Peabody Powder River Operations, LLC
Caller Box 3034
Gillette, Wyoming 82717-3034
(307) 687-3900

January 18, 2013

Cara Keslar
Monitoring Section Supervisor
Air Quality Division
Wyoming Department of Environmental Quality
122 West 25th Street
Cheyenne, WY 82002

RE: North Antelope Rochelle Mine;
High Wind Event Demonstration – RO-1 PM_{10} Monitor

Dear Cara:

On December 20, 2012, the RO-1 PM_{10} monitor operated by Peabody near its North Antelope Rochelle Mine (NARM) recorded an exceedance of the 24-hour PM_{10} NAAQS. In keeping with the AQD's guidance, Peabody hereby submits for your review, an exceptional event documentation package related to that exceedance.

This High Wind Event demonstration thoroughly and appropriately addresses the requirements and principles of Wyoming's Natural Events Action Plan, the federal Exceptional Events rule and the recently issued federal guidance for preparing such demonstrations. We have endeavored to tailor our submittal to be especially responsive to the information needs and requests of the Air Quality Division.

In the event that the AQD either has any questions about the enclosure or requires further information, please do not hesitate to contact me or Staci Hammond at your convenience. Staci can be reached at the mine (307) 464-4509, or by email shammond@peabodyenergy.com). My phone number is (307) 687-3938.

Sincerely,

Philip C. Dinsmoor
Director, Environmental Services
Peabody Energy

Enclosure

c: S. Hammond, NARM

NORTH ANTELOPE ROCHELLE MINE

DEMONSTRATION OF EXCEPTIONAL EVENT – HIGH WINDS
RO-1 PM_{10} MONITOR
DECEMBER 20, 2012

Prepared for

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
JANUARY 18, 2013

TABLE OF CONTENTS

SECTION PAGE

INTRODUCTION 1

BACKGROUND 1

DEMONSTRATION OF EXCEPTIONAL EVENT AT NARM ON December 20, 2012 3

A. General Description of the Event (Abstract).....3

B. The Event at NARM on December 20, 2012 Was a High Wind Event 4

C. Evidence Indicates That High Winds Caused the PM_{10} Exceedance 5

1. *Spatial Relationship*.....5

2. *Temporal Relationship*.....9

3. *Comparison of Event-affected Concentration to Non-event Concentration* 11

4. *Visual Observations*.....14

5. *Conclusion: High Winds Caused the PM_{10} Exceedance*.....14

D. The Historical Context for the Subject High Wind Event Is Persuasive 15

E. NARM's Significantly Contributing Sources Were Not Reasonably Controllable During the High Wind Event of December 20, 2012.....18

1. *NARM's Contributing Anthropogenic Sources Were Not Reasonably Controllable* 18

a. NARM's Contributing Anthropogenic Sources Had Reasonable Controls in Place on December 20, 2012 19

(1) BACM 19

(2) Reactionary Control Measures.....20

a) Reactionary Control Measures Focused on the Emission Source Areas that Likely Contributed Significantly to RO-1 Monitor 22

b) Reactionary Measures Where Fugitive Emissions Were Unlikely to have Contributed Significantly to the Concentrations at the RO-1 Monitor.....25

(3) Summary 26

b. NARM's Reasonable Controls Have Been Effectively Implemented and Enforced.....27

c. Wind Speeds on December 20, 2012 Were High Enough to Overwhelm NARM's Reasonable Controls.....29

d. Conclusion 30

2. *NARM's Contributing Natural Sources Were Not Reasonably Controllable*.....31

F. The High Wind Event at NARM on December 20, 2012 Was a Natural Event 31

TABLE OF CONTENTS

SECTION PAGE

G. The Measured Exceedance on December 20, 2012 Would Not Have Occurred But For the High Wind Event on That Day 32

CONCLUSION 33

TABLE

1 METEOROLOGICAL AND RO-1 MONITOR DATA FOR DECEMBER 20, 2012 6

2 METEOROLOGICAL AND RO-1 MONITOR DATA FOR NOVEMBER 27, 2011 13

FIGURE

1 Wind Rose – DECEMBER 20, 2012.....7

2 Wind Speed & Wind Gust Speed vs PM_{10} Concentration for Monitor RO-1 on December 20, 2012 10

3 North Antelope Rochelle Mine RO-1 Monitor 3-Year Historical Fluctuations of 24-Hour Averages 17

4 Timeline for RO-1 High Wind Event .....Attachment

EXHIBIT

1 Reverse Trace and Equipment Locations.....Attachment

2 Equipment Locations and Disturbed Areas .....Attachment

INTRODUCTION

The Air Quality Division (AQD) of the Wyoming Department of Environmental Quality (DEQ) requires Peabody to operate an approved ambient PM_{10} monitoring network at its North Antelope Rochelle Mine (NARM) to demonstrate compliance with the PM_{10} NAAQS, codified at Chapter 2, Section 2 of the Wyoming Air Quality Standards and Regulations (WAQSR). On December 20, 2012 one of NARM's ambient PM_{10} monitors near the Mine measured a 24-hour average PM_{10} concentration of 188 µg/m^3. This is an exceedance of the 24-hour national ambient air quality standard (NAAQS) for PM_{10}.[1] The purpose of this document is to demonstrate that this measured exceedance was caused by a high wind event.

BACKGROUND

Peabody Powder River Mining, LLC operates the North Antelope Rochelle Mine, a surface coal mine located in the southern portion of the Powder River Basin (PRB) approximately sixteen miles southeast of Wright, Wyoming. As shown in Exhibit 1, NARM includes three major pit systems: the North Pits, the East Pits and the West Pits. The southern portion of the West Pits is typically referred to as the Rail Loop Pits and constitutes the southernmost mining activity at NARM. The major mining equipment utilized at NARM includes 3 draglines, 4 coal shovels, 8 overburden shovels, 3 large-capacity loaders and a fleet of 55 haul trucks with capacities ranging from 200 tons to 400 tons. NARM also operates 9 water trucks and a large fleet of support equipment including dozers, scrapers, graders, loaders, service trucks and light-duty vehicles.

In 2007 DEQ began implementation of a Natural Events Action Plan (NEAP) for coal mines of the PRB.[2] Based on the U.S. Environmental Protection Agency's (EPA's) Natural Events Policy,[3] Wyoming's NEAP recognizes that high ambient concentrations of PM_{10} may be caused by an uncontrollable natural event that results in particles such as fugitive dust or smoke becoming entrained in ambient air. The NEAP further provides that a measured exceedance of

[1] 40 C.F.R. § 50.6. The State of Wyoming has a 24-hour state ambient air quality standard equal to the NAAQS, i.e., 150 µg/m^3.
[2] DEQ, *Natural Events Action Plan for the Coal Mines of the Powder River Basin of Campbell & Converse Counties, Wyoming* (rev. Jan. 23, 2007) (hereinafter "NEAP").
[3] Memorandum from Mary D. Nichols, EPA Ass't Administrator for Air and Radiation, to EPA Regional Air Directors, of June 6, 1996 ("Areas Affected by PM-10 Natural Events"; aka "EPA's Natural Events Policy" (NEP)).

an ambient PM_{10} standard in the PRB due to such natural events need not be considered, i.e., may be "excluded," when characterizing ambient PM_{10} levels in that area, provided the measured exceedance is demonstrated to be caused by a natural event. Finally, for a measured exceedance to be caused by a natural event, the NEAP requires that any anthropogenic sources of dust contributing significantly to the measured PM_{10} exceedance must have been controlled during that event by a three-tiered program of control measures consisting of best available control technology (BACT), best available control measures (BACM) for disturbed surface areas, and appropriate, source-specific reactionary control measures for mining operations.

Also in 2007, EPA promulgated its Exceptional Events Rule (EER).[4] Under the EER, a demonstration that a NAAQS exceedance was caused by an exceptional event must show that:

(A) The event satisfies the criteria set forth in 40 C.F.R. § 50.1(j) that:

(i) the event affects air quality;

(ii) the event is not reasonably controllable or preventable;

(iii) the event is caused by human activity that is unlikely to recur at a particular location *or* the event is a natural event; and

(iv) the event is determined by the Administrator in accordance with 40 C.F.R. § 50.14 to be an exceptional event.

(B) There is a clear causal relationship between the measurement under consideration and the event that is claimed to have affected the air quality in the area;

(C) The event is associated with a measured concentration in excess of normal historical fluctuations including background; and

(D) There would have been no exceedance or violation but for the event.

EPA issued draft guidance in 2012 to assist States in their administration of the EER by providing examples of how each of the above elements of an exceptional event may be demonstrated.[5]

[4] 40 C.F.R. § 50.14.

[5] *See, e.g.,* EPA, *Draft Guidance on the Preparation of Demonstrations in Support of Requests to Exclude Ambient Air Quality Data Affected by High Winds,* June 2012 (hereinafter "Draft High Winds Guidance"); EPA, *Draft Exceptional Events Rule Frequently Asked Questions,* June 2012.

DEMONSTRATION OF EXCEPTIONAL EVENT AT NARM ON December 20, 2012

On December 20, 2012, NARM's ambient PM_{10} monitor designated as "RO-1" recorded a 24-hour average PM_{10} concentration of 188 µg/m^3, thereby exceeding the ambient 24-hour PM_{10} standard of 150 µg/m^3. The purpose of this document is to demonstrate that this monitored exceedance was caused by an exceptional event. Peabody's conclusion that this exceedance was due to a high wind event follows from a weight-of-evidence analysis as suggested by EPA.[6] Consistent with EPA's policy that the appropriate level of supporting documentation for an exceptional event demonstration will vary on a case-by-case basis,[7] Peabody strongly believes the documentation and analyses provided herein are more than sufficient to demonstrate that the exceedance in question was caused by a high wind event.

A. General Description of the Event (Abstract)

On December 20, 2012 NARM's RO-1 TEOM recorded a 24-hour average concentration which was above the 24-hour average NAAQS for PM_{10}. On that day very high winds with hourly averages over twenty miles per hour (mph), were recorded for 21 consecutive hours.

During the very early morning hours of December 20, 2012, the wind speeds were relatively low, wind directions were variable, and hourly PM_{10} concentrations at the RO-1 monitor were also relatively low but variable. As the morning progressed the wind speeds increased to above 20 mph, wind direction became stable from the west-southwest and the hourly concentrations at RO-1 increased dramatically.

The Rail Loop Pit area was identified as the source of fugitive emissions that were reaching the monitor. BACM and BACT measures which are constantly implemented as mining progresses at NARM, were current and in place in the Rail Loop Pit areas as required by the air permit. NARM responded early in the day to the 24-hour alarm, with reactionary measures commensurate with the relatively low hourly measurements recorded at RO-1. When hourly concentrations reached high level alarm status, NARM's reactionary measures also intensified involving considerable curtailment of mining activities in the Rail Loop Pits in particular, and

[6] EPA, Draft High Winds Guidance at 8.
[7] *Id.*

throughout the mine site. The resulting significant reduction of mining activities and production volumes coupled with existing BACM and BACT controls appear to have had no discernible impact on hourly concentrations at RO-1, until such time as wind speeds also began to decrease.

No correlation appears to exist between mining activities at NARM and concentrations at RO-1 on December 20, 2012 at the elevated wind speeds. Alternatively, there is a very strong correlation between wind speed recorded at NARM and the hourly concentrations recorded at RO-1 on December 20, 2012, when wind speeds were above 20 mph. Analysis of recent historical data shows that when the wind direction and production configuration are very similar to the event day but the wind speeds are much lower, the concentrations recorded at RO-1 are also much lower. These observations and investigations lead to the conclusion that on December 20, 2012, 21 hours of consistently high winds overwhelmed the BACT, BACM and reactionary controls implemented by NARM in the Rail Loop Pit areas and around the mine site.

The following detailed analysis provides data, observations and recorded actions associated with each of the findings listed above. When all the data that is provided below is analyzed with a weight-of-evidence approach, it is clear that the exceedance recorded at RO-1 on December 20, 2012 is the direct result of the high winds on that day, or a natural and exceptional event.

B. The Event at NARM on December 20, 2012 Was a High Wind Event

While developing the NEAP for PRB coal mines, AQD commissioned a study of the relationship between meteorological conditions and ambient PM_{10} concentrations in the PRB. Among other things, that study found that the influence of wind speed on PM_{10} concentrations in the PRB increases as wind speed increases. In particular, that study found that wind speed is the dominant predictor of ambient PM_{10} concentrations in the PRB at wind speeds in excess of 20 mph.[8]

According to DEQ, a “high wind event” occurs in the PRB “when hourly average wind speeds reach or exceed 20 mph.”[9] EPA has explained further that “[g]enerally, the EPA will accept that

[8] NEAP, Appendix D (“Statistical Analyses of the Influence of Wind Speed on PM_{10} Concentration in the Powder River Basin”).
[9] NEAP at 10.

high winds could be the cause of a high 24-hour average PM_{10} or $PM_{2.5}$ concentration if there was *a least one full hour* in which the hourly average wind speed was above the area-specific high wind threshold."[10]

NARM's 10-meter meteorological tower (PRCC-1) is located roughly equidistant from the Mine's North and East Pits to the north and the Rail Loop Pits to the south. PRCC-1's wind measurements are therefore generally representative of winds experienced across the Mine. Table 1 identifies the hourly average wind speeds measured at PRCC-1 on December 20, 2012.

Table 1 shows that hourly average wind speeds exceeded 20 mph during 21 consecutive hours of the day. Because wind speeds at NARM on December 20, 2012 equaled or exceeded 20 mph for numerous hours, a high wind event, by definition, clearly occurred at NARM on that day.

