



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

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AUG 31 2005

OFFICE OF  
AIR AND RADIATION

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Carlsbad Field Office  
U.S. Department of Energy  
P.O. Box 3090  
Carlsbad, New Mexico 88221-3090

Dear Mr. Piper:

During the week of July 11, 2005, the U.S. Environmental Protection Agency (EPA) performed inspections of the Waste Isolation Pilot Plant (WIPP) waste management and storage operations (EPA-WIPP-7.05-12a) and the monitoring program (EPA-WIPP-7.05-12bc). These inspections were performed under the authority of 40 CFR 194.21 and 40 CFR Part 191, Subpart A.

As a result of the inspection, EPA determined that the activities related to emissions monitoring during waste management and storage continue to comply with the requirements of 40 CFR Part 191, Subpart A. We also determined that DOE continues to adequately monitor the ten parameters that are important to the long-term containment of waste, as identified in EPA's 1998 Certification Decision.

Copies of these inspection reports are enclosed with this letter and will be placed in the EPA public docket. If you have any questions regarding the enclosed reports, please call Chuck Byrum at (214) 665-7555.

Sincerely,

Bonnie Gitlin, Acting Director  
Radiation Protection Division

Enclosure

cc: Russ Patterson, DOE/CBFO  
Steve Casey, DOE/CBFO  
Steve Zappe, NMED  
EPA Docket

UNIQUE #	DOE UFC	DATE REC'D	ADDRESSEES
0503550	2740000	SEP 07 2005	See list on back

**DOCKET NO: A-98-49**  
**Item: II-B3-83**

**Monitoring Inspection Report**  
**INSPECTION No. EPA-WIPP-7.05-12b**  
**OF THE**  
**WASTE ISOLATION PILOT PLANT**  
**July 12 to July 15, 2005**

**U. S. ENVIRONMENTAL PROTECTION AGENCY**  
**Office of Radiation and Indoor Air**  
**Center for Federal Regulation**  
**1200 Pennsylvania Avenue, NW**  
**Washington, DC 20460**

**August 2005**

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**1.0 Executive Summary**

The U.S. Environmental Protection Agency (EPA) conducted an inspection of the Department of Energy's (DOE) Waste Isolation Pilot Plant (WIPP) on July 12 to July 15, 2005, as part of our continuing WIPP oversight program. The purpose of this inspection was to verify that DOE is adequately monitoring the ten parameters listed in the Compliance Certification Application (CCA), Volume 1, Section 7.0, in particular Table 7-7 (See Table 1, COB-M2005-1). Attachment A contains the checklist and the inspection plan used by the EPA inspector, and Attachment B lists documents reviewed by the EPA inspector.

The inspection examined the implementation of monitoring for geomechanical, hydrological, waste activity, drilling related, and subsidence parameters. The EPA inspector toured locations where measurements are taken, reviewed parameter databases, and reviewed documents and procedures directing these monitoring activities.

The inspector found that DOE, through its contractor Washington TRU Solutions (WTS), effectively implemented the monitoring programs at WIPP for all areas. EPA did not have any findings or concerns. The inspector also confirmed that the results of DOE monitoring programs are reported annually.

**2.0 Scope**

The WIPP Compliance Criteria (40 CFR Part 194.42(a)) require DOE to "conduct an analysis of the effects of disposal system parameters on the containment of waste in the disposal system." The results of these analyses were included in the 1998 CCA and were used to develop pre-closure and post-closure monitoring requirements.

Volume 1, Section 7.0, of the CCA documented DOE's analysis of monitoring. Table 7-7 of the CCA lists the ten parameters that DOE determined may affect the disposal system. These parameters are grouped into major categories and listed in Table 1.

<b>Table 1 - Monitored Parameters</b>	
<p><b>Geomechanical Parameters-</b></p> <ul style="list-style-type: none"> <li>-Creep closure,</li> <li>-Extent of deformation,</li> <li>-Initiation of brittle deformation, and</li> <li>-Displacement of deformation features.</li> </ul>	<p><b>Waste Activity Parameter-</b></p> <ul style="list-style-type: none"> <li>-Waste Activity</li> </ul> <p><b>Subsidence Parameter-</b></p> <ul style="list-style-type: none"> <li>-Subsidence measurements</li> </ul>
<p><b>Hydrological Parameters-</b></p> <ul style="list-style-type: none"> <li>-Culebra groundwater composition and</li> <li>-Change in Culebra groundwater flow direction.</li> </ul>	<p><b>Drilling Related Parameters-</b></p> <ul style="list-style-type: none"> <li>-Drilling rate and</li> <li>-The probability of encountering a Castile brine reservoir.</li> </ul>

EPA accepted these ten monitoring parameters in the certification issued on May 18, 1998. This inspection was performed under authority of 40 CFR 194.21 to verify the continued effectiveness of the parameter monitoring program at WIPP. Inspection activities included an examination of monitoring and sampling equipment both on and off site, and in the underground. EPA also reviewed numerous sampling procedures and measurement techniques and verified implementation of an effective quality assurance program.

### 3.0 Inspection Team, Observers, and Participants

The inspection consisted of three EPA staff.

Inspection Team Member	Position	Affiliation
Chuck Byrum	Inspection Leader	EPA
Shankar Ghose	Observer	EPA
Tom Peake	Observer	EPA

Numerous DOE staff and contractors participated in the inspection; below is a partial list.

DOE/Contractor Participates	Affiliation/Organization
Stan Patchet	WTS
Joel Siegel	WTS
Rey Carrasco	WTS
John Vandervatts	WTS
Steve Casey	DOE
Dave Kump	WTS
Dave Speed	WTS
Dave Hughes	WTS

The inspection began on Tuesday, July 12, 2005, at 0800 with an opening where site staff discussed changes to the monitoring program during the past year, at 1100 with a review of the hydrology monitoring program, and at 1500 with a review of the geomechanical monitor program. On July 13, 2005 at 0730 the inspector toured the underground viewing a demonstration of convergence and load cell measurements. At 1330 on the July 13 the inspector viewed a survey loop data collection demonstration on the WIPP site. Then on July 14, 2005 at 0800 the inspector viewed a demonstration of water composition sampling. Also on the July 14 at 1300 the inspector examined the database used to store Delaware Basin parameters and at

1400 he examined the WWIS waste computer database system.

