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 Hazardous Waste Bureau**

Mr. John E. Kieling, Chief
 Hazardous Waste Bureau
 New Mexico Environment Department
 2905 Rodeo Park Drive East, Building 1
 Santa Fe, New Mexico 87505-6303

Subject: Transmittal of the Mine Ventilation Rate Monitoring Annual Report

Dear Mr. Kieling:

The Mine Ventilation Rate Monitoring Annual Report required by the Waste Isolation Pilot Plant Hazardous Waste Facility Permit No. NM4890139088—TSDf is attached. The report satisfies Permit Part 4, Section 4.6.4.2. and Permit Attachment O, Section O-5a.

We certify under penalty of law that this document and all attachments were prepared under our direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on our inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of our knowledge and belief, true, accurate, and complete. We are aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If you have questions regarding this submittal, please contact Mr. George T. Basabilvazo at (575) 234-7488.

Sincerely

Jose R. Franco
 Jose R. Franco, Manager
 Carlsbad Field Office

M. F. Sharif
 M. F. Sharif, Project Manager
 Nuclear Waste Partnership LLC

Enclosure

cc: w/enclosure
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 CBFO M&RC

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Mine Ventilation Rate Monitoring Annual Report

United States Department of Energy
Carlsbad Field Office
Carlsbad, New Mexico

September 2013



**Mine Ventilation Rate Monitoring Annual Report
DOE/WIPP-13-3508**

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ABBREVIATIONS/ ACRONYMS

acfm	actual cubic feet per minute
CMRO	Central Monitoring Room Operator
hp	horsepower
MOC	Management and Operating Contractor
MVRMP	Mine Ventilation Rate Monitoring Plan
NMED	New Mexico Environment Department
Permit	Waste Isolation Pilot Plant Hazardous Waste Facility Permit
QA	quality assurance
QAPD	Quality Assurance Program Description
RPD	relative percent difference
scfm	standard cubic feet per minute
U/G	Underground
WIPP	Waste Isolation Pilot Plant

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EXECUTIVE SUMMARY

The Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit (Permit) Part 4 requires the WIPP facility Permittees to implement the WIPP Mine Ventilation Flow Rate Monitoring Plan (MVRMP) in Attachment O of the Permit. The MVRMP describes how compliance with the ventilation requirements described in Permit Part 4.5.3.2 and Attachment A2, Section A2-2a(3) for airflow rates for the total underground repository and the active disposal room are obtained and documented. The MVRMP requires ventilation flow rate measurements for the total underground repository and each active disposal room to ensure that the airflows meet Permit conditions.

Permit Part 4.6.4.2 requires that an annual report be submitted every October with the results of the data and analysis of the Mine Ventilation Rate Monitoring Plan. During the report period of July 1, 2012 through June 30, 2013, the lowest monthly annual running average total underground repository ventilation flow rate was 399,823 standard cubic feet per minute (scfm), which did not trigger any notification requirements. Notification would be required if the minimum annual running average total underground repository ventilation flow rate (calculated monthly) was under 260,000 scfm (Permit Part 4.6.4.3).

The average ventilation flow rates were calculated for the flow through the active disposal room in accordance with the MVRMP. The monthly average ventilation rate in the active disposal room was 52,756 actual cubic feet per minute (acfm). A minimum of 42,000 acfm is required to meet the 35,000 scfm flow rate stipulated in the Permit.

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1.0 INTRODUCTION

The New Mexico Environment Department (NMED) issued the WIPP Permit Renewal, NM4890139088-TSDF, on November 30, 2010.

The MVRMP in the Permit is Attachment O. The MVRMP contains the methods for documenting compliance with the ventilation requirements described in Permit Part 4.5.3.2 and Attachment A2, Section A2-2a(3).

The Permit also specifies that an annual report be submitted every October that describes the implementation of the MVRMP, and presents the results of the monitoring activities. This document was prepared to fulfill the annual reporting requirement for the period from July 1, 2012, to June 30, 2013.

1.1 Total Mine Ventilation Rate Monitoring in the Underground Repository

To comply with Permit Part 4, the running annual average mine ventilation rate is computed on a monthly basis to assure that it exceeds the minimum value of 260,000 scfm. This running annual average is calculated based on monthly averages for run-times for the WIPP facility modes of ventilation operation as tabulated in the Central Monitoring Room Operator (CMRO) Log. This information was recorded each time the ventilation system configuration changed, including periods when there was no ventilation. The operator used the logged runtime data for various modes of operation, multiplied by the flow-rates for the different modes presented in Table 1, to calculate the average monthly and annual flow rate for the facility.

