

# Nevada National Security Site Programmatic Overview

**Patrick S. Morris**  
Director, Operations and Infrastructure  
National Security Technologies, LLC

**March 18, 2014**



This work was done by National Security Technologies, LLC, under Contract No. DE-AC52-06NA25946 with the U.S. Department of Energy.



**Nevada National Security Site**

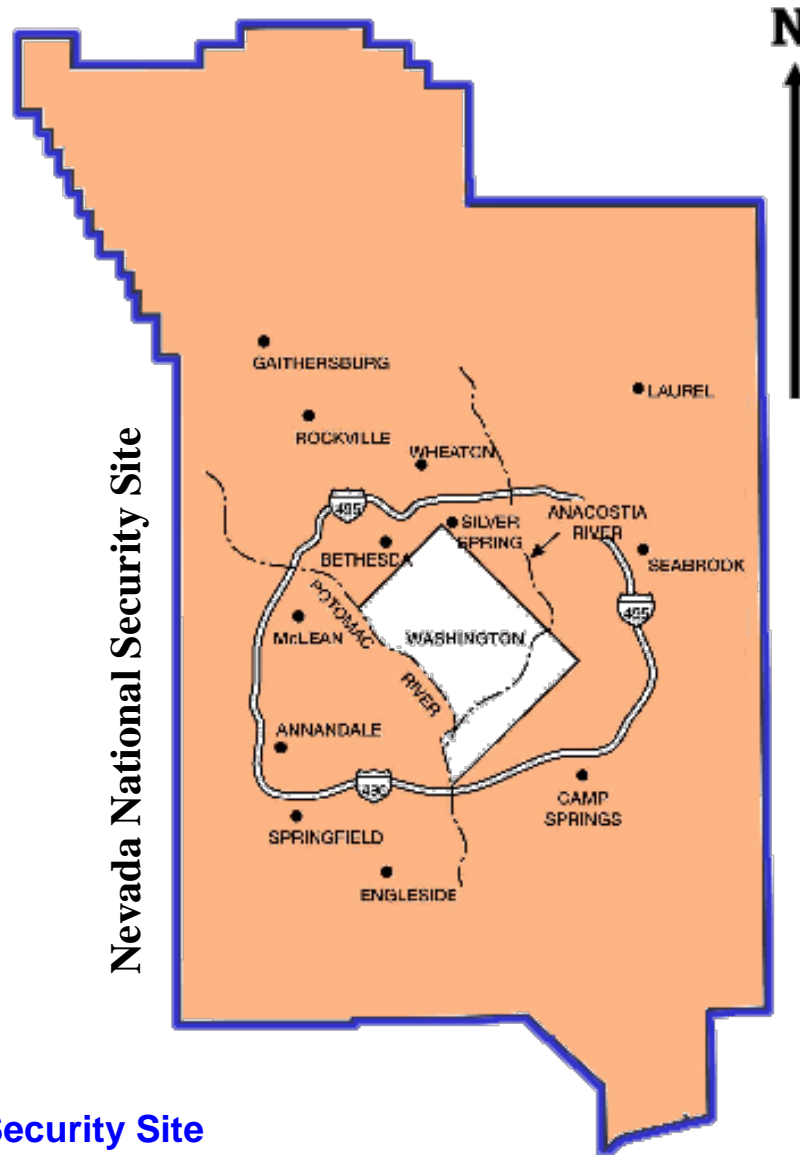
*Managed and Operated by National Security Technologies, LLC*

# On August 23, 2010 the Nevada Test Site became the Nevada National Security Site

- Recognizes fundamental change in mission:
  - From full-scale nuclear testing
  - To a broad range of national security activities



