Radioactive Waste Management

National Geological Screening

Providing information on geology

A public consultation on national geological screening guidance
8th September – 4th December 2015

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National geological screening

- What is Screening?
  - National geological screening will bring together existing information about UK geology relevant to the long-term safety of a Geological Disposal Facility
  - It is not intended to definitively rule all areas as suitable or unsuitable

- What is the Guidance?
  - The methodology for gathering and presenting the existing geological information relevant to long-term safety

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Outline for today

- Introductions
- Context-setting presentation
  - Background on geological disposal
  - Government policy
  - National geological screening
- Group discussion of consultation questions
- Feedback from group discussions

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Consultation workshop locations & dates

Support understanding of the Guidance and purpose of the Consultation

1 Oct	London
6 Oct	Newcastle
7 Oct	Brighton
14 Oct	Bristol
20 Oct	Carlisle
21 Oct	Leeds
22 Oct	Birmingham
27 Oct	Plymouth
28 Oct	Belfast
2 Nov	Ipswich
5 Nov	Manchester

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Background on geological disposal

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Why radioactive waste and geological disposal?

- UK has been a “nuclear nation” since the late 1940s
- Used to light and heat our homes, and power our industry
- Used in medicine, industry, research and defence
- Higher activity waste (HAW) inventory ~ 650,000 m^3
- Some waste will be hazardous for 100s of 1,000s of years
- Safely stored in interim surface storage up to 100 years, but requires long-term safe disposal
- Geological disposal is the internationally adopted solution for the disposal of HAW

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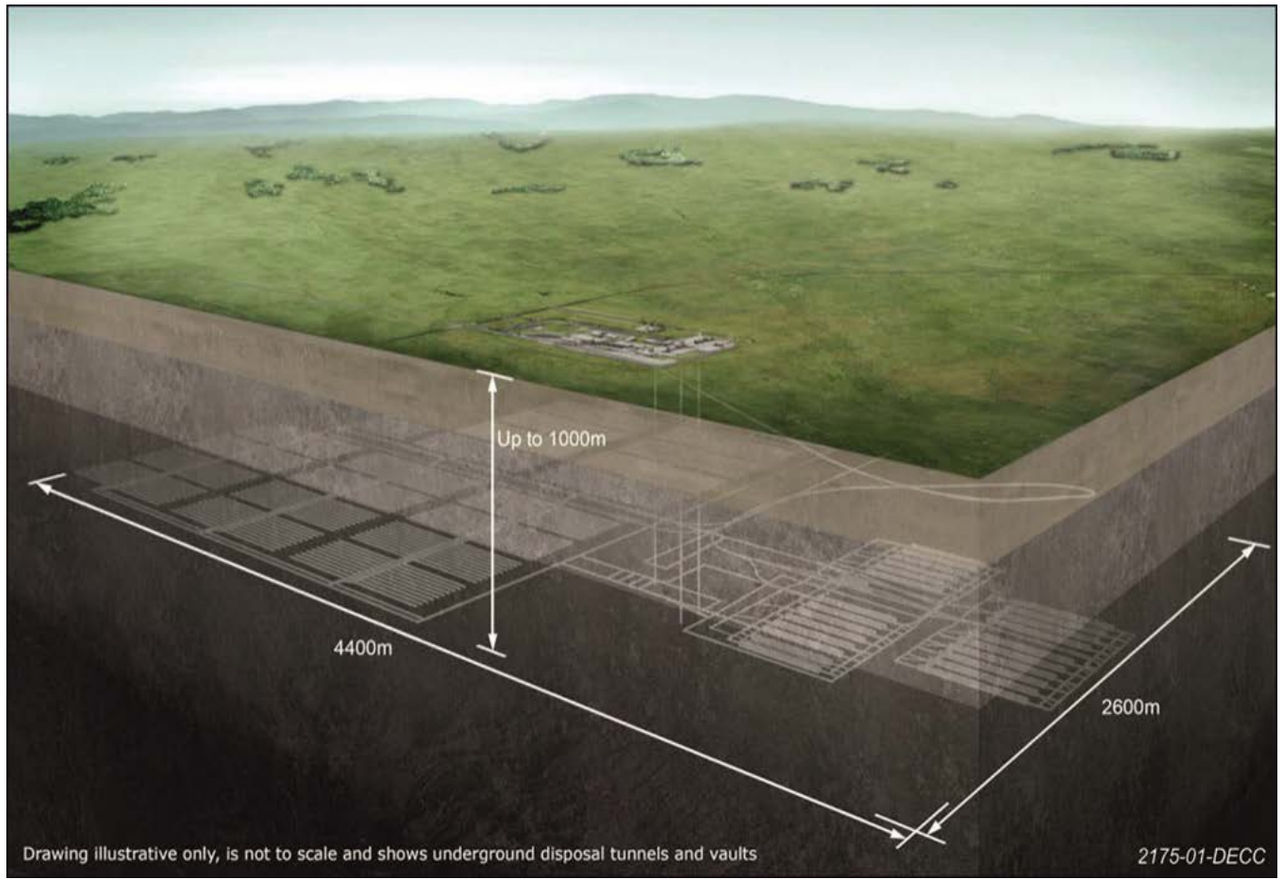
What is required for a geological disposal facility?