Table 1 – Ventilation Operating Modes and Associated Flow Rate

Mode of Operation	Flow Rate (scfm) – Nominal Values	Test and Balance Summary (June 2013)
Normal (two 600 hp fans)	425,000	±4.3%
Alternate (one 600 hp fan)	260,000	±4.4%
Maintenance Bypass [parallel operation of 600 hp fan(s) and 235 hp fan(s)]	260,000 to 425,000	NA*
Reduced (two 235 hp fans)	120,000	NA*
Minimum (one 235 hp fan)	60,000	NA*
Filtration (one 235 hp fan)	60,000	±4.8%

* Note: The modes of operations were not modeled in the June 2013 Test and Balance

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The calculation of the running average annual total mine flow rate was computed monthly using the times entered in the CMRO Log in accordance with the following formula:

Monthly Average Flow Rate = [(Normal Mode Run-Time (hours) x 425,000 scfm) + [Alternate Mode Run-Time (hours) x 260,000 scfm] + [Maintenance Bypass Run-Time (hours) x 260,000 scfm] + [(Reduced Mode Run-Time (hours) x 120,000 scfm] + [Minimum Mode Run-Time (hours) x 60,000 scfm] + [Filtration Mode Run-Time (hours) x 60,000 scfm]) / 730 hours per month.

The annual average flow rate was calculated using the times entered in the CMRO Log by the following formula:

$$\text{Annual Average Flow Rate} = \frac{\sum \text{Monthly Average for Previous 12 Months}}{12}$$

1.2 Ventilation Rate Monitoring in the Active Disposal Room

The ventilation flow rate in the active waste disposal room was measured at the entrance to the room to demonstrate compliance with Permit Part 4.5.3.2 and Attachment A2, Section A2-2a(3), which requires a minimum of 35,000 scfm of airflow through the active room when waste disposal is taking place and workers are present in the room. Permit Part 4.6.4.3 requires compliance to be evaluated monthly for the active disposal room.

A calibrated Davis ball-bearing anemometer and full-entry traverse, as described in *Subsurface Ventilation Engineering*, (McPherson 2009), is the standard method for measurement of airflow in the active waste disposal room. Airflow measurements were collected at an established location near the entrance of each active disposal room. The location was chosen by the operator to minimize airflow disturbances caused by system intersections and corners in accordance with McPherson (2009). The operator used a calibrated anemometer and the completion of a full-entry traverse. These readings verified that a minimum of 35,000 scfm ventilation flow was achieved through the active room when waste disposal was taking place and workers were present in the room. Multiple measurements were taken at each field location to ensure accurate results and correlated within 10 percent for acceptability. Data were collected and recorded by qualified operators, and the data were verified. The facility operator verified proper ventilation when waste disposal was taking place and workers were present in the room, any time there was an operational mode change, or if there was a change in the system's configuration that could affect the ventilation system. A momentary reduction in underground ventilation caused by the realignment or switching of underground ventilation fans is not an operational mode change and does not require verification of airflow in the active disposal room.

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Once the ventilation is verified, the operator records the acfm value on the log sheet. The operator compares the recorded acfm value with the minimum acfm value provided at the top of the Active Disposal Room Ventilation Rate Log Sheet. As described in Permit Attachment O, an actual airflow of at least 42,000 acfm is needed to ensure that the 35,000 scfm minimum requirement is met. The operator checks and records the airflow through the active room during the shift whenever there is an operational mode change, or a change in system configuration that could affect the ventilation system. If the required ventilation rate is not achieved, or cannot be supported due to operational needs, access to the room is restricted.

1.3 Test and Balance

The Test and Balance is a comprehensive series of measurements and adjustments designed to ensure that the system is operating within acceptable design parameters. The Test and Balance is an appropriate method of verifying system flow because it provides consistent results based on good engineering practices. The Test and Balance is conducted at 12-to-18-month intervals, as required by the MVRMP, Permit Attachment O, Section O-3a(2).

Once completed, the Test and Balance data are the baseline for underground ventilation system operations until the next Test and Balance is performed. Test and Balance results were used to accommodate varying operational conditions and to provide adequate airflow in the mine.