# NNSS is unlikely to ever suffer from encroachment



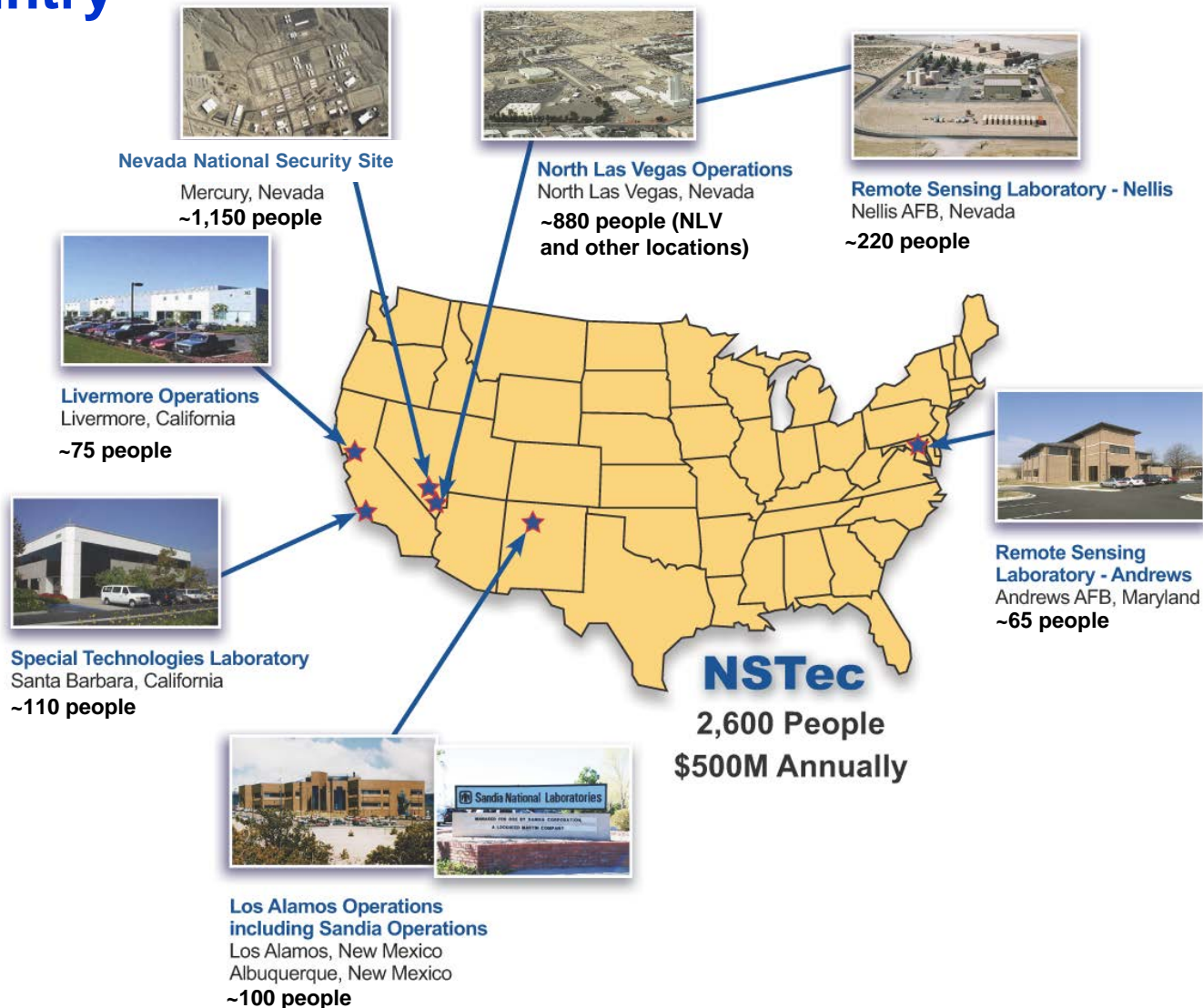
Nevada National Security Site



**Nevada National Security Site**

*Managed