CHAPTER 4
CLIMATE AND AIR QUALITY

4.1 CLIMATOLOGICAL CHARACTERISTICS

4.1.1 General Description

Navajo Mine is located in an arid and semi-arid climatic region within the Colorado Plateau physiographic province of the Western United States, geographically west of the 100th meridian west longitude. The permit area ranges in elevation from 5,000 to 5,600 feet above sea level. The average annual precipitation is 5.90 inches with an annual average net evaporation rate of 55inches (Class A Pan method)(Williams 1986). The average relative humidity ranges from 33 percent in July to 65 percent in January with an annual average of 45 percent (Navajo Mine).

Navajo Mine has collected climatological data from two onsite meteorological monitoring stations designated Met Station I and Met Station II (See Exhibit No. 4-1 for locations) since 1991. In addition, long term climatological data are available from other stations in the area, including the New Mexico State University (NMSU) Agriculture Science Center which provides the most continuous long term data base near the Navajo Mine.

4.1.2 Precipitation

Long term precipitation data is obtained from the NMSU Agriculture Science Center, located nine miles east of the Navajo Mine. The average annual precipitation for the general area for the last 34 years (1969-2003) has been 8.10 inches with a minimum of 3.57 inches in 1976 and a maximum of 14.65 inches in 1986. Automated Navajo Mine precipitation data collected since1991 and the NMSU data sets are summarized in TABLE 4-1.

Most precipitation in the region occurs from July through September from localized, high intensity, short duration thunderstorms.

4.1.3 Temperature

The NMSU site shows temperature extremes were -34 °F in 1961 and 105 °F in 1971. Navajo Mine's temperature data for the 2003 calendar year averaged approximately 56.3 °F for Met Station II. The temperature extremes in Table 4-2 were based on one-hour averages and were 32.9 °F and 79 °F. The NMSU temperature data are summarized in TABLE 4-2 and the 2003 Navajo Mine data is summarized in TABLE 4-3.

4.1.4 Growing Season

From the NMSU 1957 through 1992 data, the average frost-free growing season is 146 days. The average date of the last frost (32 °F) is usually May 19th and the first frost is usually October 11th. This data is summarized in TABLE 4-2.

NAVAJO MINE REGIONAL PRECIPITATION DATA (inches)

MET I & II Average

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Annual Total	Monthly Maximum	Monthly Minimum
1991	.	.	.	.	0.86	0.19	0.17	1.06	0.82	0.33	1.08	0.86	5.41	1.08	0.17
1992	0.12	0.14	0.92	0.03	1.08	0.02	0.46	2.03	0.55	0.36	0.15	0.38	6.21	2.03	0.02
1993	1.51	0.60	0.41	0.16	0.37	.	0.04	1.84	0.87	0.85	0.45	0.07	6.89	1.84	0.04
1994	0.03	0.44	0.13	0.26	1.17	0.12	0.39	0.39	1.10	0.77	0.40	0.36	5.55	1.17	0.03
1995	0.32	0.25	0.57	0.91	0.41	0.35	0.17	0.86	0.78	0.02	0.13	0.47	5.21	0.91	0.02
1996	0.11	0.24	0.16	0.10	0.09	0.91	0.25	0.62	0.37	1.33	0.31	0.11	4.57	1.33	0.09
1997	0.38	0.08	0.00	2.43	0.79	0.47	1.20	1.44	1.11	0.25	0.41	0.54	9.07	2.43	0.00
1998	0.17	0.43	0.20	0.04	0.01	0.00	0.46	0.95	0.58	1.69	0.84	0.03	5.38	1.69	0.00
1999	0.15	0.00	0.26	1.11	1.19	0.26	1.07	2.77	0.20	0.01	0.07	0.09	7.15	2.77	0.00
2000	0.41	0.08	1.65	0.02	0.00	0.03	0.39	0.56	0.25	1.04	0.37	0.12	4.89	1.65	0.00
2001	0.32	0.35	1.16	0.28	0.48	0.01	0.63	1.13	0.24	0.18	0.26	0.31	5.33	1.16	0.01
2002	0.01	0.00	0.05	0.30	0.00	0.00	0.11	0.31	2.57	1.09	0.53	0.21	5.15	2.57	0.00
2003	0.16	0.97	0.36	0.09	0.07	0.01	0.34	0.79	0.46	1.00	0.28	0.04	4.56	1.00	0.01
Met I & II Ave.	0.32	0.24	0.50	0.51	0.54	0.21	0.44	1.16	0.78	0.66	0.41	0.29	5.90		

NAVAJO MET I

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Annual Total
Monthy Average	0.38	0.34	0.55	0.49	0.53	0.20	0.39	1.20	0.85	0.80	0.53	0.36	6.67