C. Evidence Indicates That High Winds Caused the PM_{10} Exceedance

1. *Spatial Relationship*

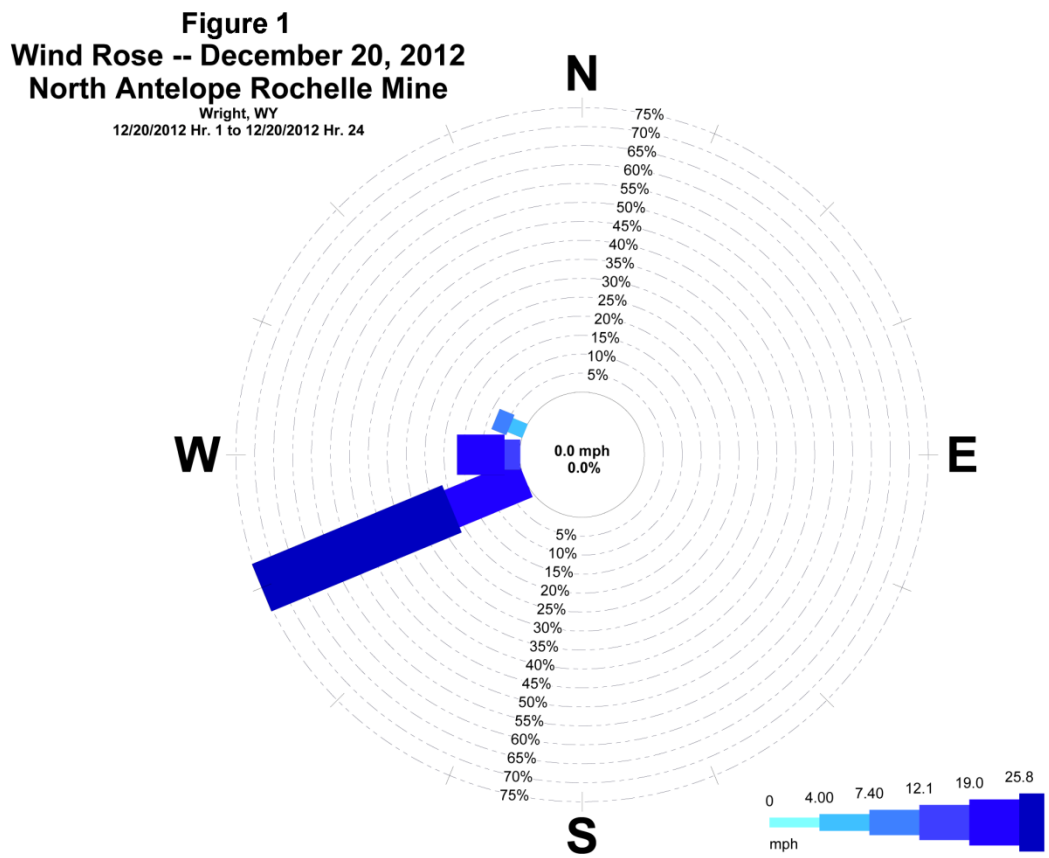
Exhibit 1 illustrates the location of the RO-1 monitor which recorded the exceedance on December 20 relative to NARM's various emission source areas having the potential to contribute to measured PM_{10} levels at that monitor. With a monitoring network for evaluating localized impacts from a mine, it is axiomatic that the likely contributors to a PM_{10} monitor's measurements during a high wind event are the particular source areas which are located upwind of that monitor, especially during the specific hours in which the high winds occurred.

[10] EPA, Draft High Winds Guidance at 40 (emphasis added).

Table 1					
METEOROLOGICAL DATA AND RO-1 MONITOR DATA FOR DECEMBER 20, 2012					
Date	Time	Wind Speed (mph)	Wind Direction (degrees)	Wind Gust Speed (mph)	Hourly PM_{10} Conc. (STP µg/m^3)
12/20/2012	100	5.1	286.3	16.4	125.8
12/20/2012	200	8.0	298.3	19.4	48.9
12/20/2012	300	17.1	276.3	27.7	64.9
12/20/2012	400	23.5	264.2	34.9	120.8
12/20/2012	500	22.0	263.9	33.5	66.1
12/20/2012	600	21.6	260.5	38.8	81.1
12/20/2012	700	23.0	253.3	34.4	199.5
12/20/2012	800	28.5	252.4	39.9	413.7
12/20/2012	900	26.5	250.9	39.1	264.9
12/20/2012	1000	28.0	251.5	42.5	399.0
12/20/2012	1100	35.0	251.1	48.7	770.6
12/20/2012	1200	34.4	254.2	48.8	604.8
12/20/2012	1300	31.0	258.2	45.8	251.3
12/20/2012	1400	28.8	256.6	40.2	92.8
12/20/2012	1500	24.2	258.3	37.9	46.2
12/20/2012	1600	25.4	253.9	39.2	59.7
12/20/2012	1700	20.9	246.8	36.4	73.1
12/20/2012	1800	27.0	251.2	40.5	126.7
12/20/2012	1900	28.9	250.8	42.6	193.1
12/20/2012	2000	29.3	257.8	43.4	99.8
12/20/2012	2100	27.3	254.7	43.6	142.9
12/20/2012	2200	25.6	255.2	42.5	98.9
12/20/2012	2300	28.6	255.8	43.4	79.4
12/20/2012	2400	28.3	256.7	41.0	92.1

Table 1 and the wind rose illustrated in Figure 1 both show that hourly average wind directions changed little throughout the day. The directions of those high winds during 21 consecutive hours were very consistent. In particular, the high winds during those 21 hours blew consistently from the west-southwest, i.e., confined within an angle between 247º and 264º. Consequently the likely significant contributors to the PM_{10} exceedance measured by the RO-1 monitor on December 20 are the emission source areas located within a sector upwind of the RO-1 monitor and bounded by wind directions between 247º and 264º.

Figure 1



As demonstrated in Exhibit 1, likely significant contributors to the measured exceedance can be identified by constructing a “reverse trace” of those predominant directions of high winds,

starting from the RO-1 monitor. Doing so results in finding that the likely significant contributors to the measured exceedance are located in the following upwind source areas:

- Active mining areas in the North and West Rail Loop Pits;
- Disturbed areas associated with the North and West Rail Loop Pits; and
- Undisturbed areas between the North and West Rail Loop Pits and the RO-1 monitor.

Conversely, mining activities as well as disturbed and undisturbed lands associated with the North Pits and East Pits were not located upwind of the RO-1 monitor during prolonged hours of high winds on December 20. Consequently, mining activities and lands related to those two main pit systems cannot reasonably be considered as source areas likely to have contributed significantly to the measured PM_{10} exceedance at RO-1.

Closer scrutiny of the hourly data within Table 1 reveals the presence of an "exceptionally high" wind event nested within the high wind event day of December 20. The hourly average values for wind directions reported from 11:00 through 13:00 varied by only 7º (251º-258º) while hourly average wind speeds of 31-35 mph for that period were considerably above the wind speed threshold. In addition, maximum hourly wind gusts over that same period peaked for the day between 45 and 49 mph.

During those "exceptionally high" wind speeds and wind gusts coming from the same direction for 3 consecutive hours, hourly average PM_{10} concentrations measured at RO-1 were especially and unusually elevated, i.e., 771, 605, and 251 $\mu g/m^3$. There can be little doubt that contributions of wind-blown particulate matter to the RO-1 monitor during those 3 particular hours were primarily responsible for that monitor's measured exceedance of the 24-hour PM_{10} NAAQS on December 20. Stated differently, the exceptionally high wind speeds coupled with the very elevated PM_{10} concentrations during those three hours also leave little doubt that high winds "affected air quality," one of the elements of a high winds event demonstration.

Furthermore, the nearly constant direction of those exceptionally high winds over 3 hourly readings allows construction of a second, narrow reverse-trace from the RO-1 monitor (251º-258º) that identifies specific source areas that almost certainly were the principal contributors to the exceedance. In particular, analysis of the trajectory for those exceptionally high winds over 3 hours identifies mining activities and disturbed lands within the West Rail Loop Pit area as

NARM sources which most likely contributed a large majority of the particulate matter measured by the RO-1 monitor on that day. Also, undisturbed lands between the West Rail Loop Pit area and RO-1 are other most likely significant contributors to the measured exceedance.

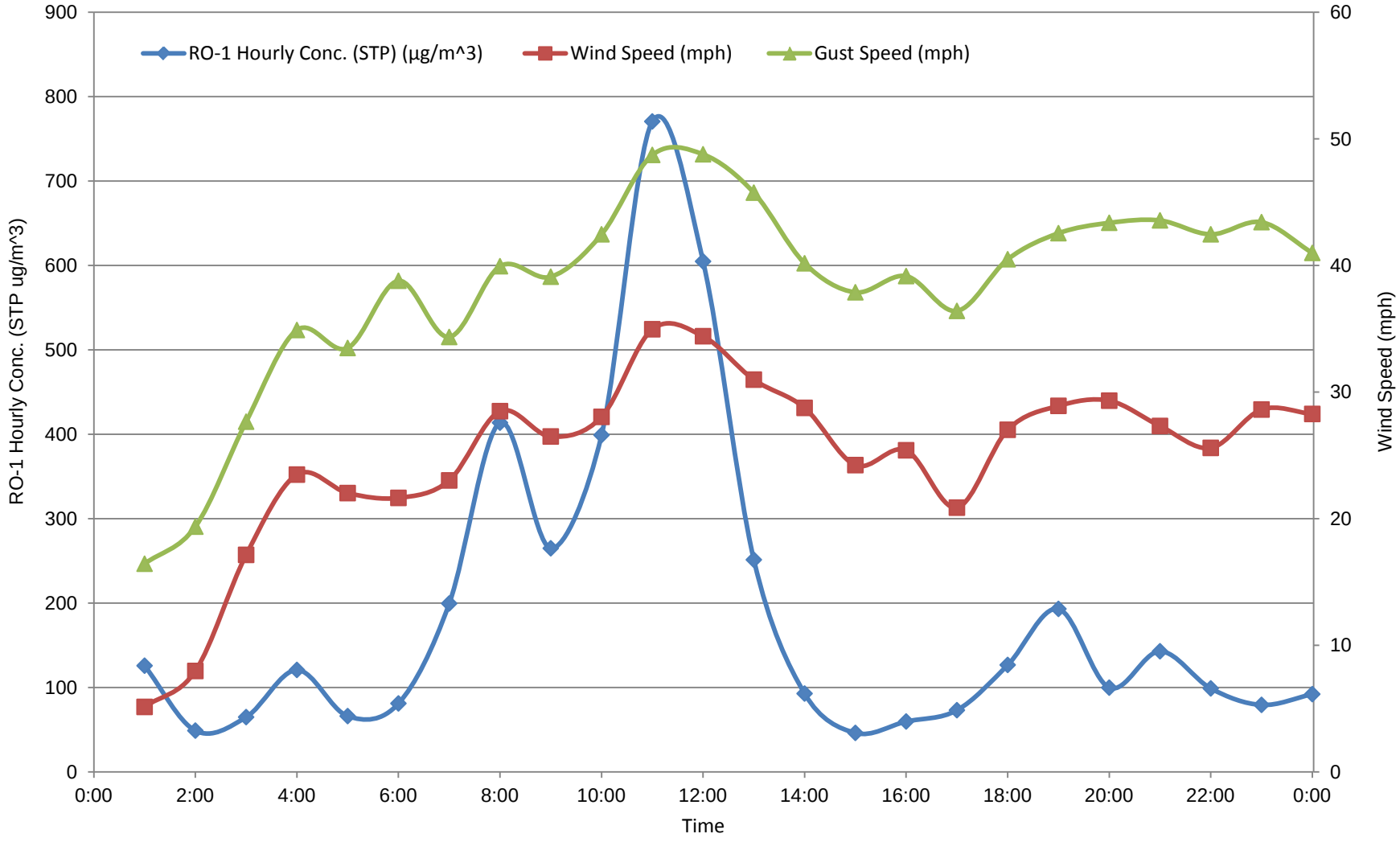
In sum, NARM source areas likely to have significantly contributed to the RO-1 monitor's measured exceedance on December 20 can be identified from the spatial relationship between that monitor and the source areas located upwind from that monitor during hours of high winds at NARM. Based on that relationship, sources within the North and West Rail Loop Pits have been identified as likely significant anthropogenic contributors to the measured exceedance on December 20. Moreover, a subset of these likely significant contributors represents the area most likely to have significantly contributed to that measured exceedance. Those "most likely" areas can be identified from the spatial relationship between the RO-1 monitor and the source areas located directly upwind from that monitor during the 3 consecutive hours of exceptionally high winds on that day.

2. *Temporal Relationship*

As shown in Figure 2, changes in PM_{10} levels measured by the RO-1 monitor clearly correlated with changes in high wind speeds at NARM on December 20, 2012. In particular, for hourly wind speeds above the PRB's high wind threshold, hourly PM_{10} concentrations at RO-1 increased when hourly wind speeds increased. Likewise, during high winds, hourly PM_{10} concentrations decreased when hourly wind speeds decreased. On the other hand, hourly PM_{10} concentrations at RO-1 did not correlate appreciably with changes in wind speed when wind speeds were below the high wind threshold.