and Operated by National Security Technologies, LLC*

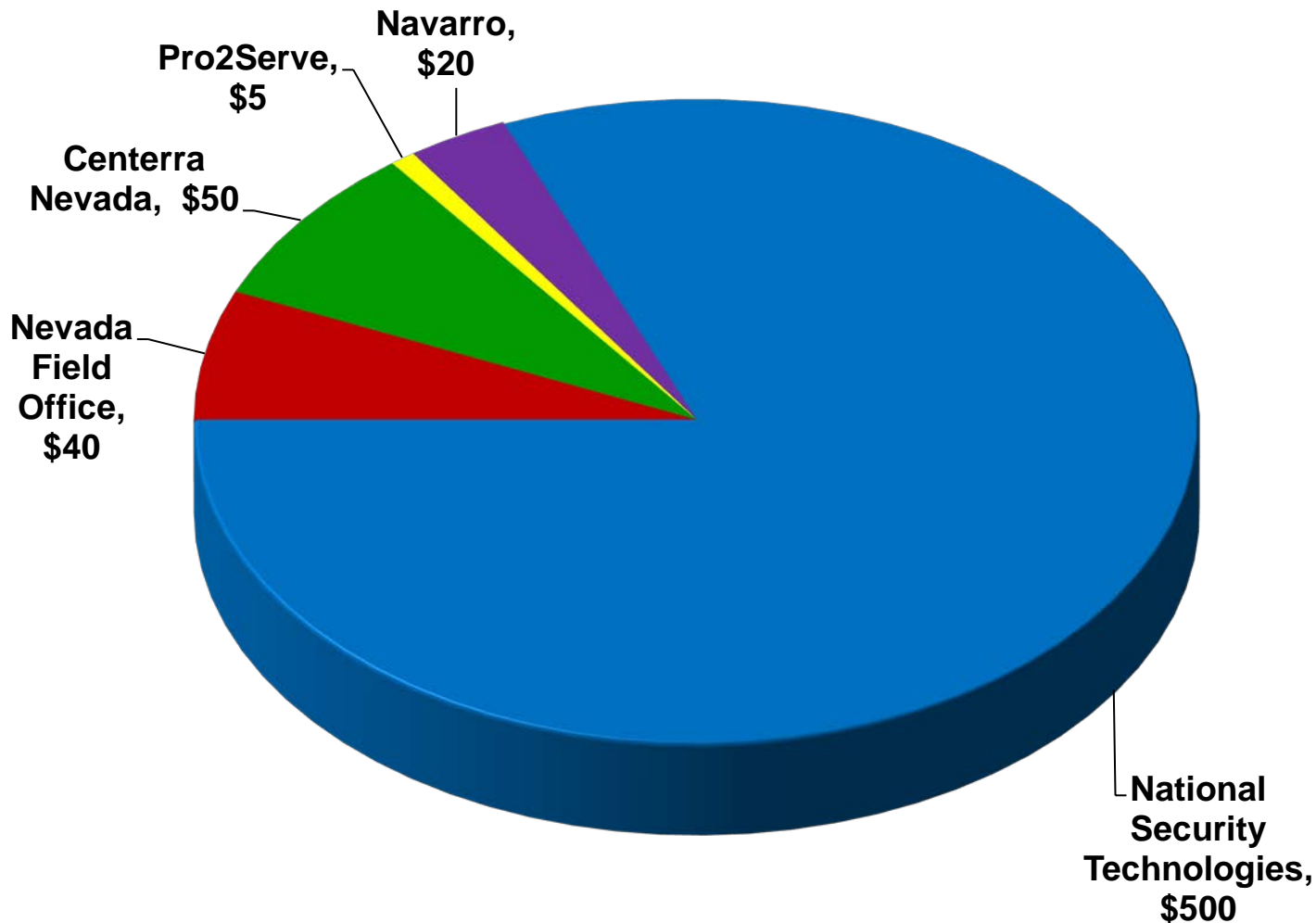
# National Security Technologies has operations across the country