NAVAJO MET II

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Annual Total
Monthy Average	0.23	0.25	0.43	0.43	0.47	0.19	0.48	1.06	0.67	0.57	0.29	0.20	5.13

Total monthly precipitation depth (inches) recorded at the NMSU Agricultural Science Center at Farmington from 1969 to 2003

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
Mean	0.47	0.44	0.71	0.57	0.52	0.26	0.85	1.10	1.09	0.95	0.72	0.42	8.10
Rank	9	10	6	7	8	12	4	1	2	3	5	11	

TABLE 4-2

NMSU TEMPERATURE EXTREMES AND FROST FREE PERIODS

Year	Max. Temp. in ^{0}F	Date of Max. Temp.	Min. Temp. in ^{0}F	Date of Min. Temp.	Date of Last 32^0 Temp. Spring	Date of First 32^0 Temp. Fall	No. of Frost Free Days
1957	100	06/28	7	01/22	04/28	10/23	178
1958	102	07/12	0	12/23	04/27	10/17	173
1959	99	07/23	-6	01/04	05/06	09/25	142
1960	102	07/29	-10	01/18	05/26	10/05	132
1961	102	06/22	-34	12/12	05/22	09/04	105
1962	101	08/15	-17	01/03	05/16	10/11	148
1963	100	07/19	-20	01/12	05/13	10/14	154
1964	101	07/20	-10	12/13	05/09	10/07	115
1965	98	08/11	-7	12/13	05/29	09/21	115
1966	100	07/06	-4	12/29	05/13	09/14	154
1967	99	07/04	-7	01/08	06/17	10/07	99
1968	100	06/23	-6	12/23	05/18	09/17	122
1969	103	08/09	4	12/31	05/01	10/05	157
1970	101	06/27	-5	01/07	05/08	09/26	141
1971	105	07/13	-22	01/07	05/30	09/18	111
1972	101	07/15	0	02/03	05/26	09/30	127
1973	100	07/05	-4	01/15	06/19	09/26	98
1974	102	06/29	16	01/03	05/22	09/28	129
1975	99	08/08	-6	01/04	06/19	09/26	98
1976	103	07/10	-5	01/02	06/15	10/07	113
1977	99	07/26	-8	01/10	04/21	10/31	193
1978	103	07/13	-15	12/11	05/06	09/20	137
1979	102	07/08	-11	01/28	05/11	10/22	164
1980	103	06/26	9	11/22	05/22	09/29	129
1981	100	07/16	1	12/24	05/07	10/22	168
1982	97	07/22	-3	02/07	05/06	10/05	152
1983	99	08/06	9	01/03	05/20	09/21	124
1984	95	07/07	2	01/18	05/08	10/15	158
1985	100	07/07	-1	02/01	05/14	09/30	139
1986	96	07/15	8	01/08	04/27	10/12	168
1987	98	07/25	1	12/15	04/21	10/19	181
1988	99	06/23	-2	01/28	05/07	11/29	206
1989	103	07/07	-14	02/07	04/30	10/18	171
1990	103	07/01	-16	12/24	04/10	10/09	181
1991	97	07/08	-3	01/01	05/05	10/28	176
1992	95	08/04	-2	12/21	04/21	10/08	170

TABLE 4-3

NAVAJO MINE 2003 TEMPERATURE SUMMARY
(hourly average in degree Fahrenheit)

Met Station II

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg.
Max	58.3	62.1	70.7	75.2	93.9	93.6	101.7	95.9	90.9	86.2	62.6	57.6	79.0
Min	19.8	14.4	23.5	27.3	33.8	53.4	61.9	59.0	42.4	32.2	15.4	11.1	32.9
Mean	38.5	36.8	44.5	53.6	65.6	73.9	82.7	76.3	67.8	59.6	41.2	34.7	56.3

4.1.5 Wind Data

The wind speed and direction data are available from Navajo Mine Met Station I and Met Station II. Cumulative wind roses for both stations are shown in FIGURES 4-1 and 4-2 for the calendar years 1991 through 2003. The wind rose data shows hourly average wind speed in meters per second (m/s) and direction. The wind rose profiles at the Navajo Mine show the prevailing high and low velocity wind directions. Episodic wind events can reach velocities up to 51 m/s (115 mph). Generally, the highest winds occur in the spring and during summer thunderstorm events. These high velocity winds are responsible for and can be correlated to the collection of elevated fugitive dust emission data.

Approximately 75 percent of the wind speed data collected falls between 1.1 to 5.0 meters/second (2.5 to 11 mph) and comes from the prevailing wind directions SSE, SE, ESE, and E. Approximately, 25 percent of the wind speed data collected falls within 5.1 to 15.0 m/s (11 to 33 mph) and comes from the opposite NW and NNW directions.

