

Exceptional service in the national interest



Sandia National Laboratories/Carlsbad

Brief Overview

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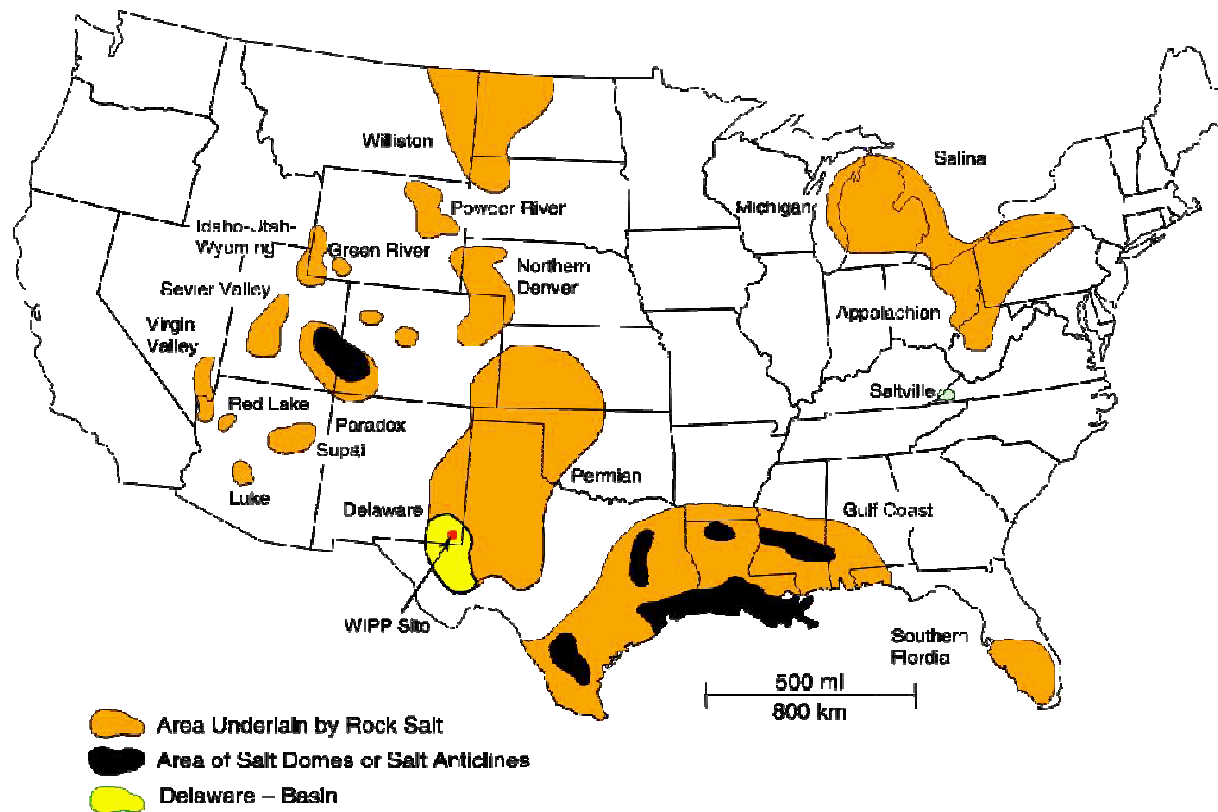


Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000. This research is funded by WIPP programs administered by the Office of Environmental Management (EM) of the U.S Department of Energy. SAND2014-1952P

National Academy of Science

1957

- National Academy of Sciences concludes that the most promising disposal option for radioactive wastes is in salt deposits.



"Salt at great depth flows. It will encapsulate any waste placed at depth and isolate it from the surface environment for eons."

"The great advantage is that no water can pass through salt. Fractures are self healing...."

