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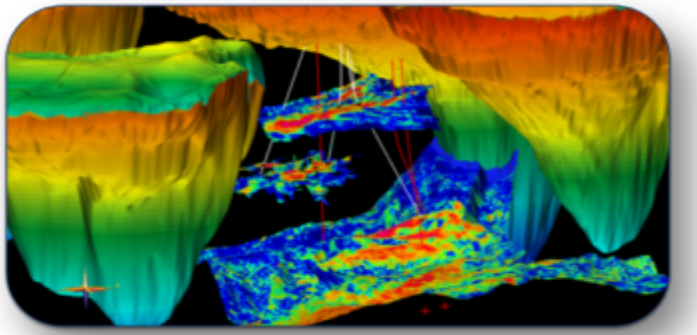

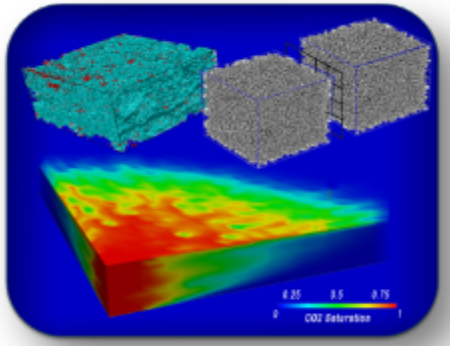

Deep Borehole LDRD

Pat Brady, Senior Scientist

Geoscience Research and Applications

U.S. DEPARTMENT OF ENERGY

NNSA

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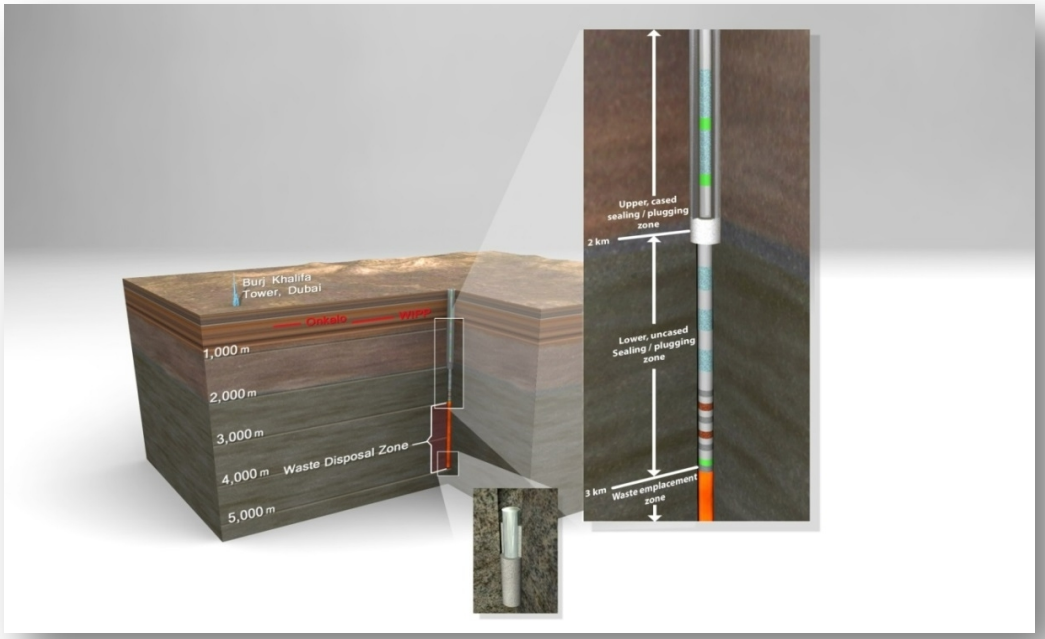
Deep Borehole Disposal Concept

- Waste disposal in boreholes in basement rock (granite) at up to 5,000 m depth
- Very old, saline, immobile groundwater
- Borehole diameter 25 to 45 cm
- Up to 400 steel waste canisters for HLW, possibly SNF
- Boreholes would be sealed with clay, cement, concrete