FIGURE 2

Wind Speed and Wind Gust Speed vs PM_{10} Concentrations for Monitor RO-1 on December 20, 2012



n_aqd_hwe_121220_fg02_130110.xlsx

The straight-line distance from the RO-1 monitor to the center of the coal pit area at the north end of the Rail Loop West Pit is 3.5 miles. The "exceptionally high" winds on December 20, blowing at an average of 33.5 mph from the coal pit area, would reach the RO-1 monitor in about 6.2 minutes. This explains why the track of hourly PM_{10} concentrations at RO-1, as shown in Figure 2, is so closely synchronized with the track of the hourly high wind speeds at NARM.

The short lag time between a change in high wind speed and the subsequent change in PM_{10} concentration at RO-1 is consistent with high winds from the North and West Rail Loop Pits reaching RO-1 in a matter of minutes. Figure 2 is fully consistent with AQD's earlier finding for the PRB that wind speed is the dominant predictor of ambient PM_{10} concentrations at wind speeds in excess of 20 mph. That temporal relationship between high wind speeds and PM_{10} levels at the RO-1 monitor was clearly present on December 20, 2012.

3. *Comparison of Event-affected Concentration to Non-event Concentration*

On December 20, 2012 the winds blew from the west-southwest at wind speeds over 20 miles per hour (mph) for 21 consecutive hours. Similarly on November 27, 2011 the winds recorded at PRCC-1 were from the west-southwest with nearly the same consistent direction and duration as on December 20, 2012. That is, the winds recorded during a 15-hour segment of November 27, 2011 were between 245°-265°, which is very similar to the limited range of wind directions during high winds on December 20, 2012.

However, wind speeds and wind gusts recorded on November 27, 2011 were much lower than those on December 20, 2012. Wind speeds on November 27, 2011, during that 15-hour segment, averaged just over 15 mph. This was 12 mph lower than average wind speeds on December 20, 2012. Hourly PM_{10} concentrations recorded at RO-1 on November 27, 2011 were much lower than hourly concentrations recorded during the high wind event on December 20, 2012. Furthermore, the 24-hour average PM_{10} concentration at RO-1 on November 27, 2011 was only 97 $\mu g/m^3$ as compared to the 24-hour average PM_{10} concentration of 188 $\mu g/m^3$ on December 20, 2012.

Examination of hourly wind speeds and hourly PM_{10} concentrations at RO-1 on November 27, 2011, as shown in Table 2 reveals no apparent correlation between wind speed and

concentration during that day. That result is to be expected when wind speeds are consistently below 20 mph, the high wind threshold for the PRB. Conversely, on December 20, 2012 there is a direct correlation between hourly PM_{10} concentrations and hourly wind speeds over 20 mph as shown in Figure 2.

Mining operations on November 27, 2011, specifically Rail Loop Pit equipment locations and disturbed acreage in proximity to the RO-1 monitor, were not substantially different from those mining operations on December 20, 2012. Thus, the significant difference in meteorological and operational conditions on those two days is that December 20, 2012 was characterized by a prolonged period of high winds but November 27, 2011 was not. The fact that the 24-hour average PM_{10} concentration at RO-1 on December 20, 2012 was so much higher than that concentration on November 27, 2011 highlights a clear causal relationship between the high winds on December 20, 2012 and the measured exceedance of the 24-hour PM_{10} NAAQS on that day.

Table 2					
METEOROLOGICAL DATA AND RO-1 MONITOR DATA FOR NOVEMBER 27, 2011					
Date	Time	Wind Speed (mph)	Wind Direction (degrees)	Wind Gust Speed (mph)	Hourly PM_{10} Conc. (STP µg/m^3)
11/27/2011	100	9.3	281.1	15.2	54.4
11/27/2011	200	8.3	281.3	15.9	58.9
11/27/2011	300	7.5	279.6	14.8	59.9
11/27/2011	400	7.1	285.4	15.8	45.9
11/27/2011	500	8.4	266.8	14.5	54.3
11/27/2011	600	10.5	258.7	18.0	72.9
11/27/2011	700	13.9	258.7	24.7	109.0
11/27/2011	800	7.2	269.7	16.5	63.6
11/27/2011	900	10.7	245.6	22.1	97.6
11/27/2011	1000	15.1	258.5	25.9	59.1
11/27/2011	1100	15.6	256.2	23.5	57.7
11/27/2011	1200	17.8	254.9	26.7	98.1
11/27/2011	1300	18.2	260.1	27.4	94.1
11/27/2011	1400	17.5	262.7	33.1	215.7
11/27/2011	1500	12.2	270.5	24.3	185.9
11/27/2011	1600	6.7	274.8	21.5	242.4
11/27/2011	1700	11.8	259.9	28.0	62.9
11/27/2011	1800	12.6	258.7	25.1	76.5
11/27/2011	1900	18.0	265.0	29.5	98.9
11/27/2011	2000	15.3	262.2	30.5	42.9
11/27/2011	2100	7.2	274.0	21.8	157.5
11/27/2011	2200	15.3	246.6	35.8	123.3
11/27/2011	2300	22.5	254.7	39.5	103.0
11/27/2011	2400	19.0	249.1	37.1	92.3

4. *Visual Observations*

AQD-issued Permit No. MD-6375A for NARM requires adherence to the Mine's Air Quality Action Plan during "high particulate events." The Action Plan specifies that mine personnel "will determine possible emission sources areas at and surrounding the mine" whenever an hourly PM_{10} concentration in excess of 250 µg/m^3 is recorded. The same action must occur when the 24-hour rolling average concentration is between 75 and 100 µg/m^3.

On the previous day (December 19) the 24-hour low level alarm had been triggered late in the evening. Winds were primarily from the northwest but variable, ranging from about 180º to 350º. Wind speeds were very low, ranging from slight to around 7 mph. Mine personnel had already begun performing visual surveys to identify possible source areas of emissions that appeared to be contributing to the elevated readings. However, no specific source areas of emissions were identified as likely contributing to the elevated readings.

In the early hours of December 20 wind direction began to shift. By 6:00, winds from the west-southwest were exceeding 20 mph and hourly PM_{10} concentrations were increasing at the RO-1 monitor. After 7:00 on December 20, a high level alarm sounded, indicating that the rolling 24-hour PM_{10} measurement at the RO-1 monitor had exceeded 100 µg/m^3. Measured hourly average wind speed at that time was 23 mph with gusts to 34 mph. In the ongoing visual surveys of operations at NARM, blowing dust was observed originating from areas associated with the Rail Loop Pits and heading downwind in the general direction of the RO-1 monitor. Although high wind speeds consistently from the west-southwest continued for the remainder of December 20, no dust from other source areas was observed blowing toward RO-1.

Those visual observations leading up to and throughout December 20, 2012 provided further evidence that one or more emission source areas in the Rail Loop Pits were likely significant contributors to PM_{10} concentrations measured at the downwind RO-1 monitor on that day.

5. *Conclusion: High Winds Caused the PM_{10} Exceedance*

The weight of the various facts discussed above clearly indicates a strong cause-and-effect relationship between sustained high winds in the area of NARM on December 20, 2012 and the concurrent measurement of a 24-hour average PM_{10} concentration at NARM's RO-1 monitor

that exceeded the 24-hour ambient PM_{10} standard. Nothing in the information available to NARM personnel suggests that other factors were responsible for the measured exceedance.

D. The Historical Context for the Subject High Wind Event Is Persuasive

High winds are not uncommon in the Powder River Basin. A prior study sponsored by AQD during development of the NEAP found that the southern portion of the PRB (including NARM) experienced winds in excess of 20 mph between 77 and 135 days per year. Furthermore, the same area of the PRB experienced winds in excess of 30 mph between 11 and 26 days per year. Yet, the frequency of previously measured PM_{10} exceedances in that region of the PRB has been far lower than the region's historical frequency of high winds.

EPA guidance acknowledges that analysis of historical fluctuations ("HF") in measured concentrations is a technical element that can be satisfied by submittal of certain comparative data.[11] To that end, a time series of ambient PM_{10} concentrations measured by NARM's RO-1 continuous monitor during the past three years is presented in Figure 3. That compilation of historical monitoring data plainly demonstrates that RO-1's measured PM_{10} level of 188 STP $\mu g/m^3$ on December 20, 2012 is atypical, i.e., not representative, of PM_{10} concentrations that have been measured by that monitor during the past three years.

A quantitative assessment of that prior monitoring data confirms what the time series in Figure 3 clearly illustrates. The average 24-hour PM_{10} concentration measured by the RO-1 monitor during the period from January 1, 2010 through December 31, 2012, was 42.9 STP $\mu g/m^3$. The measured 24-hour PM_{10} concentration on December 20, 2012 was 4.4 times greater than that average 24-hour value at RO-1 over three years. Stated differently, the measured 24-hour PM_{10} concentration on December 20, 2012 consists of the fourth highest daily measurement over that 3-year analysis period and represents the 99.9^{th} percentile of all 1,076 quality–assured 24-hour concentrations measured by RO-1 during that period.

The high wind event of December 20, 2012 is one of only three such high wind events that have occurred at RO-1 during the analysis period. Consequently, a similar assessment of the percentile of the December 20, 2012 measured PM_{10} exceedance relative to other 24-hour

[11] EPA, High Winds Guidance at 8.

measurements over the analysis period, without all high wind dust events included during that period, would not be materially different from the above result.

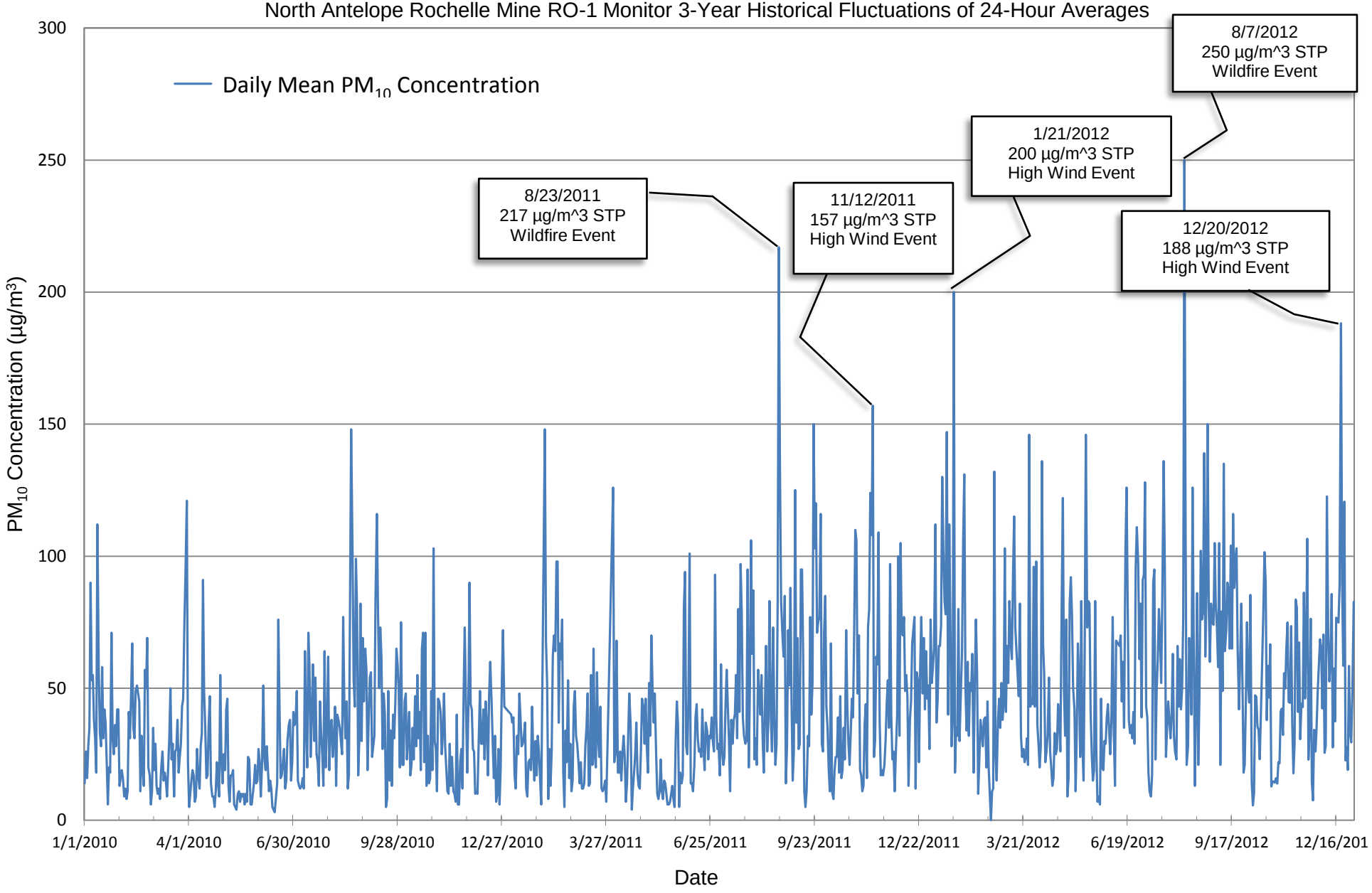
Based on that three-year period of record for RO-1 measurements, an analysis was performed on seasonal data from October 1 through December 31 of each year. The average 24-hour PM_{10} concentration for three years of that seasonal data (273 quality-assured measurements) was 43.8 µg/m^3, with a maximum value of 188 STP µg/m^3 and a minimum value of 5.6 STP µg/m^3. The measured 24-hour PM_{10} concentration on December 20, 2012 represents the 100th percentile of the October - December seasonal data for the analysis period.