The EPA inspector reviewed various activities to verify effective implementation of plans and procedures. The inspector observed a demonstration of the WIPP Waste Information System (WWIS), which is used to track the waste shipped from TRU waste sites. The inspector also reviewed the Delaware Basin Drilling Surveillance Program, Groundwater Monitoring Program, and the Geomechanical Monitoring Program.

#### 4.0 Performance of the Inspection

The EPA inspector reviewed three fundamental areas to verify continued implementation of the DOE monitoring program during the pre-closure phase: 1) written plans and procedures, 2) quality assurance procedures and records, and 3) results of the monitoring program in the form of raw data, intermediate reports, and final annual reports, if appropriate. The inspection checklist in Attachment A provides details these of inspection activities.

#### 4.1 Monitoring of Geomechanical Parameters

DOE committed to measure four geomechanical parameters in the CCA: creep closure, extent of deformation, initiation of brittle deformation, and displacement of deformation features. WIPP has four programs that supply information for these four parameters: the geomechanical monitoring program, the geosciences program, the ground control program, and the rock mechanics program. These programs are documented in the WIPP Geotechnical Engineering Program Plan, WP 07-01 (COB-M2005-D). The results of the Geotechnical Engineering Program are documented in the Geotechnical Analysis Report for July 2003 - June 2004, DOE/WIPP-00-3177, Volumes 1 and 2 (COB-M2005-A and -A2).

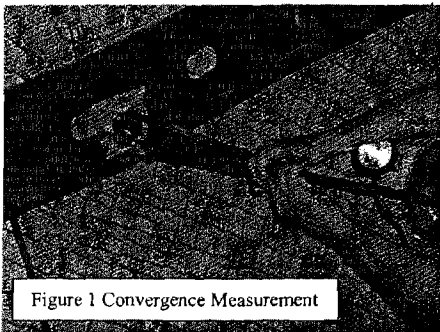


Figure 1) and load cell measurements. (COB-M2005-S16 and -S17)

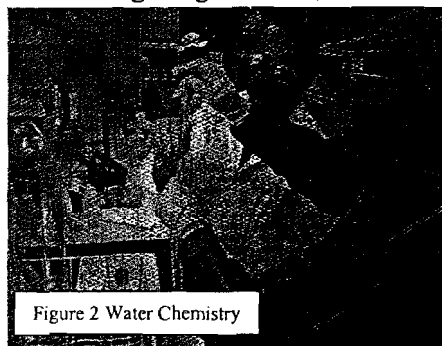
The inspector toured and reviewed underground instrumentation, the computer database, and field data sheets used to record raw measurement data. He also examined output convergence, roof-to-floor measurements, check prints to verify implement of the measurement plan (COB-M2005-S8, -S9, -S10, -S11, -S12, -S13, -S14, and -S15). While underground the inspector observed the acquisition of convergence (Figure

#### 4.2 Monitoring of Hydrological Parameters

DOE committed to measure two hydrological parameters in the CCA: Culebra groundwater composition and changes in the Culebra groundwater flow direction. Related parameters are measured and documented in the WIPP environmental monitoring program.

These programs are documented in the WIPP Groundwater Monitoring Program Plan, WP 02-1 (COB-M2005-C). Results of this program are documented in the Waste Isolation Pilot 2003 Plant Site Environmental Report, DOE/WIPP 04-2225 (COB-M2005-O2). This document describes the groundwater monitoring program and presents results for the previous year.

During the 2005 inspection the EPA inspector requested information about changes in the program since last year. Joel Siegel noted that five new Culebra wells were drilled, 13 wells plugged, 9 wells reconfigured to monitor Magenta, and 7 wells sampled for water chemistry (Figure 2) during the past year (COB-M2005-S3). This year Bill Foster and other site staff demonstrated serial sampling at the WQSP-4 well (COB-M2005-T, -W, -S26, -S27, and -S28)



#### **4.3 Monitoring of Waste Activity Parameters**

DOE committed to monitor the activity of waste emplaced in the CCA. This parameter is part of the extensive database collected for each container shipped to WIPP and is stored in the WIPP Waste Information System (WWIS). The WWIS is a software system that screens waste container data and provides reports on the Transuranic (TRU) waste sent to WIPP. The requirements for the WWIS are discussed in the WIPP Waste Information Program and System Data Management Plan, WP 08-NT.01 (COB-M2005-G1).

Dave Speed demonstrated that the WWIS can receive data and that the WWIS can generate needed reports. CBFO has committed to annual waste activity reports. Dave Speed showed the inspection team how the WWIS records waste activity information provided by the generator sites and how the computer database produces waste activity reports. The inspector obtained copies of the Nuclide Report (COB-M2005-S24).

#### **4.4 Monitoring of Drilling Related Parameters**

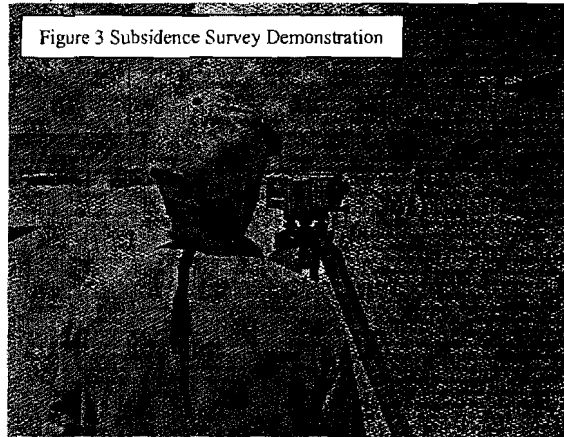
DOE committed to measure two drilling related parameters in the CCA: the drilling rate and the probability of encountering a Castile brine reservoir. These parameters are measured as part of the Delaware Basin Drilling Surveillance Plan, WP 02-PC.02 (COB-M2005-F). This surveillance program measures and records many parameters related to drilling activities around the WIPP site. The results of the surveillance program are documented annually in the Delaware Basin Annual Report, DOE/WIPP 99-2308 (COB-M2005-N).

