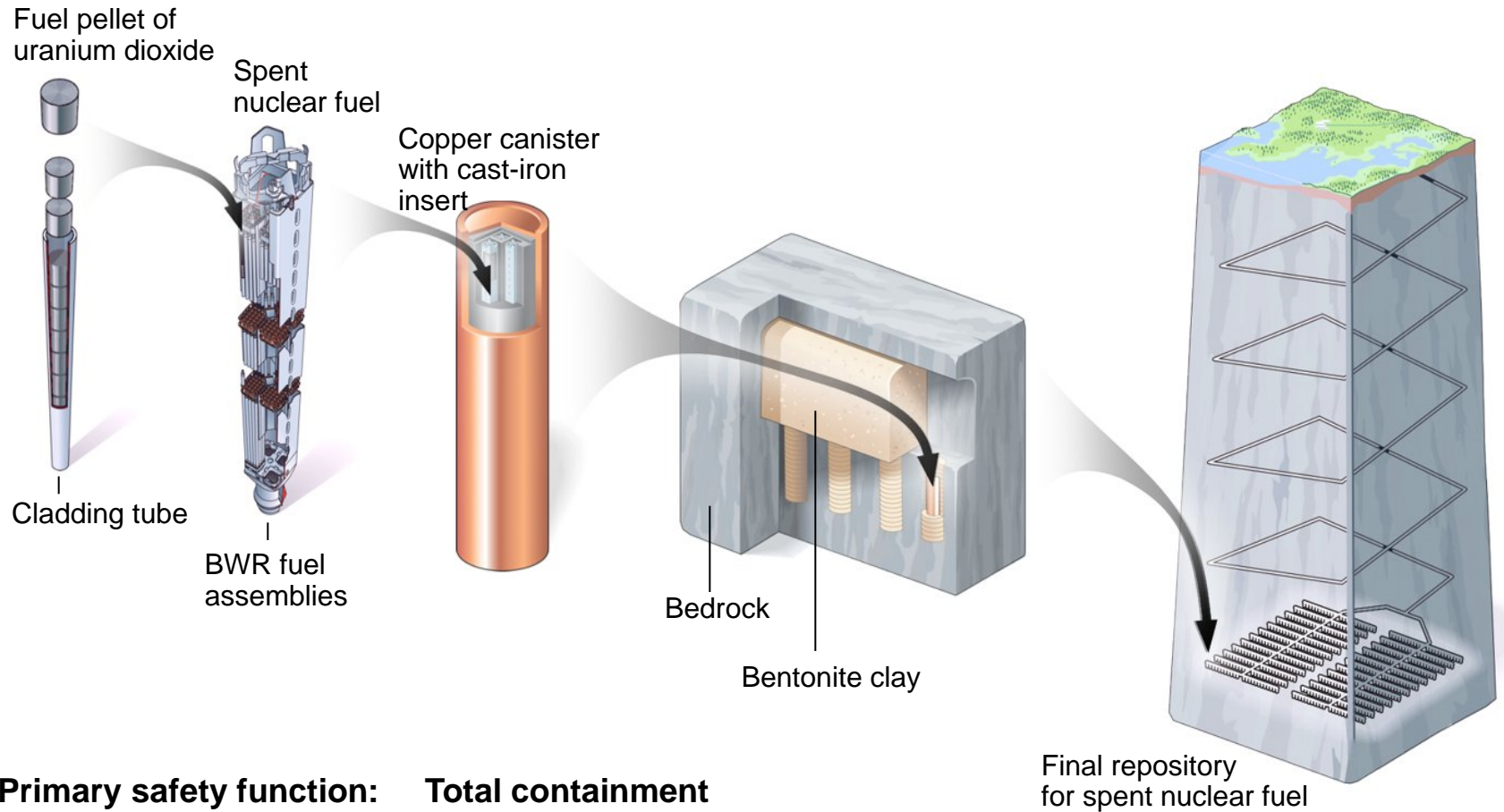




Progress in the Swedish programme for spent nuclear fuel

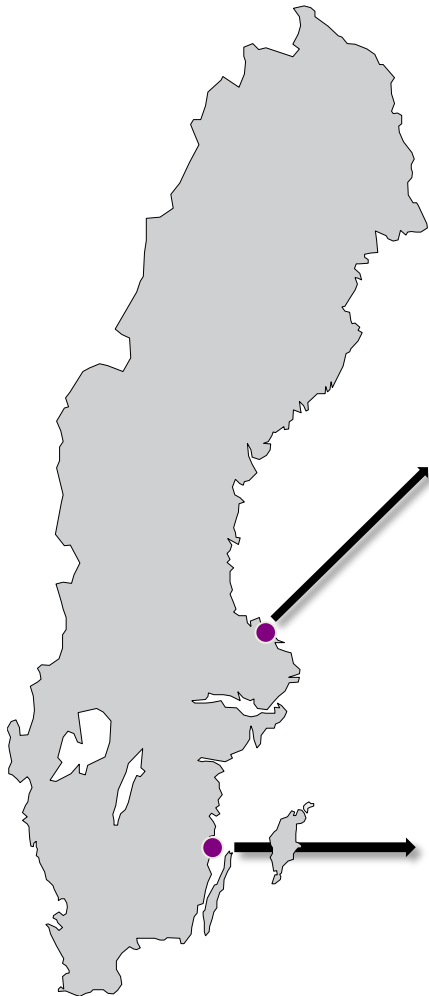
Monica Hammarström

The KBS-3 method for disposal of spent nuclear fuel



