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NMED 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 enclosed. The report satisfies Permit Part 4, Condition 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,

George T. Basabilvazo for

Jose R. Franco, Manager
Carlsbad Field Office

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

Enclosure

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Mine Ventilation Rate Monitoring Annual Report

August 2012

Total Pages: 24

Working Copy

DOE/WIPP-12-3488

Mine Ventilation Rate Monitoring Annual Report

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

August 2012

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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
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
QA	quality assurance
QAPD	Quality Assurance Program Description
RPD	relative percent difference
scfm	standard cubic feet per minute
WIPP	Waste Isolation Pilot Plant

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, 2011 through June 30, 2012, the lowest monthly annual running average total underground repository ventilation flow rate was 380,935 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 52,977 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.

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, 2011, to June 30, 2012.

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 (March 2012)
Normal (two 600 hp fans)	425,000	±3.4%
Normal (W30 Alt. Rte. Configuration)	425,000	± 3.7 %
Alternate (one 600 hp fan)	260,000	±4.1%
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	±4.15%

* Note: The modes of operations were not modeled in the March 2012 Test and Balance

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.

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 March 2012. A summary of the results of the March 2012 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 September 2013.

The W30 Alternate Route ventilation configuration is a ventilation configuration that will enable the emplacement of TRU mixed waste using W30 as the waste transport route. The W30 Alternate Route ventilation configuration has been modeled in both Normal and Filtration Modes. The W30 Alternate Route configuration was tested and balanced in Normal Mode during the March 2012 Test and Balance.

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 (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 401,021 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 November 2011, when the running annual average flow rate was 380,935 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.

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 11	382,430	384,145	52,623	54,550
Aug 11	408,270	383,736	54,666	54,592
Sep 11	383,590	381,637	54,371	54,613
Oct 11	401,380	381,119	56,089	54,737
Nov 11	415,500	380,935	55,096	54,259
Dec 11	412,600	392,201	53,220	53,945
Jan 12	392,210	401,341	53,334	53,907
Feb 12	404,160	402,952	52,598	53,485
Mar 12	394,960	401,365	48,625	53,001
Apr 12	413,220	401,532	50,395	53,212
May 12	398,770	401,567	52,077	52,754
Jun 12	405,160	401,021	52,630	**52,977**

*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 52,977 acfm for the reporting period (July 2011-June 2012). In addition, it shows that the lowest average monthly ventilation rate in the active disposal room occurred in March 2012, when the average flow rate was 48,625 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 March 2012. The next Test and Balance has been scheduled for June 2013.

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 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

WIPP conducts regular mine ventilation rate monitoring of the underground repository and active disposal rooms. 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.

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, *Washington TRU Solutions LLC Quality Assurance Program Description*
IC041098, *U/G Exhaust Mass Flow Measurement System for Fans 700A, B & C*

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)	37471	624.52	425	265419.50
ALTERNATE VENTILATION (1-700 FAN)	462	7.70	260	2002.00
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)	3186	53.10	260	13806.00
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)		0.00	60	0.00
FILTRATION 1-860 FAN thru HEPA)	3304	55.07	60	3304.00
NO VENTILATION	217	3.62	0	0.00
TOTAL		744.00		
SUM OF FLOW(kscfm-hr)				284531.50
MONTHLY AVERAGE FLOW RATE(kscfm)				**382.43**

ACTIVE ROOM

MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K actm	**52.623**
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		51.00

CALENDAR MONTH -July, 2011

COMMENTS:
None

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)	41671	694.52	425	295169.58
ALTERNATE VENTILATION (1-700 FAN)	4	0.07	260	17.33
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)	1694	28.23	260	7340.67
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)	113	1.88	60	113.00
FILTRATION 1-860 FAN thru HEPA)	1114	18.57	60	1114.00
NO VENTILATION	44	0.73	0	0.00
TOTAL		744.00		
SUM OF FLOW(kscfm-hr)				303754.58
MONTHLY AVERAGE FLOW RATE(kscfm)				408.27