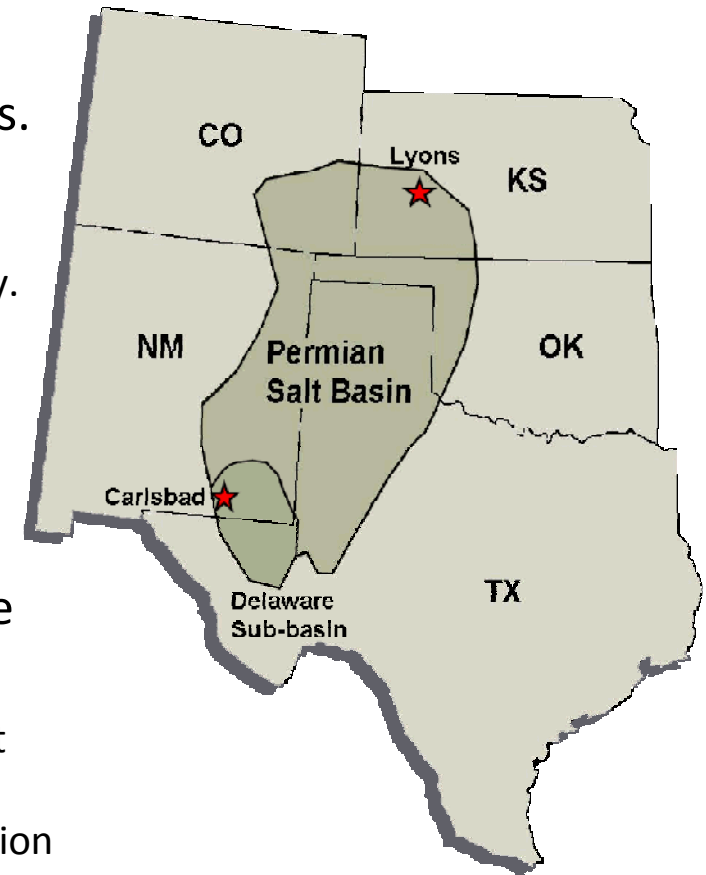
Initial Candidate Sites Focused on Bedded Salt

1968

- Project Salt Vault near Lyons Kansas.
 - Nearby oil production provided easy targets for critics and the Lyons site became politically troubled very quickly.

1972

- Local politicians from Carlsbad, NM learn of problems at Lyons (1972), and actively pursue AEC to explore nearby potash district for candidate sites.
 - Delaware Basin turns out to be deepest and thickest, but nearby oil production and potash mining still make site selection controversial.



1975

- Sandia receives first WIPP funding

DOE National Security and Military Applications of Nuclear Energy Authorization Act of 1980

1979

- Act authorized DOE to construct WIPP and to seek New Mexico endorsement to operate a geologic repository for waste generated for defense purposes (weapons development waste).
 - Act does not allow disposal of waste from civilian power production.
- Substantial influence by both local and state politicians to proceed. Economic impact (jobs) drove influence but 'good science' demanded at every step.



Construction of WIPP

1981

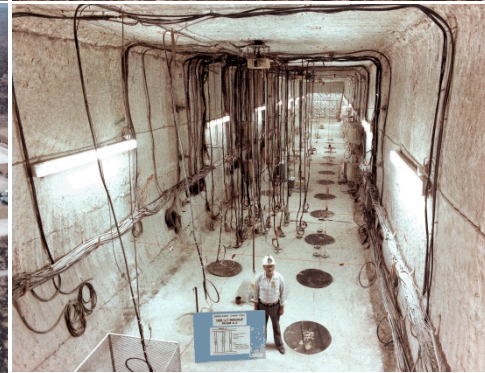
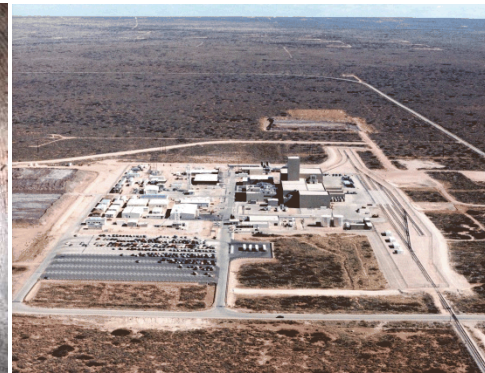
- Surface construction of WIPP begins.

1983

- First underground rooms are completed.

1988

- Engineered facility is ready for waste disposal.