The value of a historical fluctuations analysis, as EPA has noted, is that the more a measured exceedance during high winds stands out from historical concentrations, <u>the more plausible it is that a high wind event was the cause of the exceedance</u>.[12] As shown above, the magnitude of the concentration measured on December 20, 2012 at RO-1 is far greater than concentrations that typically have been observed in the past three years by that monitor. Because that December 20, 2012 concentration is such an "outlier," far from the normal range of historical concentrations, it is highly plausible that exceedance was caused by the high winds of December 20, 2012.

[12] EPA, Draft High Winds Guidance at 19.

Figure 3

North Antelope Rochelle Mine RO-1 Monitor 3-Year Historical Fluctuations of 24-Hour Averages



RO-1 December 20, 2012 High Winds

E. NARM's Significantly Contributing Sources Were Not Reasonably Controllable During the High Wind Event of December 20, 2012

Demonstrating that a PM_{10} NAAQS exceedance was caused by a high wind event requires a showing that the event, including emissions from significantly contributing anthropogenic and natural dust sources, was not reasonably controllable. Importantly, EPA has explained that the degree of event-specific information and data necessary for demonstrating that emissions were not reasonably controllable will generally be less for sustained wind speeds at or above the area-specific high wind threshold.[13] Moreover, for high wind events, EPA has observed that the level of rigor required to demonstrate that reasonable controls were (1) in place, (2) implemented and enforced, and (3) overwhelmed by high winds depends on the wind speed during the event relative to the area's high wind threshold.[14] Finally, some anthropogenic sources are not affected by high winds, e.g., transportation and industrial point sources. Those types of sources are considered "non-event sources" that are not subject to a requirement that they be reasonably controlled during a high wind event.[15]

1. *NARM's Contributing Anthropogenic Sources Were Not Reasonably Controllable*

Anthropogenic sources of dust are determined to be not reasonably controllable during a high wind event if:

(1) Those anthropogenic sources have reasonable controls in place during the event;
(2) The reasonable controls have been effectively implemented and enforced; and
(3) Wind speed was high enough to overwhelm the reasonable controls.[16]

Consistent with the basic methodology for demonstrating each element of a high wind event, a determination whether anthropogenic sources of dust were not reasonably controllable utilizes a weight-of-evidence approach.[17]

---

[13] *Id. at 12.*
[14] *Id.*
[15] *Id.*
[16] *Id.* at 10.
[17] *Id.* at 8.

a. NARM's Contributing Anthropogenic Sources Had Reasonable Controls in Place on December 20, 2012

Whether controls on anthropogenic sources were reasonable for a high wind event must be judged in light of the technical information available to the agency at the time of the event.[18] In this particular case of high winds at NARM, DEQ previously has identified the threshold for the influence of high winds in the Powder River Basin and has required implementation of economically and technically feasible controls on mines in the PRB to minimize the occurrence of PM_{10} NAAQS exceedances in that area. In particular, the DEQ-developed NEAP requires individual coal mines in the PRB to implement (1) BACM for disturbed areas at the mines on a continuing basis and (2) reactionary control measures for active mine operations during a "high particulate event." Given the underlying purpose of those controls, they constitute "reasonable controls" for NARM's anthropogenic sources of dust.

(1) BACM -- "Reasonable controls," i.e., BACM, are required at NARM for active haul roads and for disturbed areas, as follows:

- *Active long-term coal haul roads* must be treated with dust control chemicals and/or water.
- *Active short-term mine haul roads* must be watered and maintained while in use.
- *All haul roads* must be regularly maintained to reduce the amount of dust re-entrained by haulage equipment.
- *Topsoiled areas* ≥ 150 contiguous acres that will not be revegetated within 60 days of topsoil laydown and *regraded backfill areas* ≥ 150 contiguous acres that will not be topsoiled within 60 days must, as soon as feasible, be ripped or chiseled to create a roughened surface, or be seeded with a temporary vegetative cover or otherwise be effectively stabilized against wind erosion.
- *Topsoiled areas* < 150 contiguous acres that will not be immediately revegetated and *regraded backfill areas* < 150 acres that will not be topsoiled for an extended period of time must, as soon as feasible, be ripped or chiseled to create a roughened surface, or be seeded with a temporary vegetative cover or otherwise be effectively stabilized against wind erosion.
- At least 30% of the actual open acres at the Mine must be stabilized against erosion during any calendar year.

[18] *Id.* at 12.

As previously explained, sources at NARM that likely contributed significantly to the PM_{10} NAAQS exceedance measured by the RO-1 monitor on December 20, 2012 were identified by constructing a "reverse trace" of the predominant directions (247º-264º) of high winds on that day, upwind from the RO-1 monitor. The result of that "reverse trace" is shown in Exhibit 2.

Exhibit 2 identifies the following active haul roads and specific disturbed surface areas at NARM over which high winds blew toward the RO-1 monitor on December 20, 2012. As the high wind event began, the following BACM were in place on those disturbed areas identified below that were likely significant contributors to the measured exceedance at RO-1:

- A combined 200 acres (of a possible 200 acres) of various active haul roads, facilities, rail and hydrologic structures were controlled with BACM by prior use of one or more of the following methods: revegetation, riprap, chemical treatments, watering or pavement.
- Slopes adjacent to haul roads accounted for 232 acres of which all 232 acres had been scarified or temporarily revegetated prior to December 20.
- A total of 74 acres of reclaimed lands on which topsoil had been replaced. All of these acres had been immediately scarified in preparation for revegetation.
- A total of 37 acres of regraded backfill, all of which had been ripped in preparation for topsoil replacement.

In addition to the above disturbed lands at NARM for which BACM is expressly required, similar control measures were also in place on December 20, 2012 for the following other disturbed areas over which high winds passed toward the RO-1 monitor:

- 294 acres of lands that had been stripped of topsoil in advance of the pits. This disturbed ground had been scarified in all but the most inaccessible of terrain.
- A combined 67 acres of overburden and topsoil stockpiles were located within the area over which high winds passed toward the RO-1 monitor. Those stockpile areas had been previously graded, scarified and/or temporarily seeded.
- 133 acres of topsoiled acres which had recently been revegetated prior to December 20.

In short, reasonable controls were in place on December 20, 2012 for those disturbed areas at NARM that were likely significant contributors to the measured exceedance at RO-1.

(2) Reactionary Control Measures -- As with NARM's BACM requirements, the Mine's requirement to implement reactionary control measures is contained in

NARM's AQD permit. In particular, NARM's required reactionary control measures are contained in the Mine's *Air Quality Action Plan,* incorporated in its AQD permit as Appendix B. That *Action Plan* must be implemented for "high particulate events" at NARM. That is, when measured PM_{10} levels at NARM first fall within either a certain hourly range (250-500 µg/m^3) or a specified 24-hour range (75-100 µg/m^3), then operations personnel must make various preparations, including (1) status checks of ongoing operations in the different areas of the Mine, (2) periodic visual observations and monitoring of key meteorological parameters, (3) identification of emission source areas possibly contributing to elevated PM concentrations of concern, and (4) general planning for utilization of personnel and equipment resources if monitored PM_{10} concentrations continue to increase.

Should measured PM_{10} concentrations increase to the point of exceeding higher prescribed "action" thresholds on either an hourly basis (> 500 µg/m^3) or a 24-hour basis (> 100 µg/m^3), then NARM is required to "focus[ ] chemical and water treatment in active mine areas" and to implement, "if necessary, temporary realignment or suspension of certain mine activities that are determined to contribute to the levels of concern."[19]

Notably, however, NARM's *Action Plan* does not identify any specific reactionary control measure that must be applied to a particular type of mining activity, nor does the *Action Plan* specify either the extent of any particular activity's "temporary realignment or suspension" that may be "necessary" or the criteria for determining when such responses are "necessary."

Reactionary control measures implemented on December 20, 2012 were coordinated on a mine-wide basis in an effort to maximize the reduction of fugitive emissions and at the same time, continue to meet contractual commitments to customers. For the purpose of this discussion, the reactionary measures are divided into two categories. The first category addresses reactionary measures that were focused directly on the emission source areas that likely contributed significantly to the elevated concentrations measured at the RO-1 monitor. The second category consists of the reactionary measures in other parts of the mine where fugitive emissions were unlikely to have contributed significantly to the concentrations at the RO-1 monitor, but which nevertheless appeared to be contributing significantly to increasing ambient PM_{10} levels at another, nearby monitor.

[19] Permit, Appendix D.

Figure 4 is a timeline or graphical depiction of the reactionary measures implemented within the reverse trace as illustrated on Exhibit 2. These measures were focused on the emission source areas located within the Rail Loop West and North Pits which had been identified as likely significant contributors to the measured concentrations at RO-1. Data used to construct this timeline have been derived from the mine's dispatch center where most equipment is tracked via GPS-based units installed in the equipment. The data are specific as to time of day, and operating status and location on the mine site for shovels, haul trucks and draglines. Because water trucks operate across the entire mine site, there is no specific information concerning their location through time.

The chronology for applying reactionary control measures to the remainder of the active mining operations at NARM is presented in subsection (b) below. As above, the majority of this data was extracted from the mine's dispatch center records.

(a) Reactionary control measures focused on the emission source areas that likely contributed significantly to the RO-1 monitor

Prior to 1:00 on December 20, NARM had already been under a low level 24-hour alarm for several hours in response to average 24-hour concentrations between 75 and 100 µg/m^3. Operations personnel had been performing periodic visual observations in an effort to identify emission source areas at the mine that might be significantly contributing to the elevated concentrations at RO-1. In those hours leading up to December 20, operations personnel had continued to monitor the changing wind directions and low wind speeds at PRCC-1, and had initiated planning for possible reactionary measures that could become necessary.

This awareness and readiness level was maintained into the early hours of December 20, when wind speeds increased above 20 mph and wind directions remained variable but slowly shifted to originate from the west-southwest. After 7:00 on December 20, an alarm notified operations personnel that the rolling 24-hour average PM_{10} concentration at the RO-1 monitor had exceeded 100 µg/m^3. Personnel recognized that wind directions had stabilized from the west-southwest and that wind speeds were consistently above 20 mph. After 8:00, an alarm notified operations personnel that the latest hourly PM_{10} measurement had exceeded 250 µg/m^3. Operators examined recent and current wind speeds and directions, visually observed any

dusty conditions, and concluded that fugitive dust from the Rail Loop Pits, upwind of RO-1, was the likely cause of the elevated hourly measurements at that monitor.

Within the hour, operations personnel then began implementing reactionary control measures for various emission source areas in the Rail Loop Pits that were likely contributing significantly to the concentrations at RO-1. Specifically, as shown in Figure 4, reactionary measures were implemented during the high particulate event to address emissions from one dragline, one shovel, two coal loaders, associated haul trucks and support equipment, and haul roads and other disturbed areas within the upwind area identified by the reverse trace. Environmental staff personnel constructed a real time reverse trace using meteorological data collected over the previous several hours. Construction of this reverse trace confirmed that production supervisors had appropriately identified the Rail Loop Pits as the emissions source areas that were likely to be contributing significantly to the ongoing, elevated readings at RO-1.

A more rigorous, after-the-fact assessment of the conditions at NARM on December 20 (i.e., a reverse trace of predominant high wind directions upwind of the RO-1 monitor) confirmed that the active mining activities which were likely to have contributed significantly to the measured exceedance were those specific mining operations in the North and West Rail Loop Pits. As shown in Exhibit 1, one dragline (#154), one overburden shovel (#112) and two coal loaders (#372 and #375) were operating in the North and West Rail Loop Pits on December 20, 2012. The overburden shovel was assigned a total of six haul trucks. Five trucks were assigned to one of the two coal loaders. In addition to trucks, each shovel had a rubber-tire dozer and a grader assigned to maintain “dig-and-dump” areas as well as haul roads.

At 8:00 one water truck was added to the operating fleet to focus on the North and West Rail Loop pit haul roads, dumps and open areas. At the same time, dispatch notified operators to shut down dragline #154, and by 8:30 this unit was not operating. Overburden shovel #112, its 6 assigned haul trucks and various support equipment had already ceased operating in the North Rail Loop Pit. With this action, all overburden movement in the North and West Rail Loop Pits had been suspended.

With high winds continuing after 9:00, water truck #713 was placed into service with a focus in the Rail Loop Pit area. By 10:30, supervisors had shut down all other loading and haulage in the entire Rail Loop Pit areas, including coal loaders #372 and #375, the five trucks assigned to

the latter, and support graders and dozers. In sum, all operations in the North and West Rail Loop Pits had been suspended by 10:30. Shortly thereafter water trucks #710 and #711 entered service. For the remainder of the day, all mechanically available water trucks operated across the entire mine site, but with a focus on the North and West Rail Loop Pits.

For the next three hours (11:00 – 13:00), the nested "exceptionally high" winds and gusts were recorded while the North and West Rail Loop Pits were completely inactive. Two of the three highest hourly PM_{10} concentrations at RO-1 were recorded during this time. There were no changes to the inactive status of the North and West Rail Loop Pits.

After 13:00 the 1-hour alarm had changed from high to low level and was cancelled altogether after 14:00. By 16:00, wind speed had decreased to the range of 20-25 mph and PM_{10} concentrations at RO-1 were as low as 46 $\mu g/m^3$.

At 14:30, a call was placed to the District AQD office in Sheridan. NARM reported that wind speeds were still above 20 mph and although the 1-hour alarm had been terminated, hourly PM_{10} concentrations were still high enough that it was doubtful an exceedance could be avoided. A number of trains were expected and NARM personnel indicated that certain mining activities were going to be restarted to meet the train demands. District office personnel concurred with the plan.