The wind direction patterns shown are different for the two meteorological stations. At Met Station I the predominant directions are NW-WNW and E-ESE. At Met Station II the predominant directions are NNW-NW and SE-SSE. These differences represent effects of the local topography. The northern Met Station I is affected by the San Juan River Valley drainage winds which account for the shift in the prevailing wind direction to a more easterly orientation. The Met Station II wind direction patterns are considered the most representative of the wind direction patterns in the central (i.e., Hosteen and Barber) and southern (i.e., Lowe and Dixon) areas of the mine.

4.2 METEOROLOGICAL MONITORING

Navajo Mine meteorological monitoring program was redesigned in the spring of 1991. The two existing three meter tripods were replaced with two 10 meter towers at the same locations meteorological sensors and data acquisition systems were replaced. The meteorological equipment is operated in compliance with Prevention of Significant Deterioration (PSD) Meteorological Program Guidance for Regulatory Model Applications (EPA 1987). The location of the monitoring stations are shown in Exhibit No. 4-1.

Each station produces hourly averages of wind speed, wind direction, sigma theta (standard deviation of horizontal wind direction), temperature, relative humidity, and hourly precipitation totals. The wind, temperature, and humidity sensors are mounted on the towers at approximately 10 meters (about 33 feet) above ground level. The precipitation sensor is at ground level. The meteorological data collected at each station is used to document climatic condition and the identification of sources of natural (i.e., high winds) or mine related fugitive dust. Cumulative twelve-year wind rose graphic representations of the wind speed and wind direction are shown in FIGURES 4-1 and 4-2. Data used for Figures 4-1 and 4-2 are located in Appendix 4-A.