Major WIPP Events

After the Facility Readiness

1989

- Nuclear Regulatory Commission certifies the TRUPACT-II shipping container

1992

- WIPP Land Withdrawal Act designates EPA as WIPP's primary regulator

1993

- EPA issues radiation standards for waste containment.

1996

- EPA issues criteria for compliance

1998

- EPA certifies that WIPP complies with 40CFR191

1999

- First shipment of TRU waste from Los Alamos National Laboratory
- New Mexico Environment Department issues a Hazardous Waste Facility Permit

2004

- Recertification CRA-2004

2007

- Begin Remote Handled Waste Disposal

2009

- Recertification CRA-2009

2011

- SDI PCN, Panel Closure Re-Design and Repository Reconfiguration PCR



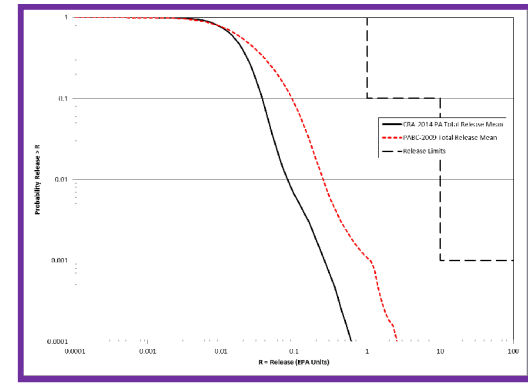
Sandia/Carlsbad Background & Missions

- Sandia is the scientific advisor for the DOE Carlsbad Field Office (CBFO)
 - Provides scientific support in performance assessment, geochemistry, hydrology and geo-mechanics for continued WIPP compliance with EPA regulations
 - Maintains a remote site in Carlsbad, New Mexico, to promote customer intimacy and to fulfill commitments made to community leaders in the mid-1990's
- The group at Sandia/Carlsbad advances the state of repository science and solves problems in domestic and international nuclear waste management
- This technical focus supports at least two of Sandia's mission areas (Secure & Sustainable Energy Future and Global Nuclear Dangers) from within the ECIS SMU
- The remote site workforce numbers approximately 50 people (mix of employees and contractors); matrix in another 10-12 people from Sandia/Albuquerque
- The remote site also supports technology-based economic development and education programs in southeastern New Mexico



SNL's WIPP Work: The Foundation for Compliance

- Performance Assessment
 - Features, Events and Processes Scenario analysis
 - Process modeling
 - Total System Performance Assessment
- Geomechanics
 - Salt creep modeling and void space analysis
 - Analysis of hydrodynamic shear strength of nuclear waste
- Geochemistry
 - Fe/Pb solubility and corrosion experiments
 - MgO hydration/carbonation experiments
 - Actinide solubility analysis
 - Geochemical modeling in high ionic strength, aqueous systems
- Hydrology
 - Ground water level monitoring and analysis in WIPP vicinity
 - Geochemical study of all water samples collected in WIPP vicinity
 - Basin-scale flow modeling
- Quality Assurance
 - Pervasive QA culture
 - Sandia WIPP Records center



People

- Sandia established an office in Carlsbad in September, 1994.
- Today we have **50** members of the workforce.
 - Carlsbad Programs Group
 - PA and Decision Analysis Department
 - Repository Performance Department
 - Business Management Support Staff

29 Sandians (All Carlsbad-Resident)

4 Students (2 Resident, 2 Non-Resident)

17 Contractors (12 Resident, 5 Non-Resident)

Facilities and Equipment at SNL/C

- Leased Space
 - NPHA (12200 ft² office)
 - NPHB (7000 ft² laboratories/servers)
- Hydrology field equipment
 - Two well-testing trailers
 - Downhole video inspection system
- Geochemistry laboratories
 - Jeol scanning electron microscope
 - X-Ray diffraction unit
 - High-Temperature aqueous chemistry
- Geomechanics
 - Horizontal/vertical flume tester
- Computing facility
 - OpenVMS 8.2 Compaq/HP Alpha cluster
 - Solaris 10 Sun blade server with Intel Quad CPUs
- Specialized records storage equipment and spaces dedicated to records storage and retrieval



NMSBA Program

The New Mexico Small Business Assistance (NMSBA) Program assists for-profit, small businesses in New Mexico to access cutting-edge technologies, solve technical challenges, and gain knowledge from laboratory experts at both Sandia National Laboratories and Los Alamos National Laboratory. The assistance is provided at no cost to the small business.