CALENDAR MONTH -August, 2011

COMMENTS:
None

ACTIVE ROOM

MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	54.666
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		56.00

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)	37312	621.87	425	264293.33
ALTERNATE VENTILATION (1-700 FAN)	3	0.05	260	13.00
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)	1810	30.17	260	7843.33
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)	5	0.08	60	5.00
FILTRATION 1-860 FAN thru HEPA)	4027	67.12	60	4027.00
NO VENTILATION	43	0.72	0	0.00
TOTAL		720.00		
SUM OF FLOW(kscfm-hr)				276181.67
MONTHLY AVERAGE FLOW RATE(kscfm)				383.59

CALENDAR MONTH -September, 2011

COMMENTS:
None

ACTIVE ROOM

MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	54.371
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		44.00

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)	38444	640.73	425	272311.67
ALTERNATE VENTILATION (1-700 FAN)	6	0.10	260	26.00
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)	6055	100.92	260	26238.33
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)		0.00	60	0.00
FILTRATION 1-860 FAN thru HEPA)	50	0.83	60	50.00
NO VENTILATION	85	1.42	0	0.00
TOTAL		744.00		
SUM OF FLOW(kscfm-hr)				298626.00
MONTHLY AVERAGE FLOW RATE(kscfm)				401.38

CALENDAR MONTH -October, 2011

COMMENTS:
None

ACTIVE ROOM

MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	56.089
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		65.00

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)	40749	679.15	425	288638.75
ALTERNATE VENTILATION (1-700 FAN)		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)	2420	40.47	260	10521.33
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)		0.00	60	0.00
FILTRATION 1-860 FAN thru HEPA)		0.00	60	0.00
NO VENTILATION	23	0.38	0	0.00
TOTAL		720.00		
SUM OF FLOW(kscfm-hr)				299160.08
MONTHLY AVERAGE FLOW RATE(kscfm)				415.50

CALENDAR MONTH -November, 2011

COMMENTS:
None

ACTIVE ROOM

MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	55.096
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		54.00

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)	41336	688.93	425	292796.67
ALTERNATE VENTILATION (1-700 FAN)	1588	26.47	260	6881.33
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)	1679	27.98	260	7275.67
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)	15	0.25	60	15.00
FILTRATION 1-860 FAN thru HEPA)	3	0.05	60	3.00
NO VENTILATION	19	0.32	0	0.00
TOTAL		744.00		
SUM OF FLOW(kscfm-hr)				306971.67
MONTHLY AVERAGE FLOW RATE(kscfm)				**412.60**

CALENDAR MONTH -December, 2011

COMMENTS:
None

ACTIVE ROOM

MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	**53.220**
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		43.00

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)	38418	640.30	425	272127.50
ALTERNATE VENTILATION (1-700 FAN)	2970	49.50	260	12870.00
MAINTENANCE BYPASS (1-700 FAN w/ 1-860 FAN)	272	4.53	260	1178.67
MAINTENANCE BYPASS (1-700 FAN w/ 2 860-FANS)	0	0.00	260	0.00
MAINTENANCE BYPASS (2-700 FANS w/ 1-860 FAN)	1064	17.73	260	4610.67
MAINTENANCE BYPASS (2-700 FANS w/ 2-860 FANS)	0	0.00	260	0.00
REDUCED VENTILATION (0-700 FANS w/ 2-860 FANS)	2	0.03	120	4.00
MINIMUM VENTILATION (0-700 FANS w/ 1-860 FAN)	10	0.17	60	10.00
FILTRATION 1-860 FAN thru HEPA)	1000	16.67	60	1000.00
NO VENTILATION	904	15.07	0	0.00
TOTAL		744.00		
SUM OF FLOW(kscfm-hr)				291800.83
MONTHLY AVERAGE FLOW RATE(kscfm)				**392.21**