Isolation and containment of the radioactive waste ensuring long-term safety

- Suitable site
- Willing community
- Design and safety case
- Waste packaged in a form compatible with GDF safety case



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Underground facilities – rock types

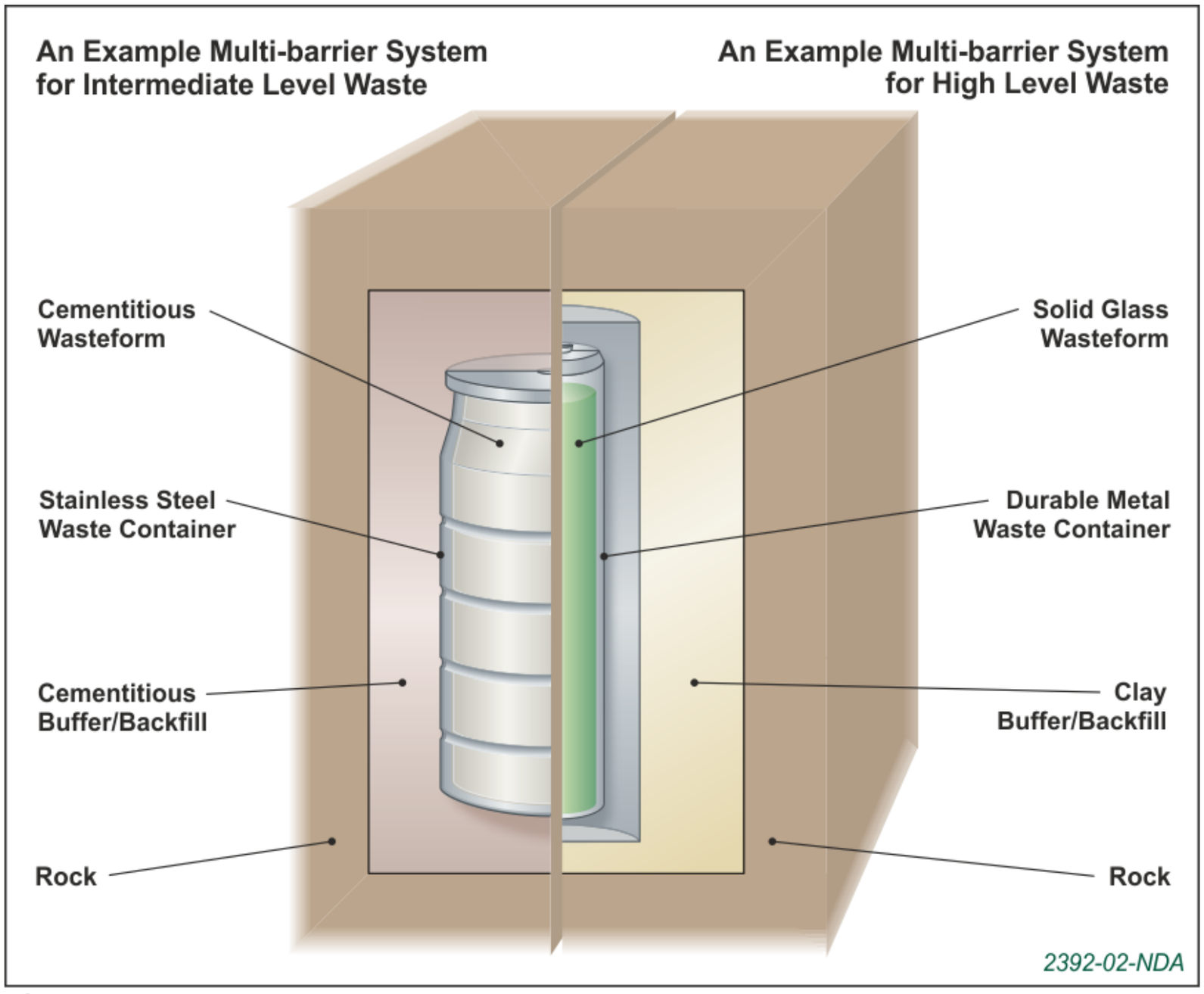
SKB Aspo Hard Rock Laboratory (Sweden)