Inspectors reviewed the drilling surveillance database, examined drilling rate changes, and permitted and active injection wells while interviewing Dave Hughes. Inspectors received maps of recent activity near WIPP (COB-M2005-S28 and -S29).

#### 4.5 Monitoring of Subsidence Parameters

DOE committed to measure subsidence at the WIPP site. This parameter is documented as part of the WIPP Underground and Surface Surveying Program, WP 09-ES.01 (COB-M2005-B). DOE performs subsidence surveys at the site annually during pre-closure operations. The results of this program are reported annually in the WIPP Subsidence Monument Leveling Survey - 2004, DOE/WIPP 04-2293 (COB-M2005-E).

This year Ben Zimmerly and the survey crew demonstrated (Figure 3) the acquisition of a survey loop on the WIPP site and showed the inspector how DOE staff or contractors take raw field survey data and calculate final surface elevations.



#### 5.0 Summary of finding, observation, concerns, and recommendations.

Based on program documents, interviews, and field demonstrations during the inspection, EPA concludes that the monitoring program covers the ten monitor parameters required in the certification decision; that the monitoring, sample collection, and sample/data analysis procedures reviewed were complete and appropriate; that staff were adequately trained and implemented the procedures adequately; and that appropriate quality assurance measures are applied. For these reasons, we find that DOE has maintained adequate parameter monitoring during the past year and has the procedures and requirements in place to sustain their program into the next year. EPA has no findings or concerns.



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**Attachment A: Inspection Plan and Checklist**

**Preliminary-WIPP Monitoring Inspection Plan**  
**40 CFR 194.42 for the year 2005**  
**With Planned Activities**

**Purpose:** Verify that the Department of Energy (DOE) can demonstrate that the Waste Isolation Pilot Plant (WIPP) is monitoring the parameter commitments made in the documentation to support the EPA's certification decision, in particular CCA, Volume 1, Section 7.2, Table 7.7 and Appendix MON. This inspection is conducted under the authority of 40 CFR 194, Section 21.

This inspection is part of EPA's continued oversight to ensure that WIPP can, in fact, monitor the performance of significant parameters of the disposal system.

**Scope:** Inspection activities will include an examination of monitoring and sampling equipment both on and off site, and in the underground. A review of sampling procedures and measurement techniques may be conducted. Quality assurance procedures and documentation for each of these activities will also be reviewed.

**Location:** This inspection will be held at the WIPP facility location twenty-six miles south east of Carlsbad, New Mexico and the surrounding vicinity as needed.

**Duration:** The EPA expects to complete its inspection in two days. Each day will begin with an opening meeting at 8:00 a.m. and end at 5:00 p.m. with a closeout session.

**Expected Date:** Week of July 11, 2005.

**Documents For Review:** Provide the latest versions for this inspection and any other pertinent documentation and/or procedures.

**Planned Activities:**

**-Geomechanical Parameters:** See Figure 6-3 of DOE/WIPP 05-3177, Vol. 1. Acquire measurements at vertical borehole extensometer, radial convergence points and loadcell in or near Panel 3 Room 1 using appropriate procedures. Verify results shown in DOE/WIPP 05-3177, Vol. 2 Table 6-3, and 7-1 and Figures 6-62, 6-69, 6-71, 6-82, 6-91, 6-92, 6-93, and 7-9.

**-Hydrological Parameter:** Reasonably demonstrate sampling of Culebra groundwater composition using appropriate procedures at a selected monitor well including a discussion of any chemical analysis done. (If time permits we may examine the laboratory.) Verify how data is developed (laboratory results), reduced (such as modeling), and included in the Section 6.0 of DOE/WIPP 03-2225.

**-Subsidence Measurements:** Review past year subsidence measurement activities including use of appropriate procedures in these activities. Verify results shown in Table F of DOE/WIPP 04-2293.

**-Drilling Related Parameters:** Verify that drilling information, in particular drilling rate and probability of encountering Castile brine, is accumulated reasonably using procedures

appropriately. Verify that results presented in Sections 2.5, 2.6 and Table 7.0 are reasonably collected and drilling rate and Castile brine pocket encounters are calculated correctly.

**-Waste Activity Parameters:** Verify that waste activity is traced and calculated correctly. Examine the WWIS, WWIS Nuclide Report, and other applicable reports to verify results.

Pre-closure Monitoring Commitments			
#	Question	Comment (Objective Evidence)	Result
<b>Geomechanical Parameters</b>			
1	<p>Does DOE demonstrate that they have implemented plans/programs/procedures to measure -</p> <p>a) Creep Closure;</p> <p>b) Extent of Deformation;</p> <p>c) Initiation of Brittle Deformation and</p> <p>d) Displacement of Deformation Features</p> <p>during the pre-closure phase of operations as specified in the CCA part of the geomechanical monitoring system?</p> <p>(CCA, Volume 1, Table 7-7; App MON, Table MON-1) 40 CFR 194.42 (c) and (e)</p> <p><b>Please Note:</b>  <b>SAT = Satisfactory</b>  <b>USAT = Unsatisfactory</b></p>	<p>WIPP Geotechnical Engineering Program Plan, WP 07-01(COB-M2005-D), documents the program planned to measure, document, report, and QA these four activities. Section 3.0 of WP 07-01 documents the Geomechanical Monitoring Program and records the activities associated with this program, the methods used, and reporting plans. Section 4.0 of WP 07-01 documents the quality assurance requirements of these activities.</p> <p>During this inspection Rey Carrasco and Dennis Mathieu demonstrated the adequacy of the program and that the program produces satisfactory results (COB-M2005-S8, -S9, -S10, -S11, -S12, -S13, -S14, and -S15). They showed samples remote measurement, sample plots, and Rick Whiteley performed underground measurements of convergence and rock bolt load cells (COB-M2005-S16 and -S17). WTS continues to enhance roof control to mitigate the impact of these stringers anhydrite stringers in Panels 3 and 4.</p> <p>Results of this program are documented annually in the Geotechnical Analysis Report for each reporting period (COB-M2005-A and -A2).</p> <p>The inspector toured and reviewed the computer system and databases used to collect and process recorded data.</p>	SAT
2	Does DOE demonstrate that they have implemented an effective quality assurance program for item 1 above? 40 CFR 194.22	During this inspection the EPA inspector evaluated the quality assurance program and found it to be adequate.	SAT
3	Does DOE demonstrate that the results of the geotechnical investigations are reported annually? (CCA, App. MON, Page MON-10)	WP 07-01, page 6, Section 3.2 requires that analysis be performed annually and results are published in the geotechnical analysis report.	SAT