CALENDAR MONTH -January- 2012

COMMENTS:
None

ACTIVE ROOM

MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	**53.334**
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		33.00

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)	37791	629.85	425	267686.25
ALTERNATE VENTILATION (1-700 FAN)	1921	32.02	260	8324.33
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)	1022	17.03	260	4428.67
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)	85	1.42	60	85.00
FILTRATION 1-860 FAN thru HEPA)	774	12.90	60	774.00
NO VENTILATION	167	2.78	0	0.00
TOTAL		696.00		
SUM OF FLOW(kscfm-hr)				281298.25
MONTHLY AVERAGE FLOW RATE(kscfm)				404.16

CALENDAR MONTH -February- 2012

COMMENTS.
None

ACTIVE ROOM

MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	52.598
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		47.00

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)	38137	635.62	425	270137.08
ALTERNATE VENTILATION (1-700 FAN)	1634	27.23	260	7080.67
MAINTENANCE BYPASS (1-700 FAN w/ 1-860 FAN)	42	0.70	260	182.00
MAINTENANCE BYPASS (1-700 FAN w/ 2 860-FANS)	0	0.00	260	0.00
MAINTENANCE BYPASS (2-700 FANS w/ 1-860 FAN)	3506	58.43	260	15192.67
MAINTENANCE BYPASS (2-700 FANS w/ 2-860 FANS)	0	0.00	260	0.00
REDUCED VENTILATION (0-700 FANS w/ 2-860 FANS)	91	1.52	120	182.00
MINIMUM VENTILATION (0-700 FANS w/ 1-860 FAN)	136	2.27	60	136.00
FILTRATION 1-860 FAN thru HEPA)	941	15.68	60	941.00
NO VENTILATION	153	2.55	0	0.00
TOTAL		744.00		
SUM OF FLOW(kscfm-hr)				293851.42
MONTHLY AVERAGE FLOW RATE(kscfm)				**394.96**

CALENDAR MONTH -March- 2012

COMMENTS:
None

ACTIVE ROOM

MONTHLY AVERAGE FLOW (kacfm)	MINIMUM – 35K scfm – 42K acfm	**48.625**
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		52.00

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)	40185	669.75	425	284643.75
ALTERNATE VENTILATION (1-700 FAN)	1335	22.25	260	5705.00
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)	1630	27.17	260	7063.33
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)	25	0.42	60	25.00
NO VENTILATION	25	0.42	0	0.00
TOTAL		720.00		
SUM OF FLOW(kscfm-hr)				297517.08
MONTHLY AVERAGE FLOW RATE(kscfm)				**413.22**

ACTIVE ROOM

MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	**50.395**
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		52.00

CALENDAR MONTH -April- 2012

COMMENTS:
None

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)	38680	644.67	425	273983.33
ALTERNATE VENTILATION (1-700 FAN)	727	12.12	260	3150.33
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)	4370	72.83	260	18936.67
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)	615	10.25	60	615.00
NO VENTILATION	248	4.13	0	0.00
TOTAL		744.00		
SUM OF FLOW(kscfm-hr)				296685.33
MONTHLY AVERAGE FLOW RATE(kscfm)				**398.77**

ACTIVE ROOM

MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	**52.077**
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		49.00

CALENDAR MONTH -May- 2012

COMMENTS:
None

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)	40251	670.85	425	285111.25
ALTERNATE VENTILATION (1-700 FAN)	40	0.67	260	173.33
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)	2278	37.97	260	9871.33
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)	15	0.25	60	15.00
FILTRATION 1-860 FAN thru HEPA)	609	10.15	60	609.00
NO VENTILATION	609	10.15	0	0.00
TOTAL		730.03		
SUM OF FLOW(kscfm-hr)				295779.92
MONTHLY AVERAGE FLOW RATE(kscfm)				405.16

CALENDAR MONTH -June- 2012

COMMENTS:
None

ACTIVE ROOM

MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	52.630
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		44.00