Higher strength rocks such as granite are being investigated in Sweden and Finland

ANDRA underground test and research site (Bure, France) Lower strength sedimentary rocks, such as clays and mudrocks are proposed as host rocks in France and Switzerland

Waste Isolation Pilot Plant (USA) Evaporite rocks (salt deposits) provide a dry environment and are in use in the USA and Germany

Isolation and containment: multi-barrier system



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UK Government Policy

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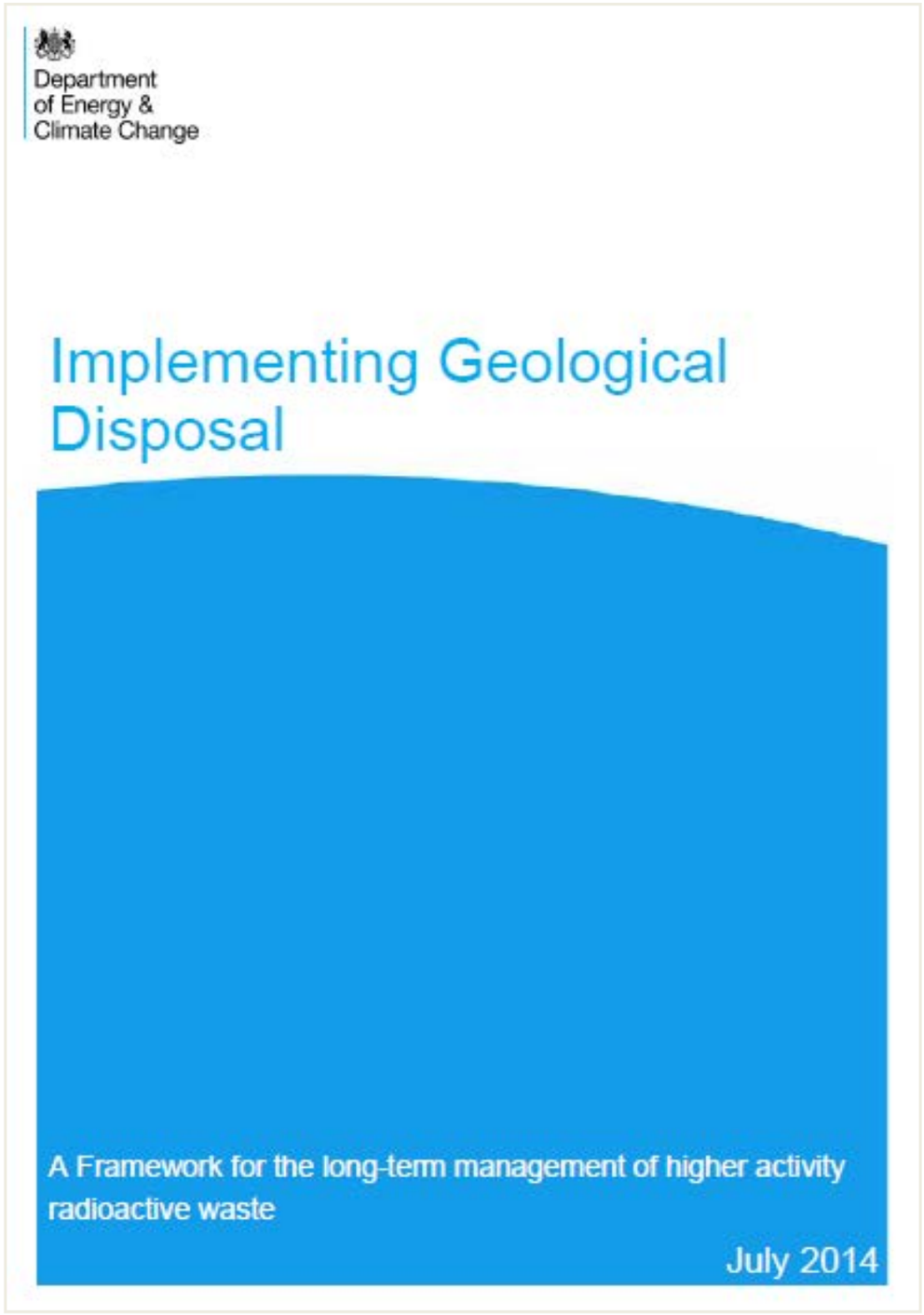
Implementing Geological Disposal