Primary safety function: Total containment
Secondary safety function: Retardation

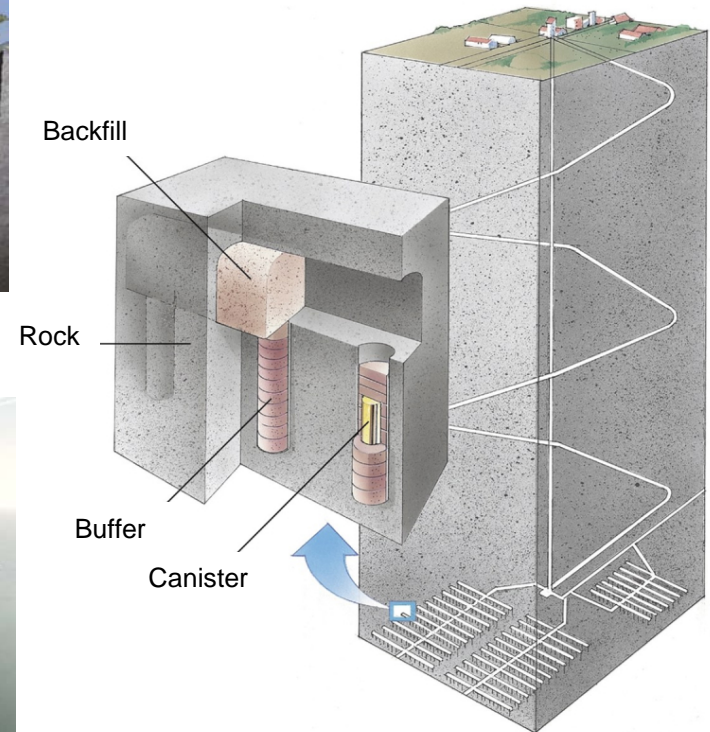
License applications submitted March 2011 for