## Nevada National Security Site

Managed and Operated by National Security Technologies, LLC

# Nevada Enterprise funding supports the State of Nevada (\$M)



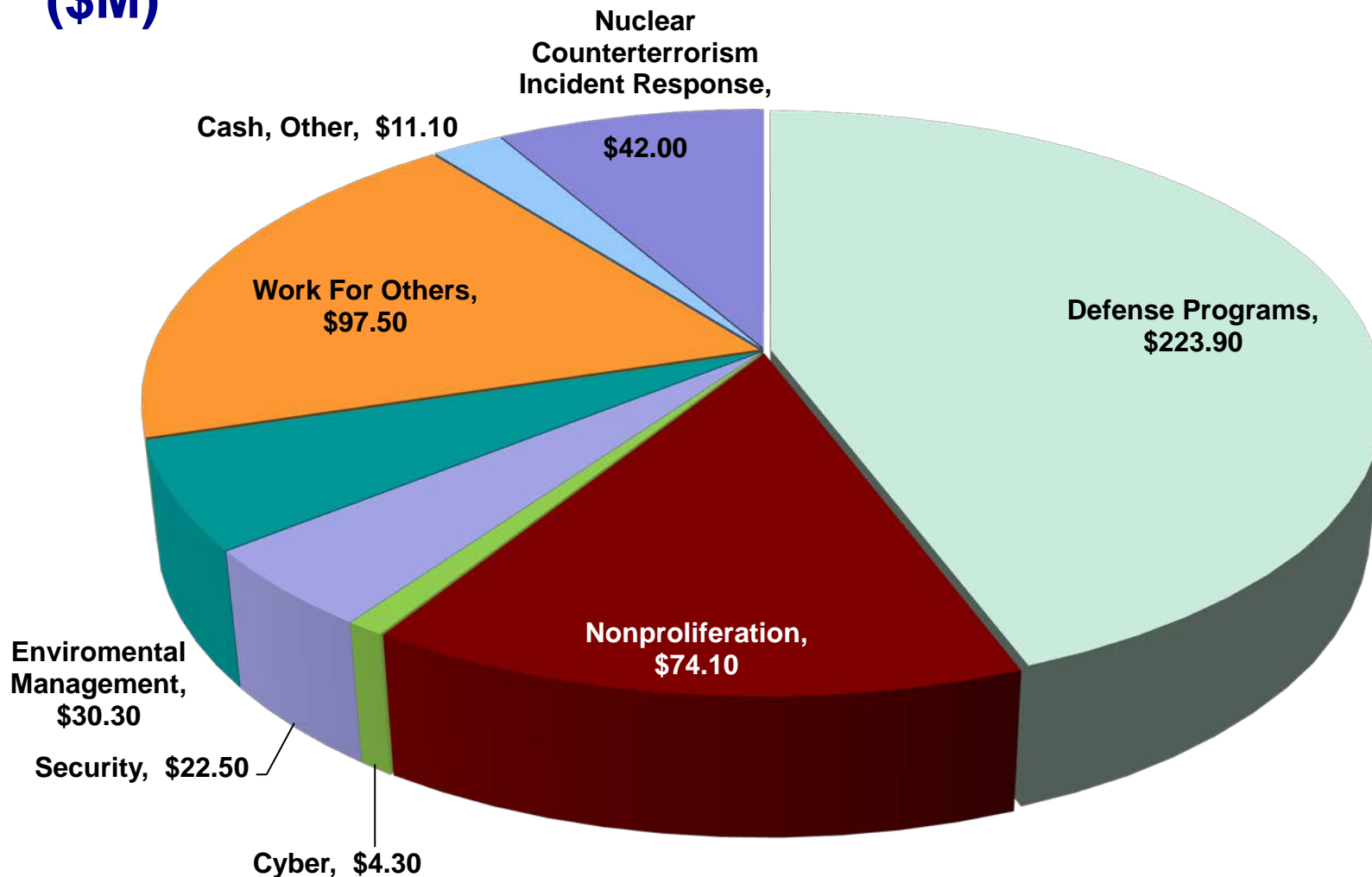
**Nevada Enterprise Funding - ~ \$615M**



**Nevada National Security Site**

Managed and Operated by National Security Technologies, LLC

# FY 2013 NSTec funding by major program elements (\$M)



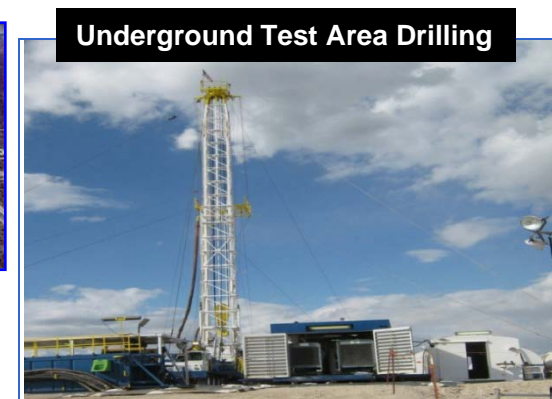
**Total = \$505.7 M**





# Our scope of activities are of national importance

- Stockpile Stewardship
  - Subcritical experiments
  - Materials studies experiments
  - Experimental criticality capability
- Department of Defense activities
  - Training
  - Test and Evaluation
- Global Security
  - Nonproliferation
  - Emergency Response
  - Treaty Verification and Validation
- Support for the intelligence community
  - Sensor development
  - Facility evaluation
- Environmental Restoration / Waste Management
  - Disposal of radioactive waste
  - Characterization & remediation of legacy wastes
  - Borehole Management
  - Underground Test Area (UGTA)