Figure 4-1

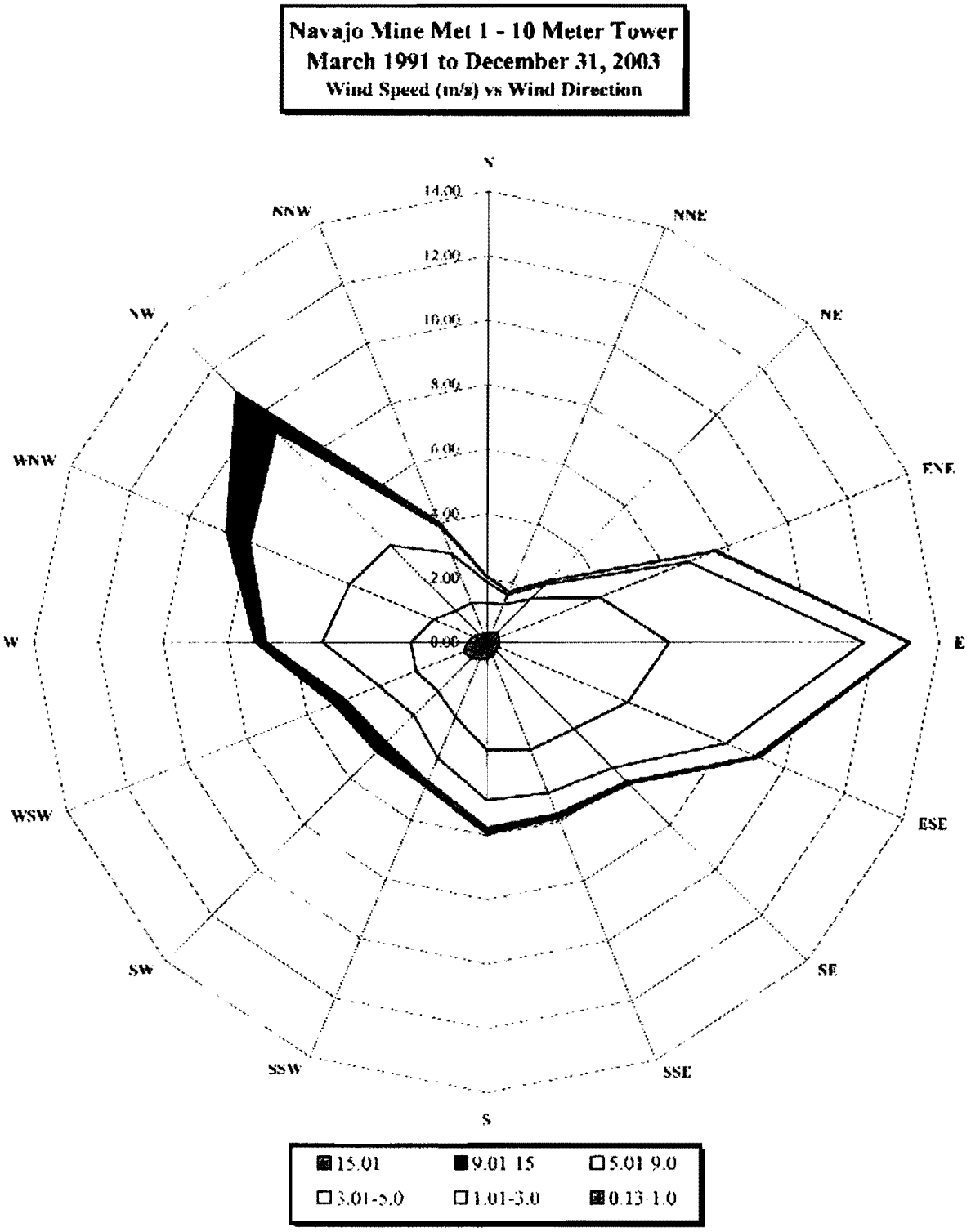

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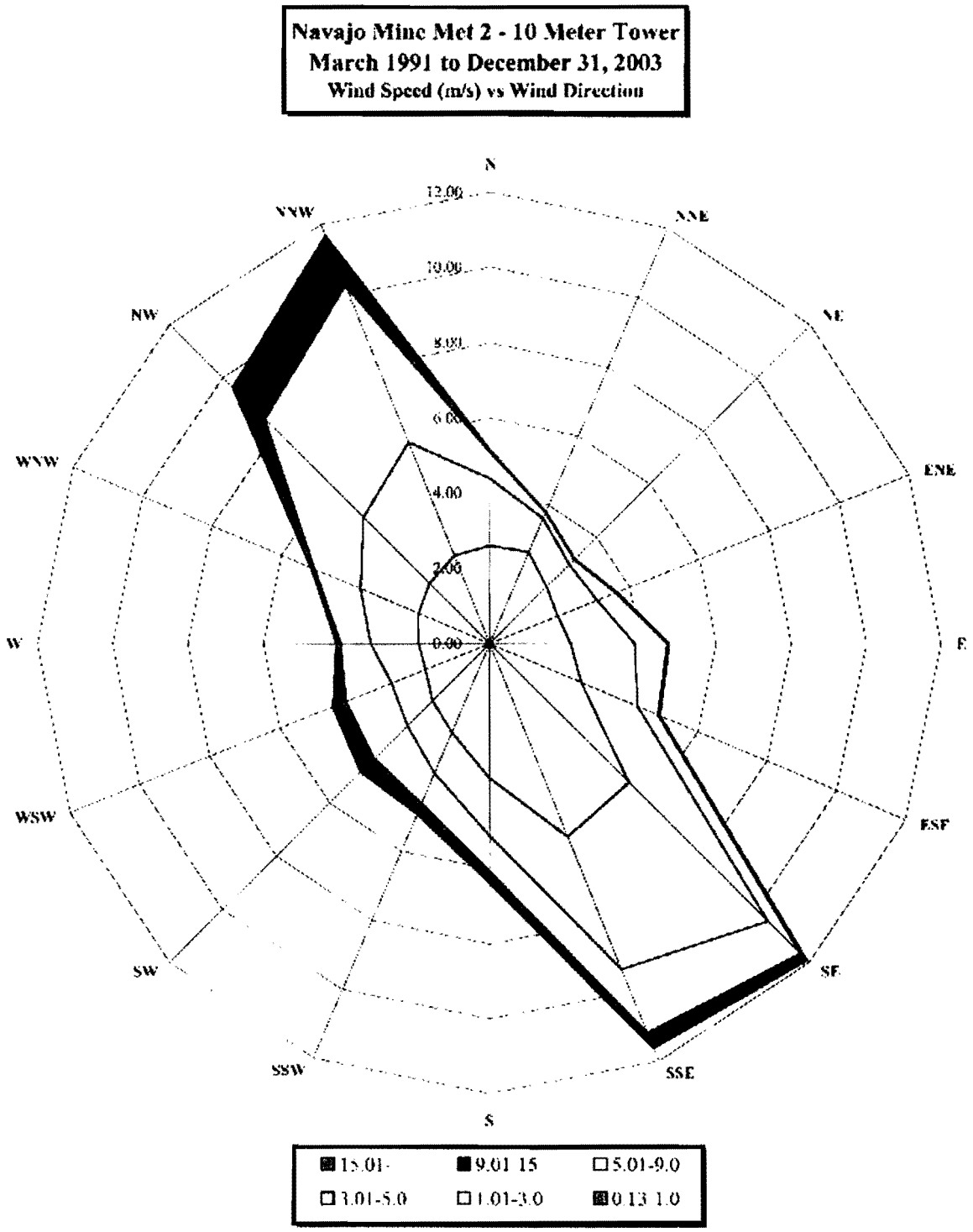
Figure 4-2



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4.3 AIR POLLUTION CONTROL PLAN

4.3.1 Air Quality

No quantitative air quality data existed for the Four Corners Region and premining activities. Power generation, mining, agricultural, oil and gas, and transportation activities have started or increased substantially in the region since the early 1960's. The Grand Canyon Visibility Transport Commission is currently conducting the study of the air quality in the Four Corners Region.

