SAND2011-3235P

Compliance Monitoring Program

EPA Inspection – 2011

May 10th - 12th 2011

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Presentation Overview

- Compliance Monitoring Parameters - COMPs
- Brief description 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 2010

Compliance Monitoring Program

- **Compliance Monitoring is used to monitor the disposal system to detect substantial and detrimental deviations from expected performance**
  - **Also addresses EPA requirements in 40 CFR 194.42 – Monitoring**

- **Analyze specific monitoring data against Performance Assessment assumptions, repository conditions and expectations**
  - **Annual assessment in COMPs reports**
    - ***Sandia National Laboratories Compliance Monitoring Parameter Assessment for 2010,* ERMS 554585**

Compliance Monitoring Program

Important Note: Since this is a QA compliance activity, only published data can be used in the analysis such that the data used here is generally one to two years behind what is being discussed today in the other presentations

Example – Geotechnical COMPs assessment uses *Geotechnical Analysis Report For July 2008 – June 2009* (April 2010)

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 this Reporting Period

- Trigger Value (TV) Report - Revision 2
  - New TV for Change in Culebra Groundwater Flow
  - Deleted TVs for:
    - Drilling Rate – Impact of Drilling Rate changes assessed during each recertification
    - Extent of Deformation – Not an indicator of long-term performance
    - Displacement of Deformation Features – Not an indicator of long-term performance
  - Changed TV assessment period
    - Waste Activity COMP assessment period was changed from when a panel was half full to annual

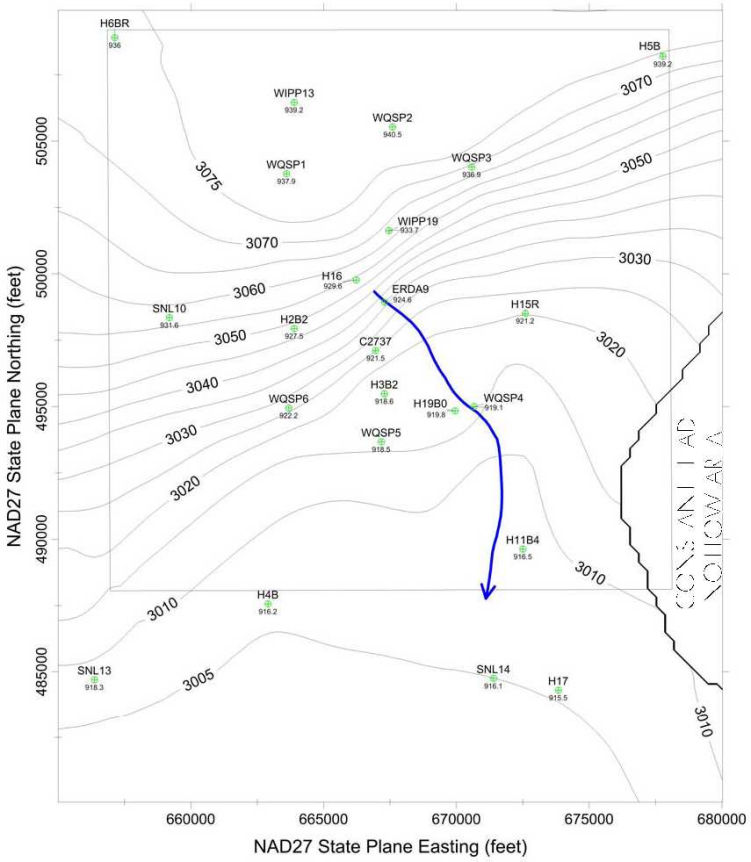
What's New

- **COMP Assessment Change - Culebra Groundwater Flow COMP**
  - **Assessment process was modified to align Hazardous Waste Facilities Permit and Compliance Recertification Application (CRA) "change in groundwater flow" reporting**
  - **CRA used a new method of calculating transmissivity fields that no longer uses a range of freshwater heads as inputs (this range was also used as trigger value for this COMP)**

New Assessment and TV Method

– Model-predicted travel time in the Culebra is compared to the distribution found in PA, for an ensemble-average model with best-fit boundary conditions to the current year's observed freshwater heads. The 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. This is used as the new TV for the groundwater flow COMP

New Assessment Method



June 2009 modeled Culebra potentiometric surface of the immediate WIPP vicinity (DOE 2010) generated using ensemble average distributed aquifer parameters from the SNL Culebra flow model used in performance assessment baseline calculation for CRA-2009; see Kuhlman (2010b).