The Test and Balance interval is sufficient to account for changes in the mine and verify system performance. Minor system modifications that occur between tests produce small changes to the system resistance in comparison to the overall system resistance. Historic data indicate changes can be attributed to additional or reduced linear feet of mined passage such as mining new entries or closure of formerly ventilated portions of the mine, or reduction in drift size due to salt creep.

The most recent Test and Balance of the mine ventilation system was performed in June 2013. A summary of the results of the June 2013 Test and Balance is presented in Table 1 in accordance with Permit Section O-5a. The next Test and Balance will be due no later than October 2014.

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1.4 Quarterly Airflow Verification Checks

Quarterly verification checks of the total mine airflow were performed in accordance with the inspection schedule identified in the Permit Attachment E, procedure IC041098 (Underground [U/G] Exhaust Mass Flow Measurement System for Fans 700A, B & C). These checks require the measurement of airflow induced by each of the fans during various modes of operation using a standard pitot tube traverse. The flow measurement indicators (e.g., central monitoring system, Flosonic[®]) are then compared to the standard pitot traverse. If the relative percent difference (RPD) was greater than ± 5 percent, sensors were cleaned and calibrated. Another pitot tube traverse was then performed to verify an RPD of less than ± 5 percent.

The equipment used to perform the quarterly airflow verification checks was controlled and calibrated through the WIPP Metrology Program. The WIPP Metrology Program ensures that maintenance and test equipment used in the performance of maintenance activities meets the WIPP Quality Assurance Program Description (QAPD) requirements and is traceable to National Institute of Standards and Technology standards. The frequency and method of calibration are governed by the WIPP facility Metrology Program using the manufacturer's recommendations and the equipment's reliability.

2.0 MINE VENTILATION RATE MONITORING RESULTS

This section presents the results of implementing the mine ventilation rate monitoring program. The data presented in this section was collected in accordance with the latest revision of the MVRMP as documented in Permit Attachment O.

2.1 Total Mine Ventilation Rate

A summary of the monthly total mine ventilation rate flow data is provided in Table 2. This table shows that the running annual average total mine ventilation flow was 404,823 scfm for the reporting period. In addition, it shows that the lowest running annual average mine ventilation flow rate in the underground repository occurred in December 2012, when the running annual average flow rate was 353,120 scfm. This running annual average was above the 260,000 scfm range required in Permit Part 4.5.3.2.

The data sheets showing the calculation of the mine ventilation rate monitoring data monthly averages are presented in Attachment 1.

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Table 2 - Summary of Total Mine and Active Disposal Room Ventilation Flow Rate Monitoring Data

	Total Mine Ventilation Flow Data (avg scfm)	Running Annual Average Total Mine Ventilation Flow Data (avg scfm)*	Active Disposal Room Ventilation Flow Data (avg acfm)	Running Annual Active Disposal Room Annual Average (acfm)
Jul 12	413,770	403,633	51,261	52,864
Aug 12	398,190	402,793	55,122	52,902
Sep 12	402,820	404,395	52,697	52,762
Oct 12	407,470	404,903	53,836	52,574
Nov 12	414,030	404,780	54,224	52,502
Dec 12	353,120	399,823	54,224	52,585
Jan 13	412,480	401,513	54,297	52,666
Feb 13	419,270	402,772	51,317	52,559
Mar 13	413,320	404,302	51,898	52,832
Apr 13	419,600	404,833	52,288	52,989
May 13	414,850	406,173	48,605	52,700
Jun 13	388,950	404,823	53,297	52,756

*Note: Running Annual Average is calculated based on the twelve previous months and includes data not presented in this table.

2.2 Active Disposal Room Ventilation Rate

Monitoring was performed at the start of each shift, any time there was an operational mode change, or if there was a change in the system's configuration whenever workers were present. If the minimum 35,000 scfm flow rate in the active disposal room could not be achieved, access to the disposal room was restricted.

Table 2 shows that the running annual average active disposal room ventilation flow rate was 52,756 acfm for the reporting period (July 2012-June 2013). In addition, it shows that the lowest average monthly ventilation rate in the active disposal room occurred in May 2013, when the average flow rate was 48,605 acfm. A minimum of 42,000 acfm is required to meet the 35,000 scfm flow rate stipulated in the Permit.

2.3 Test and Balance

The most recent Test and Balance of the mine ventilation system was performed in June 2013. The next Test and Balance will be scheduled no later than October 2014.