At 14:30 coal loader #372 was moved and began operation around 15:30 in a location further south and outside of the reverse trace. Its operation continued outside the reverse trace for the remainder of the day. During the period from 14:00 to 16:00 dragline #154 was brought back into service (specific timing is somewhat unclear) and at 16:00 coal loader #375 and its truck fleet were restarted to replenish coal silo inventories. At about 17:30 overburden shovel #112 and its trucks returned to production.

After 17:00 PRCC-1 recorded a resurgence of wind speed and RO-1 measured increased 1-hour PM_{10} concentrations, although the 1-hour alarm was not triggered. Nevertheless, dragline #154 and coal loader #375 and its truck fleet were again shut down and remained down for the rest of the day. Until the end of the day on December 20, the only active mining in the North and West Rail Loop Pits was overburden shovel #112.

(b) Reactionary measures where fugitive emissions were unlikely to have contributed significantly to the concentrations at the RO-1 monitor

As noted earlier, reactionary control measures implemented on December 20 were coordinated on a mine-wide basis. This required a centralized control and planning effort that was centered in the mine's dispatch center. The initial analysis and observation of wind speed and direction and emission source areas, and the subsequent planning efforts were therefore focused on the entire mine.

At the 6:30 shift change it was noted that wind speeds had exceeded 20 mph for at least three hours. Dispatch decided not to start up overburden shovel #107 in the East Rail Loop Pit until an additional water truck became available. This occurred at 8:00 when one water truck was added to the operating fleet as noted in (a) above.

At 8:00 and 9:00 high concentrations were recorded at RO-1 and at samplers at the adjacent School Creek Mine. In response, dispatch called for dragline #120, two overburden shovels (#107 and #109) and their respective truck fleets, all in the NARM East Pit, to be shut down. In addition, overburden backhoe #938 in the very south end of the West Rail Loop Pit, outside of the reverse trace, was also shut down.

Very high PM_{10} concentrations were recorded at RO-1 and samplers at the adjacent School Creek Mine at 10:00 and 11:00, the latter being the highest hourly concentration for the day. Consequently, dispatch notified supervisors to shut down all equipment on the mine site except for water trucks. This was accomplished by about 11:30. In addition to that equipment located in the North and West Rail Loop Pits as described in (a) above, this action involved ten coal and overburden shovels, more than 40 trucks and two draglines along with all support equipment. Most of this equipment remained out of operation until after 14:00.

Limited operations were resumed after 14:00 when coal operations in the North pits (shovels #156 and #103) were resumed. In an effort to minimize emissions, coal hauls which had earlier been conducted on haul roads across the mine spoils, were instead directed to longer hauls on well-established and chemically-treated roads. This helped to reduce the need for water trucks in the North Pit area and facilitate their focus in the Rail Loop Pits. In addition, coal shovels in

the East Pit (#108) and the East Rail Loop Pit (#104) returned to operation to replenish coal silo inventories.

After 19:00 wind speeds and RO-1 concentrations began to increase, although not high enough to trigger the 1-hour alarm. In response to this, East Pit coal operations were again shut down including coal shovels #105 and #108 and their respective truck and support equipment fleets.

(**3) Summary --** As required by NARM's permit, BACM was fully in place during the December 20, 2012 high wind event for those disturbed areas expressly named in the permit that likely contributed significantly to the measured exceedance. Furthermore, although not required by regulation or permit, BACM had also been implemented at NARM's other disturbed areas that likely contributed significantly to the measured exceedance. NARM also implemented a series of practicable and appropriate reactionary control measures, ultimately leading to a complete suspension of <u>all</u> mining activities that were likely significant contributors to the measured exceedance, i.e., all operations in the North and West Rail Loop Pits. Furthermore, substantial, "focused" watering of haul roads in the areas around those pits was implemented throughout the day on December 20, 2012.

NARM also implemented significant reactionary control measures for activities where fugitive emissions were unlikely to have contributed significantly to the concentrations at the RO-1 monitor, but which nevertheless appeared to have been threatening compliance with the 24-hour PM_{10} NAAQS at other nearby monitors. In particular, on December 20, 2012, reactionary control measures were implemented across the mine site, including a complete shutdown of the entire mine at 11:30. This extreme level of reactionary measures was an attempt to reduce the concentrations recorded not only at RO-1 but also at other nearby, downwind monitors at the adjacent School Creek Mine. Although at the end of the day those additional, comprehensive reactionary measures were unable to prevent a measured exceedance at RO-1, Peabody believes those extreme, across-the-mine reactionary measures at NARM were directly responsible for measured concentrations at School Creek's SC-3 monitor remaining below the ambient standard throughout the high particulate event on December 20, 2012.

Peabody remains mindful that nothing within Wyoming's NEAP or EPA's EER mandates a complete shutdown of core mining operations during a high wind event. Rather, the NEAP and the EER contemplate the implementation of reasonable control measures during a high wind

event in an attempt to offset the inevitable increase in fugitive dust emissions when high winds simply overwhelm most, if not all, best available control measures. However, on December 20, 2012, Peabody determined that the "perfect storm" circumstances of the prolonged high winds and substantial gusts on that day, coupled with the year-to-date monitoring results at NARM and School Creek, essentially dictated that extreme reactionary control measures be implemented in this particular case.

The evidence arising from an objective assessment of (1) the reduced, and ultimately shutdown, operations in the Rail Loop North and West Pits on December 20, 2012, (2) the increased frequency of watering haul roads serving those pits on that day, and (3) the BACM fully in place for NARM's disturbed areas affected by high winds on that day weighs heavily in support of a conclusion that NARM's anthropogenic sources of dust upwind of the RO-1 monitor were reasonably controlled.

b. NARM's Reasonable Controls Have Been Effectively Implemented and Enforced

Compliance with NARM's requirements to implement BACM and reactionary control measures is evaluated in a variety of ways. For example, each year DEQ conducts a full on-site inspection of NARM's operations to assess the Mine's compliance with the relevant requirements in NARM's air quality permit. The most recent DEQ inspection prior to the December 20, 2012 measured exceedance was performed on August 7, 2012. Overall, DEQ did not observe a violation of any permit condition.

In particular, the following excerpts from DEQ's 2012 inspection report summarize DEQ's observations of NARM's compliance with general site requirements and individual BACM requirements:

- AQ 2012 Inspection Report – NARM p. 5
  "During the site inspection, haul roads were observed and appeared to be well maintained with very little dust. Several water trucks were observed watering the haul roads as we drove around the different areas of the mine."

- AQ 2012 Inspection Report – NARM p. 5
  "[AQD] were shown several areas [where] dust control measures had been implemented on disturbed areas, such as ripping and seeding."

- AQ 2012 Inspection Report –NARM Appendix - Compliance Table
  Condition 13: "…coal truck dump pads shall be cleaned, treated, and maintained"
  Compliance Status - **In compliance**

- AQ 2012 Inspection Report – NARM Appendix - Compliance Table
  Condition 14: "…all permanent haul roads shall be treated with chemical dust suppressant in addition to water to control fugitive emissions…"
  Compliance Status - **In compliance**

- AQ 2012 Inspection Report – NARM Appendix - Compliance Table
  Condition 15: "…all temporary haul routes, … shall be treated with water…"
  Compliance Status - **In compliance**

- AQ 2012 Inspection Report – NARM Appendix - Compliance Table
  Condition 17a: "Topsoiled areas < 150 contiguous acres….and regraded backfill areas < 150 contiguous acres..shall be…stabilized against wind erosion…"
  Compliance Status – **In compliance, "examples of stabilized acreage were observed"**
- AQ 2012 Inspection Report – NARM Appendix - Compliance Table
  Condition 17b: "Topsoiled areas ≥ 150 contiguous acres….and regraded backfill areas ≥ 150 contiguous acres…shall be…stabilized against wind erosion."
  Compliance Status – **In compliance, "examples of stabilized acreage were observed"**

- AQ 2012 Inspection Report – NARM Appendix-Compliance Table
  Condition 18 - "…at a minimum, stabilize 30 percent of the actual open acres…"
  Compliance Status - **In compliance**

At the time of that DEQ inspection, NARM was not experiencing high winds and elevated PM_{10} measurements. Consequently, DEQ had no opportunity to observe the Mine's implementation of any reactionary control measures in keeping with its Air Quality Action Plan. Nevertheless, the following findings were recorded by DEQ:

- AQ 2012 Inspection Report – NARM - Compliance Table
  Condition 24: "The contingency action plan [AQAP] has been adhered to."
  Compliance Status – **In Compliance**

- AQ 2012 Inspection Report – NARM - Compliance Table
  Condition 25: "No demonstration showing that the Air Quality Action Plan is adequate has been required."
  Compliance Status – **In Compliance**

- AQ 2012 Inspection Report – NARM - Compliance Table

Condition 26: "Measures taken under the Air Quality Action Plan are being documented."
Compliance Status – **In Compliance**

Also noted in NARM's 2012 inspection report is a general summary comment on the compliance status of the mine. "Therefore, it has been determined that Peabody Powder River Services LLC is in compliance with all air quality requirements at NARM."[20] In summary, the agency conducted numerous activities including (1) a review of documents prior to the inspection, (2) the on-site inspection, (3) preparation of the inspection report, and (4) agency management reviews of the inspection report. The agency concluded that NARM was in compliance with all required permit conditions outlined in permit MD-6375A, including conditions detailing BACT and BACM requirements.

Along with its on-site inspections of NARM and reviews of NARM's required records and reports, DEQ has an active enforcement program to address measured PM_{10} exceedances. An example of DEQ's satisfaction of its enforcement obligation is evidenced by its response to a recently measured PM_{10} exceedance at NARM prior to this December 20, 2012 event. After Peabody had reported that exceedance, DEQ investigated the particular circumstances surrounding an incident of August 23, 2011 and subsequently issued a Notice of Violation (NOV) to Peabody, alleging that NARM had failed to minimize fugitive dust emissions from its operations and had failed to adhere to its Air Quality Action Plan.[21]

In sum, Wyoming DEQ has an active compliance-monitoring program for evaluating NARM's implementation of its required BACM and reactionary control measures. Moreover, DEQ takes enforcement actions against NARM's failure to satisfy those requirements in an effort to eliminate the likelihood of future exceedances of the PM_{10} NAAQS around NARM.

c. Wind Speeds on December 20, 2012 Were High Enough to Overwhelm NARM's Reasonable Controls

DEQ has determined that 20 mph is the high wind threshold for the Powder River Basin. An area-specific high wind threshold is representative of the sustained wind speeds that are

[20] Wyoming Department of Environmental Quality- Air Quality Division's 2012 Inspection Report for Peabody Powder River Services, North Antelope Rochelle Mine, Report date November 19, 2012, at. 8
[21] *In the Matter of the Notice of Violation Issued to Powder River Coal, LLC*, Docket No. 5014-12 (DEQ June 29, 2012) (Notice of Violation). Discussions between the parties regarding settlement of this particular alleged NOV were ongoing at the time of this demonstration's submittal.

capable of overwhelming reasonable controls on anthropogenic sources of dust. As a result of those reasonable controls being overwhelmed, significant emissions begin to be transported in the direction of the high winds.

This high wind event demonstration has previously shown that wind speeds at NARM during December 20, 2012 exceeded 20 mph for a total of 21 hours. All of those hours were characterized by high winds from the same general direction passing over the North and West Rail Loop Pits. Moreover, 3 of those hours were characterized by exceptionally high winds (hourly average of 31-35 mph) from virtually the same direction passing over the West Rail Loop Pit. Winds gusted during those latter 3 hours at hourly maxima reaching nearly 49 mph.

There can be no doubt that wind speeds at NARM on December 20, 2012 were more than high enough to overwhelm NARM's reasonable controls on the anthropogenic sources of dust at the North and West Rail Loop Pits.

d. Conclusion

The preceding discussion has shown that during high winds at NARM on December 20, 2012:

- That NARM's anthropogenic sources which likely contributed significantly to the measured PM_{10} exceedance on that day at the RO-1 monitor had reasonable controls in place prior to commencement of a high wind event on that day;
- That those reasonable controls have been effectively implement by NARM and enforced by DEQ; and
- That wind speeds during December 20, 2012 were high enough to overwhelm NARM's reasonable controls that were in place on that day.

Based on that showing, Peabody has demonstrated that NARM's significantly contributing anthropogenic sources were not reasonably controllable on December 20, 2012.

2. *NARM's Contributing Natural Sources Were Not Reasonably Controllable.*

Natural sources of dust are determined to be not reasonably controllable if wind speeds are high enough to cause emissions from natural, undisturbed areas.[22] An area-specific high wind threshold is representative of the sustained wind speeds that are capable of causing emissions from natural disturbed areas. DEQ has determined that 20 mph is the high wind threshold representative of conditions in the Powder River Basin.

In Exhibit 2, the grey surface area which is located upwind of the RO-1 monitor but prior to NARM's upwind anthropogenic sources that likely contributed significantly to the measured exceedance on December 20, 2012 consists of 646 acres of natural, undisturbed lands. High winds at or above 20 mph and from the same general direction passed over those naturally stabilized surfaces for 21 hours. For 3 of those hours, exceptionally high winds from virtually the same direction passed over those natural, undisturbed lands.

