North Dakota site chosen for test of nuclear waste disposal concept developed in Sheffield

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The US Department of Energy (DOE) is investigating a safer, faster and cheaper method of disposing of high-level nuclear waste than the conventional mined repository planned for implementation in several countries, including the UK. Known as deep borehole disposal the concept has been developed in the UK at the University of Sheffield.

The DOE has selected a Battelle Memorial Institute-led team to drill a test borehole to over 16,000 feet in the crystalline basement rock formation near Rugby, North Dakota, as the next stage of proving the deep borehole concept.

The Sheffield Deep Borehole Disposal Research Group, in collaboration with Sandia National Laboratories, is currently developing a program of research and development for the field test which will include key issues such as how to prevent groundwater corrosion of the waste packages and how to seal the borehole to prevent any escape of the radioactive waste.

No active waste is planned to go into the test borehole but if the field test is successful, the USA hopes to dispose of its 'hottest' and most radioactive waste - left over from cold war plutonium production and currently stored at Hanford in Washington State - in a similar borehole.

Professor Fergus Gibb said "A successful disposal of such highly active wastes could lead to the adoption of deep borehole disposal for other, larger volume, wastes such as spent nuclear fuel (for which no operating disposal facility yet exists anywhere in the world) and for the high-level

wastes from fuel reprocessing."

The Sheffield group calculate that all of the UK's high level nuclear waste from spent fuel reprocessing could be disposed of in just six boreholes 5km deep, fitting within a site little larger than a football pitch.

In March three members of the Sheffield group will be presenting papers on deep borehole disposal at 'Waste Management 2016' in Phoenix, Arizona. Professor Fergus Gibb, Dr Karl Travis and John Beswick (of Marriott Drilling) will talk on technical options, the Hanford wastes and borehole construction respectively. This is the first time this prestigious meeting has included a session on borehole disposal and indicates the importance the US attaches to the new concept.

Provided by University of Sheffield