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2.4 Quarterly Airflow Verification Checks

Maintenance Operations performs a quarterly airflow verification check of the total mine airflow to document that the flow measurement indicators are accurate. The data sheets showing the as-left condition of the quarterly verification checks are available at the facility.

3.0 QUALITY ASSURANCE RESULTS

This section describes the Quality Assurance Program as it relates to the MVRMP.

3.1 Description of Mine Ventilation Rate Monitoring QA Program

Quality Assurance associated with the MVRMP consists of several elements. The qualifications of personnel conducting ventilation flow measurements are maintained through a prescribed training qualification process. The ventilation simulation software program is controlled in accordance with the Management and Operating Contractor (MOC) *Quality Assurance Program Description* (WP 13-1), and WIPP facility computer software Quality Assurance (QA) plans.

Data and records generated by the MVRMP, as well as records, and procedures to support the MVRMP, are maintained and managed in accordance with the MOC's QAPD. Nonconformance or conditions adverse to quality are addressed and corrected as necessary in accordance with applicable Quality Assurance procedures.

Instrumentation used to implement the MVRMP is of known precision and accuracy. This information is recorded in the instrumentation calibration documentation.

4.0 SUMMARY OF MINE VENTILATION RATE MONITORING

Regular mine ventilation rate monitoring of the underground repository and active disposal rooms is conducted at the WIPP facility. The following is an analysis of the data from this program:

- Permit requirements related to mine ventilation rate monitoring have been met.
- Data quality is acceptable.
- Ventilation through the mine was maintained above Permit stipulated levels.

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REFERENCES
DOCUMENT NUMBER AND TITLE
New Mexico Environment Department, November 30, 2010, Waste Isolation Pilot Plant Hazardous Waste Facility Permit, Identification No. NM4890139088-TSDF
McPherson, Malcolm J., 2009, Subsurface Ventilation Engineering, Omnipress, Second Edition
WP 13-1, <i>Nuclear Waste Partnership LLC Quality Assurance Program Description</i>
IC041098, <i>U/G Exhaust Mass Flow Measurement System for Fans 700A, B & C</i>

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Attachment 1 – Monthly Summary of Mine Ventilation Rate Monitoring

**WIPP MINE VENTILATION
RATE MONITORING PLAN**

SURFACE				
MODE OF OPERATION	RUNTIME (min)	RUNTIME (hours)	FLOW RATE (kscfm)	TOTAL FLOW (kscfmhr)
NORMAL VENTILATION (2-700 FANS)	42779	712.98	425	303017.92
ALTERNATE VENTILATION (1-700 FAN)	7	0.12	260	30.33
MAINTENANCE BYPASS (1-700 FAN w/ 1-860 FAN)	0	0.00	260	0.00
MAINTENANCE BYPASS (1-700 FAN w/ 2-860-FANS)	0	0.00	260	0.00
MAINTENANCE BYPASS (2-700 FANS w/ 1-860 FAN)	882	14.70	260	3822.00
MAINTENANCE BYPASS (2-700 FANS w/ 2-860 FANS)	0	0.00	260	0.00
REDUCED VENTILATION (0-700 FANS w/ 2-860 FANS)	0	0.00	120	0.00
MINIMUM VENTILATION (0-700 FANS w/ 1-860 FAN)	0	0.00	60	0.00
FILTRATION 1-860 FAN thru HEPA)	972	16.20	60	972.00
NO VENTILATION	0	0.00	0	0.00
TOTAL		744.00		
SUM OF FLOW(kscfm-hr)				307842.25
MONTHLY AVERAGE FLOW RATE(kscfm)				413.77

CALENDAR MONTH -July- 2012

COMMENTS:
None

ACTIVE ROOM		
MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	51.261
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		37.00

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Attachment 1 – Monthly Summary of Mine Ventilation Rate Monitoring

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SURFACE				
MODE OF OPERATION	RUNTIME (min)	RUNTIME (hours)	FLOW RATE (kscfm)	TOTAL FLOW (kscfmhr)
NORMAL VENTILATION (2-700 FANS)	40527	675.45	425	287066.25
ALTERNATE VENTILATION (1-700 FAN)	2	0.03	260	8.67
MAINTENANCE BYPASS (1-700 FAN w/ 1-860 FAN)	0	0.00	260	0.00
MAINTENANCE BYPASS (1-700 FAN w/ 2 860-FANS)	0	0.00	260	0.00
MAINTENANCE BYPASS (2-700 FANS w/ 1-860 FAN)	1550	25.83	260	6716.67
MAINTENANCE BYPASS (2-700 FANS w/ 2-860 FANS)	0	0.00	260	0.00
REDUCED VENTILATION (0-700 FANS w/ 2-860 FANS)	0	0.00	120	0.00
MINIMUM VENTILATION (0-700 FANS w/ 1-860 FAN)	0	0.00	60	0.00
FILTRATION 1-860 FAN thru HEPA)	2464	41.07	60	2464.00
NO VENTILATION	97	1.62	0	0.00
TOTAL		744.00		
SUM OF FLOW(kscfm-hr)				296255.58
MONTHLY AVERAGE FLOW RATE(kscfm)				398.19