Consequently, given their prolonged exposure to those high wind conditions, those 646 acres of natural, undisturbed lands likely contributed significantly to the measured exceedance at the RO-1 monitor on December 20, 2012. Those natural sources of windblown dust were not reasonably controllable because the high winds over a prolonged period on that day were able to entrain significant amounts of dust from those lands. Furthermore, emissions from those natural, undisturbed lands were not reasonably controllable through the use of any specific control measures due to the cost of applying those controls over such a large land area and because of the potential detrimental effect on the natural ecosystem that could result.[23]

F. The High Wind Event at NARM on December 20, 2012 Was a Natural Event

A high wind event is classified as a natural event in cases where windblown dust is entirely from natural sources or where all significant anthropogenic sources of windblown dust have been reasonably controlled.[24] In this demonstration, Peabody has first identified those particular anthropogenic sources at NARM (mining activities and disturbed areas) that were located upwind of the RO-1 monitor during extended periods of high winds. Those were the "significant

[22] EPA, High Wind Guidance at 10.
[23] *Id.* at 43.
[24] *Id.* at 5.

anthropogenic sources" on December 20, 2012 that had to be reasonably controlled in order for the high wind event of that day to be classified as a natural event.

Peabody has shown herein (1) how each of the "significant" disturbed areas on December 20, 2012 was reasonably controlled with the applicable BACM required, and (2) how each of the "significant" mining activities was reasonably controlled through implementation of practical and appropriate reactionary control measures that were consistent with the control scheme within NARM's permitted Action Plan.

Therefore, because a high wind event occurred at NARM on December 20, 2012, and because the significant sources of windblown dust at NARM on that day were reasonably controlled, that high wind event also constituted a natural event.

G. The Measured Exceedance on December 20, 2012 Would Not Have Occurred But For the High Wind Event on That Day.

The demonstration of a high wind event must also show that the measured concentration would have been below the applicable NAAQS without the impact of the high winds. However, that showing generally does not need a single or precise approximation of the estimated air quality impact from the event. Rather, for events where the typical concentrations on non-event days are well below the applicable NAAQS, the showing that a measured concentration would not have been an exceedance but for the high winds may be relatively straightforward and a qualitative explanation may be acceptable.[25]

The circumstances of this particular high wind event on December 20, 2012 justify a qualitative explanation for why the exceedance on that day would not have occurred but for the high wind event. First, the previous Historical Fluctuations analysis showed that the typical 24-hour PM_{10} concentration at the RO-1 monitor during the past three years was well below the NAAQS of 150 $\mu g/m^3$. The measured concentration of 188 $\mu g/m^3$ on December 20, 2012 was nowhere near the "normal" concentration that would otherwise have been expected at the RO-1 monitor on that day.

[25] *Id.* at 23.

Second, a previous analysis herein compared hourly concentrations at RO-1 on December 20, 2012 to hourly concentrations at RO-1 on another day. During those two days, wind directions were virtually the same, but wind speeds for those two days were dramatically different. On December 20, 2012 wind speed ranged from 22-35 mph, while wind speeds on the other day were, except for one outlying hour, below the high wind threshold of 20 mph. With all key factors other than wind speed being roughly the same on each day, the high winds on December 20, 2012 were almost certainly responsible for the much higher hourly PM_{10} concentrations on that day.

Finally, on December 20, 2012 a full suite of BACM had been in place on all disturbed areas of NARM that could have contributed significantly to the measured exceedance on that day. Moreover, NARM took extraordinary measures to mitigate emissions not only from active mining sources that could have contributed significantly to the measured exceedance but also from the remaining active mining sources throughout the mine, even though those latter sources were not implicated as significant contributors to the exceedance. Indeed, over one period of that high particulate event, all mining activity at NARM was completely shut down. Due in part to that total shut-down, NARM had to cancel the loading of one complete train. Nevertheless, with sustained wind speeds being well above the high wind threshold, most, if not all, of the BACM were overwhelmed or defeated, but emission reductions achieved by reactionary control measures were not able to offset enough of the emission increases arising from widespread failures of BACM. In other words, in spite of the comprehensive, and ultimately extreme, control measures implemented at NARM on December 20, 2012, an exceedance of the 24-hour PM_{10} NAAQS was measured by one of NARM's ambient monitors.

In light of those considerations, Peabody believes the measured exceedance on December 20, 2012 is a textbook example of the result of a high wind event. Sources upwind of the measured exceedance were reasonably controlled, but the magnitude and the duration of the high winds on that day plainly caused those controls to fail. Had those high winds not overwhelmed the reasonable controls in place, the likelihood that an exceedance would still have occurred is very minimal.

Conclusively proving the absence of all other possible or plausible causes of the measured exceedance is not required by EPA's Exceptional Events Rule or by DEQ's NEAP. The weight of the evidence presented herein that high winds caused the exceedance on December 20,

2012 is very persuasive. A finding that the measured exceedance at RO-1 would not have occurred but for the high winds is the only reasonable conclusion that the evidence supports.

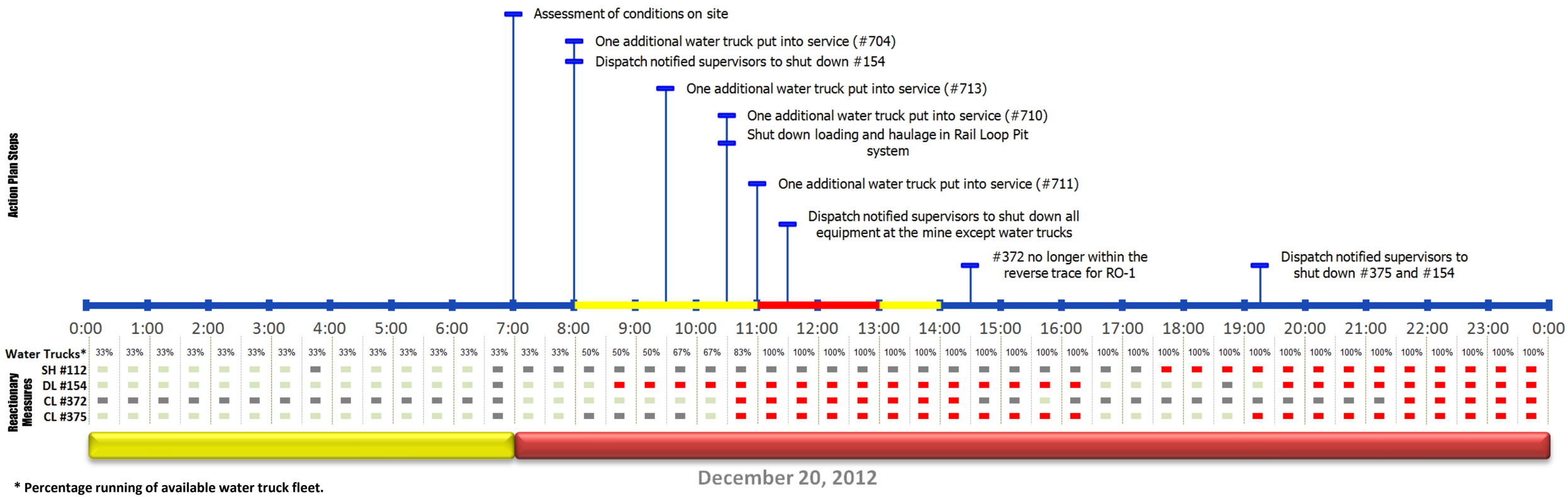
CONCLUSION

On December 20, 2012 high winds blew over the North Antelope Rochelle Mine. At the end of that day, an exceedance of the PM_{10} NAAQS was recorded by one of the Mine's ambient PM_{10} monitors. The preceding discussion has demonstrated just how strongly those two occurrences were interrelated.

In particular, the demonstration above has shown that on that day (1) a natural event in the form of high winds was present at NARM and that (2) those high winds affected air quality in the area, in general, and at the RO-1 monitor, in particular. Moreover, the demonstration herein has shown that on that day (3) the measured exceedance at RO-1 was far in excess of the normal fluctuations in that monitor's measurements, and that (4) there was a clear causal relationship between the persistent high winds and the measured exceedance at RO-1. In addition, the above demonstration has shown that (5) a high wind dust event occurred at RO-1 because NARM's significant anthropogenic sources of dust and NARM's significant natural sources of dust were overwhelmed considerably by high winds on that day. Finally, the demonstration herein has shown that (6) the measured exceedance at RO-1 would not have happened in the absence of high, and at times exceptionally high, wind speeds from a persistent direction on that day which overwhelmed the reasonable controls in place on those significant sources at NARM.

In sum, the demonstration herein has shown that the measured PM_{10} NAAQS exceedance at NARM on December 20, 2012 was caused by a high wind event.

Figure 4: Timeline for RO-1 High Wind Event December 20, 2012



* Percentage running of available water truck fleet.

1hr Alarms
shown on timeline

Low Level: 250 – 500 µg/m³

3:00 4:00 5:00 6:00

High Level: 500+ µg/m³

3:00 4:00 5:00 6:00

24hr Alarms
shown beneath timeline

Low Level: 75 – 100 µg/m³

High Level: 100+ µg/m³

Equipment Activity

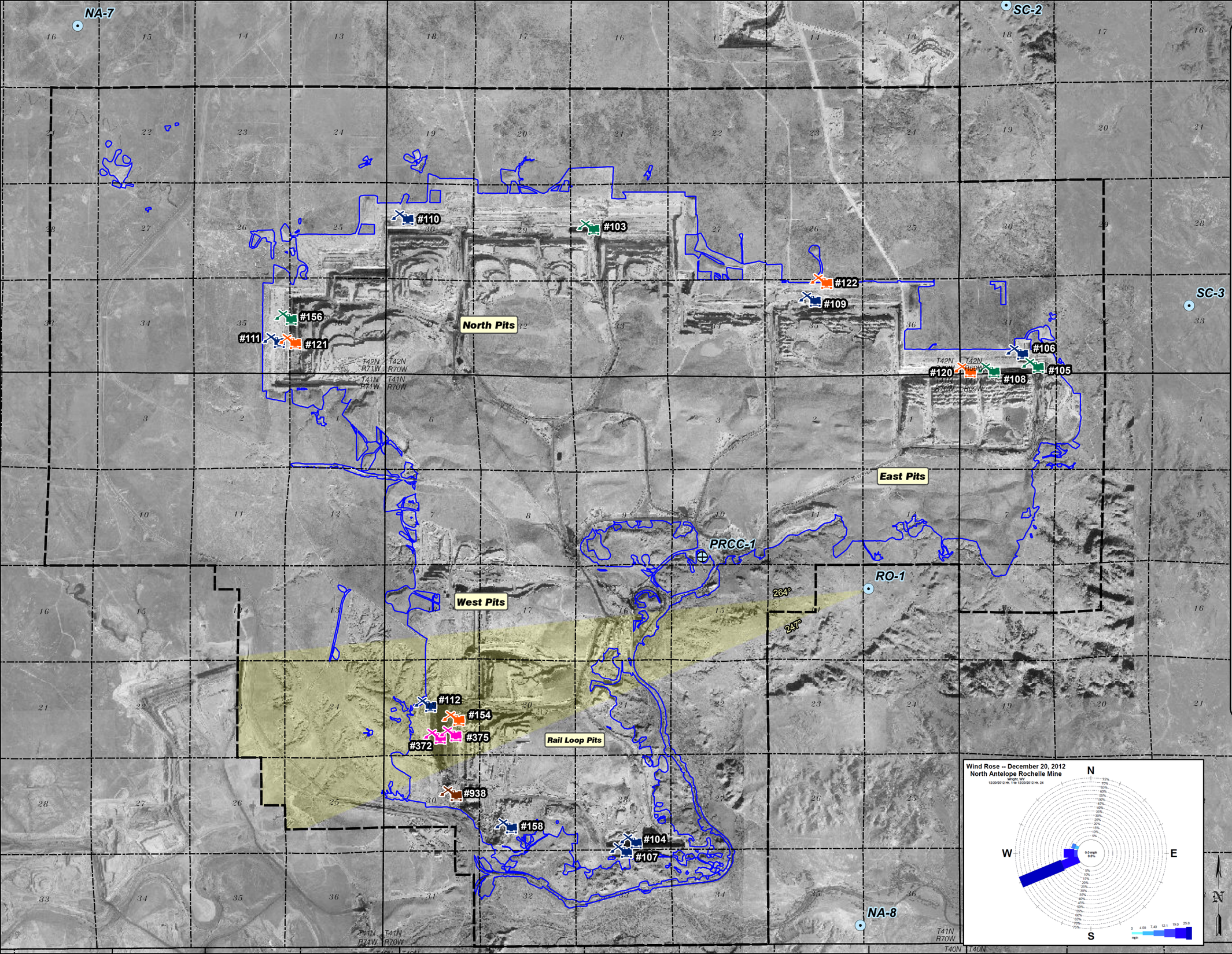
- Normal Production
- Normal Operation Shutdown
- Reactionary Measures

Equipment Abbreviations

CL = Coal Loader
DL = Dragline
SH = Shovel

Notes:

1. Supervisors and Environmental staff notified each hour of alarm.
2. Wind speed and wind direction were analyzed every hour of alarm.
3. Water trucks are active over the entire mine site, and all other equipment on this timeline is within the reverse trace from RO-1 TEOM.



