SAND2012-5614P

Compliance Monitoring Program

EPA Inspection – 2012

July 17th – 19th 2012

Steve Wagner
SNL/JHA

Sandia National Laboratories is a multi-program laboratory operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Company, 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.

Sandia National Laboratories

Presentation Overview

- Brief description and scope of the Compliance Monitoring Program and what is monitored
- Summary of what is new for this reporting period
- Briefly discuss Compliance Monitoring Program results for 2011

Compliance Monitoring Program

- **Addresses EPA requirements in 40 CFR 194.42 – Monitoring**

- **Compliance Monitoring is used to monitor the disposal system to detect substantial and detrimental deviations from expected long-term repository performance**
  - **Monitoring parameters were selected based on their importance to the WIPP performance assessment**
  - **Since "substantial and detrimental deviations" are not expected – the program compares specific monitoring data against performance assessment assumptions, repository conditions and expectations**
  - **Exceedance from expectations (Trigger Values; TVs) does not indicate an out-of-compliance condition**

  - **Annual assessment in COMPs reports**
    - ***Sandia National Laboratories Compliance Monitoring Parameter Assessment for 2011,* ERMS 556779**

What is Monitored

- Ten Compliance Monitoring Parameters (COMPs)
  - Drilling Rate
  - Probability of Encountering a Brine Reservoir
  - Waste Activity
  - Subsidence
  - Changes in Groundwater Flow
  - Change in Groundwater Composition
  - Creep Closure
  - Extent of Deformation
  - Initiation of Brittle Deformation
  - Displacement of Deformation Features

What's New

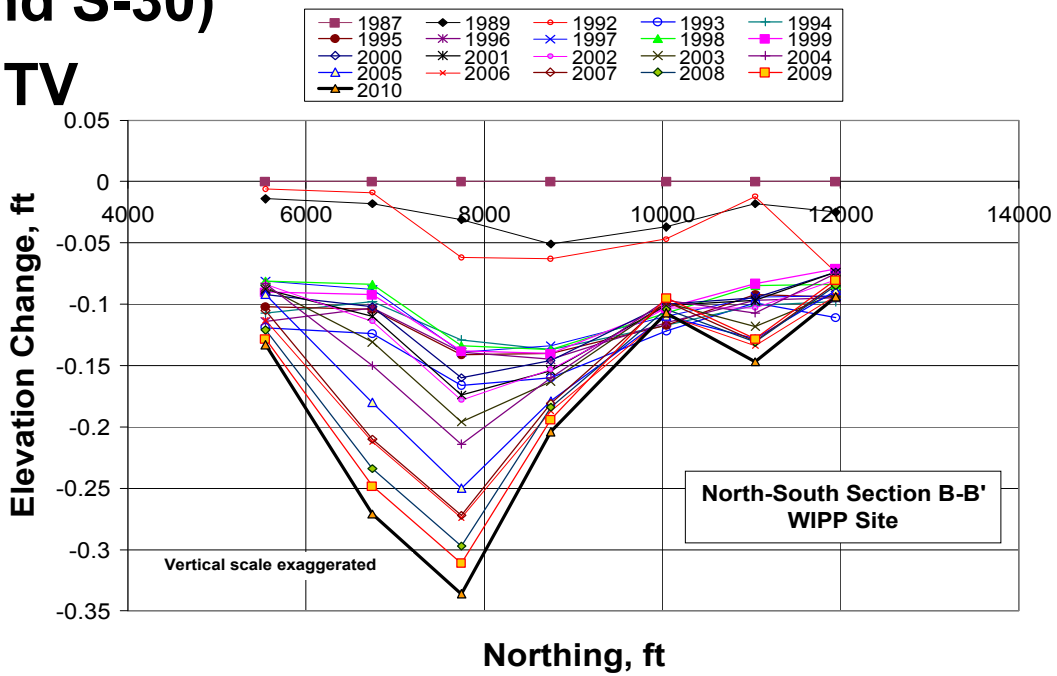
- First year for new annual WQSP sampling
  - COMPs compare 2 rounds of sampling
- Second year for COMP Assessment Change - Culebra Groundwater Flow COMP
  - Reminder of change
    - Assessment process was modified to align with HWFP reporting of this parameter
    - New TV - Model-predicted travel time from the center of the WIPP panels to the WIPP LWB must fall within the distribution found using 100 model runs from the most current baseline PA

COMPs Results for 2010

- Drilling Rate (bh/km^2/10,000yrs)
  - 2010 62.3
  - 2011 64.1
  - No TV
- Probability of Encountering a Brine Reservoir
  - No new Castile brine encounters
- Waste Activity
  - Emplaced Curies less than PA input parameters/RH less than 5.1 MCi