CALENDAR MONTH -August- 2012

COMMENTS: None

ACTIVE ROOM		
MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	55.122
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		44.00

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Attachment 1 – Monthly Summary of Mine Ventilation Rate Monitoring

**WIPP MINE VENTILATION
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SURFACE				
MODE OF OPERATION	RUNTIME (min)	RUNTIME (hours)	FLOW RATE (kscfm)	TOTAL FLOW (kscfmhr)
NORMAL VENTILATION (2-700 FANS)	38814	646.90	425	274932.50
ALTERNATE VENTILATION (1-700 FAN)	2052	34.20	260	8892.00
MAINTENANCE BYPASS (1-700 FAN w/ 1-860 FAN)	0	0.00	260	0.00
MAINTENANCE BYPASS (1-700 FAN w/ 2 860-FANS)	122	2.03	260	528.67
MAINTENANCE BYPASS (2-700 FANS w/ 1-860 FAN)	724	12.07	260	3137.33
MAINTENANCE BYPASS (2-700 FANS w/ 2-860 FANS)	248	4.13	260	1074.67
REDUCED VENTILATION (0-700 FANS w/ 2-860 FANS)	253	4.22	120	506.00
MINIMUM VENTILATION (0-700 FANS w/ 1-860 FAN)	21	0.35	60	21.00
FILTRATION 1-860 FAN thru HEPA)	938	15.63	60	938.00
NO VENTILATION	28	0.47	0	0.00
TOTAL		720.00		
SUM OF FLOW(kscfm-hr)				290030.17
MONTHLY AVERAGE FLOW RATE(kscfm)				402.82

CALENDAR MONTH -September- 2012

COMMENTS:
None

ACTIVE ROOM		
MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	52.697
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		39.00

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Attachment 1 – Monthly Summary of Mine Ventilation Rate Monitoring

**WIPP MINE VENTILATION
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SURFACE				
MODE OF OPERATION	RUNTIME (min)	RUNTIME (hours)	FLOW RATE (kscfm)	TOTAL FLOW (kscfmhr)
NORMAL VENTILATION (2-700 FANS)	41013	683.55	425	290508.75
ALTERNATE VENTILATION (1-700 FAN)	463	7.72	260	2006.33
MAINTENANCE BYPASS (1-700 FAN w/ 1-860 FAN)	0	0.00	260	0.00
MAINTENANCE BYPASS (1-700 FAN w/ 2-860-FANS)	0	0.00	260	0.00
MAINTENANCE BYPASS (2-700 FANS w/ 1-860 FAN)	2033	33.88	260	8809.67
MAINTENANCE BYPASS (2-700 FANS w/ 2-860 FANS)	242	4.03	260	1048.67
REDUCED VENTILATION (0-700 FANS w/ 2-860 FANS)	0	0.00	120	0.00
MINIMUM VENTILATION (0-700 FANS w/ 1-860 FAN)	0	0.00	60	0.00
FILTRATION 1-860 FAN thru HEPA)	783	13.05	60	783.00
NO VENTILATION	106	1.77	0	0.00
TOTAL		744.00		
SUM OF FLOW(kscfm-hr)				303156.42
MONTHLY AVERAGE FLOW RATE(kscfm)				407.47

CALENDAR MONTH -October- 2012

COMMENTS:
None

ACTIVE ROOM		
MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	53.836
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		47.00