Field test site to be selected in early 2016, with commencement of drilling in mid-2016

FEATURES

DEEP SLEEP

Boreholes drilled into Earth's crust get a fresh look for nuclear waste disposal

By Warren Cornwall

One of the world's biggest radioactive headaches sits in an aging cinderblock building in the desert near Hanford, Washington, at the bottom of a pool of water that glows with an eerie blue light. The nearly 2000 half-meter-long steel cylinders are filled with highly r... doned it. Over the past 5 years, however, as improved drilling technologies converged with the political and technical woes bedeviling other nuclear waste solutions, boreholes have regained their allure. DOE has gone from spending almost nothing on borehole research to planning a full-scale field test, costing at least $80 million. And

nature International weekly journal of science

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Archive > Volume 507 > Issue 7490 > News > Article

NATURE | NEWS

US seeks waste-research revival

Radioactive leak brings nuclear repositories into the spotlight.

Jeff Tollefson

04 March 2014

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Final Disposal in Deep Boreholes Using Multiple Geological Barriers: Digging Deeper for safety

Endlagerung in tiefen Bohrlöchern unter Nutzung mehrfacher geologischer Barrieren –: Weiter in die Tiefe gehen für die Sicherheit

International Expert-Workshop o... 201...

Berlin, Germany

Organisation: KIT, TU Freiberg, Herrenknecht GmbH

Participation (intended): Baker-Hughes, IAEA, IfG, GNS, GRS, Sandia, RWTH Aachen, TU Clausthal-Zellerfeld, NAGRA, University Uppsala, Piewak & Partner, Hydroisotop, MIT, BGR, BMWi, BMUB, Umweltministerium BaWü, net, Uni Freiburg, Regierungspräsidium BaWü, Ökoinstitut, DBETec, ...

BERLIN 2015

also, written up in …

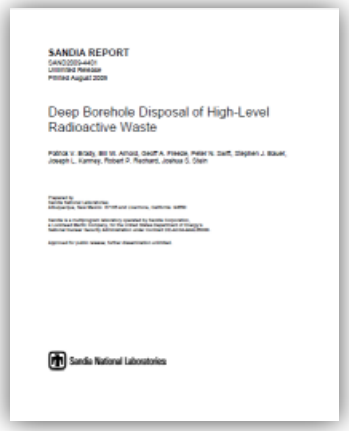
The Economist

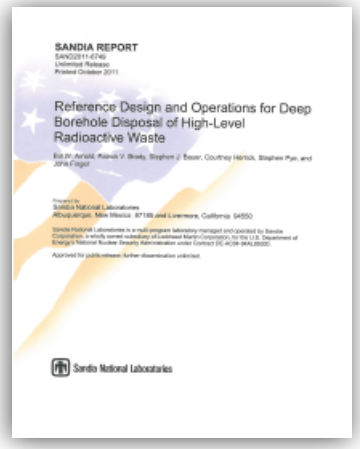
Forbes

The Motley Fool

Sandia has led development of the Deep Borehole disposal option from 2009 LDRD to DOE field test program initiated in 2015

"DOE should develop an RD&D plan and roadmap for taking the borehole disposal concept to the point of a licensed demonstration." *Blue Ribbon Commission final report, January 26, 2012.*