# NNSS is the unique experimental facility in support of safety, security, and effectiveness of the nuclear deterrent

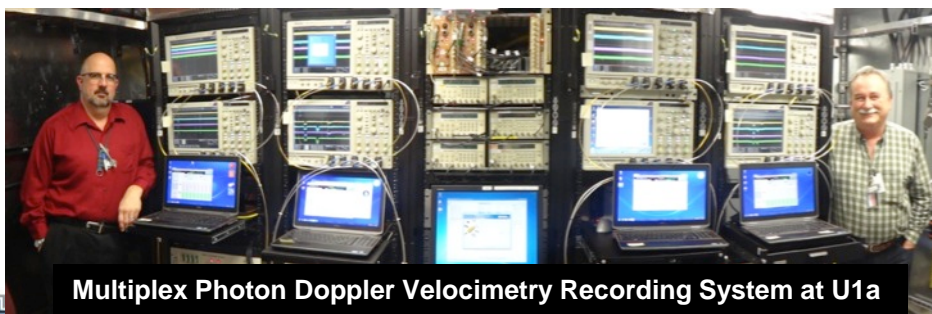
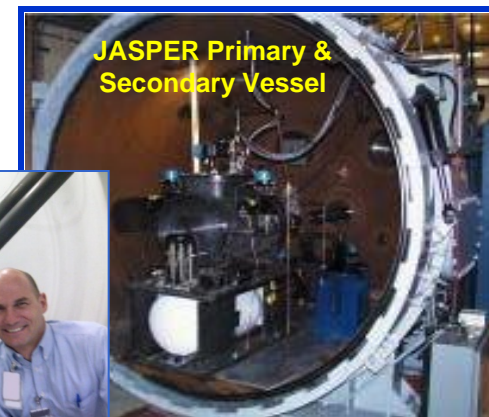
## Key Experiments & Capabilities

- Dynamic material properties experiments including classes of Subcritical Experiments
  - Materials Thermodynamic Properties (e.g. Equation of State) and Constitutive Properties (e.g., strength, spall, ejecta) studies Next-gen hydro, dynamic materials, High Energy Density Physics (HEDP) radiation & neutron diagnostic life-cycle development
- Teaming in advanced radiographic sources, detectors, & imaging R&D
- Experiment data capture, post-processing, algorithms, analysis, and 2D/3D display



## Key Facilities and Experimental Platforms

- U1a Complex for underground Subcritical Experiments, Cygnus dual-axis radiography
- JASPER 2-stage gas gun for premier, high-precision materials data
- Device Assembly Facility for nuclear materials handling, criticality experiments
- Big Explosives Experiment Facility and High Explosives Complex for large-scale explosive experiments



**Nevada National Security Site**

Managed and Operated by National Security Technologies, LLC



# Expanding mission in Global and Homeland Security

- Nation's experts in detecting and locating dirty bombs, improvised explosive devices (IED), and other nuclear and radiological sources
- Characterize the threat environment
- Radiological monitoring and assessment
- Produce specialized equipment
- Trained over 145,000 emergency responders and other personnel
- Test and evaluate equipment to defeat terrorists
- Nonproliferation testing and evaluation



IED test at Big Explosives Experimental Facility (BEEF)



Emergency Response training

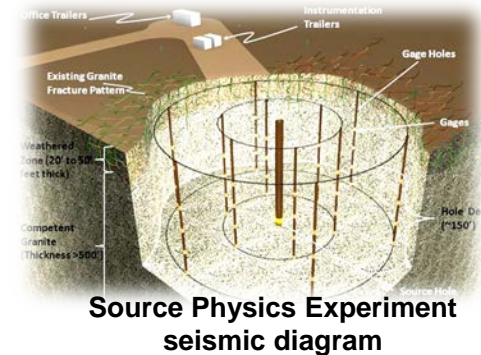


Chemical release experiments at NPTEC



# National Center for Nuclear Security (NCNS) at the NNSS focused on arms control verification and nonproliferation R&D

- Treaty Verification Technologies – Test, Evaluation & Training
  - Develop, test, and train on new arms control verification technologies
  - Multi-agency, possibly international participation, data center for verification and confidence building
- Nonproliferation Technologies – Test, Evaluation & Training
  - Develop, test, and train on technologies to locate Weapons of Mass Destruction or signatures of their development
  - Demonstration of improved ways to deal with terrorist nuclear devices
  - Multi-agency, possible international participation
- Operationally focused - technical nuclear forensics
  - Exercise the equipment and methods to be used in a real event
  - On-site inspection exercises/training
- Strong collaboration with the National Laboratories, UNLV, and UNR