- Eligibility
 - For-profit small business located in New Mexico
 - Pay or file gross receipts tax to the State of New Mexico
- Technical assistance is provided in the form of research hours valued up to . . .
 - \$10,000 annually if the small business is located in Bernalillo County
 - \$20,000 annually if the small business is located outside of Bernalillo County
- Restrictions
 - Assistance provided must not be available through private industry at reasonable cost
 - NMSBA cannot provide case or equipment to the small business
 - NMSBA cannot provide assistance to government or nonprofit entities
 - NMSBA cannot endorse companies, products, or services

NMSBA Projects



Eldorado Biofuels, LLC

“NMSBA brought the science and procedures to test our technology. We wouldn’t be where we are today without access to New Mexico’s national labs.”

Paul Laur, CEO

Eldorado Biofuels, LLC

Royal Fiber Spinnery

“NMSBA’s attitude is, ‘Tell us what the problem is and let’s see if we can fix it.’ That’s the kind of thing that made this country great in the first place.”

Rod Dakan, Owner

Royal Fiber Spinnery



NMSBA Projects in SE New Mexico

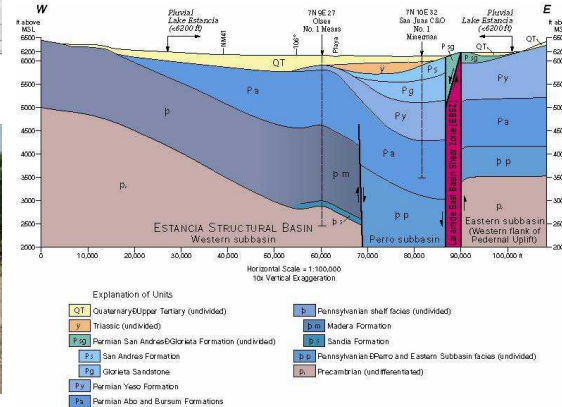
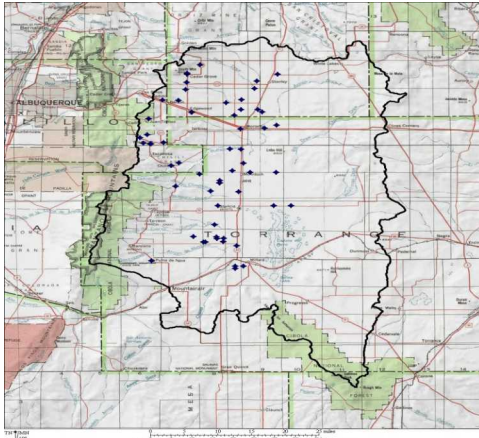


PLATE 2. Hydrogeologic section of the central Estancia groundwater basin (EGWB)



- 147 Projects performed in Eddy County (tied with Dona Ana County for 3rd highest county number in the state)
- 41 projects in Otero, 69 projects in Chaves and 28 projects in Lea County, many of which originated from SNL/Carlsbad
- Since 2000, more than \$4 million dollars in technical assistance from SNL/Carlsbad to companies in the state of NM

Data as of 12/31/2013

We Are Involved in Our Community



- Support the CHS Chapter of the Business Professionals of America by hiring student interns
- Provide scholarships at Carlsbad and Loving high schools
- Provide SNMERC with science kit refills
- SNMERC Board of Directors
- Board of Directors for Carlsbad Department of Development
- Member of the Carlsbad Chamber of Commerce
- Support local science fairs in Carlsbad and Roswell
- Support public school outreach programs
- Lockheed Martin charitable contributions
- United Way of Carlsbad and South Eddy County
- Annual River Blitz
- Walk for Life
- Christmas Anonymous
- Christmas on the Pecos
- Boy Scouts of America