- Published July 2014
- Sets out the UK Government's framework for managing higher activity radioactive waste
- Updates and replaces 2008 MRWS White Paper
- An 'enabling' document which addresses many issues that stakeholders have raised
- Sets out a clear plan and timescales to address some remaining concerns and help communities participate



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Geological disposal: roles and responsibilities

Key

- **Communities**
  Sit at the heart of this process – they can talk to Government and the developer throughout. A geological disposal facility (GDF) cannot proceed without community support.
- **Government**
  Owns the policy, sponsors the project and provides funding.
- **Regulators**
  Independent bodies will only authorise construction and operation of a facility if the developer can demonstrate that it will be safe, secure and the environment will be protected.
- **Developer**
  Responsible for designing, building, operating and closing a facility safely.
- **Committee on Radioactive Waste Management (CoRWM)**
  Provides independent advice to Government and scrutiny on radioactive waste management.

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Policy framework and Initial Actions

- Based on willingness of local communities to participate
- Recognises importance of providing upfront information (geology, socio-economic impacts and community representation/ investment)

Initial Actions

- Amendments to national land-use planning arrangements for GDF and boreholes
- Providing greater clarity on how DECC/RWM intend to work with communities
- A national geological screening exercise

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National geological screening

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National geological screening

Providing information on geology

Exercise has 2 parts:

- developing Guidance which sets out how the information will be assembled and presented
- applying the Guidance

The Guidance comprises:

- the safety requirements to which the geological environment contributes
- geological attributes that are relevant to meeting these safety requirements
- sources of existing geological information relevant to understanding these attributes
- a description of the outputs that will be produced based on this existing geological information

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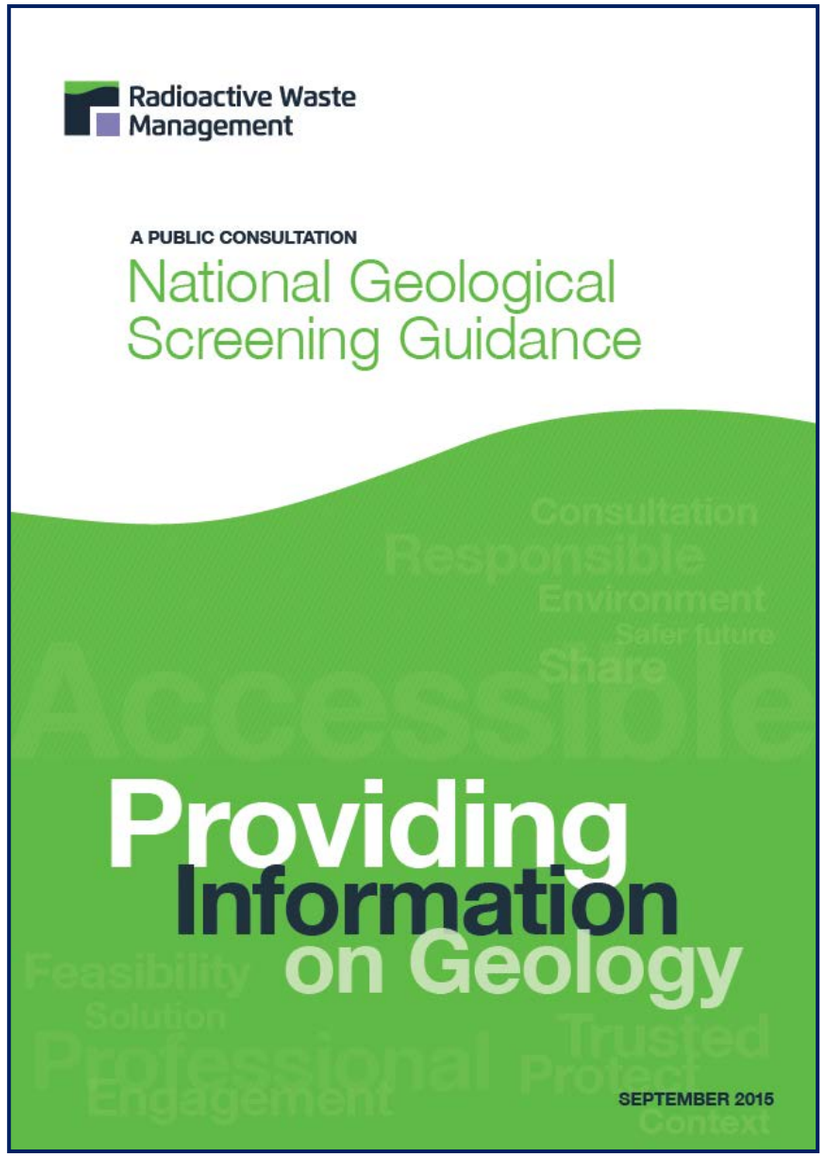
Consultation document

