

**From:** [Tanner Shatto](#)  
**To:** [Stephens, Adam](#); [Amber Potts](#); [Belle Ayr Dispatch](#); [Bernadette Hinshaw](#); [Beth Goodnough](#); [Bill Jenkins](#); [Bob Edwards](#); [Brad Steidley](#); [Brent Helms](#); [Hansen, Bryan](#); [Brian Percifield](#); [CAB Guards](#); [Cara Keslar](#); [Chris Hanify](#); [Cody Weatherly](#); [Craig Weber](#); [DaLyn Hugo](#); [Daniel Sharon](#); [Darla Potter](#); [Darryl Maunder](#); [Dave Kline](#); [Eagle Butte Dispatch](#); [Gordan Shinkle](#); [Gretchen Romans](#); [Vauthier, Jaye B](#); [Jack Clary](#); [Jamie O'Dell](#); [Jeffrey Hancock](#); [Jessica Andrews](#); [Smith, Jim P.](#); [John Gallatin](#); [Judy Stallman](#); [Justin Blake](#); [K Hampleman](#); [Keith Guille](#); [Ken Grey](#); [Kim Deti](#); [KOAL](#); [Landon Smith](#); [Laura Ackermann](#); [Laura Blake](#); [Lecia Craft](#); [Lynn Sweet](#); [Mark Thrall](#); [Mdispatcher](#); [Monica Williams](#); [DL-NARMSecurity](#); [DL-RawhideSecurity](#); [Rena Knezovich](#); [Rick Comer](#); [Basko, Rose](#); [Scott Norman](#); [Rexroat, Scott E.](#); [Stevan Mueller](#); [Steve Bell](#); [Tim Mendenhall](#); [Tom Osborn](#); [Tom Ruff](#)  
**Subject:** Fwd: Air Pollution Alert (3/28/2015)  
**Date:** Saturday, March 28, 2015 9:07:35 AM

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----- Forwarded message -----

**From:** **Kyle Carstens - NOAA Federal** <[kyle.carstens@noaa.gov](mailto:kyle.carstens@noaa.gov)>  
**Date:** Sat, Mar 28, 2015 at 3:37 AM  
**Subject:** Air Pollution Alert (3/28/2015)  
**To:** Tanner Shatto <[tanner.shatto@wyo.gov](mailto:tanner.shatto@wyo.gov)>

AIR QUALITY ALERT MESSAGE  
WYOMING AIR QUALITY DIVISION  
RELAYED BY NATIONAL WEATHER SERVICE RAPID CITY SD  
310 AM MDT SAT MAR 28 2015

...BLOWING DUST HEALTH ALERT IN EFFECT FOR ALL OF POWDER RIVER  
BASIN OF NORTHEASTERN WYOMING FROM 3 PM THIS AFTERNOON UNTIL  
MIDNIGHT TONIGHT...

WEST WIND OF 20 TO 35 MPH EARLY THIS AFTERNOON WILL SHIFT TO THE  
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THE WINDS WILL DECREASE AROUND MIDNIGHT.

THE WYOMING AIR QUALITY DIVISION RECOMMENDS THE ELDERLY...YOUNG  
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CONDITIONS.

--

Tanner B. Shatto  
District 3 Engineer  
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Air Quality Division  
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**From:** [Hansen, Bryan](#)  
**To:** [Tanner Shatto](#)  
**Cc:** [Dinsmoor, Phil](#); [Guthrie, Jim](#); [Kezar, Cyrus](#); [Knezovich, Rena J.](#); [Basko, Rose](#)  
**Subject:** Re: Air Pollution Alert (3/28/2015)  
**Date:** Saturday, March 28, 2015 8:23:43 PM

---

Tanner: SC-3, RO-1 and NA-8 may exceed; high wind event no doubt. Both School Creek and NARM have suspended operations.

BWH  
Sent from my iPhone

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**From:** [Tanner Shatto](#)  
**To:** [Hansen, Bryan](#)  
**Subject:** Re: Air Pollution Alert (3/28/2015)  
**Date:** Monday, March 30, 2015 7:13:35 AM

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How did Saturday turn out?

On Sat, Mar 28, 2015 at 8:23 PM, Hansen, Bryan <[BHansen@peabodyenergy.com](mailto:BHansen@peabodyenergy.com)> wrote:

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**Cc:** [Basko, Rose](#); [Kezar, Cyrus](#); [Knezovich, Rena J.](#)  
**Subject:** RE: Air Pollution Alert (3/28/2015)  
**Date:** Monday, March 30, 2015 9:32:00 AM

---

NA-8 exceeded: 276  
RO-1 exceeded: 190  
SC-3 did not exceed: 154

BWH

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**From:** [Daniel Sharon](#)  
**To:** [Dinsmoor, Phil](#)  
**Cc:** [Cara Keslar](#)  
**Subject:** Exceptional Event Demonstration Packages  
**Date:** Thursday, May 28, 2015 4:43:47 PM

---

Hello Phil,

The AQD has received the 5/20/15 extension request for the submittal of NARM's exceptional event demonstrations. I know you already spoke with Cara about this but I wanted to let you know in writing that the AQD has granted this request. We'll keep an eye out for these demonstrations before June 30, 2015.

Thank you,

Daniel Sharon  
Air Quality Monitoring Project Manager  
Wyoming DEQ, Air Quality Division  
122 West 25th Street  
Cheyenne, WY 82002  
Office: (307) 777-7104  
Email: [daniel.sharon@wyo.gov](mailto:daniel.sharon@wyo.gov)

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North Antelope Rochelle Mine  
Caller Box 3034  
Gillette, Wyoming 82717-3034

June 28, 2015

Cara Keslar  
Natural Resources Program 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 for RO-1 PM<sub>10</sub> Monitor

Dear Cara:

On March 28, 2015 the RO-1 PM<sub>10</sub> monitor operated by Peabody at the North Antelope Rochelle Mine (NARM) recorded an exceedance of the 24-hour PM<sub>10</sub> NAAQS. In keeping with the Air Quality Division's guidance, Peabody hereby submits for your review, an exceptional event documentation package related to that exceedance.

This High Wind Event demonstration thoroughly addresses the requirements and principles of the federal Exceptional Events rule and the federal guidance for preparing such demonstrations. In particular we have adjusted our package format to reflect comments and observations made by Air Quality Division at the exceptional event "training session" earlier this year.

Please note that the NA-8 monitor at NARM also recorded an exceedance on that same date. We have prepared individual packages for each of the monitors. There is some duplication between the two packages, however, each is construction to be a stand-alone document. The NA-8 package is being submitted under separate cover.

In the event that the AQD either has any questions about the enclosure or requires further information, please do not hesitate to contact me at 464-4500 at your convenience.

Sincerely,

A handwritten signature in blue ink, appearing to read "Cyrus Kezar".

Cyrus Kezar  
Senior Environmental Analyst  
NARM

Enclosure

c: B. Hansen  
T. Shatto

NORTH ANTELOPE ROCHELLE MINE

DEMONSTRATION OF EXCEPTIONAL EVENT – HIGH WINDS  
RO-1 PM<sub>10</sub> MONITOR  
MARCH 28, 2015

Prepared For

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY  
AIR QUALITY DIVISION

June 29, 2015



## TABLE OF CONTENTS

1.0 INTRODUCTION.....	1
2.0 BACKGROUND .....	3
3.0 EXCEPTIONAL EVENT DEMONSTRATION.....	4
3.1 AN AIR QUALITY EVENT OCCURRED .....	4
3.2 THE EXCEEDANCE WAS CAUSED BY A NATURAL EVENT .....	8
3.3 THE EVENT WAS NOT REASONABLY PREVENTABLE OR CONTROLLABLE .....	10
3.3.1 <i>Dust Control and Reactionary Measures Taken</i> .....	12
3.3.2 <i>Affected Area and Level of Control and Demonstration of Compliance with BACM</i> .....	17
3.3.3 <i>Demonstration of Compliance with Air Quality Permit Conditions</i> .....	20
3.3.4 <i>Production Levels Before, During, and After Exceedance</i> .....	21
3.3.5 <i>Impacts From Area Coal Mines</i> .....	22
3.4 THE EVENT WAS IN EXCESS OF NORMAL HISTORICAL FLUCTUATIONS .....	23
3.5 CLEAR CAUSAL RELATIONSHIP BETWEEN MEASURED EXCEEDANCE AND THE EVENT .	29
3.6 THE EXCEEDANCE WOULD NOT HAVE OCCURRED BUT FOR THE HIGH WIND EVENT ..	33
4.0 CONCLUSION .....	36
5.0 REFERENCES.....	37
APPENDIX A – NARM REAL-TIME EMISSION MONITORING PROGRAM .....	38
APPENDIX B – HIGH WIND WARNING AND AIR QUALITY ALERT.....	41
APPENDIX C – WDEQ AQD COMMUNICATION LOG .....	43
APPENDIX D – NARM 2014 DUST SUPPRESSION REPORT .....	46
APPENDIX E – METHOD 9 OPACITY OBSERVATION REPORT .....	50
APPENDIX F – METHOD 22 OPACITY OBSERVATION REPORT .....	51