Pre-closure Monitoring Commitments			
#	Question	Comment (Objective Evidence)	Result
<b>Hydrological Parameters</b>			
1	<p>Does DOE demonstrate that they have implemented plans/programs/procedures to measure -</p> <p>a) Culebra Groundwater Composition;</p> <p>b) Change in Culebra Groundwater Flow Direction</p> <p>during the pre-closure phase of operations as specified in the CCA part of WIPP's groundwater monitoring plan?</p> <p>(CCA, Volume 1, Table 7-7; App MON, Table MON-1) 40 CFR 194.42 (c) and (e)</p>	<p>WIPP Groundwater Monitoring Program Plan, WP 02-1(COB-M2005-C) documents the program plans to measure, document, report, and QA these two activities. WP 02-1 documents the Groundwater Surveillance Program Plan and records the activities associated with this program, methods used, and reporting plans. Section 11.0 of WP 02-1 documents quality assurance requirements.</p> <p>Joel Siegel discussed changes to the program over the past year. This year site Bill Foster and other staff demonstrated actual serial sampling procedures at WQSP-4 (COB-M2005-T, -W, -S26, -S27 and -S28). As part of this sampling they measure the depth to water and serial sample the water chemistry over a number of days to get in situ water for complete sampling and laboratory analysis.</p>	SAT
2	<p>Does DOE demonstrate that they have implemented an effective quality assurance program for item 1 above? (CCA, App MON, Page MON-22) 40 CFR 194.22</p>	<p>During this inspection the EPA inspector evaluated the quality assurance program and found it to be adequate.</p>	SAT
3	<p>Does DOE demonstrate that the results of the groundwater monitoring program are reported annually? (CCA, App. MON, Page MON-22)</p>	<p>WP 07-01, page 33, Section 8.1.3 requires that analysis be performed annually and results are published in the Waste Isolation Pilot Plant Site Environmental Report (COB-M2005-O).</p>	SAT

Pre-closure Monitoring Commitments			
#	Question	Comment (Objective Evidence)	Result
<u>Waste Activity Parameters</u>			
1	<p>Does DOE demonstrate that they have implemented plans/programs/procedures to measure -</p> <p>a) Waste Activity?</p> <p>(CCA, Volume 1, Table 7-7; App MON, Table MON-1) 40 CFR 194.42 (c) and (e)</p>	<p>WIPP Waste Information System Program and Data Management Plan, WP 08-NT.01 (COB-M2005-G1) describes how the WWIS is used to measure and store waste activity among other things.</p> <p>Dave Speed demonstrated the use of the WWIS and generated numerous reports (COB-M2005-S23 and -S24). Such as the Nuclide Report which summaries isotopes emplaced at WIPP. He also presented and update of the MgO balance and amount of compacted waste emplaced (COB-M2005-S5 and -S6). These activities demonstrate that waste activity is adequately monitored.</p> <p>He demonstrated that waste activity is adequately monitored.</p>	SAT
2	<p>Does DOE demonstrate that they have implemented an effective quality assurance program for item 1? (CCA, App WAP, page C-30) 40 CFR 194.22</p>	<p>During this inspection the EPA inspector evaluated the quality assurance program and found it to be adequate.</p>	SAT
3	<p>Does DOE demonstrate that the results of the waste activity parameters are reported annually? (CCA Volume, Section 7.2.4 Reporting)</p>	<p>WP 08-NT.01 Section 6, page 11 "Regulatory Reporting" documents that results are reported annually.</p>	SAT

Pre-closure and Post Closure Monitoring Commitments			
#	Question	Comment (Objective Evidence)	Result
<b>Drilling Related Parameters</b>			
1	<p>Does DOE demonstrate that they have implemented plans/programs/procedures to measure -</p> <p>a) Drilling Rate; and</p> <p>b) Probability of Encountering a Castile Brine Reservoir?</p> <p>(CCA, Volume 1, Table 7-7; App MON, Table MON-1) 40 CFR 194.42 (c) and (e)</p>	<p>The Delaware Basin Drilling Surveillance Plan, WP 02-PC.02 (COB-M2005-F), documents the program planned to measure document, report, and QA these two activities. Section 6.0 of WP 02-PC.02 documents quality assurance requirements.</p> <p>Dave Hughes discussed changes during the past year (COB-M2005-S4, -S4a, and -S4b). He reported on brine encounters, drilling rate calculations, and provided maps of drilling activities near WIPP (COB-M2005-S28 and S29).</p> <p>He demonstrated that DOE is adequately monitoring these parameters.</p>	SAT
2	<p>Does DOE demonstrate that they have implemented an effective quality assurance program for item 1 above? (CCA, App DMP, page DMP-9) 40 CFR 194.22</p>	<p>During this inspection the EPA inspector evaluated the quality assurance program and found it to be adequate.</p>	SAT
3	<p>Does DOE demonstrate that the results of the drilling related parameters are reported annually? (CCA Volume, Section 7.2.4 Reporting; App DMP, page DMP-9)</p>	<p>WP 02-PC.02 Section 6.0 documents that results are reported annually.</p>	SAT