Consulting on national geological screening Guidance

- Approach
- Sources of information
- Form of outputs



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Geological attributes

Rock type

- Distribution of suitable host rock types (higher strength rocks, lower strength sedimentary rocks, evaporite rocks) at the depths of a GDF
- Properties of rock formations that surround the host rocks

Rock structure

- Locations of highly faulted and folded zones
- Locations of major faults

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Geological attributes

Groundwater

- Presence and properties of aquifers
- Presence of geological features and rock types which may indicate separation of shallow and deep groundwater systems
- Locations of features likely to permit rapid flow of deep groundwater to near-surface environments
- Groundwater age and chemical composition

Hutton’s unconformity
Siccar point
BGS

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Geological attributes

Natural processes

- Distribution and patterns of seismicity
- Extent of past glaciations

Resources

- Locations of existing deep mines
- Locations of intensely deep-drilled areas
- Potential for future exploration or exploitation of resources

Abandoned deep fluorite mine, Weardale

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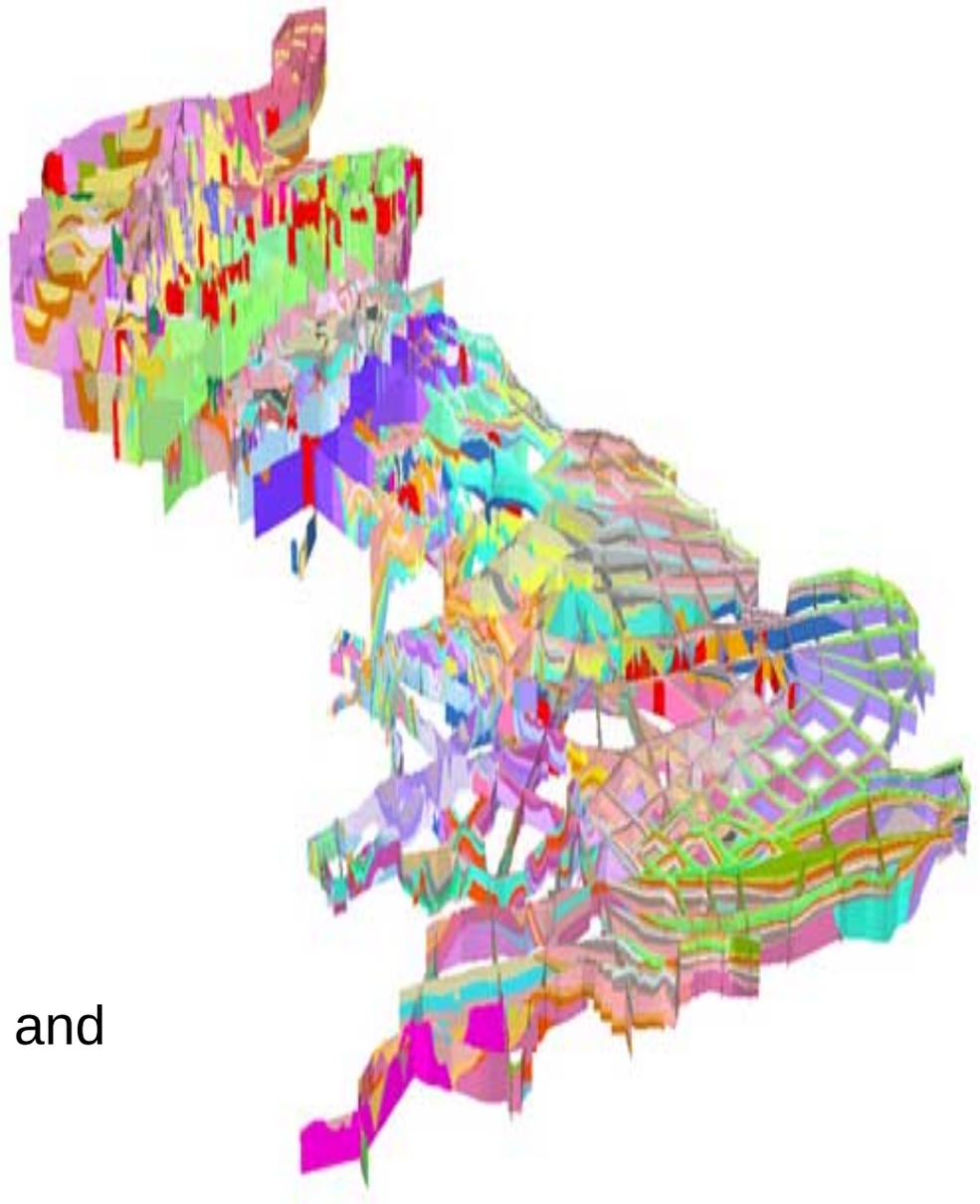
Sources of information

Publicly available national datasets and compilations held by BGS and EA

- BGS maps, memoirs, stratigraphic summaries and reports: distribution of rock formations and rock types, information about deep mines and resources, structures, geochemistry etc.

- The BGS GB3D model: incorporating results from mapping, boreholes and geophysics. ***This will be demonstrated today.***

- Environment Agency maps and reports: superficial and bedrock aquifers in England and Wales