Legend

- MET Station
- TEOM Location
- Total Cumulative Disturbance as of End of Dec. 2012 (20,479 acres)
- NARM LNCM Boundary
- Reverse Trace from RO-1

Equipment Locations

- #103 Coal Shovel
- #104 Overburden Shovel
- #105 Coal Shovel
- #106 Overburden Shovel
- #107 Overburden Shovel
- #108 Coal Shovel
- #109 Overburden Shovel
- #110 Overburden Shovel
- #111 Overburden Shovel
- #112 Overburden Shovel
- #120 Dragline
- #121 Dragline
- #122 Dragline
- #154 Dragline
- #156 Coal Shovel
- #158 Overburden Shovel
- #372 Coal Loader
- #375 Coal Loader
- #938 Overburden Hoe

0 5000 10000'

Peabody ENERGY

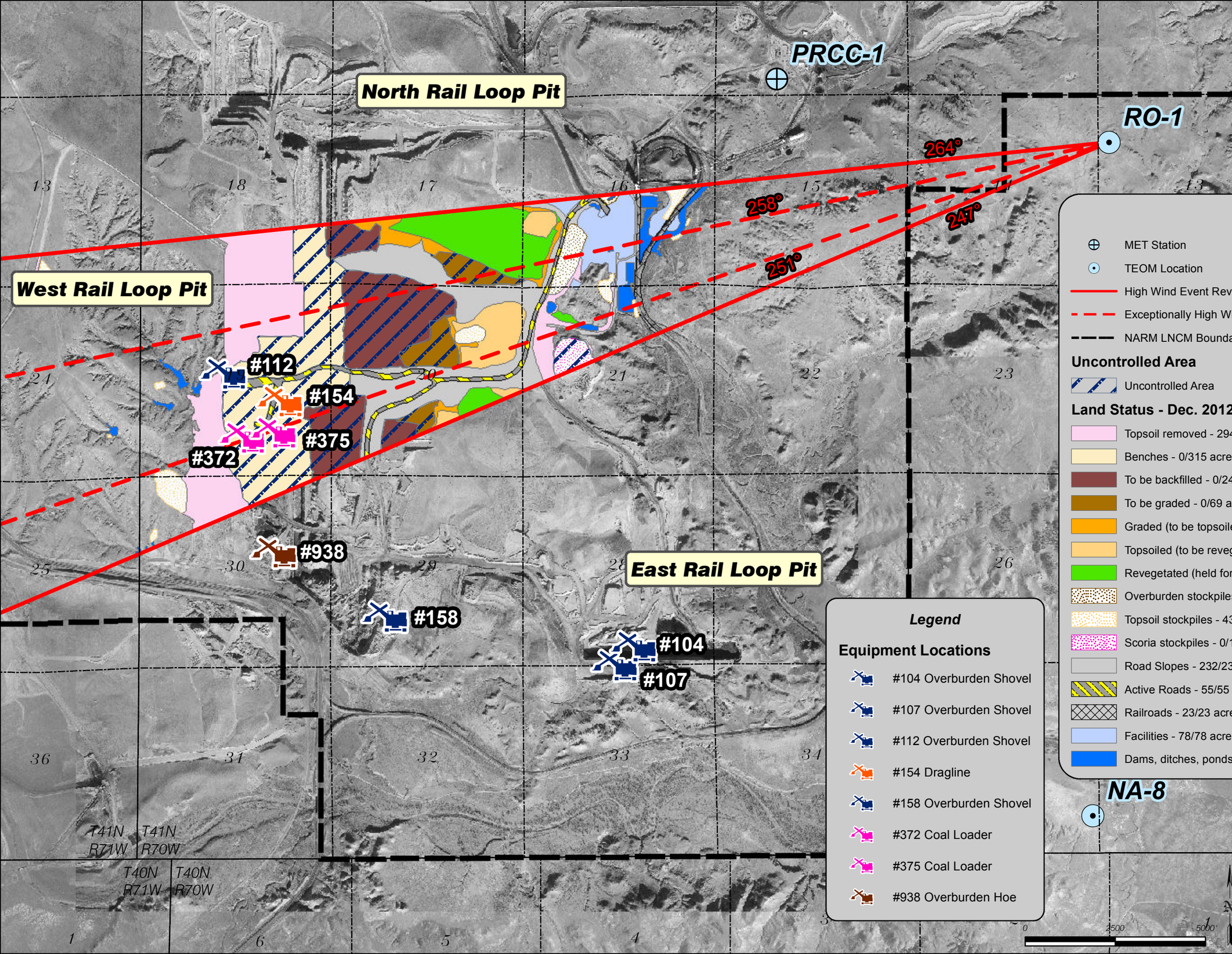
NORTH ANTELOPE ROCHELLE MINE
Caller Box 3034 Gillette, WY 82717

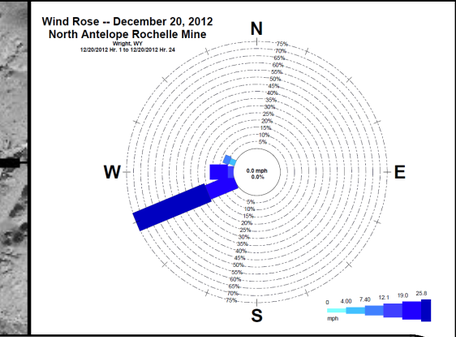
DECEMBER 20, 2012 RO-1 HIGH WIND EVENT
EXHIBIT 1

REVERSE TRACE AND EQUIPMENT LOCATIONS

Permit No. MD-6375A

Designed By: ACH/PCD/JLG	Scale: 1" = 5000'
Drawn By: ACH	C.I.: N/A
Checked By: PCD/JLG	Sheet: 1 of 1
Date Drawn: 1/9/12	File: n_and_hwe_121220_ro1_ex01_130109.mxd





Legend

- MET Station
- TEOM Location
- High Wind Event Reverse Trace from RO-1 (247°-264°)
- Exceptionally High Wind Event Reverse Trace from RO-1 (251°-258°)
- NARM LNCM Boundary

Uncontrolled Area

- Uncontrolled Area

Land Status - Dec. 2012 (1,037/1,687 acres controlled)

- Topsoil removed - 294/294 acres controlled
- Benches - 0/315 acres controlled
- To be backfilled - 0/247 acres controlled
- To be graded - 0/69 acres controlled
- Graded (to be topsoiled) - 37/37 acres controlled
- Topsoiled (to be revegetated) - 74/74 acres controlled
- Revegetated (held for release) - 133/133 acres controlled
- Overburden stockpiles - 24/24 acres controlled
- Topsoil stockpiles - 43/43 acres controlled
- Scoria stockpiles - 0/19 acres controlled
- Road Slopes - 232/232 acres controlled
- Active Roads - 55/55 acres controlled
- Railroads - 23/23 acres controlled
- Facilities - 78/78 acres controlled
- Dams, ditches, ponds - 44/44 acres controlled

Legend

Equipment Locations

- #104 Overburden Shovel
- #107 Overburden Shovel
- #112 Overburden Shovel
- #154 Dragline
- #158 Overburden Shovel
- #372 Coal Loader
- #375 Coal Loader
- #938 Overburden Hoe

Peabody ENERGY

NORTH ANTELOPE ROCHELLE MINE
Caller Box 3034 Gillette, WY 82717

JANUARY 21, 2012 RO-1 HIGH WIND EVENT
EXHIBIT 2

EQUIPMENT LOCATIONS AND DISTURBED AREAS

Permit No. MD-6375A

Designed By: ACH/PCD	Scale: 1" = 2500'
Drawn By: ACH	C.I.: N/A
Checked By: PCD/JLG/SH	Sheet: 1 of 1
Date Drawn: 1/9/13	File: n acd hwe_121220 ro1 ex02 130109.mxd

Department of Environmental Quality

To protect, conserve and enhance the quality of Wyoming's environment for the benefit of current and future generations.

Matt Mead, Governor

Todd Parfitt, Director

March 13, 2013 Certified Mail Receipt Number: 7011 1570 0003 4871 6881

Staci Hammond
Environmental Analyst
North Antelope Rochelle Mine
Caller Box 3034
Gillette, WY 82717-3034

Re: Request for Flag under the Exceptional Event Rule for PM_{10} December 20, 2012 Exceedance at Site RO-1

Dear Ms. Hammond,

The Air Quality Division (AQD) has reviewed the request to flag the December 20, 2012 PM_{10} ambient monitored data at site RO-1 as an Exceptional Event in accordance with 40 CFR Part 50.14 at the North Antelope Rochelle Mine (NARM). Although the AQD has placed a temporary "High Wind" flag in AQS on the December 20, 2012 PM_{10} data, with the description "Possible Exceptional Event – under evaluation by AQD", the team of AQD staff found deficiencies in the "weight of evidence" approach presented in the January 18, 2013 submittal. Supplemental information is needed before AQD can determine if all elements were addressed to exclude event-related concentrations from regulatory determinations.

The review team requests the following information to supplement the packet:

- Please include tabular hourly wind (average and gust) data for the day prior to and the day following the exceedance.
- Please include tabular particulate (hourly average and 24-hour average) data for the day prior and the day following the exceedance for all three monitors at the facility (NA-7, NA-8 and RO-1). This should include 24-hour average data for the RO-1 monitor, which was not included in the Exceptional Event packet.
- Please explain how 24-hour average data is calculated throughout the day. Is the data an average of the last 24 hours, or is the data averaged since midnight?
- Please discuss the reason that 33% of the facility's water trucks were operating at the start of the day in light of the fact that the facility started the day with a low level warning for PM_{10}.
- Page 2 of the High Wind Event Demonstration packet states that the NEAP follows a three-tier approach consisting of 1) BACT 2) BACM, and 3) Reactionary Control Measures. On Page 19 the document states that the NEAP requires individual coal mines to implement BACM and reactionary control measures. The Division requests that Peabody correct and/or clarify these statements to include BACT. In addition, the items listed on Page 19 of the demonstration are under the heading of BACM; however, these items are permit requirements and considered BACT. Please correct the heading for the items listed on Page 19.

The AQD level of review for Exceptional Event packages is greatly dependent on the level of detail and information provided by the facility in the request to flag exceedances. EPA has also provided examples of exceptional events demonstrations that meet the requirements of the draft high wind guidance. The following link http://www.epa.gov/ttn/analysis/exevents.htm is the best place to find examples of information that are needed to have EPA concur with an exceptional event demonstration.

Please keep in mind that while AQD had an extensive staff of monitoring, compliance and permitting personnel available to evaluate the documentation packet, this packet will also be reviewed by the public and EPA.

Please submit the requested supplemental information to Cara Keslar, Monitoring Section Supervisor no later than two (2) weeks from receipt of this letter. The AQD evaluation team will reconvene to determine if all requirements were met under the Exceptional Event Rule. If all requirements of the rule were met, AQD will keep the flags in the AQS database and the documentation package will be made available for public review and submitted to EPA Region 8 for concurrence. If you have questions please contact me at (307) 335-6963 or kirk.billings@wyo.gov.

Sincerely,

Kirk Billings
Monitoring Project Advisor

Cc: Cara Keslar, Monitoring Section Supervisor
Tanner Shatto, District 3 District Engineer

March 27, 2013

DEQ-AQ Division
2100 W 5th St.
Sheridan, WY 82801

Re: Response on comments for Flag under the Exceptional Event Rule for PM_{10} December 20,2012 Exceedance at Site RO-1

Dear Mr. Shatto,

Enclosed is the requested supplemental information for the Exceptional Event package North Antelope Rochelle Mine submitted in accordance with 40 CFR Part 50.14. North Antelope Rochelle Mine has requested to flag the December 20 , 2012 PM_{10} ambient monitored data at site RO-1.

Mr. Kirk Billings requested the following supplemental information:

"Please include tabular hourly wind (average and gust) data for the day prior to and the day following the exceedance."

Please see tables for meteorological data included in this package.

"Please include tabular particulate (hourly average and 24-hour average) data for the day prior and the day following the exceedance for all three monitors at the facility."

Please see tables for particulate data included in this package.

"Please explain how 24-hour average data is calculated throughout the day. Is the data an average of the last 24 hours, or is the data averaged since midnight."

The 24-hour average is a rolling average of the last 24 hours. The 24-hour average is a calculation of the hourly reading for the previous 24 hours from the current time. The sum of the last 24 hours is then divided by 24 to get the 24-hour average.

"Please discuss the reason that 33% of the facility's water trucks were operating at the start of the day in light of the fact that the facility started the day with a low level warning for PM_{10} ."

As the reviewer has noted, NARM entered the day of December 20, 2012 under a low-level 24-hour alarm which had been triggered earlier on December 19, 2012. During the second half of December 19th, twenty-four hour average concentrations at RO-1 were consistent – they varied by a maximum of only 7 micrograms. Concentrations were relatively constant or slightly decreasing during the last five hours of the day. After 1600 hours on December 19th, wind speeds dropped to less than 10 mph. Operations personnel determined that the operating water truck fleet was adequate because:

- The 24-hour concentration was holding steady or decreasing,
- Wind speeds were decreasing, and

- hourly concentrations at RO-1, while elevated, had not risen to a level high enough to trigger and hourly low level alarm

Twenty-four hour alarms can remain in place for many hours after events which trigger them have passed. Under the conditions at the end of December 19th, it was determined that additional water trucks were not warranted.

During the early hours of December 20th, the low level 24-hour alarm continued but hourly concentrations at RO-1 had decreased by about 30% as compared to the concentration at the end of December 19th. Additional water trucks were determined to be unnecessary to maintain control of haulage emissions. This condition continued through 4:00 when wind speeds increased and exceeded 20 mph and wind directions began to shift. As noted in the original submittal for this event, the high level 24-hour alarm at 7:00 triggered re-evaluation of the changing meteorological conditions. By the 8:00 when a low level hourly alarm was triggered, additional water trucks were being added to the operating fleet.

"Page 2 of the High Wind Event Demonstration packet states that the NEAP follows a three-tier approach consisting of 1) BACT 2) BACM, and 3) Reactionary Control Measures. On Page 19 the document states that the NEAP requires individual coal mines to implement BACM and reactionary control measures. The Division requests that Peabody correct and/or clarify these statements to include BACT. In addition, the items listed on Page 19 of the demonstration are under the heading of BACM; however, these items are permit requirements and considered BACT. Please correct the heading for the items listed on Page 19."