Pre-closure and Post Closure Monitoring Commitments			
#	Question	Comment (Objective Evidence)	Result
<b>Subsidence Measurements</b>			
1	<p>Does DOE demonstrate that they have implemented plans/programs/procedures to measure -</p> <p>a) Subsidence measurements?</p> <p>(CCA, Volume 1, Table 7-7; App MON, Table MON-1) 40 CFR 194.42 (c) and (e)</p>	<p>WIPP Underground and Surface Surveying Program, WP 09-ES.01 (COB-M2005-B), documents the program used to measure, documents, report, and QA these activities.</p> <p>Ben Zimmerly demonstrated that procedures are adequately implemented when he and a survey crew shot a short demonstration survey on the WIPP site, he also showed how the raw field data collected is reduced to useful survey and how annual results are calculated (COB-M2005-S19, S20, S21, and S22).</p> <p>They demonstrated that subsidence is adequately monitored at the site.</p>	SAT
2	<p>Does DOE demonstrate that they have implemented an effective quality assurance program for item 1? 40 CFR 194.22</p>	<p>During this inspection the EPA inspector evaluated the quality assurance program and found it to be adequate.</p>	SAT
3	<p>Does DOE demonstrate that the results of the subsidence measurements are reported annually? (CCA Volume, Section 7.2.4 Reporting)</p>	<p>WP 09-ES.01 Section 1.1 documents that results are reported annually</p>	SAT



**Attachment B: Documents Reviewed**

Documents Received and Reviewed During Inspection 194.42 Monitoring Inspection July 2005 DOE Documents

ID#	Document Title	Subject Matter	Source
COB-M2005-1	Table 7-7 from Chapter 7 of the CCA; Pre-closure and Post-closure Monitored Parameters.	Parameters committed by DOE to be measured. COB-M2005-1	DOE, CCA, Chapter 7, Table 7-7.
COB-M2005-2	CCA, Appendix MON and Attachment MONPAR. In particular Table MON-1, pages MON-10, MON-29	Both documents discuss the pre- and post-closure parameters selected to be monitored at the WIPP site. COB-M2005-2	DOE, CCA documentation.
COB-M2005-A	Geotechnical Analysis Report for July 2003 - June 2004,	This report is an example of the results of the geomechanical monitoring program. COB-M2005-A and A2	DOE/WTS
and	DOE/WTS-04-3177, Volumes One and Two (Support Data),		
COB-M2005-A2	March 2005		
COB-M2005-B	Subsidence Monitoring: WIPP Underground and Surface Surveying Program WP 09-ES.01 Revision 4, 07/16/03	Demonstrates DOE's implementation of subsidence monitoring. COB-M2005-B	DOE/WTS
COB-M2005-C	Hydrological Monitoring: WIPP Groundwater Monitoring Program Plan WP 02-1 Revision 6, 3/6/03	Demonstrates DOE's implementation of hydrological monitoring. COB-M2005-C	DOE/WTS
COB-M2005-Q	Strategic Plan for Groundwater Monitoring at the Waste Isolation Pilot Plant DOE/WTS-03-3230, February 2005	Describes the objectives and goals of the groundwater monitoring program. COB-M2005-Q	DOE/WTS
COB-M2005-D	Geomechanical Monitoring: WIPP Geotechnical Engineering Program Plan WP 07-01, Revision 3, 12/17/02	Demonstrates DOE's implementation of geomechanical monitoring. COB-M2005-D	DOE/WTS
COB-M2005-E	WIPP Subsidence Monument Leveling Survey - 2004 DOE/WTS 05-2293, December 2004	This report is an example of the results of the subsidence monitoring program. COB-M2005-E	DOE/WTS
COB-M2005-F	Delaware Basin Drilling Surveillance Plan WP 02-PC.02, Revision 1, 7/1/04	Documents DOE's drilling monitoring plan. COB-M2005-F	DOE/WTS
COB-M2005-G1	WIPP Waste Information System Program and Data Management Plan WP 08-NT.01, Revision 12, 5/5/05	Demonstrates DOE's implementation of waste activity monitoring. COB-M2005-G1	DOE/WTS
COB-M2005-R	Delaware Basin Drilling Database Upgrade Process - Management Control Procedure WP 02-EC3002, Revision 1, 06/14/00	Documents how state and commercial well data is entered. COB-M2005-R	DOE/WTS
COB-M2005-S	Electric Submersible Pump Monitoring System Installation and Operation - Technical Procedure WP 02-EM1002, Revision 1, 09/30/99	Installation and operation instructions for submersible pump. COB-M2005-S	DOE/WTS
COB-M2005-T	Final Sample and Serial Sample Collection - Technical Procedure WP 02-EM1006, Revision 5, 8/12/04	Describes water sample collection. COB-M2005-T	DOE/WTS
COB-M2005-W	Groundwater Serial Sample Analysis - Technical Procedure WP 02-EM1005, Revision 4, 06/11/03	Instruction for taking serial samples. COB-M2005-W	DOE/WTS

Documents Received and Reviewed During Inspection 194.42 Monitoring Inspection July 2005 DOE Documents