Spent Fuel Repository at Forsmark

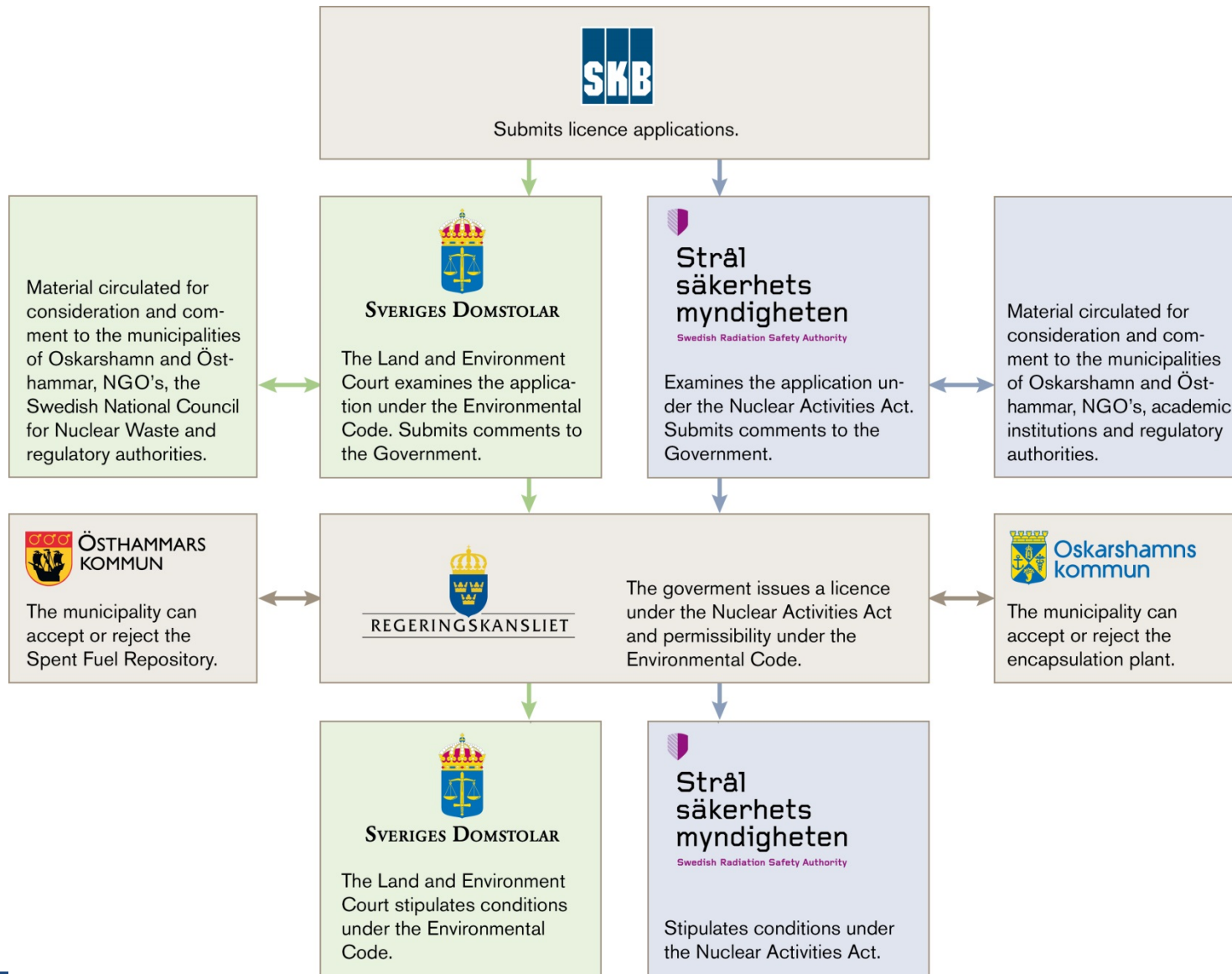


Encapsulation plant, Clink, in Oskarshamn



Encapsulation plant and Spent fuel repository

Two laws - two parallel licensing processes – SKB needs five approvals



Encapsulation plant and Spent fuel repository

Achieved milestones

- 1995 SR 95 – Template for safety report with descriptive examples
- 1995 The operation of Äspö Hard Rock Laboratory started
- 1998 The Canister Laboratory started
- 1999 SR-97 – Safety assessment study, to analyse and compare conditions at three sites in Sweden
- 2002-2009 Site investigations for a final repository for spent nuclear fuel on two sites
Development of methods for site-investigations
- 2006 SR-Can, Safety assessment study, preparatory step for SR-Site, presented an initial analysis for Forsmark and Laxemar
- 2006 Application for the Encapsulation plant (Nuclear Activities Act)
- 2009 Forsmark selected
- 2011 SR-Site, Safety assessment of a repository in Forsmark, SR-Site
- 2011 Applications for the Spent fuel repository (Nuclear Activities Act) and the KBS-3 system (Environmental Code)
- 2011 Licensing process initiated
- 2012-2015 Approximately 3000 pages of supplements filed to SSM and Court



Swedish Radiation Safety Authority – KBS-3 licensing review

- 277 requests for explanation or additional information up to March 2013
 - Additional requests received through November 2014
- Continuous dialogue SKB-SSM
- SKB answers provided gradually
 - Major deliveries
 - April, June and December 2013
 - February, July and September 2014
- SSM initial review completed and in – depth review started
- March 2015 SKB provides updated information on encapsulation plant and interim storage capacity (11000 tons)



