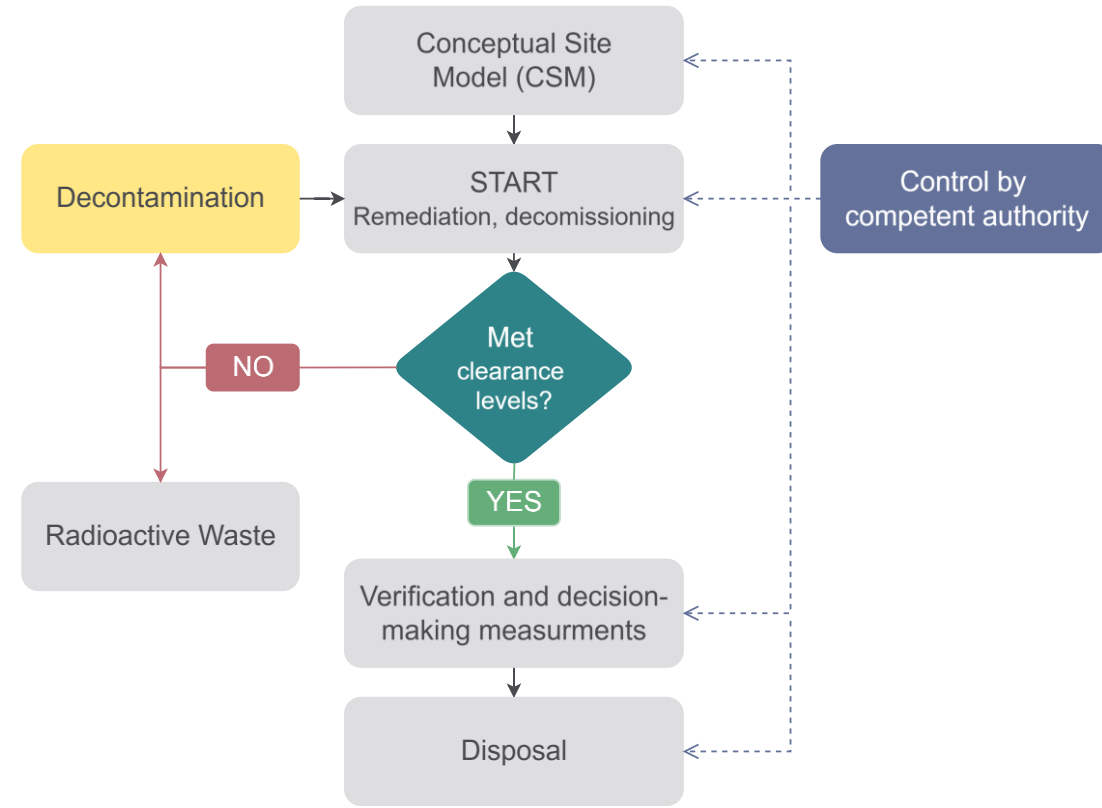


Geschäftsfeld Strahlenschutz  
 Spargelfeldstraße 191, 1220 Wien



# From Experience to Efficiency

Each project helps refine the next.



4.2.1.2 Zusammenfassende Bewertung der VA		BW
4.2.1.2.1	Die Messergebnisse der AGES (Anhang in Tabelle X) bestätigen die Messergebnisse der NES.	A
4.2.1.2.2	Die Materialproben erfüllen die Kriterien zur eingeschränkten Freigabe (Quotientensumme ≤ Eins) gemäß der Studie von Brenk Systemplanung GmbH.	X
4.2.1.2.3	Zur Berücksichtigung der Plutoniumisotope wurden die seitens NES ermittelten Isotopenverhältnisse von Pu-238/Am-241 mit 0,49, Pu-239/Am-241 mit 0,26, Pu-240/Am-241 mit 0,26 und mit Pu-241/Am-241 5,37 (Standortvektor) angewendet.	X
4.2.1.2.4	Für die Bewertung von Sr-90 wurde der von NES mittels EMA bzw. der von AGES mittels radiochemischer Analyse ermittelte Wert herangezogen.	X

4.2.1.3 Beschreibungen zur Bewertung der VA		BW
Nummer	Beschreibung	BW
4.2.1.2.1	Beispieltext	A

Austrian Agency for Health  
and Food Safety



**Viktorija Herzner**  
viktorija.herzner@ages.at

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