The only potential air emission caused by the Navajo Mine is fugitive dust. Fugitive dust at the Navajo Mine is generated as a result of coal mining, transportation, and handling operations. The fugitive dust produced by the mine is primarily surface soil particles, and minor coal dust.

4.3.2 Air Pollution Control Compliance

The Navajo Mine monitors air quality for PM_{10} concentrations and is in compliance with 30 CFR § 780.15 Air Pollution Control Plan.

Navajo Mine air monitoring program is operated in compliance with the following applicable regulations and guidance: 40 CFR, Appendix J-Reference Method for the Determination of Particulate Matter as PM_{10} in the Atmosphere; Quality Assurance Handbook for Air Pollution Measurement Systems: Volume I Principles (EPA 600/9-76-005, Dec. 1984), Volume II Ambient Air Specific Methods (EPA 600/R-94/038A), and Volume IV. Meteorological Measurements (EPA 600/4-90/003, August 1989).

The Navajo Mine is in the Four Corners Interstate Air Quality Control Region as designated by the Environmental Protection Agency (EPA). The ambient air quality attainment status for PM_{10} in this region was designated as "Unclassifiable" per 40 CFR § 81, 11/06/91.

4.3.3 Air Monitoring Program

The air-monitoring program at Navajo Mine started with a Total Suspended Particulate (TSP) monitoring program established in 1988 that consisted of four General Metal Works (GMW) high volume air TSP samplers. The program was later improved in 1991 with an expanded PM_{10} and TSP monitoring program. The current sampling network consists of two high volume PM_{10} General Metal Works samplers and three BGI PQ 100 PM_{10} monitors. The samplers run simultaneously on a 24-hour, once every six days schedule as per the U.S. EPA Ambient Air Particulate Monitoring National 6 Day Schedule. Particulate sampling instrumentation, procedures, data reporting, and interpretation follow the applicable methodology described in 40 CFR Part 50, National Primary and Secondary Ambient Air Quality Standards. Calibration and quality assurance procedures are performed in accordance with U.S. EPA guidelines, 40 CFR Part 50, 58, and the U.S. EPA Quality Assurance Handbook for Air Pollution Measurement Systems: Volume II Ambient Air Specific Methods.

The samplers and their locations are listed in TABLE 4-4. Locations are given using the New Mexico Base Coordinate System. The location of each sampler is shown in Exhibit No. 4-1.

TABLE 4-4

AIR MONITORING STATIONS AND LOCATIONS

Particulate Sampler Designation	Site Location	Parameter Monitoring	Coordinates (Feet)	Sampler Site Elevation (Feet)
NM01	Watson	PM_{10}	329,443 East 2,084,326 North	5307
NM03-1	N. Dixon	PM_{10}	293,765 East 2,016,114 North	5370
NM04B	E. Lowe	PM_{10}	305,508 East 2,014,620 North	5401
NM06	South of North Area Facilities	PM_{10}	314,218 East 2,068,468 North	5437
NM07	W. Area IVN	PM_{10}	291,016 East 2,004,298 North	5430

4.3.3.1 Air Monitor Siting

The air monitors are positioned throughout the mine and located in areas that will facilitate the characterization of fugitive dust emissions from the mining and reclamation operations. Applicable EPA guidance found in 40 CFR Part 58, Appendix E and the EPA Quality Assurance Handbook for Air Pollution Measurement Systems Volume II; Ambient Air Specific Methods, Section 2.11.3, April 1994 as well as various other applicable and general siting criteria were used to locate monitor stations. The siting criteria used included: 1) access on existing public and/or tribal roads; 2) topography and vegetation; 3) proximity to active mine areas and local residences; long range mine plan, and 4) bias from roads, structures, agricultural, and other non-mining activities.

The three primary siting criteria used were: 1) the locations of the most active mining areas, 2) long range mining plan and 3) the location of adjacent residences. Areas adjacent to the most active areas of the mine were selected to determine the potentially most elevated air emissions. To facilitate the collection of long-term representative monitoring data, monitoring stations were selected in areas that will be not be mined in the next five years.

The siting criteria and the related rationale for locating each monitoring station is found in TABLE 4-5.