## LIST OF TABLES

Table 1: NARM Wind Speeds and PM <sub>10</sub> Concentrations on 3/28/15.....	4
Table 2: TEOM Alarm and Response Chronology .....	12
Table 3: TEOM Alarm and Response Log.....	16
Table 4: Dust Suppression - Water Trucks.....	17
Table 5: Controlled Acreage.....	20
Table 6: 24-Hr PM <sub>10</sub> Concentrations on 3/28/15 vs. Historical .....	28

## LIST OF FIGURES

Figure 1: School Creek Holmes East Pit at 14:41 on 3/28/15 .....	8
Figure 2: NARM Facing East Toward Pine Tree and Elk Pits at 15:00 on 3/28/15.....	5
Figure 3: NARM Facing East Toward Pine Tree and Elk Pits at 14:58 on 3/28/15.....	6
Figure 4: NARM Facing South Toward Cast Drills in Elk Pit at 14:58 on 3/28/15.....	7
Figure 5: NARM NA-8 Wind Speeds and PM <sub>10</sub> Concentrations on 3/28/15 .....	9
Figure 6: NARM Wind Rose on 3/28/15 .....	10
Figure 7: Time Line of Responsive Actions for NA-8 High Wind Event on 3/28/15 .....	15
Figure 9: NARM and School Creek Production for Week of March 28, 2015 .....	22
Figure 10: North Antelope Rochelle and School Creek Monitoring Stations .....	23
Figure 11: NARM NA-7 TEOM Monitoring History .....	24
Figure 12: NARM NA-8 TEOM Monitoring History .....	25
Figure 13: NARM RO-1 TEOM Monitoring History .....	25
Figure 14: School Creek SC-1 TEOM Monitoring History .....	26
Figure 15: School Creek SC-2 TEOM Monitoring History .....	27
Figure 16: School Creek SC-3 TEOM Monitoring History .....	27
Figure 17: NARM and School Creek TEOM Values for Week of March 28, 2015.....	29
Figure 18: NARM Hourly TEOM Values vs. Wind Speed on 3/28/15 .....	30
Figure 19: NA-8 Cumulative Average TEOM Values vs. Wind Speed on 3/28/15.....	31
Figure 20: NARM and SCM Historical Hourly TEOM Values vs. Wind Speed .....	32
Figure 21: NA-7 Hourly TEOM Values vs. Wind Speed on 3/28/15 .....	34
Figure 22: NA-8 Hourly TEOM Values vs. Wind Speed on 3/28/15 .....	34
Figure 23: RO-1 Hourly TEOM Values vs. Wind Speed on 3/28/15 .....	35

## **EXHIBITS**

Exhibit 1 – Reverse Trace from PM<sub>10</sub> Monitor RO-1

Exhibit 2 – Regional Mine Disturbed Areas

## 1.0 INTRODUCTION

Peabody Powder River Mining, LLC operates the North Antelope Rochelle Mine (NARM), 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 4 draglines, 6 coal shovels, 8 overburden shovels, 4 large-capacity loaders and a fleet of 79 haul trucks with capacities ranging from 200 tons to 400 tons. NARM also operates 11 water trucks and a large fleet of support equipment including dozers, scrapers, graders, loaders, service trucks and light-duty vehicles. NARM operates a continuous PM<sub>10</sub> monitoring network consisting of three TEOM samplers: one at an upwind site (NA-7) and two at downwind sites (NA-8 and RO-1), as well as a meteorological station (PRCC-1) where wind speed and wind direction (among other parameters) are recorded.

On March 28, 2015 the NARM RO-1 sampler recorded a PM<sub>10</sub> concentration in excess of the 24-hour PM<sub>10</sub> Wyoming Ambient Air Quality Standard (WAAQS) and the 24-hour PM<sub>10</sub> National Ambient Air Quality Standard (NAAQS). The purpose of this document is to demonstrate that the measured exceedance was caused by an exceptional event.

High winds of significant duration and velocity were recorded at the meteorological station on that same date. Analysis shows that the elevated sampler readings directly correlate with the high wind speeds. Operating personnel made an assessment of conditions, and took action to reduce the generation of emissions from mining activities during the initial hours of the event. Actions included focusing water trucks on active areas, slowing haul truck traffic, and reducing overburden excavation activity on the site. As conditions worsened on March 28, all mining activities were shut down. Control measures and reactionary measures almost certainly reduced the generation of fugitive dust, but because of the prolonged period of high wind speeds, these measures were overwhelmed. As a result they were not successful in reducing the 24-hour average to below the daily standard.

This document demonstrates that on and before March 28, 2015, NARM was in compliance with Air Quality Permit MD-16282 (WDEQ 2014b). NARM implemented reasonable and appropriate controls in response to high winds and elevated dust

concentrations on March 28. Finally, it demonstrates a clear causal relationship between the unusually high winds on that date, and the elevated dust concentrations which ultimately caused an exceedance of the WAAQS. Peabody's conclusion that the exceedance was due to a high wind event follows from a weight-of-evidence analysis as suggested by EPA (EPA 2013b). 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, 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. The fact that two continuous monitors at NARM recorded exceedances, two monitors at School Creek Mine recorded high values very near the standard, and a continuous monitor at the neighboring Antelope Mine exceeded the standard on the same day, strengthens this demonstration.

## 2.0 BACKGROUND

In 2007, EPA promulgated the Exceptional Events Rule (EER) at 40 CFR 50.14. In 2013 EPA issued draft guidance to assist States in their administration of the EER by providing examples of the required elements of a high-wind exceptional event demonstration (EPA 2013b). These requirements are found in 40 CFR parts 50 and 51. In accordance with the EER and associated guidance, the following discussion and analysis demonstrates:

- 1) Air quality was affected, i.e., there was an air quality event on March 28, 2015
- 2) The air quality event was caused by high winds that constituted a natural event
- 3) The event was not reasonably controllable or preventable
- 4) The event was in excess of normal historical fluctuations
- 5) A clear causal relationship exists between the measured exceedance and the event
- 6) The exceedance would not have occurred but for the event

This demonstration is aligned with EPA's weight-of-evidence approach, a method of combining all available evidence in support of a hypothesis. Each of the six demonstration elements listed above is supported by its own evidence, but EPA's ultimate determination also considers how these elements may overlap or reinforce each other. A strong demonstration of one element could enhance the persuasiveness of, or ease the level of rigor required for the demonstration of another element.

For a comprehensive controls analysis, the EPA will place significantly more weight on the wind speed data associated with high particulate matter concentrations when they correspond to wind speeds above the applicable high wind threshold. EPA will likely expect more detailed demonstrations as sustained winds decrease below the applicable high wind threshold (EPA 2013b). In this case, it will be shown that hourly average wind speeds reached unusually high levels, exceeding both Wyoming's high wind threshold for the Powder River Basin and the default EPA threshold for high-wind events.

### 3.0 EXCEPTIONAL EVENT DEMONSTRATION

The following demonstration offers visual, analytical and chronological evidence that an exceptional event occurred at NARM's RO-1 monitor on March 28, 2015.

#### 3.1 An Air Quality Event Occurred

Table 1 shows elevated PM<sub>10</sub> concentrations beginning shortly after noon on March 28. All three monitors experienced a rapid increase starting at 16:00 hours. At the same time, peak wind gusts exceeded 50 mph, most likely entraining large amounts of fugitive dust that high sustained winds kept airborne.

**Table 1: NARM Wind Speeds and PM<sub>10</sub> Concentrations on 3/28/15**

Hour	Wind Speeds (mph)		PM <sub>10</sub> Concentrations (µg/m <sup>3</sup> )		
	Average	Gust	NA-7	NA-8	RO-1
1:00	1.67	2.98	9.7	39.3	105.8
2:00	1.58	3.94	7.7	50.5	56.7
3:00	3.57	6.78	7.5	51.1	57.8
4:00	6.83	9.53	9.6	60.9	25.3
5:00	3.63	7.47	10.8	51.2	31.5
6:00	2.29	5.31	20.6	53.5	35.3
7:00	2.35	5.04	47.5	38.6	33.4
8:00	5.82	15.11	13.5	47.1	33.9
9:00	5.49	12.73	9.7	41.0	45.5
10:00	18.53	28.85	8.3	7.4	63.3
11:00	26.01	37.65	6.6	16.5	96.8
12:00	27.01	44.33	9.7	51.3	99.9
13:00	33.05	46.35	21.9	147.6	275.0
14:00	33.30	48.14	16.7	135.3	178.7
15:00	32.22	46.85	19.3	36.5	148.1
16:00	36.07	56.06	31.7	745.3	697.6
17:00	45.25	61.97	42.2	3069.2	1060.6
18:00	34.94	50.93	173.9	614.6	346.5
19:00	32.51	45.34	257.9	634.5	436.4
20:00	30.57	45.30	215.9	328.5	232.2
21:00	33.07	52.12	280.0	392.8	321.2
22:00	31.00	45.80	105.4	167.8	204.0
23:00	28.88	39.66	107.5	102.5	129.1
24:00	28.18	42.00	27.2	70.8	69.3

The photographs in Figures 1 through 3, taken from the north highwall of the Elk Pit at approximately 15:00 hours, confirm these high ambient particulate levels. Figure 4 is a photograph taken from the southwest corner of the Holmes West pit at the School Creek Mine. Exceedances at NARM's NA-8 monitor and at the neighboring Antelope Mine, as well as high values at the School Creek Mine monitors, indicate that air quality was affected over a large area. Air quality and high wind alerts were issued on March 28 in anticipation of these conditions (Appendix B).