ID#	Document Title	Subject Matter	Source
COB-M2005-M	WID Quality Assurance Program Description WP 13-1 Revision 25, 6/16/05	Demonstrates DOE's implementation of quality assurance program. COB-M2005-M	DOE/WTS
COB-M2005-N	Delaware Basin Monitoring Annual Report	Demonstrates DOE's implementation of drilling surveillance program. COB-M2005-N	DOE/WTS
COB-M2005-O	Waste Isolation Pilot Plant Site Environmental Report, Calendar Year 2002, DOE/WTS 03-2225, Rev. 1, Sept. 2003	Example of the results of the environmental monitoring program, in particular hydrological parameters. COB-M2005-O	DOE/WTS
COB-M2005-O2	Waste Isolation Pilot Plant 2003 Site Environmental Report, DOE/WTS 04-2225	Example of the results of the environmental monitoring program, in particular hydrological parameters. COB-M2005-O2	DOE/WTS
COB-M2005-P	Subsidence Survey Data Acquisition Report, Technical Procedure WP 09-ES4001 Revision 0, 6/13/02	Procedure documents methods used for acquiring data, creating database, and generating report on subsidence monuments COB-M2005-P	DOE/WTS
COB-M2005-AA	WIPP CH Documented Safety Analysis, DOE/WTS-95-2065 Revision 8, July 7, 2004	Describes various safety analysis done at WIPP. COB-M2005-AA	DOE/WTS
COB-M2005-AB	WIPP Environmental Monitoring Plan, DOE/WTS-99-2194 Revision 2, Feb. 2004	Describes environmental monitoring plan. COB-M2005-AB	DOE/WTS
COB-M2005-AC	Cation and Anion Analysis, Technical Procedure, WP 02-EM1007 Revision 1, 9/19/03	Documents steps to analysis cation and anions of water samples. COB-M2005-AC	DOE/WTS
COB-M2005-AD	Groundwater level measurement, Technical Procedure, WP 02-EM1014 Revision 3, 10/15/03	Steps to do borehole water level measurements. COB-M2005-AD	DOE/WTS
COB-M2005-AE	Pressure Density Survey, Technical Procedure, WP 02-EM1021 Revision 2, 10/29/02	Used to determine average density of fluid in borehole. COB-M2005-AE	DOE/WTS
COB-M2005-AF	Administrative Processes For Environmental Monitoring and Hydrology Programs, Management Control Procedure, WP 02-EM3001 Revision 8, 10/18/04	Guidance to maintain QA of monitoring sampling. COB-M2005-AF	DOE/WTS
COB-M2005-AG	WIPP Core Storage, Handling, and Distribution, Management Control Procedure, WP 07-EU3504, Revision 2, 6/20/02	Defines methods for storage, handling and distribution of cores at the core storage facility. COB-M2005-AG	DOE/WTS
COB-M2005-AJ	Geologic and Fracture Mapping Of Facility Horizon Drifts, Technical Procedure, WP 07-EU1001, Revision 1, 09/03/04	Define methods used for geologic and fracture mapping at WIPP.	DOE/WTS

Documents Received and Reviewed During Inspection 194.42 Monitoring Inspection July 2005 DOE Documents

ID#	Document Title	Subject Matter	Source
COB-M2005-AK	Geologic Core Logging, Technical Procedure, WP 07-EU1002, Revision 0, 03/07/03	Defines method used for geologic rock core logging at WIPP. DOE/WTS	DOE/WTS
COB-M2005-AH	Location of Underground Drilling Holes, WP 07-EU1003, Revision 2	Procedure provides instruction on how to document information, such as location, for underground boreholes larger than two inches and six feet long.	DOE/WTS
COB-M2005-AI	Manually Acquired Geomechanical Instrumentation Data, WP 07-EU1301, Revision 4, 05/25/04	Procedure provides instructions on how to manually collect data from convergence points, multi-position borehole extensometers, piezometer, strain gages, earth pressure cells, and rockbolt loadcells.	DOE/WTS
COB-M2005-AL	Geomechanical Instrument Data Processing, Technical Procedure, WP 07-EU1303, Revision 1, 12/02/04	Describes methods used for processing manually and remotely acquired geomechanical instrument data at WIPP.	DOE/WTS
COB-M2005-AM	Installing Convergence Reference Points, WP 07-EU1304, Technical Procedure, Revision 2, 02/23/04	Details steps needed to layout and install convergence points in new drifts or to replace point at WIPP.	DOE/WTS
COB-M2005-AN	Installing Multiposition Borehole Rod Ext., Technical Procedure, WP 07-EU1305, Revision 1, 01/18/05	Details steps needed to install multi-position borehole extensometers.	DOE/WTS
COB-M2005-AO	Installing Wire Convergence Meters, Technical Procedure, WP 07-EU1307, Revision 0, 12/12/00	Steps needed to install remote and manually read convergence meters.	DOE/WTS
COB-M2005-AP	Radiochemistry Quality Assurance Plan, 12-RL.01, Revision 11, 03/18/05	Describes the management policy and organizational structure, and QA requirement for radiochemical analysis.	DOE/WTS
COB-M2005-AQ	Sample Tracking and Custody, Technical Procedure, WP 12-RL1001, Revision 6, 05/05/05	Instructions for documenting receipt and storage of samples in WIPP laboratory.	DOE/WTS
COB-M2005-AR	Alpha Spectroscopy System Operation, Technical Procedure, WP 12-RL1002, Revision 4,	Direction for calibrating and operating the Canberra Alpha Spectroscopy System as interfaced with the Genie 2000.	DOE/WTS
COB-M2005-AS	Establishing Gross Alpha and Gross Beta Self-Absorption Curves, Technical Procedure, WP 12-R1008, Revision 2, 04/24/02	Instructions for preparing samples of known activity and known weight to generate self-absorption curves for each of the gas proportional counters.	DOE/WTS
COB-M2005-AT	Gross Alpha and Gross Beta Activity in Air Filter, Soil, Water, Sludge, and Biota, Technical Procedure, WP 12-RL1009, Revision 2, 08/26/04	Guidance for rapidly performing a variety of screening matrices for both high and low activity radionuclides.	DOE/WTS