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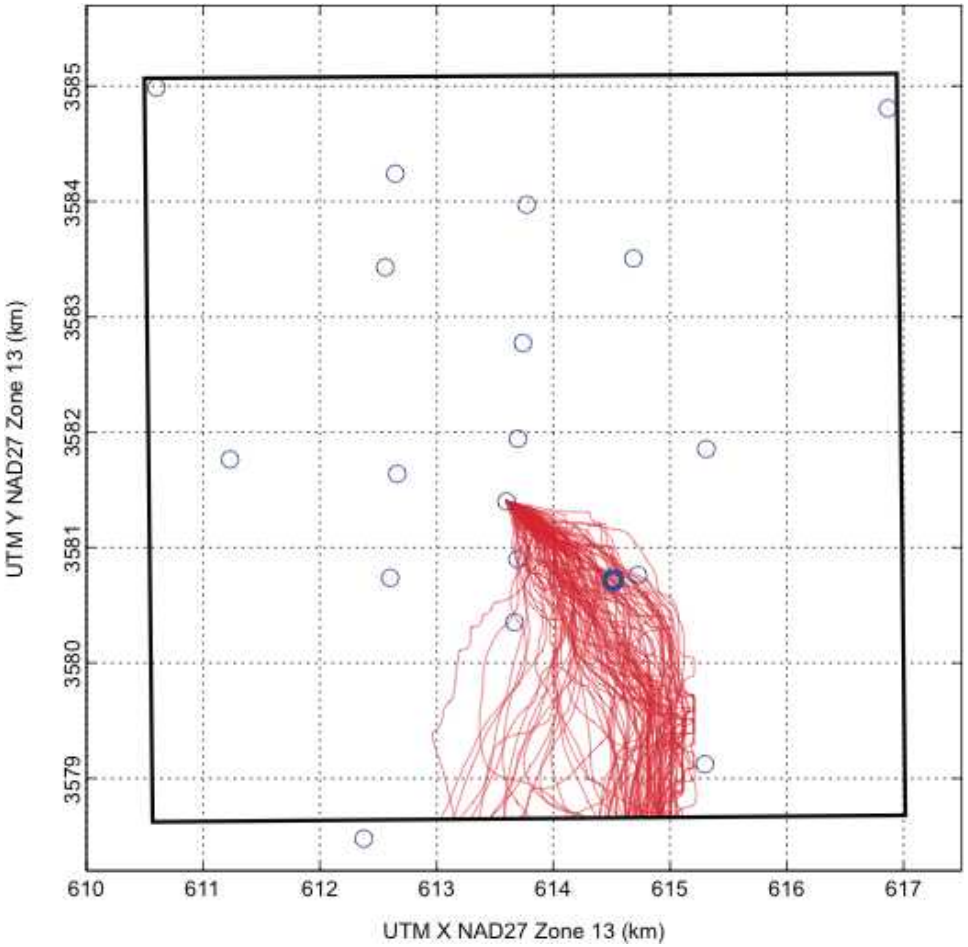
New Assessment Method



Distribution of 100 particle traces (red lines) from C-2737 (center of waste panels) to WIPP LWB (heavy black line) for CRA-2009 PABC; Figure from Kuhlman (2010b). Culebra monitoring wells are indicated with blue circles.

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New Assessment Method Results

- The predicted travel time for a particle currently falls within the range modeled for PA (the new TV). The 2010 COMP travel time indicates that the current observed freshwater heads are consistent with the model used in PA, and therefore are within the newly defined TV.

COMPs Results for 2010

- Drilling Rate (bh/km^2/10,000yrs)
  - 2009 61.3
  - 2010 62.3
  - No TV
- Probability of Encountering a Brine Reservoir
  - No new Castile brine encounters
- Waste Activity
  - Less than PA input parameters/RH less that 5.1 MCi
- Subsidence
  - Less than TV

COMPs Results for 2010

- Changes in Groundwater Flow
  - Within new TV
- Change in Groundwater Composition
  - The potassium ion concentration in WQSP-4 rounds 27, 28, and 29 were all below the lower 95% CI of 832 mg/L, and exceeded the TV. Potassium is one of the minor cations, and this deviation is not a significant event warranting further investigation at this time
  - 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 2010 COMPs report as a result of the monitoring data analysis