**Figure 1: Facing East Toward Pine Tree and Elk Pits at 15:00 on 3/28/15**



**Figure 2: Facing East Toward Pine Tree and Elk Pits at 14:58 on 3/28/15**



**Figure 3: NARM Facing South Toward Cast Drills in Elk Pit at 14:58 on 3/28/15**



**Figure 4: School Creek Holmes East Pit at 14:41 on 3/28/15**



### **3.2 The Exceedance Was Caused by a Natural Event**

Table 1 shows the response of all three NARM continuous monitors to the hourly wind conditions. The parallel rise in  $PM_{10}$  concentrations at the upwind site and both downwind sites strongly implicates high winds, as opposed to changes in mining activities, as the cause of the exceedance. Figure 5 graphs the hourly average  $PM_{10}$  concentrations at RO-1 along with hourly average wind speeds on March 28. This graph clearly demonstrates a positive, nonlinear correlation between wind speed and  $PM_{10}$  concentration. Above 30 mph, slight increases in wind speed correspond to disproportionate increases in  $PM_{10}$  concentration. Figure 6 shows the wind rose from the NARM meteorological monitoring station. It confirms the high wind speeds and reveals a bimodal wind direction. On the afternoon of March 28 high winds blew from the west-southwest. A storm front passed through the area between 17:00 and 18:00 hours, sustaining the high wind speeds but shifting the wind direction to blow from the

north-northwest. The wide range of wind directions during the high-wind event thus caused multiple anthropogenic sources of fugitive dust to impact the RO-1 monitor.

**Figure 5: NARM RO-1 Wind Speeds and PM<sub>10</sub> Concentrations on 3/28/15**

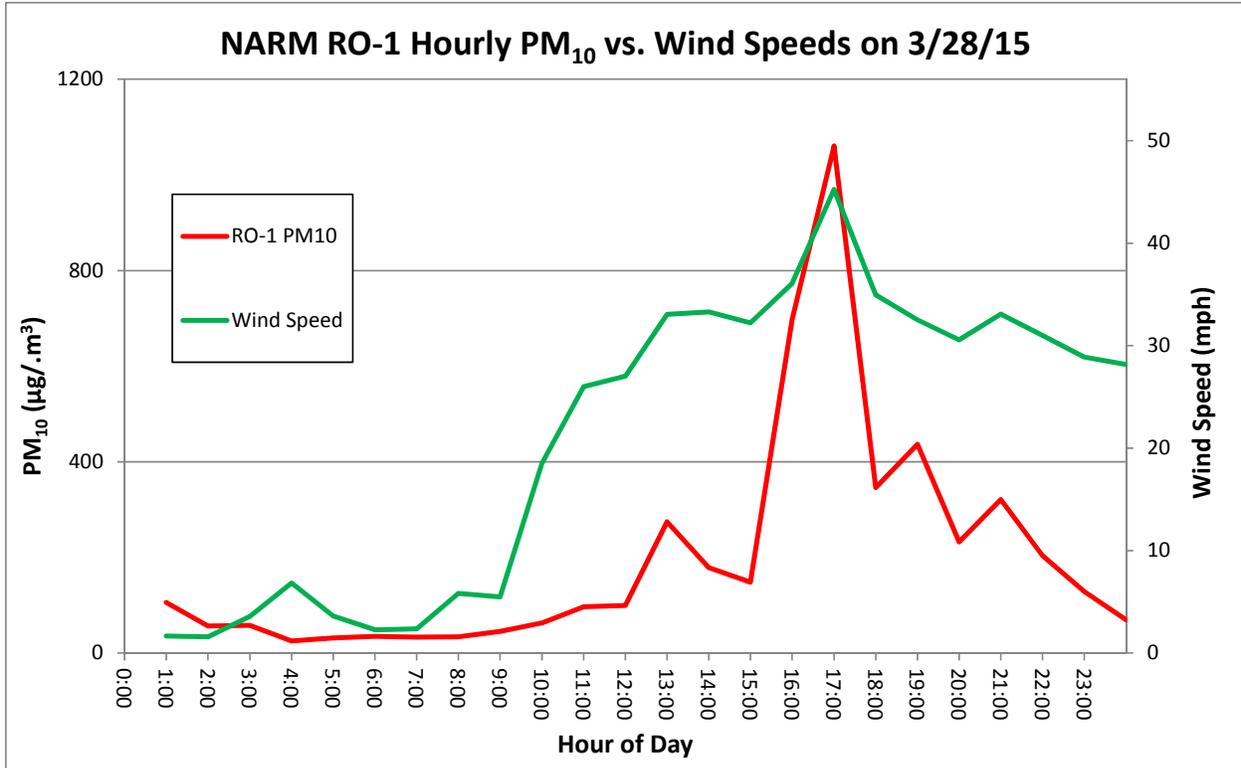
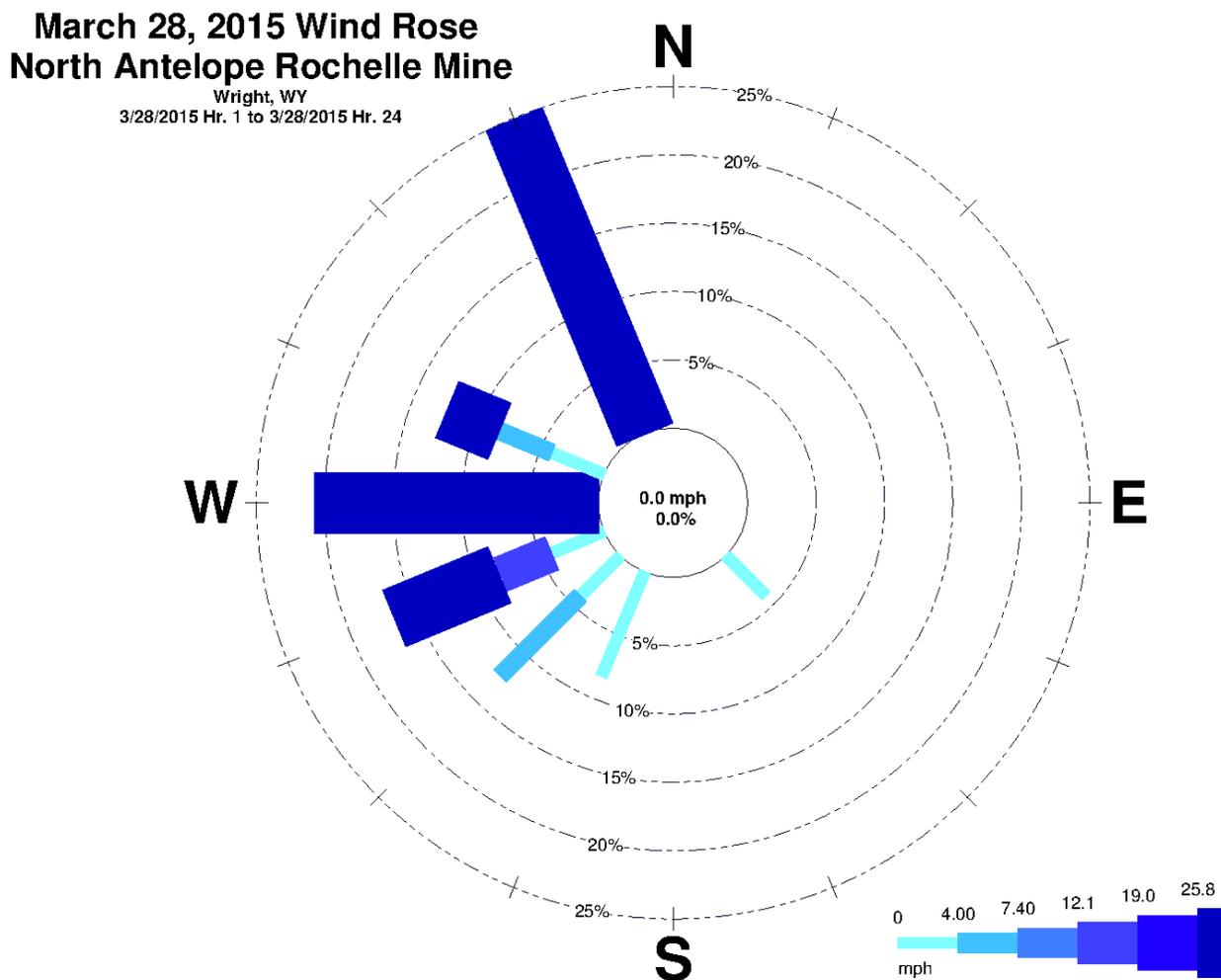


Figure 6: NARM Wind Rose on 3/28/15



### 3.3 The Event Was Not Reasonably Preventable or Controllable

EPA recommends that a basic controls analysis should identify all contributing emission sources in upwind areas, whether anthropogenic or natural, and provide evidence that those sources were reasonably controlled (EPA 2013b). The area upwind from the RO-1 monitor includes natural areas (i.e., native grassland), anthropogenic sources at neighboring surface mines, anthropogenic sources not associated with mining, and anthropogenic sources at NARM. Relatively high PM<sub>10</sub> concentrations on March 28 at the NA-7 monitor, positioned to measure background air quality, suggest that natural sources contributed to the exceedance at RO-1. The dominant contributors, however, were likely anthropogenic. At NARM, these sources include earth-moving activities, coal excavation, hauling and processing, and wind erosion from areas disturbed by mining. Control of these sources is achieved through ongoing Best Available Control Measures

(BACM) and reactionary measures taken during episodes of elevated PM<sub>10</sub> concentrations. It is not feasible to quantify emissions or source controls associated with other anthropogenic sources in the area such as neighboring mines and non-mining activities. Therefore, the following discussion of anthropogenic sources of dust will be limited to NARM sources only. Such sources 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.