Strål
säkerhets
myndigheten

Swedish Radiation Safety Authority



Environmental Court – KBS-3 licensing review

- 2012: Court asked about requests for additional information/explanation
- 350 questions/requests sent to court by stakeholders
- April 2013 SKB responses sent to court (600 pages)
- Autumn 2013 reviewers reactions on SKB answers
- September 2014 SKB provides additional responses and statements
- March 2015 SKB provides updated information on encapsulation plant and interim storage capacity (11000 tons)



Main review comments on SKB applications

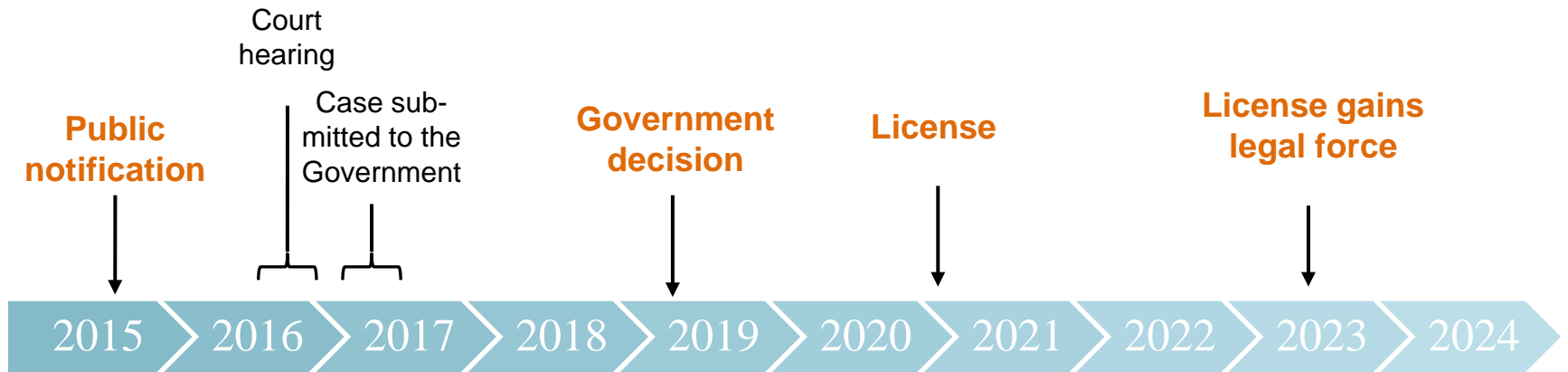
- Scope of Environmental Code Application and Environmental Impact Assessment
 - Level of detail with respect to nuclear safety issues
- Scope of documentation of other disposal methods
 - Deep boreholes
 - Spent fuel as a resource
- Site selection
 - Close to nuclear power plants
 - Inland site – regional groundwater flow
- Long term safety issues
 - Canister integrity
 - Detailed technical issues – mainly from SSM
- “Conventional” environmental consequences
 - Discharges to water
 - Consequences for endangered species and nature values
 - Consequences from traffic, noise from operations
 - Management of rock from excavation

Updated time-schedule for the licensing

- September- October 2015: Public notification of the applications according to the Nuclear Activities Act.
- January 2016: Review statements from stakeholders to be submitted to SSM
- April 2016: SSM presents its review statement on the license according to the Environmental Code to the Environmental Court.
- January-March 2017: SSM presents its statement to the Government

Encapsulation plant and Spent fuel repository

Estimated Time Schedule for Licensing



Technical development together with Posiva

- Finalize the development of the KBS-3 concept based on joint technical solutions and resolving outstanding issues for the KBS-3 concept.
 - joint planning and joint projects
- Areas
 - Harmonization of requirements on the repository system.
 - Canister design and encapsulation including welding and testing.
 - Development of manufacturing technology and design of production system.
 - Bentonite materials and supply chain.
 - Bentonite-block and -pellet production.
 - Buffer and backfill design, Deposition tunnel plug, (Installation techniques).
 - Detailed investigations – including qualification of deposition tunnels and holes.
 - Tunnel production.
 - Research issues related to long term safety and to the foundation of the ongoing technology development.
- Realization of these joint areas of development into specified projects is currently ongoing.
- Discussions and studies are ongoing regarding joint production facilities for canister, buffer and backfill



Thank you!