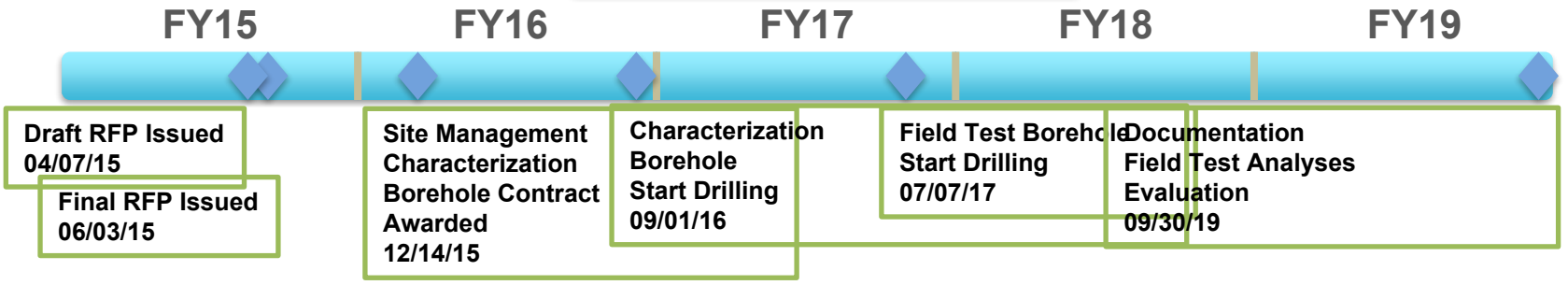


Sandia 2009-2011 Deep Borehole LDRD

Sandia led 2012 DOE/NE Deep Borehole Roadmap

Sandia led 2014 DOE/NE Deep Borehole Project Plan

5-year project implementation plan



Sandia National Laboratories

Leading Indicators

	Elements of "Value"						
Leading-ish Indicator or Measure	of a al Lab?	e state art?	eal ns for ers?	nents xternal ?	unities dia to	e SNL's al ion?	Attractive and stimulating for staff?
PhD hiring from top-ranked schools	Π	Π	?	?	?	Π	Π
Retention of top-ranked researchers	Π	Π	?	?	?	Π	Π
Funding efficiency = proposals submitted vs. proposals funded	?	?	?	?	Π	Π	Π
Identification of the "right" locations in which to publish and/or to present to get visibility	Π	Π	Π	Π	Π	Π	Π
Identification of "preferred" partners and nurturing of "preferred" partnerships	Π	?	?	?	Π	Π	?
Number and frequency of conversations with customers about research topics	Π	?	Π	Π	Π	?	Π
Customer incorporation in planning documents / workshops / dialog	Π	?	Π	Π	Π	Π	Π
Follow-on R&D or implementation investment by federal customers and or commercial investment	Π	?	Π	Π	Π	Π	Π
Industry representation on Sandia External Advisory Boards	Π	?	Π	Π	?	Π	Π
Industry input to LDRD calls and project selections	Π	Π	Π	Π	Π	Π	Π

Strong & Focused Leadership by Sandia Management + …

Sandia National Laboratories

Lagging Indicators

Helped solve a national problem + …

	Elements of "Value"						
Lagging Indicator or Measure	…y of a …al Lab?	…ce state …art?	…real …ms for …hers?	…ments …xternal …entities?	Opportunities for Sandia to team?	Enhance SNL's technical reputation?	Attractive and stimulating for staff?
Refereed publications in high-impact journals	Π	Π	?	?	Π	Π	Π
Journal covers and cover articles	Π	Π	?	?	Π	Π	Π
Books and book chapters	Π	Π	?	?	?	Π	Π
Citations	Π	Π	?	?	Π	Π	Π
Invited talks	Π	?	?	?	Π	Π	Π
Best conference paper and poster awards	Π	Π	?	?	?	Π	Π
Workshop and conference leadership	Π	?	?	?	Π	Π	Π
Professional leadership (editors, society officers and committees)	Π	?	?	?	Π	Π	Π
TA's, patents (applications and awards), copyrights, etc.	Π	Π	Π	Π	?	Π	Π
CRADAs	Π	Π	Π	Π	Π	Π	Π
Media Recognition	Π	?	?	?	?	Π	Π
Awards (e.g., R&D 100, PECASE, etc.)	Π	Π	?	?	?	Π	Π
Follow-on funding	Π	?	Π	Π	?	?	Π