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 (EPA 2013b).

Section 3.3.1 below addresses the reactionary controls applied to anthropogenic emission sources at NARM on March 28, 2015. Reactionary controls were triggered by high wind warnings and air quality alerts issued by government agencies (Appendix B), and by high PM<sub>10</sub> concentrations at the NA-8 and RO-1 monitors (Table 1). The high PM<sub>10</sub> concentrations generated alarms and prompted actions in accordance with NARM's *Action Plan*, represented by the Real-Time Emission Monitoring Program (Appendix A). These controls ranged from increased water application on roads and other ground-level sources of fugitive dust, to limitation and ultimate cessation of mining activities.

Section 3.3.2 addresses the ongoing controls applied to anthropogenic emission sources at NARM. It quantifies controlled and uncontrolled areas upwind from the RO-1 monitor on March 28, 2015, and specifies the BACM in place on and before that date. Section 3.3.3 demonstrates compliance with conditions related to fugitive dust control, including BACM, as specified in the current NARM Air Quality Permit.

Section 3.3.4 discusses the impact of reactionary control measures on overburden and coal production, as well as train shipments on the day of the exceedance. Section 3.3.5 discusses the location of neighboring mines relative to wind directions, and the

possibility that they may have contributed to elevated PM<sub>10</sub> concentrations at RO-1 on March 28, 2015.

In summary, the following discussion demonstrates that despite reasonable and appropriate control measures applied to emission sources upwind from the RO-1 monitor on March 28, 2015, prolonged high winds on that day caused an exceedance of the NAAQS.

### 3.3.1 *Dust Control and Reactionary Measures Taken*

As with NARM's BACM requirements, the Mine's requirement to implement reactionary control measures is contained in NARM's air permit. In particular, NARM's required reactionary control measures are contained in the Mine's *Air Quality Action Plan*, incorporated in its air permit as Appendix B (WDEQ 2014a). The provisions of the *Action Plan* are included in this document as Appendix A.

The *Action Plan* must be implemented for "high particulate events" at NARM. That is, when measured PM<sub>10</sub> levels at NARM first fall within either a certain hourly range (250-500 µg/m<sup>3</sup>) or a specified 24-hour range (75-100 µg/m<sup>3</sup>), 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<sub>10</sub> concentrations continue to increase.

Should measured PM<sub>10</sub> concentrations increase to the point of exceeding higher prescribed "action" thresholds on either an hourly basis (> 500 µg/m<sup>3</sup>) or a 24-hour basis (> 100 µg/m<sup>3</sup>), 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" (AQD 2014).

Figure 7 presents a time line of TEOM alerts and responsive actions taken on March 28, 2015. Table 2 summarizes the chronology of events, and Table 3 provides supporting details. Monitor RO-1 registered a concentration of 106 µg/m<sup>3</sup> at 1:00 hours. RO-1 triggered a warning by virtue of the daily threshold since the first hourly average for the day is also the first daily average. A site assessment was conducted, but the daily

average dropped significantly the next hour and continued to fall. Since winds were very light in the early hours, it is likely that stagnant air contributed to the high value so early in the day. The airborne dust impacting RO-1 may have dissipated as the light breeze shifted direction between 1:00 and 2:00.

An air quality alert issued by the WDEQ Air Quality Division (AQD) at 9:07 and a high-wind warning issued by the National Weather Service at 10:07 prompted another site assessment. In response, at 12:00 hours water application was focused on the most active emission sources. At 13:00 hours the NARM dispatch alerted all areas of the mine to high winds, which by then exceeded 30 mph. At 14:00 hours top speeds for select coal and overburden haul trucks were reduced to no more than 20 mph, less than half the normal top speed. Also at 14:00 hours the dragline drop height was lowered. At 15:00 hours all topsoil stripping was shut down.

At 16:00 hours both the NA-8 and RO-1 monitors generated high concentration alarms, which prompted a pit advisory for no unnecessary travel. All coal trucks were slowed, all dragline and dozer push operations were shut down, and the circuit 2 truck dump and crushers were shut down. At 17:00 hours, when the wind speed averaged 45 mph, all mining activities were suspended. The entire mine remained idle until after 23:00 hours, at which time mining activity was gradually resumed.

Table 4 lists the water trucks active at NARM on March 28, 2015, along with tank capacities and load counts. In response to the high winds and elevated PM<sub>10</sub> concentrations, 2.76 million gallons of water were applied to fugitive emission sources at NARM on that day. This represents more than three times the average daily water application rate throughout the previous calendar year.

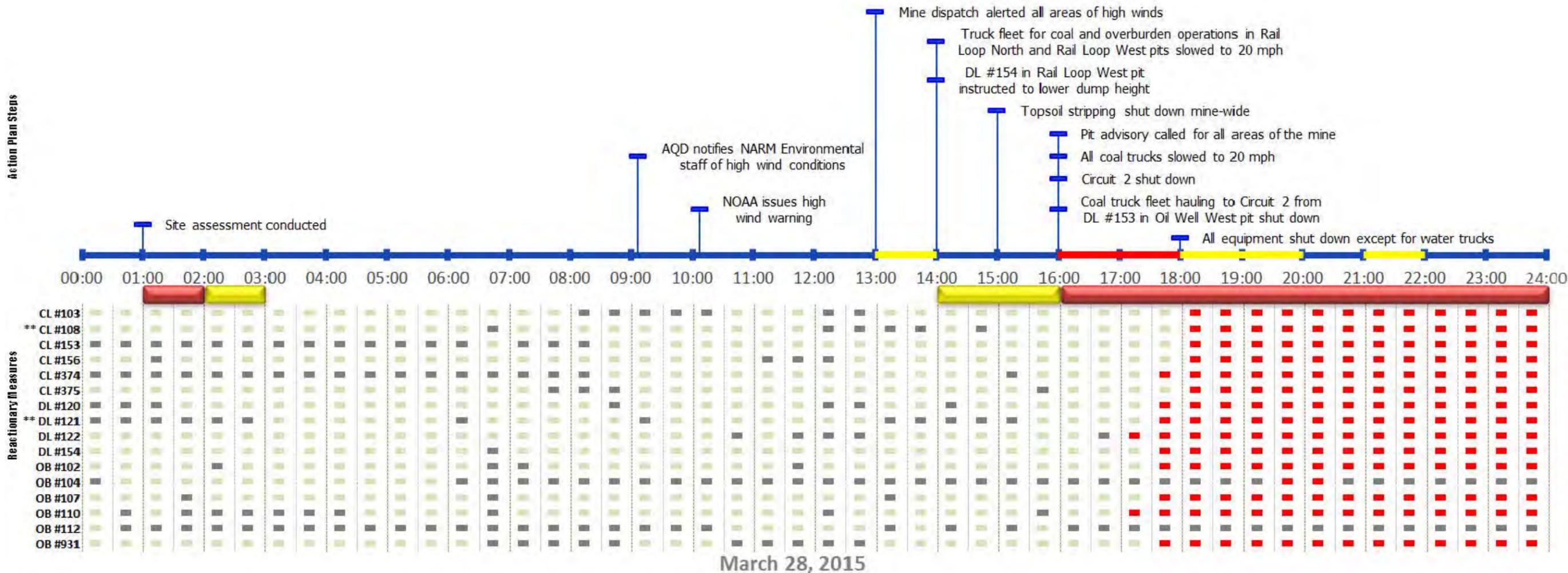
Figure 1 demonstrates that despite hourly average wind speeds remaining above 30 mph from 13:00 hours until 23:00 hours on March 28, hourly PM<sub>10</sub> concentrations at NA-8 fell precipitously at 18:00 hours and continued a downward trend for the remainder of the day. It is reasonable to assume that at least part of this drop was a direct result of the reactionary measures NARM implemented to control fugitive dust. Although these measures were appropriate, they were insufficient to avoid the 24-hour exceedance at RO-1. Even with a complete mine shutdown for six hours, the high winds continued to overwhelm the controls in place.