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**WIPP MINE VENTILATION
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SURFACE				
MODE OF OPERATION	RUNTIME (min)	RUNTIME (hours)	FLOW RATE (kscfm)	TOTAL FLOW (kscfmhr)
NORMAL VENTILATION (2-700 FANS)	40392	673.20	425	296110.00
ALTERNATE VENTILATION (1-700 FAN)	134	2.23	260	580.67
MAINTENANCE BYPASS (1-700 FAN w/ 1-860 FAN)	0	0.00	260	0.00
MAINTENANCE BYPASS (1-700 FAN w/ 2 860-FANS)	0	0.00	260	0.00
MAINTENANCE BYPASS (2-700 FANS w/ 1-860 FAN)	935	15.58	260	4051.67
MAINTENANCE BYPASS (2-700 FANS w/ 2-860 FANS)	1696	28.27	260	7349.33
REDUCED VENTILATION (0-700 FANS w/ 2-860 FANS)	0	0.00	120	0.00
MINIMUM VENTILATION (0-700 FANS w/ 1-860 FAN)	0	0.00	60	0.00
FILTRATION 1-860 FAN thru HEPA)	11	0.18	60	11.00
NO VENTILATION	32	0.53	0	0.00
TOTAL		720.00		
SUM OF FLOW(kscfm-hr)				298102.67
MONTHLY AVERAGE FLOW RATE(kscfm)				414.03

CALENDAR MONTH -November- 2012

COMMENTS:
None

ACTIVE ROOM		
MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	64.224
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE	32.00	

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Attachment 1 – Monthly Summary of Mine Ventilation Rate Monitoring

**WIPP MINE VENTILATION
RATE MONITORING PLAN**

SURFACE				
MODE OF OPERATION	RUNTIME (min)	RUNTIME (hours)	FLOW RATE (kscfm)	TOTAL FLOW (kscfmhr)
NORMAL VENTILATION (2-700 FANS)	35880	598.00	425	254150.00
ALTERNATE VENTILATION (1-700 FAN)	1604	26.73	260	6950.67
MAINTENANCE BYPASS (1-700 FAN w/ 1-860 FAN)	68	1.13	260	294.67
MAINTENANCE BYPASS (1-700 FAN w/ 2 860-FANS)	0	0.00	260	0.00
MAINTENANCE BYPASS (2-700 FANS w/ 1-860 FAN)	1720	28.67	260	7453.33
MAINTENANCE BYPASS (2-700 FANS w/ 2-860 FANS)	485	8.08	260	2101.67
REDUCED VENTILATION (0-700 FANS w/ 2-860 FANS)	0	0.00	120	0.00
MINIMUM VENTILATION (0-700 FANS w/ 1-860 FAN)	12	0.20	60	12.00
FILTRATION 1-860 FAN thru HEPA)	237	3.95	60	237.00
NO VENTILATION	6074	101.23	0	0.00
TOTAL		768.00		
SUM OF FLOW(kscfm-hr)				271199.33
MONTHLY AVERAGE FLOW RATE(kscfm)				353.12

CALENDAR MONTH -December- 2012

COMMENTS:
No ventilation due to the 004 damper replacement.

ACTIVE ROOM		
MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	54.224
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		44.00

**Mine Ventilation Rate Monitoring Annual Report
DOE/WIPP-13-3508**

Attachment 1 – Monthly Summary of Mine Ventilation Rate Monitoring

**WIPP MINE VENTILATION
RATE MONITORING PLAN**

SURFACE				
MODE OF OPERATION	RUNTIME (min)	RUNTIME (hours)	FLOW RATE (kscfm)	TOTAL FLOW (kscfmhr)
NORMAL VENTILATION (2-700 FANS)	42080	701.33	425	298066.67
ALTERNATE VENTILATION (1-700 FAN)	936	15.60	260	4056.00
MAINTENANCE BYPASS (1-700 FAN w/ 1-860 FAN)	0	0.00	260	0.00
MAINTENANCE BYPASS (1-700 FAN w/ 2 860-FANS)	0	0.00	260	0.00
MAINTENANCE BYPASS (2-700 FANS w/ 1-860 FAN)	623	10.38	260	2699.67
MAINTENANCE BYPASS (2-700 FANS w/ 2-860 FANS)	350	5.83	260	1516.67
REDUCED VENTILATION (0-700 FANS w/ 2-860 FANS)	0	0.00	120	0.00
MINIMUM VENTILATION (0-700 FANS w/ 1-860 FAN)	0	0.00	60	0.00
FILTRATION 1-860 FAN thru HEPA)	546	9.10	60	546.00
NO VENTILATION	105	1.75	0	0.00
TOTAL		744.00		
SUM OF FLOW(kscfm-hr)				306885.00
MONTHLY AVERAGE FLOW RATE(kscfm)				412.48