No site preparation, construction of buildings or structures, or land surface disturbance at the air monitoring sites is performed other than access by vehicle or foot traffic and initial monitor setup and demobilization. The monitoring equipment and structures are non-permanent structures that will be removed when monitoring is completed. The monitoring stations generally consist of a trailer mounted solar panel and an air monitoring instrument mounted to a footed elevated metal stand or mounted on a metal tripod assembly. The total land disturbed by monitoring equipment and activities is relatively small, approximately 20 feet x 20 feet. Only existing roads are used for access to the monitoring stations. The access routes used include mine roads and are provided in TABLE 4-5.

TABLE 4-5

AIR MONITOR SITING INFORMATION

Monitor	Land Status	Siting Criteria	Rationale	Access
NM01	Prelaw	Closest to large population Reclamation completed	1. Location will provide background data and assessment of Navajo Mine Fugitive Dust Control Plan.	Two track dirt road and walk-in
NM03-1	Permanent	1. Lowe and Dixon Pits and Lowe Coal Stockpile and loading areas. 2. Outside of 5 year mine plan. 3. Location is in the vicinity of local residence.	1. Location will allow for the long term monitoring data collection. 2. Assess the effectiveness of Navajo Mine Fugitive Dust Control Plan in the Dixon Pit area.	Two track dirt road and walk-in.
NM04B	Permanent	1. Lowe and Dixon Pits and Lowe Coal Stockpile and loading areas. 2. Outside of 5 year mine plan. 3. Location is in the vicinity of local residence.	1. Location will allow for long term monitoring data collection. 2. Assess the effectiveness of Navajo Mine Fugitive Dust Control Plan in the Dixon Pit area.	Existing gravel road and tribal two track dirt road.
NM06	Permanent	1. North Area coal loading and reclaim operations. 2. Location is in the vicinity of local residence.	1. Location will allow for long term monitoring data collection. 2. Assess the effectiveness of Navajo Mine Fugitive Dust Control Plan in the North Facilities area.	Public road and two track dirt road.

Table 4-5 (Continued)				
Monitor	**Land Status**	**Siting Criteria**	**Rationale**	**Access**
NM07	Permanent	1. W Area IVN and future Coal Stockpile and loading areas. 2. Outside of 5 year mine plan. 3. Location is in the vicinity of a local residence.	1. Location will provide background data. 2. Long term monitoring data collection. 3. Assess the effectiveness of Navajo Mine Fugitive Dust Control Plan in the future Area IVN pit area.	Two track dirt road and walk in.

4.3.3.2 Reporting

Quarterly air monitoring report will be submitted to the Office of Surface Mining (OSM) (CHAPTER 11, Section 11.2.6). The air monitoring report generally contains particulate monitoring results, analysis of samples collected, detailed particulate data, and quality assurance quality control summaries.

4.3.3.3 Corrective Action

In the unlikely event that a fugitive dust level in excess of NAAQS is detected at a monitoring station, Navajo Mine will make an assessment of the occurrence to determine if the source is from mining related activities or if this level is attributable to natural causes. The assessment will incorporate air quality particulate and meteorological data collected by Navajo Mine air monitoring program along with other air quality data that may be available in the region. In addition, mine activity records will be reviewed to determine potential mine activity sources. Navajo Mine will review its currently approved fugitive dust control measures and perform specific mitigation measures if possible to minimize future fugitive dust emissions resulting from mining related activity within the permit area.

4.3.3.4 Quality Assurance

Air monitoring and analysis procedures follow the Navajo Mine Quality Assurance Project Plan (QAPP). The QAPP defines the general protocols that will be employed for the collection, and analysis of air monitoring data. Quality Assurance Performance Audits are conducted every six months for meteorological towers and quarterly for PM_{10} particulate samplers. Corrective action(s) that is identified during audits or inspections are documented and completed as soon as reasonably possible.

4.4 REFERENCES

Navajo Mine. Onsite met tower data from Navajo Mine's meteorological stations.

US Environmental Protection Agency. 1994. Quality Assurance Handbook for Air Pollution Measurement Systems: Volume II, Ambient Air Quality Monitoring Program. EPA-600/R-94/038A; April.

US Environmental Protection Agency. 1987. Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD). Office of Air Quality Planning and Standards, Research Triangle Park, NC. EPA-450/4-8/00/, May.

US Environmental Protection Agency. 1994. Quality Assurance Handbook for Air Pollution Measurement Systems: Volume II, Ambient Air Specific Methods. EPA-600/R-94/028A. Section 2.10 and Section 2.11.0, April.

US Environmental Protection Agency. 1987. Onsite Meteorological Program Guidance for Regulatory Model Applications.