**Table 2: TEOM Alarm and Response Chronology**

Time	Hourly PM <sub>10</sub> µg/m <sup>3</sup>		Daily PM <sub>10</sub> µg/m <sup>3</sup>		Action Taken
	NA-8	RO-1	NA-8	RO-1	
1:00				105	Site assessment conducted
9:07					AQD notifies NARM Environmental staff of high wind conditions
10:07					NOAA issues high wind warning
13:00		275			Mine dispatch alerted all areas of high winds
14:00		178		81	Truck fleet for coal and overburden operations in Rail Loop North and Rail Loop West pits slowed to 20 mph
14:00		178		81	DL #154 in Rail Loop West pit instructed to lower dump height
15:00		148		85	Topsoil stripping shut down mine-wide
16:00	745	697	98	124	Pit advisory called for all areas of the mine
16:00	745	697	98	124	All coal trucks slowed to 20 mph mine-wide
16:00	745	697	98	124	Circuit 2 shut down
16:00	745	697	98	124	Coal truck fleet hauling to Circuit 2 from DL #153 in Oil Well West pit shut down
17:00	3069	1060	273	179	All mining activity shut down
18:00	615	346	292	188	All mining activity shut down
19:00	634	436	310	201	All mining activity shut down
20:00	328	232	311	203	All mining activity shut down
21:00	393	320	315	208	All mining activity shut down
22:00	168	204	308	208	All mining activity shut down
23:00	102	129	299	204	All mining activity shut down
24:00	71		290	199	Coal mining activities ramping back up

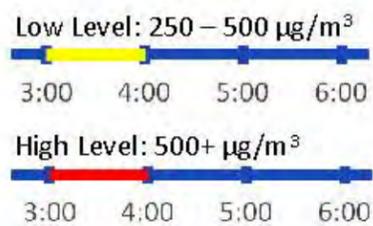
= Caution Level     = Warning Level

Figure 7: Time Line of Responsive Actions for RO-1 High Wind Event on 3/28/15



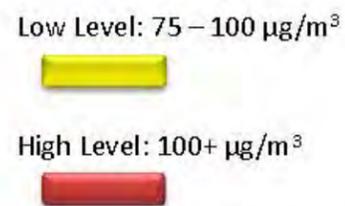
**1hr Alarms**

shown on timeline



**24hr Alarms**

shown beneath timeline



**Equipment Activity**

- Green square: Normal Production
- Grey square: Normal Operation Shutdown
- Red square: Reactionary Measures

**Equipment Abbreviations**

- CL = Coal Loader
- DL = Dragline
- OB = Overburden Shovel

**Notes:**

1. Mine and crew supervisors notified each hour of alarm.
2. Wind speed and wind direction were analyzed every hour of alarm.
3. All equipment on the timeline is within the reverse trace from RO-1 TEOM unless noted with a double asterisk (\*\*).

Table 3: TEOM Alarm and Response Log

Date	Time	NA-8		RO-1		CONTACTED				REACTIONARY CHANGES								COMMENTS	
		Hourly Avg	Midnight Avg	Hourly Avg	Midnight Avg	OVERBURDEN	COAL	DRAGLINE	DRILL AND BLAST	WEATHER CONDITIONS	WATER TRUCKS	CONTRACTORS	MINE INSPECTIONS	HAUL ROUTES ADJ.	DUMP LOW	MIN. ROAD WORK	OPERATION		PIT ADVISORY
3/28/2015	1:00	39.3	39.3	105.8	105.8	X	X	X			X								Winds at 14mph out of the West, 11 thinks it might be coming from C1 crusher and plant and will check it out.
3/28/2015	2:00	44.9	50.5	81.3	56.7														
3/28/2015	3:00	47.0	51.1	73.4	57.8														
3/28/2015	4:00	50.5	60.9	61.4	25.3														
3/28/2015	5:00	50.6	51.2	55.4	31.5														
3/28/2015	6:00	51.1	53.5	52.1	35.3														
3/28/2015	7:00	49.3	38.6	49.4	33.4														
3/28/2015	8:00	49.0	47.1	47.5	33.9														
3/28/2015	9:00	48.1	41.0	47.2	45.5														
3/28/2015	10:00	44.1	7.4	48.9	63.3														
3/28/2015	11:00	41.6	16.5	53.2	96.8														
3/28/2015	12:00	42.4	51.3	57.1	99.9	X	X	X	X										Water truck to water around mega tanks, yellow brick road
3/28/2015	13:00	50.5	147.6	73.9	275.0	X	X	X	X	X									Very windy (high wind warnings from dispatch), Fisher not crushing
3/28/2015	14:00	56.5	135.3	81.4	178.7	X	X	X	X	X			X	X					375 Coal trucks and 107 ovb trucks slowing to 20 mph in railloop, 154 dumping low, windy
3/28/2015	15:00	55.2	36.5	85.8	148.1	X	X	X	X		X								Shut McCoy topsoil stripping down, 121 just started running
3/28/2015	16:00	98.3	745.3	124.0	697.6	X	X	X	X	X	X						X	X	108 and 153 run down while C2 down, called pit advisory in all areas (No Unnecessary Travel), all overburden runs shut down, 374 West Pit operation shut down, all North NARM operations shut down, 931 shut down, all draglines shut down, dozer push shut down, all coal trucks slowed to 20 mph, wind 36 mph from the SouthWest, kept water trucks running , contacted Cyrus about the readings and actions taken, coal run completely shut down, reclamation crew shut down
3/28/2015	17:00	273.1	3069.2	179.1	1060.6	X	X	X	X										Everything still shut down (refer to previous hour actions taken)
3/28/2015	18:00	292.1	614.6	188.4	346.5	X	X	X	X	X	X						X	X	Everything remaining shut down for another hour to see if the 24 hour readings can be saved. Bryan and Cyrus have been notified of this hours readings and will be contacted on the next hours readings as well. Water trucks will continue to run and hit roadways and upper dump areas.
3/28/2015	19:00	310.1	634.5	201.5	436.4	X	X	X	X	X	X						X	X	Continue to remain down for another hour and see if the hourly goes below 150 on any of the monitors. (Follow previous comments as well).
3/28/2015	20:00	311.0	328.5	203.0	232.2	X	X	X	X	X	X						X	X	Continue to remain down until hourly concentration goes below 150, wind shifted more towards the north still around 30 mph, (Follow previous comments and plan and continue to monitor).
3/28/2015	21:00	314.9	392.8	208.6	321.2	X	X	X	X	X	X						X	X	Remain down until hourly concentration goes below 150, and plan to fire up after midnight but take it slow and continue to monitor for any spike. (Continue to follow above measures).
3/28/2015	22:00	308.2	167.8	208.4	204.0	X	X	X	X	X	X						X	X	Remain down until after midnight and try to fire up and continue to monitor for spikes. (Follow above measures).
3/28/2015	23:00	299.3	102.5	205.0	129.1	X	X	X	X	X	X						X	X	Remain down until after midnight and try to fire up and continue to monitor for spikes. (Follow above measures). Wind is NNW at 28mph.
3/29/2015	0:00	289.7	70.8	199.3	69.3	X	X	X	X	X	X				X	X	X	X	Fired up coal runs at Narm and Narm North. Fired up drills and Dozers.

Notes to Table 3:

1. Midnight average is the cumulative average PM<sub>10</sub> concentration from midnight to the hour in question
2. An "X" in the Contacted columns means the supervisor of the indicated pit operation was notified of any warnings or required control measures at the hour in question
3. An "X" in the Reactionary Changes columns means the indicated control measure was implemented at the hour in question

**Table 4: Dust Suppression - Water Trucks**

Water Truck ID	Loads	Tank Size	Total Gallons
702	15	20,000	300,000
703	12	20,000	240,000
704	17	20,000	340,000
705	14	20,000	280,000
711	13	40,000	520,000
712	7	40,000	280,000
714	17	40,000	680,000
715	3	40,000	120,000
TOTAL GALLONS APPLIED 3/28/2015			2,760,000
AVERAGE GALLONS PER DAY IN 2014			875,127
RELATIVE WATER APPLICATION RATE ON 3/28/2015			315%

*3.3.2 Affected Area, Level of Control and Demonstration of Compliance with BACM*

Air Quality Permit MD-16282 (WDEQ 2014a) requires BACM at NARM for active haul roads and for disturbed areas, prescribed 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  $\geq$  150 contiguous acres that will not be revegetated within 60 days of topsoil laydown and regraded backfill areas  $\geq$  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 18% of the actual open acres at the Mine must be stabilized against erosion during any calendar year.

Sources at NARM that likely contributed significantly to the PM<sub>10</sub> NAAQS exceedance measured by the RO-1 monitor on March 28, 2015 were identified by constructing a “reverse trace” of the predominant directions (250°-347°) of high winds on that day, upwind from the RO-1 monitor. The result of that “reverse trace” is shown in Exhibit 1.

Exhibit 1 identifies categories of disturbed surface areas at NARM over which high winds blew toward the RO-1 monitor on March 28, 2015. Each of these areas was a likely contributor to the measured exceedance at RO-1. As the high wind event began on March 28, the following BACM were in place on the disturbed areas identified in Exhibit 1:

- A combined 843 acres (of a possible 843 acres) of various facilities, rail and hydrologic structures were controlled with BACM on March 28 by prior use of one or more of the following methods: revegetation, riprap, chemical treatments, or pavement.
- Roads accounted for 1,581 acres. All coal haul roads and active overburden haul roads were controlled on and prior to March 28 by chemical treatment and/or watering. Pavement was used on mine access roads.
- Topsoil had been recently replaced on a total of 18 acres of reclaimed lands. All of these acres had been scarified in preparation for revegetation.
- A total of 327 acres of recently regraded backfill had been ripped in preparation for topsoil replacement. Another 40 acres had not yet been treated because they were not planned to remain without topsoil for an extended period of time.