CALENDAR MONTH -January- 2013

COMMENTS No waste handling activities due to outage

ACTIVE ROOM		
MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	54.297
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		28.00

**Mine Ventilation Rate Monitoring Annual Report
DOE/WIPP-13-3508**

Attachment 1 – Monthly Summary of Mine Ventilation Rate Monitoring

**WIPP MINE VENTILATION
RATE MONITORING PLAN**

SURFACE				
MODE OF OPERATION	RUNTIME (min)	RUNTIME (hours)	FLOW RATE (kscfm)	TOTAL FLOW (kscfmhr)
NORMAL VENTILATION (2-700 FANS)	39233	653.88	425	277900.42
ALTERNATE VENTILATION (1-700 FAN)	44	0.73	260	190.67
MAINTENANCE BYPASS (1-700 FAN w/ 1-860 FAN)	0	0.00	260	0.00
MAINTENANCE BYPASS (1-700 FAN w/ 2 860-FANS)	0	0.00	260	0.00
MAINTENANCE BYPASS (2-700 FANS w/ 1-860 FAN)	423	7.05	260	1833.00
MAINTENANCE BYPASS (2-700 FANS w/ 2-860 FANS)	420	7.00	260	1820.00
REDUCED VENTILATION (0-700 FANS w/ 2-860 FANS)	0	0.00	120	0.00
MINIMUM VENTILATION (0-700 FANS w/ 1-860 FAN)	0	0.00	60	0.00
FILTRATION (1-860 FAN thru HEPA)	5	0.08	60	5.00
NO VENTILATION	195	3.25	0	0.00
TOTAL		672.00		
SUM OF FLOW(kscfm-hr)				281749.08
MONTHLY AVERAGE FLOW RATE(kscfm)				419.27

CALENDAR MONTH -February- 2013

COMMENTS:
No waste handling activities due to outage.

ACTIVE ROOM		
MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	51.317
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		6.00

**Mine Ventilation Rate Monitoring Annual Report
DOE/WIPP-13-3508**

Attachment 1 – Monthly Summary of Mine Ventilation Rate Monitoring

**WIPP MINE VENTILATION
RATE MONITORING PLAN**

SURFACE				
MODE OF OPERATION	RUNTIME (min)	RUNTIME (hours)	FLOW RATE (kscfm)	TOTAL FLOW (kscfmhr)
NORMAL VENTILATION (2-700 FANS)	42656	710.93	425	302146.67
ALTERNATE VENTILATION (1-700 FAN)	0	0.00	260	0.00
MAINTENANCE BYPASS (1-700 FAN w/ 1-860 FAN)	0	0.00	260	0.00
MAINTENANCE BYPASS (1-700 FAN w/ 2 860-FANS)	0	0.00	260	0.00
MAINTENANCE BYPASS (2-700 FANS w/ 1-860 FAN)	777	12.95	260	3367.00
MAINTENANCE BYPASS (2-700 FANS w/ 2-860 FANS)	239	3.98	260	1035.67
REDUCED VENTILATION (0-700 FANS w/ 2-860 FANS)	0	0.00	120	0.00
MINIMUM VENTILATION (0-700 FANS w/ 1-860 FAN)	2	0.03	60	2.00
FILTRATION 1-860 FAN thru HEPA)	962	16.03	60	962.00
NO VENTILATION	4	0.07	0	0.00
TOTAL		744.00		
SUM OF FLOW(kscfm-hr)				307513.33
MONTHLY AVERAGE FLOW RATE(kscfm)				413.32

CALENDAR MONTH -March- 2013

COMMENTS:

ACTIVE ROOM		
MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	51.898
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		30.00