IED  
experiment



Source Physics  
Experiment drill rig



## Environmental Management is a major program and focus at the NNSS

- Environmental protection, compliance and monitoring of air, water, plants, animals and cultural resources at the NNSS
- Investigation and implementation of corrective actions to address contaminated groundwater, facilities, and soils resulting from historic nuclear testing
- Permanent disposal of low-level, mixed low-level radioactive waste and non-radioactive classified waste



## Environmental Restoration Program at NNSS is a success

### **Industrial Sites/Soils**

- Restoration activities at the NNSS and Tonopah Test Range are 97% complete
- Baseline to be completed by 2030
- The majority of the restoration program will be complete, and all that will remain is monitoring- 2,086 of 2,140 IS/Soils sites closed to date.



### **Underground Test Area (UGTA)**

- Multi-agency investigation of groundwater contamination resulting from underground testing and modeling of the current and future extent of contaminant transport
- NSTec provides geological and hydrologic interpretations, drills groundwater wells, and performs well development and testing



### **Borehole Management Project/UGTA**

- Plug legacy boreholes with no future use to reduce the risk of contaminant transport to groundwater
  - The project was completed Sept 2012, with a total of 822 boreholes plugged since FY 2000





## Radioactive Waste Program safely disposes of Low Level Waste (LLW) and Mixed Low Level Waste (MLLW)

- The Radioactive Waste Program has contributed more than \$10M over the last ten years to Nevada counties; \$0.50 per cubic foot
- Disposal has averaged 1.5 million ft<sup>3</sup> per year over the past 5 years
- NNSS accepts less than 5% of the LLW and MLLW in the entire DOE complex



## Team NSTec joins Team Nevada in pursuit of Federal Aviation Administration (FAA) Unmanned Aircraft System (UAS) Site Selection

- On April 2, 2012, Governor Sandoval appointed Dr. Ray Juzaitis to the Nevada Autonomous Systems Panel to pursue the FAA's Center of Excellence designation for UAS integration into National Airspace
- Desert Rock Airport on the NNSS was selected as one of the Nevada Site Ranges
- NSTec Team joined Team Nevada in providing data, experience, capabilities, and processes to support Nevada in response to FAA
- FAA decision in December 2013 included Nevada as one of the six chosen sites
- NSTec continues to work with Nevada in pursuit of UAS market



# Challenges to Operating a Diverse Portfolio – Integrating Safety Cultures is the Greatest Challenge

- Integration of multiple safety cultures
  - Engineered/Process Based versus Expert Based
  - Often engaged late in the process which effectives the evaluation of adequacy with hazard identification and analyses
- Safety Management Program Integration
  - Workforce needs to understand requirements
  - Multiple Safety Management Programs creates significant opportunity for confusion and unclear safety chain responsibility
  - Conflicts must be resolved during initial decision if work will be accepted
  - Some functional areas do not support multiple Safety Management Programs



# Challenges to Operating a Diverse Portfolio – Balancing Risk Must be Done Transparently

- Managing Risks across multiple customers
  - Risks are not perceived equally
  - Users have little understanding on impacts to others
  - Transparent Enterprise Risk Management is critical to Stakeholder participation and support
- Instilling discipline in **Conduct/Formality of Operations**
  - critical to mission success
    - The “Deliberate Speed” message takes time for customers to understand value
    - Internal struggles with importance of Conduct/Formality will have greatest negative impact on performance
    - Will have the greatest impact on Leadership’s acceptance of Risk than any other parameter





## Challenges to Operating a Diverse Portfolio – Deconflicting Priorities of National Programs is Challenging

- Deconflicting priorities of various customers
  - Everyone/thing is Priority 1
- If not managed correctly can allow Programs to ignore their responsibilities
  - Critical Infrastructure
  - Key Safety Programs
  - Technical/Scientific personnel development
- Cost of doing business must be well understood and communicated