In addition to the above disturbed lands at NARM for which BACM is expressly required, similar control measures were also in place on March 28, 2015 for the following disturbed areas over which high winds passed toward the NA-8 monitor:

- 1,214 acres of lands that had been stripped of topsoil in advance of the pits. All of this disturbed ground had been scarified.
- A combined 1,196 acres of overburden and topsoil stockpiles had been graded and scarified.

Table 5 itemizes the controlled and uncontrolled disturbed acreage within the RO-1 reverse trace at NARM on March 28, 2015. The controlled area includes 5,480 acres of revegetated land. In short, of the 15,628 acres that had been disturbed by NARM within the reverse trace area, reasonable controls were in place on 10,659 or 68% of those acres.

**Table 5: Controlled Acreage Within RO-1 Reverse Trace**

Class Name	Backtrace Angle	Controlled Acres	Uncontrolled Acres
Topsoil removed	250.4° - 347.3°	1,214	
Benches	250.4° - 347.3°		1,884
To be backfilled	250.4° - 347.3°		2,773
To be graded	250.4° - 347.3°		313
Graded (to be topsoiled)	250.4° - 347.3°	327	
Topsoiled (to be revegetated)	250.4° - 347.3°	18	
Revegetated (held for release)	250.4° - 347.3°	5,480	
Overburden stockpiles	250.4° - 347.3°	358	
Topsoil stockpiles	250.4° - 347.3°	838	
Roads	250.4° - 347.3°	1,581	
Railroads	250.4° - 347.3°	40	
Facilities	250.4° - 347.3°	526	
Dams, ditches, ponds	250.4° - 347.3°	277	
Total Acres	250.4° - 347.3°	10,659	4,969

### 3.3.3 Demonstration of Compliance with Air Quality Permit Conditions

The Air Quality Division's 2014 Annual Inspection Report (WDEQ 2014b) shows that NARM was in compliance with all air permit conditions related to fugitive dust control as of August 28, 2014. NARM Air Permit MD-16282 was approved on September 5, 2014 with similar conditions imposed. Following is a summary of the evidence that NARM was in compliance with each Permit MD-16282 condition on and before March 28, 2015. This discussion applies only to fugitive dust control as prescribed in conditions 6, 8 through 17, 21, and 23 through 25 in MD-16282.

Condition 6 addresses the operation and maintenance of passive enclosure control systems (PECS) and atomizer/foggers designed to control particulate emissions from crushers and coal handling systems. All coal plant controls were in compliance with Permit MD-16282 and 40 CFR Part 60 Subpart Y. Appendix F contains the most recent (prior to the date of the exceedance) Method 22 opacity observation reports for these systems.

Conditions 8 through 12 address the operation, maintenance and inspection of truck dumps. All truck dumps were in compliance with Permit MD-16282 and 40 CFR Part 60 Subpart Y, as demonstrated in Appendix E, which contains the most recent (prior to the date of the exceedance) Method 9 opacity observation reports for all truck dumps.

Conditions 13 and 14 address haul road dust suppression, according to the BACM discussed in Section 3.3.2 above. Long-term compliance with this condition is demonstrated in the Annual Inspection Report (WDEQ 2014b) and the Annual Dust Suppression Report (Appendix D). Compliance on March 28, 2015 is demonstrated by the water truck activities documented in Table 3 above, as well as the gallons of water applied (Table 4). Condition 15 requires NARM to submit an annual report of dust suppression activities by April 1<sup>st</sup>. The 2014 report was submitted in accordance with this condition.

Conditions 16 and 17 relate to the control of open acres subject to wind erosion, according to the BACM discussed in Section 3.3.2 above. The 2014 Annual Inspection Report verified compliance with these conditions (WDEQ 2014b). Table 5 above compares controlled and uncontrolled open areas that fall within the reverse trace of the range of wind directions from Site RO-1 during the high-wind event on March 28, 2015. Exhibit 1 shows the spatial distribution of these open areas.

Condition 21 requires NARM to notify the Air Quality Division (AQD) within 15 days of any monitored exceedance of the PM<sub>10</sub> standard that occurs at a continuous monitor. The log of email correspondence is presented in Appendix C, confirming that NARM complied with this requirement relative to the 24-hour exceedances at NA-8 and RO-1 on March 28, 2015.

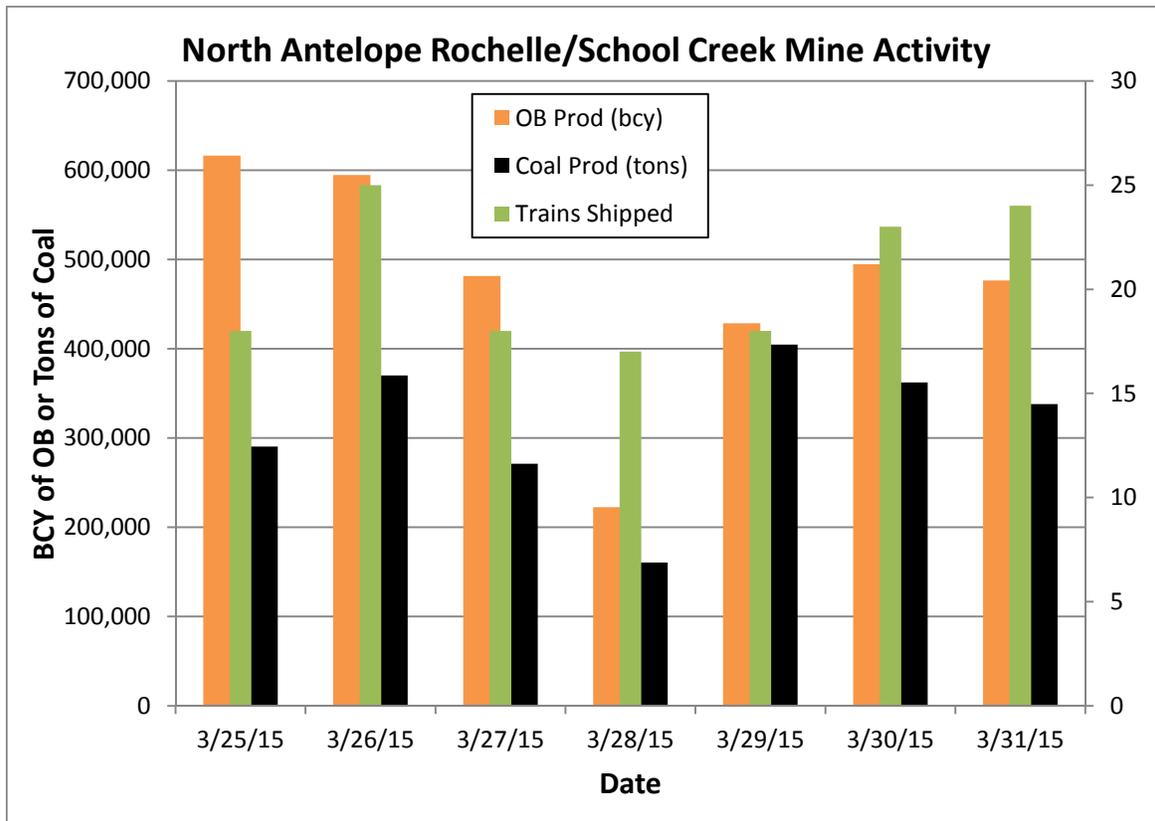
Conditions 23 through 25 require that NARM adhere to its contingency action plan for high particulate events. Table 2 above documents the chronology and levels of TEOM alarms on March 28, along with the actions taken in response. These responses are consistent with the Real-Time Emission Monitoring Program, part of the *Action Plan* implemented at NARM (see Appendix A).

### 3.3.4 *Production Levels Before, During, and After Exceedance*

In response to high PM<sub>10</sub> concentration alerts, NARM initiated reactive measures on March 27. Measures implemented on the afternoon of March 28 culminated in the cessation of all mining activities. Figure 9 shows the drop off in overburden production,

coal production, and train shipments in response to these reactive measures, as well as the resumption of more normal production rates on subsequent days. Overburden production on March 28 was 43% of the average for the 3 days before and 3 days after March 28, while coal production was 47% of this average. Figure 9 provides tangible evidence of the shut-down of mining operations on the afternoon of March 28, as documented in Table 2, Table 3, and Figure 7.

**Figure 9: NARM and School Creek Production for Week of March 28, 2015**



### 3.3.5 Impacts From Area Coal Mines

Neighboring mines include the Black Thunder, Antelope and School Creek mines. Exhibit 2 shows the exposed acreages within the March 28, 2015 reverse trace from monitor RO-1. Nearly 12,400 acres are disturbed by entities other than NARM within an approximately 15-mile radius of RO-1. Peabody cannot attest to the level of control nor can it influence that control on these acres, with the exception of 286 exposed acres at School Creek Mine (SCM), which is under Peabody’s control. Management of the operations at NARM and SCM is coordinated, and Peabody took all reasonable steps to control emissions at both mines on March 28.