The reviewer has raised an issue that points to an apparent discrepancy between the NEAP and the NARM permit. We propose to address the issue by changing the original High Wind Event Demonstration submittal in the following way. The text has been revised to:

- include a reference to BACT in the initial paragraph on page 19;
- revise the title of subsection (1) to " (1) BACT/BACM" on page 19; and
- revise the text under subsection (1) in several places on pages 19 and 20 to include reference to BACT along with the reference to BACM.

Enclosed with this submittal are the three revised pages for replacement in the document. Pages 19 and 20 contain actual revisions. Those revisions caused text to be pushed onto page 21, so it is also included. Two copies are provided. One has the changes highlighted for ease in locating them. The other is for insertion into the High Wind Event Demonstration submittal.

The apparent discrepancy noted above can be seen in comparisons of descriptions of various control strategies in permit MD-6375A with descriptions of similar activities in the NEAP. In one document (MD-6375) activities such as revegetation, surface pitting, and contouring are referred to as BACT in certain applications. However, the NEAP refers to some of these practices as BACM in other applications. Elapsed time is probably the explanation for these differences. Peabody believes that the changes we have applied to the High Wind Event Demonstration submittal (on the enclosed revised pages) alleviate the concern by addressing the practices under a joint heading and discussion of BACT and BACM.

Thank you for your time in reviewing our Exceptional Event package.

Please contact me at (307) 464-4509 if you have any questions.

Sincerely,

Staci Hammond
Environmental Supervisor

Cc: Kirk Billings, WDEQ-Lander
Cara Keslar, WDEQ-Cheyenne

METEOROLOGICAL DATA FOR DECEMBER 19, 2012				
Date	Time	Wind Speed (mph)	Wind Direction (degrees)	Wind Gust Speed (mph)
12/19/2012	100	5.7	328.9	7.7
12/19/2012	200	7.9	334.0	12.6
12/19/2012	300	7.5	324.8	10.7
12/19/2012	400	10.0	333.4	15.8
12/19/2012	500	13.2	357.0	17.8
12/19/2012	600	13.0	0.8	18.1
12/19/2012	700	12.9	353.9	20.0
12/19/2012	800	12.7	332.8	18.4
12/19/2012	900	12.9	329.4	18.1
12/19/2012	1000	10.9	334.4	18.4
12/19/2012	1100	18.3	342.0	27.6
12/19/2012	1200	22.7	335.7	30.6
12/19/2012	1300	21.2	334.6	29.6
12/19/2012	1400	21.3	333.8	29.8
12/19/2012	1500	19.3	331.4	27.1
12/19/2012	1600	16.1	325.5	24.9
12/19/2012	1700	9.5	329.2	14.9
12/19/2012	1800	7.0	347.6	11.0
12/19/2012	1900	3.5	339.1	7.7
12/19/2012	2000	4.6	242.7	9.6
12/19/2012	2100	3.5	298.6	7.8
12/19/2012	2200	1.5	324.3	4.3
12/19/2012	2300	0.0	180.8	2.3
12/19/2012	2400	0.5	243.4	4.9

METEOROLOGICAL DATA FOR DECEMBER 21, 2012				
Date	Time	Wind Speed (mph)	Wind Direction (degrees)	Wind Gust Speed (mph)
12/20/2012	100	25.7	255.5	40.5
12/20/2012	200	23.1	259.6	35.4
12/20/2012	300	22.9	249.9	37.6
12/20/2012	400	14.5	253.0	31.6
12/20/2012	500	6.1	312.1	26.8
12/20/2012	600	18.4	250.5	39.3
12/20/2012	700	10.7	268.9	18.1
12/20/2012	800	9.1	266.1	19.6
12/20/2012	900	15.3	260.1	37.0
12/20/2012	1000	27.2	243.5	41.3
12/20/2012	1100	16.6	253.6	29.2
12/20/2012	1200	21.6	249.3	34.3
12/20/2012	1300	22.2	253.8	35.0
12/20/2012	1400	17.5	241.7	30.1
12/20/2012	1500	16.3	240.6	31.4
12/20/2012	1600	15.1	245.8	31.0
12/20/2012	1700	7.7	249.8	14.9
12/20/2012	1800	10.4	228.1	23.4
12/20/2012	1900	17.4	223.7	29.1
12/20/2012	2000	8.6	243.2	19.1
12/20/2012	2100	7.3	264.2	18.7
12/20/2012	2200	11.9	264.0	27.5
12/20/2012	2300	17.8	247.7	31.5
12/20/2012	2400	16.3	257.1	34.2

North Antelope Rochelle Mine Exceptional Event Data

Date	Time	**RO-1** Hourly Conc. (STP ug/m3)	**RO-1** 24-hr. avg. Conc. (STP ug/m3)	NA-8 Hourly Conc. (STP ug/m3)	NA-8 24-hr. avg. Conc. (STP ug/m3)	NA-7 Hourly Conc. (STP ug/m3)	NA-7 24-hr. avg. Conc. (STP ug/m3)
12/19/12	100	56.9	67.6	131.4	61.6	10.8	8.5
12/19/12	200	34.4	68.3	110.7	65.4	5.5	8.4
12/19/12	300	39.9	69.0	109.2	68.2	5.2	8.4
12/19/12	400	70.5	70.8	61.5	69.4	5.6	8.4
12/19/12	500	51.2	71.7	33.6	69.8	4.2	8.4
12/19/12	600	52.6	73.3	39.4	71.1		
12/19/12	700	45.5	74.3	34.0	70.9	8.0	8.6
12/19/12	800	106.9	76.7	26.2	69.6	11.5	8.8
12/19/12	900	74.6	77.2	14.1	68.2	8.7	8.8
12/19/12	1000	119.6	80.6	18.4	66.5	10.6	9.1
12/19/12	1100	77.5	83.9	36.1	65.8	7.8	9.2
12/19/12	1200	71.5	86.8	49.7	67.9	4.5	9.3
12/19/12	1300	56.2	88.7	15.9	68.6	3.9	9.4
12/19/12	1400	32.1	87.8	22.4	66.5	5.2	9.3
12/19/12	1500	21.4	88.0	11.2	66.5	6.1	9.3
12/19/12	1600	20.0	88.2	18.0	65.2	6.9	9.3
12/19/12	1700	36.5	88.1	39.8	63.8	7.7	8.9
12/19/12	1800	103.0	88.8			10.4	7.8
12/19/12	1900	233.1	93.4	76.1	64.8	11.1	7.8
12/19/12	2000	160.8	93.7	79.9	63.9	24.6	8.3
12/19/12	2100	211.6	91.8	102.4	62.9	17.4	8.5
12/19/12	2200	183.1	92.1	101.9	61.9	16.9	8.7
12/19/12	2300	164.5	90.7	105.4	62.8	12.9	8.9
12/19/12	2400	125.8	89.6	106.5	62.5	5.8	8.9

North Antelope Rochelle Mine Exceptional Event Data

Date	Time	**RO-1** Hourly Conc. (STP ug/m3)	**RO-1** 24-hr. avg. Conc. (STP ug/m3)	NA-8 Hourly Conc. (STP ug/m3)	NA-8 24-hr. avg. Conc. (STP ug/m3)	NA-7 Hourly Conc. (STP ug/m3)	NA-7 24-hr. avg. Conc. (STP ug/m3)
12/20/12	100	125.8	92.2	97.9	60.1	4.1	8.7
12/20/12	200	48.9	92.8			4.8	8.7
12/20/12	300	64.9	93.8	28.7	55.8	6.3	8.7
12/20/12	400	120.8	96.0	28.8	52.4	4.3	8.7
12/20/12	500	66.1	96.6	32.2	49.2	5.4	8.8
12/20/12	600	81.1	97.8	17.4	47.3	9.9	9.0
12/20/12	700	199.5	104.2	26.9	47.1	15.1	9.3
12/20/12	800	413.7	117.0	54.4	47.7	10.7	9.3
12/20/12	900	264.9	124.9	26.9	47.4	13.5	9.6
12/20/12	1000	399.0	136.6	136.1	52.0	16.2	9.9
12/20/12	1100	770.6	165.6	208.3	60.1	23.7	10.7
12/20/12	1200	604.8	187.9	84.2	62.8	19.9	11.4
12/20/12	1300	251.3	196.1	50.7	63.4	15.0	11.9
12/20/12	1400	92.8	198.6	52.8	63.5	13.7	12.3
12/20/12	1500	46.2	199.6	21.0	63.7	9.5	12.4
12/20/12	1600	59.7	201.2	15.6	63.5	8.6	12.4
12/20/12	1700	73.1	202.7	15.8	63.7	8.8	12.3
12/20/12	1800	126.7	203.7	21.7	63.8	7.6	12.1
12/20/12	1900	193.1	202.0	27.6	63.3	11.8	12.1
12/20/12	2000	99.8	199.4	14.7	60.7	14.4	11.6
12/20/12	2100	142.9	196.6	10.7	57.9	11.5	11.3
12/20/12	2200	98.9	193.0	11.9	54.1	9.0	11.0
12/20/12	2300	79.4	189.5	10.8	50.3	9.5	10.8
12/20/12	2400	92.1	188.2	9.8	46.3	9.2	10.9

North Antelope Rochelle Mine Exceptional Event Data

Date	Time	**RO-1** Hourly Conc. (STP ug/m3)	**RO-1** 24-hr. avg. Conc. (STP ug/m3)	NA-8 Hourly Conc. (STP ug/m3)	NA-8 24-hr. avg. Conc. (STP ug/m3)	NA-7 Hourly Conc. (STP ug/m3)	NA-7 24-hr. avg. Conc. (STP ug/m3)
12/21/12	100	201.4	191.3	17.9	40.4	11.3	11.3
12/21/12	200	145.6	195.3	12.8	39.2	11.6	11.5
12/21/12	300	114.1	197.4	14.5	38.6	8.0	11.6
12/21/12	400	69.3	195.2	11.9	37.8	8.5	11.7
12/21/12	500	90.1	196.2	27.0	37.4	8.4	11.9
12/21/12	600	71.2	195.9	14.8	37.4	13.2	12.0
12/21/12	700	87.9	191.3	18.1	36.9	13.0	11.9
12/21/12	800	64.8	176.7	17.6	35.7	15.0	12.1
12/21/12	900	112.0	170.3	14.6	35.4	17.6	12.4
12/21/12	1000	174.8	161.0	17.1	30.6	14.8	12.4
12/21/12	1100	42.6	130.6	20.8	22.8	15.3	12.1
12/21/12	1200	51.4	107.8	16.6	20.0	28.0	12.6
12/21/12	1300	140.4	103.2	27.8	19.0	18.5	12.8
12/21/12	1400	85.6	102.9	21.0	17.7	12.2	12.7
12/21/12	1500	62.4	103.6	17.6	17.5	13.4	12.8
12/21/12	1600	47.5	103.1	14.8	17.4	17.5	13.1
12/21/12	1700	43.6	101.8	15.9	17.2	18.3	13.3
12/21/12	1800	62.0	99.1	17.5	17.0	20.1	13.8
12/21/12	1900	60.5	93.6	14.4	16.4	23.6	14.2
12/21/12	2000	40.1	91.1	10.8	16.1	14.7	14.2
12/21/12	2100	77.1	88.4	19.8	16.6	8.1	14.1
12/21/12	2200	89.9	88.0	20.5	16.9	7.9	14.0
12/21/12	2300	103.6	89.0	16.5	17.1	7.2	13.9
12/21/12	2400	107.5	89.7	27.3	17.8	6.3	13.8

Matt Mead, Governor

Department of Environmental Quality

To protect, conserve and enhance the quality of Wyoming's environment for the benefit of current and future generations.

Todd Parfitt, Director

April 29, 2013

Staci Hammond
Environmental Analyst
North Antelope Rochelle Mine
Caller Box 3034
Gillette, WY 82717-3034

Re: Request for Flag under the Exceptional Event Rule for PM_{10} December 20, 2012 Exceedance

Dear Ms. Hammond,

On December 20, 2012, the North Antelope Rochelle Mine's (NARM) RO-1 sampler recorded an exceedance of the 24-hour PM_{10} standard, with a final concentration of 188 $\mu g/m^3$.

On January 22, 2013 the Air Quality Division (AQD) received a request that data for the RO-1 monitor on this day be flagged under 40 CFR Part 50.14 "Treatment of Data Influenced by Exceptional Events" due to high winds.

On March 4, 2013, at the request of the AQD, NARM submitted additional information to clarify the request to flag the data under 40 CFR Part 50.14.

After review of the submitted materials, the AQD has decided to pursue NARM's request to flag the PM_{10} data collected at the RO-1 monitor on December 20, 2012 under 40 CFR 50.14.

The next step in the process is a 30 day public comment period. In order to move forward, the AQD needs an electronic copy of all the documentation and correspondence submitted during the review process. All correspondence, starting with the original notification to the AQD, the original Exceptional Event packet, any requests for additional information, responses to those requests and other information submitted to the AQD during the review process should be combined into a single, chronologically ordered .pdf document and submitted to the AQD.

Once received, the chronological packet will be posted to the AQD's website and the public comment period will be advertised.

NARM's final packet is requested on or before May 13, 2013. Please email it to kirk.billings@wyo.gov

Please contact Kirk Billings at (307) 335-6963 or kirk.billings@wyo.gov if you have any questions regarding this matter.

Sincerely,

Cara Keslar
Monitoring Section Supervisor

Cc: Kirk Billings, Air Quality Analyst
Tanner Shatto, District 3 District Engineer