US Environmental Protection Agency. 1995. A Report on Air Quality in California, Arizona, Nevada, and Hawaii. EPA/909/R/95/001, May.

Williams, Jerry, 1986 New Mexico in Maps. University of New Mexico.

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APPENDIX 4-A

Met 1 and Met 2 Wind Direction vs. Wind Speed back-up data

Navajo Mine Met 1 - 10 Meter Tower
March 1991 to December 31, 2003
Wind Direction vs Wind Speed

Wind Direction (degrees)	Wind Speed (m/s) 0.13-1.0	1.01-3.0	3.01-5.0	5.01-9.0	9.01-15	15.01-	Total
N	0.29	0.93	0.64	0.16	0.02	0.00	2.05
NNE	0.33	0.93	0.33	0.11	0.02	0.00	1.72
NE	0.43	1.49	0.63	0.15	0.03	0.00	2.74
ENE	0.38	3.36	2.96	0.87	0.06	0.00	7.64
E	0.38	5.24	6.04	1.37	0.07	0.00	13.10
ESE	0.37	4.36	3.29	1.00	0.11	0.01	9.13
SE	0.38	3.41	1.72	0.61	0.11	0.01	6.23
SSE	0.44	3.16	1.46	0.68	0.14	0.00	5.89
S	0.51	2.84	1.56	0.84	0.20	0.01	5.95
SSW	0.55	1.95	1.40	0.78	0.17	0.01	4.87
SW	0.69	1.45	1.06	1.19	0.42	0.01	4.81
WSW	0.79	1.57	1.23	1.13	0.37	0.01	5.10
W	0.61	1.73	2.76	1.72	0.33	0.01	7.16
WNW	0.46	1.34	2.82	3.34	0.77	0.01	8.74
NW	0.35	1.03	2.89	4.98	1.70	0.06	11.00
NNW	0.26	1.06	1.66	0.87	0.18	0.00	4.03
Total	7.22	35.85	32.44	19.81	4.69	0.15	100.15

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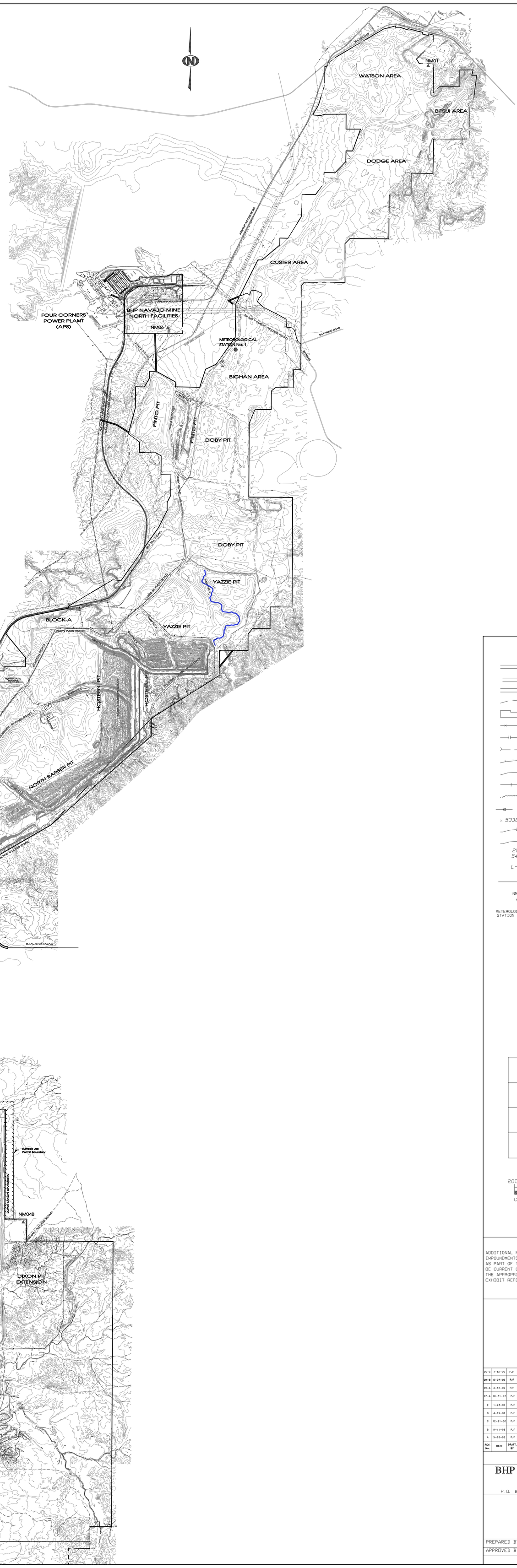
Navajo Mine Met 2 - 10 Meter Tower
March 1991 to December 31, 2003
Wind Direction vs Wind Speed