### 3.4 The Event Was in Excess of Normal Historical Fluctuations

Evidence is presented below to demonstrate that the 24-hour average PM<sub>10</sub> concentration at RO-1 on March 28, 2015 was extremely improbable. Additional evidence shows that five other continuous monitors in the vicinity also recorded unusually high values on that day. All three continuous PM<sub>10</sub> monitors at NARM and all three continuous monitors at the neighboring School Creek Mine (SCM) registered historically high values. The probability that concurrent high PM<sub>10</sub> levels at all six sites reflect nothing more than normal historical fluctuations is very near zero.

For continuous PM<sub>10</sub> measurements, NARM has one upwind TEOM monitor (NA-7) and two downwind TEOM monitors (NA-8 and RO-1). SCM has one upwind TEOM monitor (SC-1) and two downwind TEOM monitors (SC-2 and SC-3). The PM<sub>10</sub> and meteorological monitoring sites at NARM and SCM are shown in Figure 10, along with the wind roses from the meteorological stations at both mines on March 28, 2015.

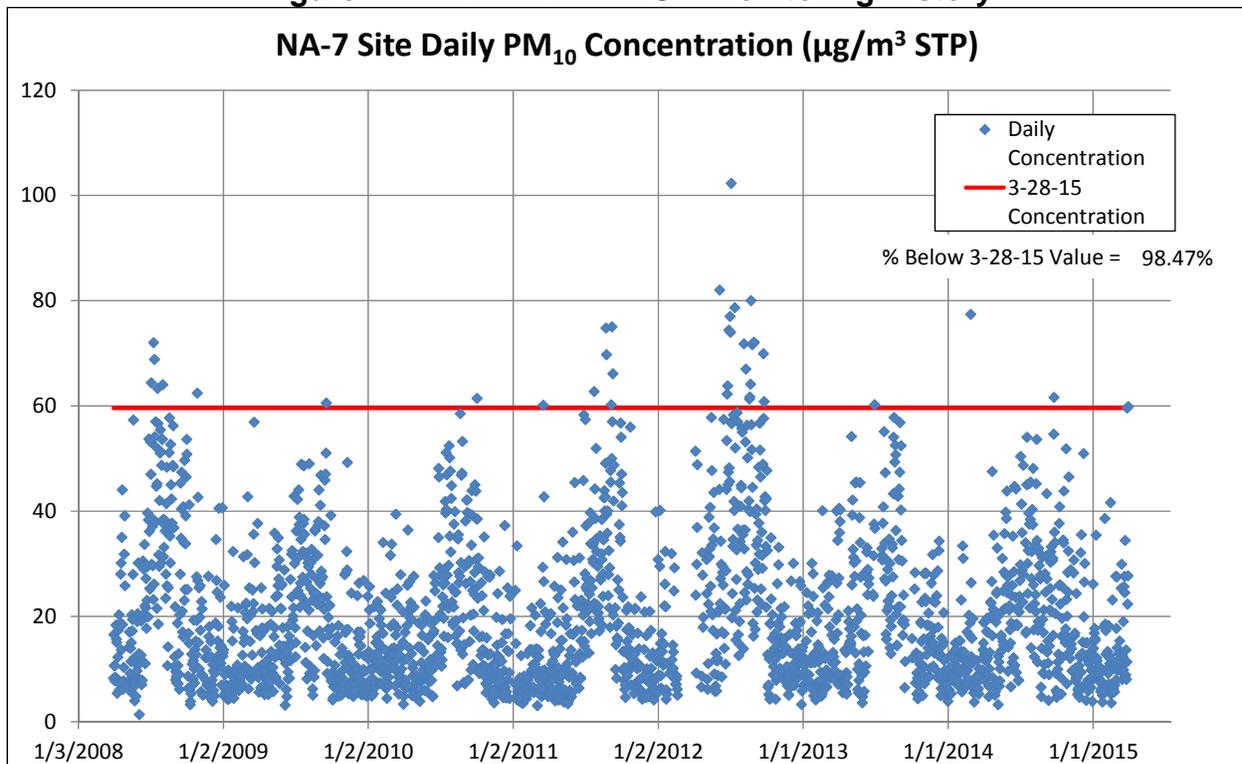
**Figure 10: North Antelope Rochelle and School Creek Monitoring Stations**



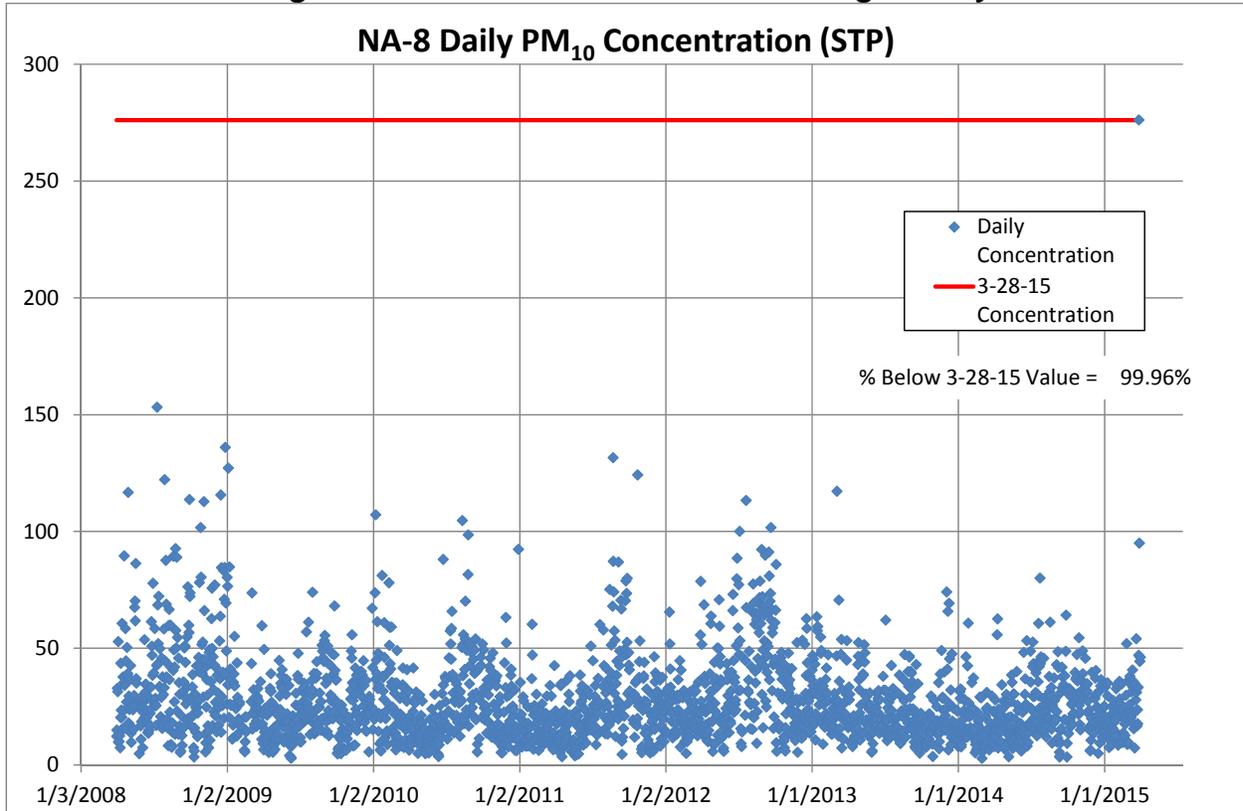
All three TEOM sites at NARM were evaluated: the background site and the two sites that exceeded the standard. On 3/28/15 the background site registered a 24-hour average in the 98<sup>th</sup> percentile of the last 7 years of daily averages (Figure 11). The two sites with exceedances both measured in the 99<sup>th</sup> percentile (Figure 12 and Figure 13). On 3/28/15 the NARM RO-1 site registered the fourth-highest daily average for this 7-year monitoring period. Therefore, 24-hour PM<sub>10</sub> concentrations for the date were substantially above the normal fluctuations at each site.

School Creek monitoring sites exhibit a similar history. On 3/28/15 the background site registered a 24-hour average in the 97<sup>th</sup> percentile of the last 4 years of daily averages (Figure 14). The two downwind sites both measured in the 99<sup>th</sup> percentile (Figure 15 and Figure 16). Although no official exceedances were measured at School Creek, 24-hour PM<sub>10</sub> concentrations for the date were substantially above the normal fluctuations at each of the three sites.