ID#	Document Title	Subject Matter	Source
COB-M2005-AU	Sample Preparation, Technical Procedure, WP12-RL1010, Revision 5, 09/09/04	Directions for preparing samples to determine activity of radionuclides.	DOE/WTS
COB-M2005-AV	Elemental Separation - Strontium 90, Technical Procedure, WP 12-RL1011, Revision 8, 07/30/03	Directions for performing elemental separation of strontium from samples.	DOE/WTS
COB-M2005-AW	Elemental Separation - Transuranic Products, Technical Procedure, WP 12-RL1012, Revision 5, 02/05/04	Describes method for elemental separation and purification of actinide isotopes in samples.	DOE/WTS
COB-M2005-AX	Sample Mounting, Technical Procedure, WP 12-RL1013, Revision 5, 09/28/04	Directions for electrodeposition sample mounting and neodymium fluoride coprecipitation sample mounting of actinides in preparation for alpha spectroscopy counting.	DOE/WTS
COB-M2005-AY	Routine Laboratory Operations, Technical Procedure, WP 12-RL1014, Revision 4, 08/20/04	Instructions for routine laboratory operation.	DOE/WTS
COB-M2005-AZ	Canberra Alpha Analyst System Operation, Technical Procedure, WP 12-RL1015, Revision 8, 03/31/05	Directions for calibrating and operating the Canberra Alpha Analyst 32-chamber alpha spectroscopy system.	DOE/WTS
COB-M2005-BA	Operation of the Oxford Series 5 Gas Proportional Counter, Technical Procedure, WP 12-RL1016, Revision 5, 04/01/05	Guidance for the operation of the Oxford Series 5 Gas Proportional Counter.	DOE/WTS
COB-M2005-BB	Plutonium-241 Analysis, Technical Procedure, WP 12-RL1200, Revision 0, 11/26/03	Provides method for the analysis of Pu 241 in any matrix after preparation of the sample in accordance with WP 12-RL1012 and WP 12-RL1015.	DOE/WTS
COB-M2005-BC	Packard LSC 2750TR Operation and Quench Cuench Curve Determination, Technical Procedure, WP 12-RL1313, Revision 5, 04/01/05	Steps needed for operation and efficiency determination of Packard LSC 2750TR Tri-Carb Scintillation Counters.	DOE/WTS
COB-M2005-BD	Procount 2000 Gamma Spectroscopy System Operation, Technical Procedure, WP 12-RL1331, Revision 6, 09/29/04	Instructions for operation of the Canberra Gamma Spectroscopy System using the Procount 2000 software.	DOE/WTS
COB-M2005-BE	Genie 2000 Gamma Spectroscopy System Operation, Technical Procedure, WP 12-RL1332, Revision 4, 04/01/05	Describes method for performing calibrations and sample counting on high purity Germanium Gamma Spectroscopy System using Genie 2000 software and SNL batch files.	DOE/WTS
COB-M2005-BF	Standardization of Carrier Used for Radiochemical Analysis, Technical Procedure, WP 12-RL1333, Revision 0, 10/17/03	Standardizes the concentration of carries used for chemical recovery determinations.	DOE/WTS

Documents Received and Reviewed During Inspection 194.42 Monitoring Inspection July 2005 DOE Documents

ID#	Document Title	Subject Matter	Source
COB-M2005-BG	Operation of Eurisy Mini 20 Alpha-Beta Multi-detector Counting System, Technical Procedure, WP 12-RL1335, Revision 2, 09/21/04	Instructions for the operation and calibration of the Eurisy Mini20 Alpha-Beta Multi-detector. Used for analyzing air filters for gross alpha and beta activity.	DOE/WTS
COB-M2005-BH	Operation of Tennelec LS4000 Gross Alpha/Beta Counting System, Technical Procedure, WP 12-RL1340, Revision 7, 04/01/05	Instructions for the operation and calibration of the Tennelec LB4100 Gross Alpha/Beta Counting System.	DOE/WTS
COB-M2005-BI	Radiochemistry Laboratory Waste Management, Technical Procedure, WP 12-RL1400, Revision 5, Draft Working Document, No Data	Instructions for handling, management, and disposal of laboratory waste.	DOE/WTS
COB-M2005-BJ	Radiochemistry Laboratory Waste Management, Technical Procedure, WP 12-RL1400, Revision 4, 09/16/03	Instructions for handling, management, and disposal of laboratory waste.	DOE/WTS
COB-M2005-BK	Radiochemistry Laboratory Data Validation and Verification, Technical Procedure, WP 12-RL3002, Revision 5, 04/28/04	Instructions for performing radiochemistry analytical data verification and validation by radiochemistry staff.	DOE/WTS
COB-M2005-BL	Data Reduction and Reporting, Technical Procedure, WP 12-RL3003, Revision 4, 09/29/04	Instructions for processing laboratory data from the time of sample receipt to the reporting of final results.	DOE/WTS
COB-M2005-BM	Radiological Control WIPP Statement of Work and Data Quality Objectives For Analysis of RADCON Samples by WIPP Laboratories, Revision 3A	SOW and DQO for WIPP laboratory.	DOE/WTS
COB-M2005-BN	Installing Rock Bolt Load Cells, Technical Procedure, WP 07-EU1306, Revision 1, 02/28/05	Steps to install rock bolt load cells.	DOE/WTS
COB-M2005-BO	Control of Radioactive Standards, Technical Procedure, WP 12-RL1550, Revision 5, 02/19/04	Instructions for labeling, maintaining inventory, dilution of standards, completing standard logbook for new standards received, expired standards, depleted standards, and recertification or standards.	DOE/WTS
COB-M2005-S1a	External Oversight Activity Sign-in Sheets, Opening Meetings on 07/12/05 and Closeout Meeting on 07/14/04.	Sign-in sheets.	DOE/WTS
COB-M2005-S1b	Presentation: WTS Geotechnical Engineering 40 CFR 194.42 Inspection, July 2005, 7/12/05, by John Vandervats	Summary of changes to geotechnical parameter measurements during the past year. Summary of impact of Panel 4 mining.	DOE/WTS
COB-M2005-S3	Environmental Monitoring and Hydrology, July 12, 2005, by Joel Seigel.	Summary of years activities. Five Culebra wells drilled and 13 wells plugged this year. 9 reconfigured to monitor Magenta. 7 wells sampled of water chemistry.	DOE/WTS