**Mine Ventilation Rate Monitoring Annual Report
DOE/WIPP-13-3508**

Attachment 1 – Monthly Summary of Mine Ventilation Rate Monitoring

**WIPP MINE VENTILATION
RATE MONITORING PLAN**

SURFACE				
MODE OF OPERATION	RUNTIME (min)	RUNTIME (hours)	FLOW RATE (kscfm)	TOTAL FLOW (kscfmhr)
NORMAL VENTILATION (2-700 FANS)	41818	696.97	425	296210.83
ALTERNATE VENTILATION (1-700 FAN)	22	0.37	260	95.33
MAINTENANCE BYPASS (1-700 FAN w/ 1-860 FAN)	0	0.00	260	0.00
MAINTENANCE BYPASS (1-700 FAN w/ 2 860-FANS)	0	0.00	260	0.00
MAINTENANCE BYPASS (2-700 FANS w/ 1-860 FAN)	1083	18.05	260	4693.00
MAINTENANCE BYPASS (2-700 FANS w/ 2-860 FANS)	252	4.20	260	1092.00
REDUCED VENTILATION (0-700 FANS w/ 2-860 FANS)	0	0.00	120	0.00
MINIMUM VENTILATION (0-700 FANS w/ 1-860 FAN)	0	0.00	60	0.00
FILTRATION 1-860 FAN thru HEPA)	23	0.38	60	23.00
NO VENTILATION	2	0.03	0	0.00
TOTAL		720.00		
SUM OF FLOW(kscfm-hr)				302114.17
MONTHLY AVERAGE FLOW RATE(kscfm)				419.60

CALENDAR MONTH -APRIL- 2013

COMMENTS:

ACTIVE ROOM		
MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	52.288
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		38.00

**Mine Ventilation Rate Monitoring Annual Report
DOE/WIPP-13-3508**

Attachment 1 – Monthly Summary of Mine Ventilation Rate Monitoring

**WIPP MINE VENTILATION
RATE MONITORING PLAN**

SURFACE				
MODE OF OPERATION	RUNTIME (min)	RUNTIME (hours)	FLOW RATE (kscfm)	TOTAL FLOW (kscfmhr)
NORMAL VENTILATION (2-700 FANS)	42101	701.68	425	298215.42
ALTERNATE VENTILATION (1-700 FAN)	296	4.93	260	1282.67
MAINTENANCE BYPASS (1-700 FAN w/ 1-860 FAN)	0	0.00	260	0.00
MAINTENANCE BYPASS (1-700 FAN w/ 2 860-FANS)	172	2.87	260	745.33
MAINTENANCE BYPASS (2-700 FANS w/ 1-860 FAN)	901	15.02	260	3904.33
MAINTENANCE BYPASS (2-700 FANS w/ 2-860 FANS)	1016	16.93	260	4402.67
REDUCED VENTILATION (0-700 FANS w/ 2-860 FANS)	0	0.00	120	0.00
MINIMUM VENTILATION (0-700 FANS w/ 1-860 FAN)	47	0.78	60	47.00
FILTRATION 1-860 FAN thru HEPA)	51	0.85	60	51.00
NO VENTILATION	56	0.93	0	0.00
TOTAL		744.00		
SUM OF FLOW(kscfm-hr)				308648.42
MONTHLY AVERAGE FLOW RATE(kscfm)				414.85

CALENDAR MONTH -MAY- 2013

COMMENTS:

ACTIVE ROOM		
MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	48.605
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE	39.00	

**Mine Ventilation Rate Monitoring Annual Report
DOE/WIPP-13-3508**

Attachment 1 – Monthly Summary of Mine Ventilation Rate Monitoring

**WIPP MINE VENTILATION
RATE MONITORING PLAN**

SURFACE				
MODE OF OPERATION	RUNTIME (min)	RUNTIME (hours)	FLOW RATE (kscfm)	TOTAL FLOW (kscfmhr)
NORMAL VENTILATION (2-700 FANS)	36891	614.85	425	261311.25
ALTERNATE VENTILATION (1-700 FAN)	502	8.37	260	2175.33
MAINTENANCE BYPASS (1-700 FAN w/ 1-860 FAN)	117	1.95	260	507.00
MAINTENANCE BYPASS (1-700 FAN w/ 2 860-FANS)	429	7.15	260	1859.00
MAINTENANCE BYPASS (2-700 FANS w/ 1-860 FAN)	1773	29.55	260	7683.00
MAINTENANCE BYPASS (2-700 FANS w/ 2-860 FANS)	728	12.13	260	3154.67
REDUCED VENTILATION (0-700 FANS w/ 2-860 FANS)	703	11.72	120	1406.00
MINIMUM VENTILATION (0-700 FANS w/ 1-860 FAN)	130	2.17	60	130.00
FILTRATION 1-860 FAN thru HEPA)	1816	30.27	60	1816.00
NO VENTILATION	111	1.85	0	0.00
TOTAL		720.00		
SUM OF FLOW(kscfm-hr)				280042.25
MONTHLY AVERAGE FLOW RATE(kscfm)				388.95

CALENDAR MONTH -JUNE- 2013

COMMENTS:

ACTIVE ROOM		
MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	53.297
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		43.00