Wind Direction (degrees)	Wind Speed (m/s)						
	0.13-1.0	1.01-3.0	3.01-5.0	5.01-9.0	9.01-15	15.01-	Total
N	0.09	2.50	1.79	0.70	0.07	0.00	5.15
NNE	0.09	2.55	0.97	0.17	0.01	0.00	3.80
NE	0.08	2.04	0.86	0.19	0.02	0.00	3.19
ENE	0.07	1.87	1.13	0.52	0.04	0.00	3.64
E	0.07	2.08	1.69	0.86	0.06	0.00	4.76
ESE	0.08	2.56	1.63	0.58	0.06	0.00	4.91
SE	0.11	5.12	5.23	1.22	0.23	0.00	11.91
SSE	0.11	5.42	3.82	1.83	0.42	0.01	11.63
S	0.11	3.47	1.52	0.95	0.29	0.01	6.36
SSW	0.11	2.45	1.18	0.88	0.28	0.02	4.93
SW	0.12	2.02	0.94	1.24	0.50	0.01	4.84
WSW	0.09	1.75	0.97	1.31	0.38	0.00	4.50
W	0.10	1.79	1.28	0.79	0.12	0.00	4.07
WNW	0.09	1.97	1.67	1.31	0.12	0.00	5.16
NW	0.11	2.16	2.48	3.69	1.17	0.03	9.64
NNW	0.10	2.41	3.25	4.49	1.37	0.06	11.69
Total	1.51	42.18	30.42	20.75	5.13	0.16	100.16

(5/94; 5/04)



"NOTE"
ADDITIONAL MINE STRUCTURES, INCLUDING ROADS RAILROAD, PONDS, IMPOUNDMENTS AND CULVERTS, ALTHOUGH PRESENT ON THIS EXHIBIT AS PART OF THE AERIAL BASE MAPPING, ARE NOT INTENDED TO BE CURRENT OR ACCURATE ON THIS EXHIBIT. PLEASE REFER TO THE APPROPRIATE P.A.P TEXT SECTION FOR A MINE STRUCTURE EXHIBIT REFERENCE.

REV. No.	DATE	DRAFT. BY	REVISION DESCRIPTION	ENG.	E.Q.	P.S.	ENG.
				APPROVALS			
09-C	7-12-09	PJF	ADDED 1BR EASTSIDE OF LOWE PIT AND SUBMITTED TO OSM FOR REVIEW.	Shiver Smith	YB		
09-B	5-07-09	PJF	REVISED NM07 AIR MONITORING STATION LOCATION IN A4N AND SUBMITTED TO OSM FOR REVIEW.	D. VAUGHN	YB		
09-A	3-18-09	PJF	ADDED NM07 AIR MONITORING STATION IN A4N AND SUBMITTED TO OSM FOR REVIEW.	WS	YB		
07-A	10-31-07	PJF	RESUBMITTED FOR THE A4N DEVELOPMENT TO OSM FOR REVIEW AND APPROVAL.	WS	YB		
E	1-23-07	PJF	ADDED A4N WET 3 STA (SOUTH OF COTTONWOOD WASH AND WESTSIDE OF BURNHAM ACCESS ROAD, AND SUBMITTED TO OSM FOR REVIEW.	WS	MC		WB
D	4-19-01	PJF	REMOVED NM02A, CHANGE NM04A TO NM04B AND SUBMITTED TO OSM FOR PERMIT UPDATE.	MC	MC		WB
C	12-21-00	PJF	CHANGE NM-03 TO NM-03-1,REMOVED NM-02B AND SUBMITTED TO OSM FOR REVIEW AND APPROVAL.	MC	MC		WB
B	9-11-98	PJF	CHANGE NM-04 TO NM-04A AND SUBMITTED TO OSM FOR REVIEW AND APPROVAL.	JL	MC		WB
A	5-26-98	PJF	MID-TERM SUBMITTAL TO OSM FOR REVIEW AND APPROVAL	GW	PNS		WB

EXHIBIT 4-1

BHP NAVAJO COAL COMPANY

NAVAJO MINE

P. O. BOX 1717 FRUITLAND, NEW MEXICO 87416

AIR QUALITY AND METEOROLOGICAL MONITORING STATIONS

PREPARED BY PJF	DRAWN BY PJF	SCALE 1" = 2000'
APPROVED BY	DATE April 14, 1998	

Path: G:\Gs\OSM_SUBM\PER_PROG\CH_04-AIR MONITOR\AIR MONITOR\EXH_4-1.pro
PJFoster \Plot Time: Wed Jul 15 11:43:05 2009