ID#	Document Title	Subject Matter	Source
COB-M2005-S4	Delaware Basin Monitoring - 2005, Magenta Well Network,	Summary of results for Delaware Basin monitoring activities.	DOE/WTS
COB-M2005-S4a	Culebra Well Network, 7/12/05, by Dave Hughes.	During rate up to 55.1 holes per square kilometer as of June 2005. Two maps that show existing Magenta and Culebra monitor wells.	DOE/WTS
COB-M2005-S4b			
COB-M2005-S5	Compacted waste emplaced, 7/12/05, by Dave Speed.	399 in WWIS, 265 containers underground as of 7/11/05 at 1632 hours.	DOE/WTS
COB-M2005-S6	Update, MgO Balance - 07/11/06 @ 1617 hours, 7/12/05, by Dave Speed.	Panel 2 Room1, 1.81 Safety Factor, Panel 3 Room 7, 4.36 Safety Factor	DOE/WTS
COB-M2005-S8	WP 07-EU1301 Attachment 5 - GIS Field Data Sheet from Ray Carrasco and Dennis Mathieu	Sample of field data sheet to record convergence and load cell measurements. Recorded 7/11/05 and 7/12/05.	DOE/WTS
COB-M2005-S9	Check graphic from the RBLC Field Data Entry screen of the geotechnical database computer system.	Load cell measurement manual input example. For GISID 34061, reading of 8260 measured at 7/11/05 0800.	DOE/WTS
COB-M2005-S10	RBLC Field Data Checkprint for data point GISID 34061, values 8260 measured 7/11/05 @ 0800 hours.	Checkprint used to verify value is input correctly.	DOE/WTS
COB-M2005-S11	Rock Bolt Load Cell plot at S3080 Drift-E727 located in Panel 3 between Rooms 2 and 3.	Plot of multiple load cell measurements taken in 2005. Load (KIPS) verses Year plot.	DOE/WTS
COB-M2005-S12	Plots of Extensometer measurements at center roof location of Panel 3 Room 1. 51X-GE-00354-2, 7/12/05	Plot of remotely measured extensometer underground. Shot location of sensor in roof of 5, 10 and 20 feet. Also show impact of 5 foot and 12 foot roof bolts.	DOE/WTS
COB-M2005-S13	Check print to verify remote extensometer measurement at 51X-GE-00354-2, 07/12/05 at 1509 hours.	Verifies remote extensometer measurement taken at Panel 3 Room 1.	DOE/WTS
COB-M2005-S14	Rock Bolt Load Cell plot at S3080 Drift-E580.	Show example of bolt going into yield by the flattening of the plot.	DOE/WTS
COB-M2005-S15	Rock Bolt Load Cell plot at S3080 Drift-E727 located in Panel 3 between Rooms 2 and 3.	Plot of remotely measured extensometer underground. Shot location of sensor in roof of 5, 10 and 20 feet. Also show impact of 5 foot and 12 foot roof bolts.	DOE/WTS
COB-M2005-S16	WP 07-EU1301 Attachment 2 - GIS Field Data Sheet by Rick Whiteley	Used to record actual measurement underground. In this case load cell in Panel 3 near Room 1. 07/13/05 at 0835 hours. This was a demonstration measurement for the inspection.	DOE/WTS

ID#	Document Title	Subject Matter	Source
COB-M2005-S17	WP 07-EU1301 Attachment 2 - GIS Field Data Sheet by Rick Whiteley	Used to record actual measurement underground. In this case a convergence point in Panel 3 Room 1 Room Center at E520 - S2916. 07/13/05 at 0826 hours. This was demonstration measurement for the inspection.	DOE/WTS
COB-M2005-S18	Email listing the Pressure-Density Survey Results for 2004 from Mark Crawley.	List of fluid density for WIPP wells measured during 2004. Measurements taken between 08/02/04 and 12/15/04.	DOE/WTS
COB-M2005-S19	Raw field data from demonstration survey loop.	Density ranges from 1.005 to 1.206.	DOE/WTS
COB-M2005-S20	Data sheet from DIGILEV Varion 10.94d computer program, 07/13/05 at 1435 hours.	From Ben Zimmerman and the subsidence survey crew. Adjusted data from the demonstration survey loop. First output from conversion of raw survey data using DIGILEV computer program..	DOE/WTS
COB-M2005-S21	Final results from DIGILEV computer program calculation of demonstration loop.	Results of demonstration loop show cumulative distance of 390.81 feet.	DOE/WTS
COB-M2005-S22	WIPP Subsidence Monuments, State Plane Coordinates.	Name and location of subsidence survey points, monuments, used in the subsidence survey.	DOE/WTS
COB-M2005-S23	Summary report of tracked items in the WIPP WWIS by panel and room. By Dave Speed	Includes ten tracked radionuclides, metals, CPR, cement, MgO, etc.	DOE/WTS
COB-M2005-S24	WIPP WWIS Nuclide Report as of 07/14/05 at 1422 hours. By Dave Speed	List waste mass and activity of emplaced waste at WIPP.	DOE/WTS
COB-M2005-S27	Round one of serial sampling at monitor well WQSP-4 recorded 02/28/05, Bill Foster	First series of sample taking during the semiannual water serial sampling. Samples values such as temperature, Eh, pH, specific gravity, chloride, etc.	DOE/WTS
COB-M2005-S25	Round two of serial sampling at monitor well WQSP-4 recorded 03/01/05, Bill Foster		DOE/WTS
COB-M2005-S26	Round three of serial sampling at monitor well WQSP-4 recorded 03/02/05, Bill Foster		DOE/WTS
COB-M2005-S28	Color Map of Hydrocarbon Well Within The Nine Township Area Surrounding The WIPP Site, DBM-55, as of June 2005. by Dave Hughes		DOE/WTS
COB-M2005-S29	Color Map of WIPP Monitor Well Locations for FY-2006, DBM-54, as of 07/11/05. By Dave Hughes		DOW/WTS