COMPs Results for 2010

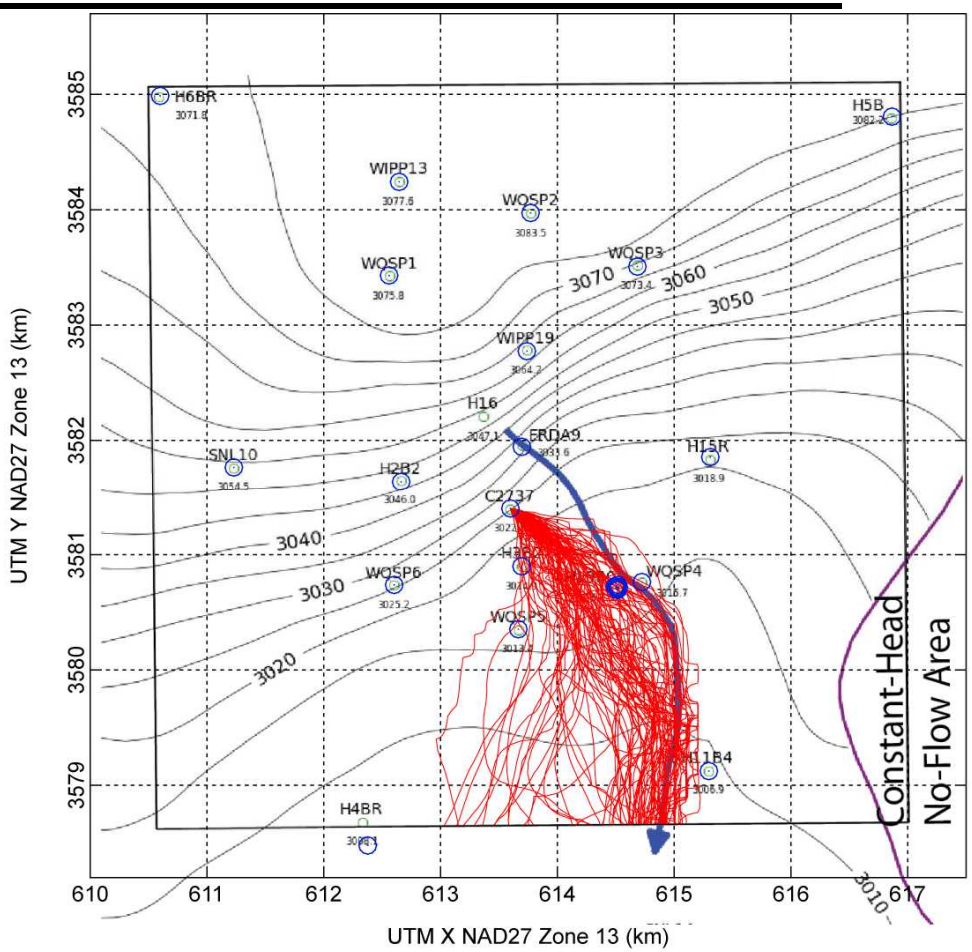
- **Subsidence**
  - **The highest subsidence rates measured for the 2009-2010 surveys correspond to benchmarks located over the newer panels (e.g., S-418, S-26, S-28, S-29 and S-30)**
  - **Less than TV**



Sandia National Laboratories

COMPs Results for 2010

- **Changes in Groundwater Flow**
  - **Within new TV**



Distribution of 100 particle traces (red lines) from C-2737 (center of waste panels) to WIPP LWB for CRA-2009 PABC. Culebra monitoring wells are indicated with blue circles (COMPS 2011)

Sandia National Laboratories

COMPs Results for 2010

- Change in Groundwater Composition
  - TV – When Ion concentration for both primary and duplicate sample are outside the baseline 95% confidence window for 3 consecutive rounds
    - Cl^- ion concentration for WQSP-1 rounds 28 - 31
    - SO_4^{2-} ion concentration for WQSP-3 rounds 28 - 31
    - K^+ ion concentration in WQSP-4 rounds 27 - 31
  - No action recommended at this time in COMPs report. Further instances may invoke further analysis.
  - All other wells met the TV

COMPs Results for 2010

- Creep Closure
  - Creep rate within the TV
- Extent of Deformation
  - Within expectations – no TV
- Initiation of Brittle Deformation
  - Within expectations – no TV
- Displacement of Deformation Features
  - Within expectations – no TV

COMPs Summary

- 10 monitoring parameters are assessed and compared to PA expectations and assumptions
- No additional actions were specified in the 2011 COMPs report as a result of the monitoring data analysis