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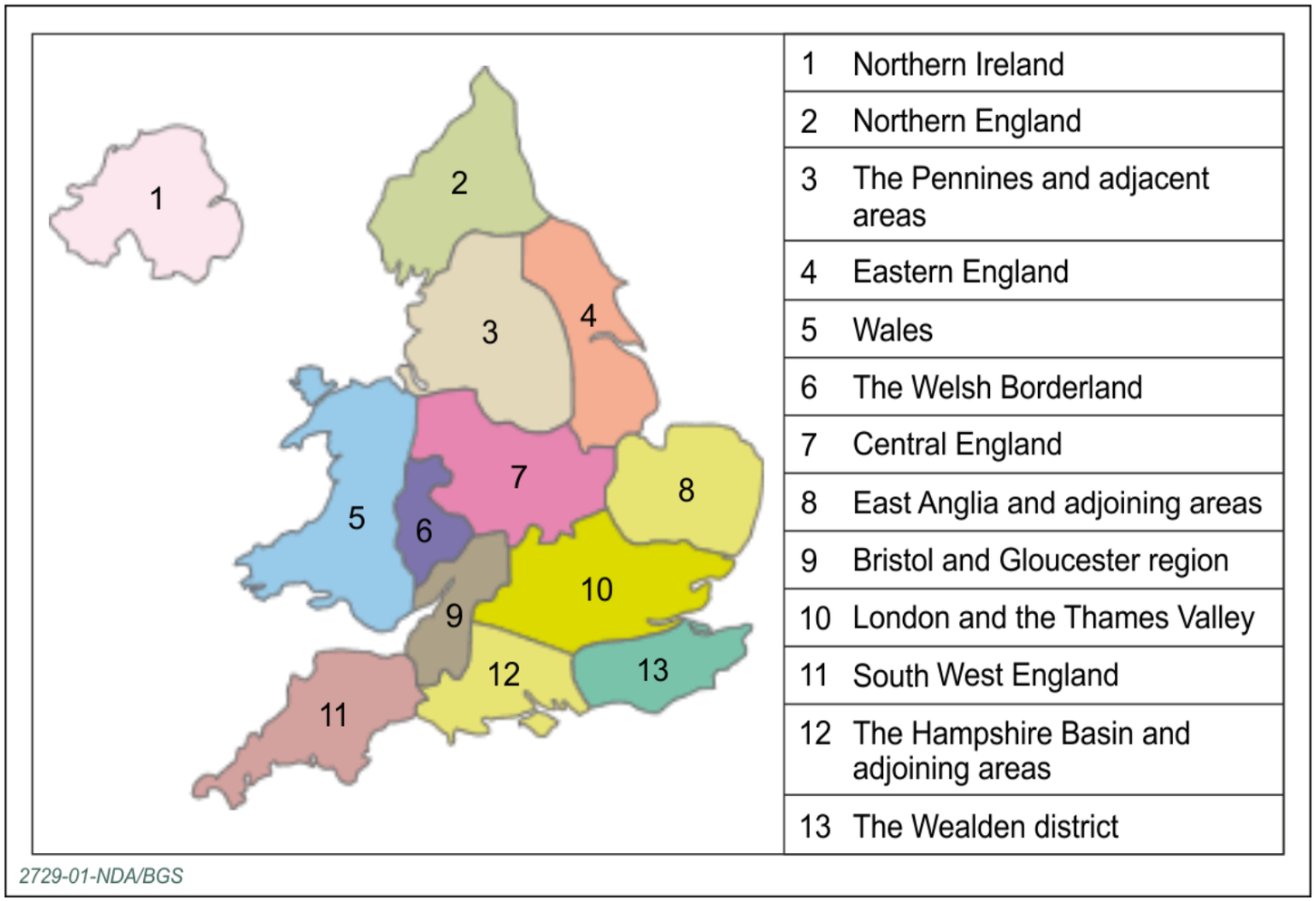
Proposed outputs

A series of brief narratives by geological region of England, Wales and Northern Ireland, illustrated with maps where appropriate



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Outline for today

- Introductions
- Context-setting presentation
  - Background on geological disposal
  - Government policy
  - National geological screening
- Lunch
  - Demonstrations
- Group discussion of consultation questions
  - Tea and coffee
- Feedback from group discussions

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Consultation questions for roundtable discussion

1. To what extent do you think our proposed approach to providing national-scale existing information about geology relevant to long-term safety is appropriate? Please give your reasons.

2. To what extent do you think the sources of information are appropriate and sufficient for this exercise? Please give your reasons.

3. To what extent do you agree or disagree with the proposed form of the outputs from geological screening? What additional outputs would you find useful?

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What happens next?

- The consultation will be open until the 4th December
- RWM will analyse responses
  - *Revise the national geological screening guidance*
  - *Provide a consultation response*
- Discuss revised national geological screening guidance with the Independent Review Panel
- Finalise and publish Guidance
- Apply Guidance during 2016 to produce outputs

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Thank you

- Please respond to the consultation here:
- http://www.nda.gov.uk/rwm/national-geological-screening/consultation/
- Consultation ends 4th December 2015

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Regulation

- A GDF will only be built, operated and closed if it meets the requirements of the independent regulators:
  - *Office for Nuclear Regulation*
  - *Environment Agency, Natural Resources Wales, Northern Ireland Environment Agency*

- These requirements implement the protection standards established nationally and internationally

- The regulators will make their requirements clear to the developer, and any communities considering hosting a GDF

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ONR's role in geological screening

- Screening about long-term environmental safety rather than nuclear safety
- At this stage, ONR's involvement concerns:
  - *Setting out our approach to regulation of geological disposal*
  - *Initial advice to RWM on safety, security and transport matters so regulatory standards/requirements taken into account in the design of the GDF*
  - *Regulating storage of radioactive waste at existing licensed nuclear sites until a GDF is available*
  - *Working with the environment agencies to ensure our regulatory processes are aligned*

- Further information: http://www.onr.org.uk/geodisposal.htm