**Figure 11: NARM NA-7 TEOM Monitoring History**



**Figure 12: NARM NA-8 TEOM Monitoring History**



**Figure 13: NARM RO-1 TEOM Monitoring History**

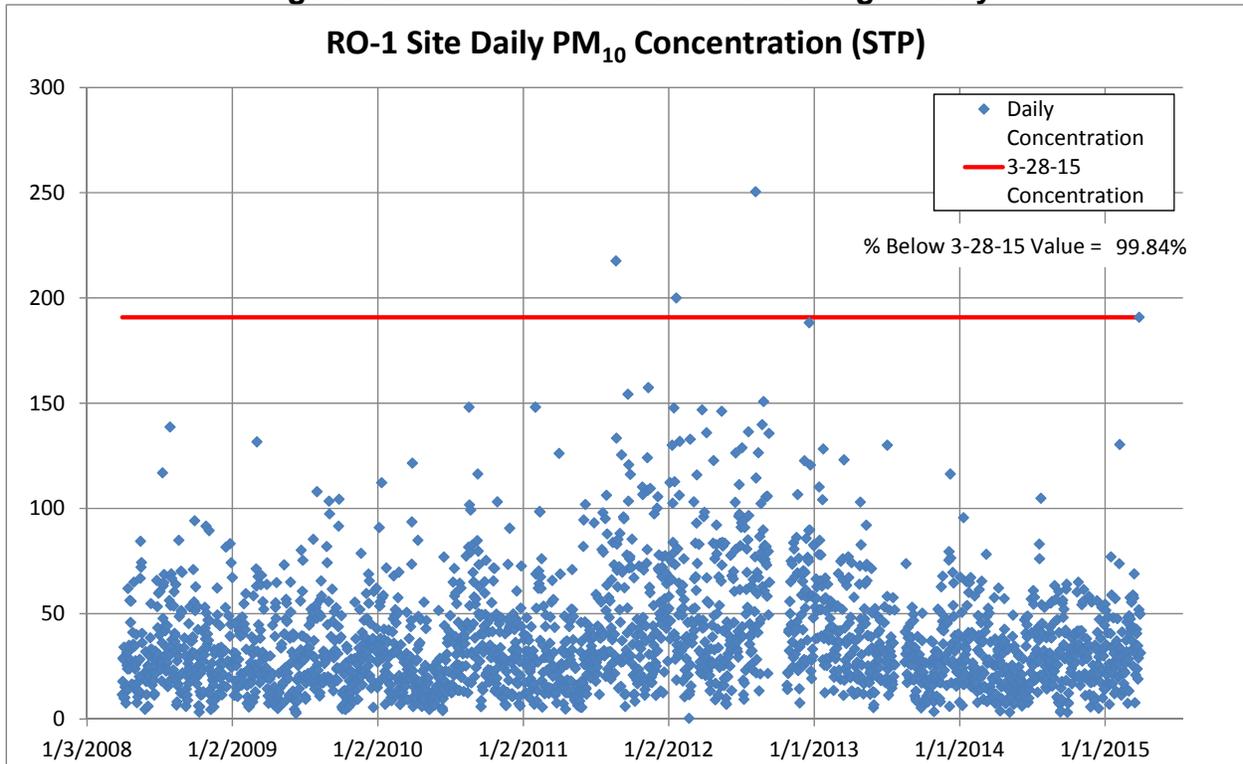
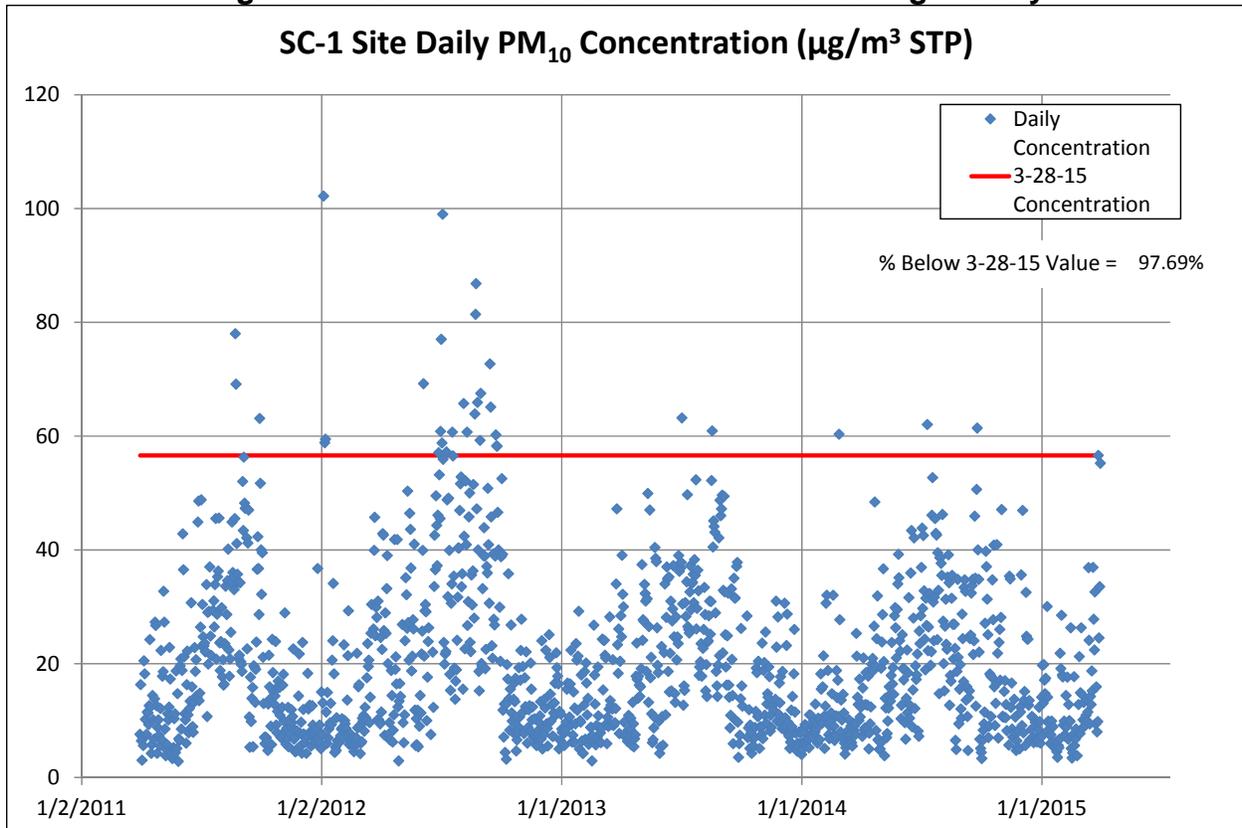
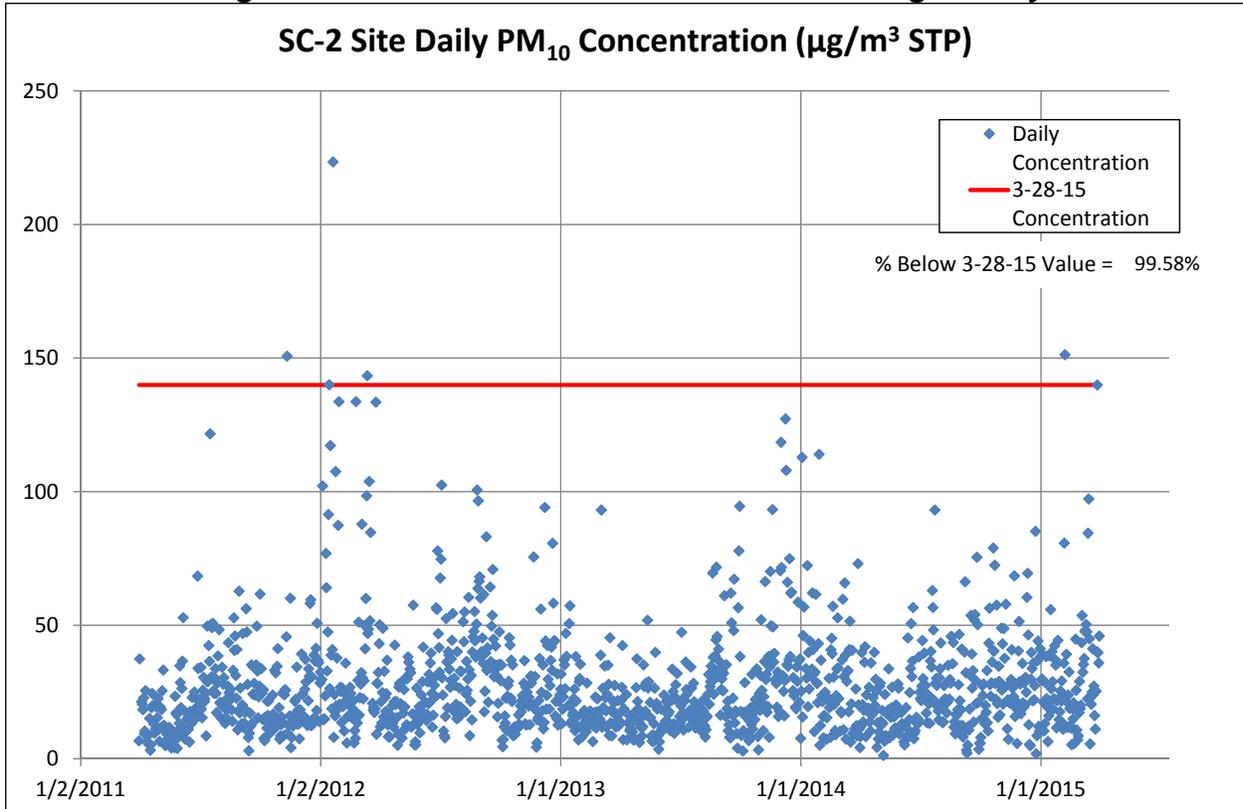


Figure 14: School Creek SC-1 TEOM Monitoring History



**Figure 15: School Creek SC-2 TEOM Monitoring History**



**Figure 16: School Creek SC-3 TEOM Monitoring History**

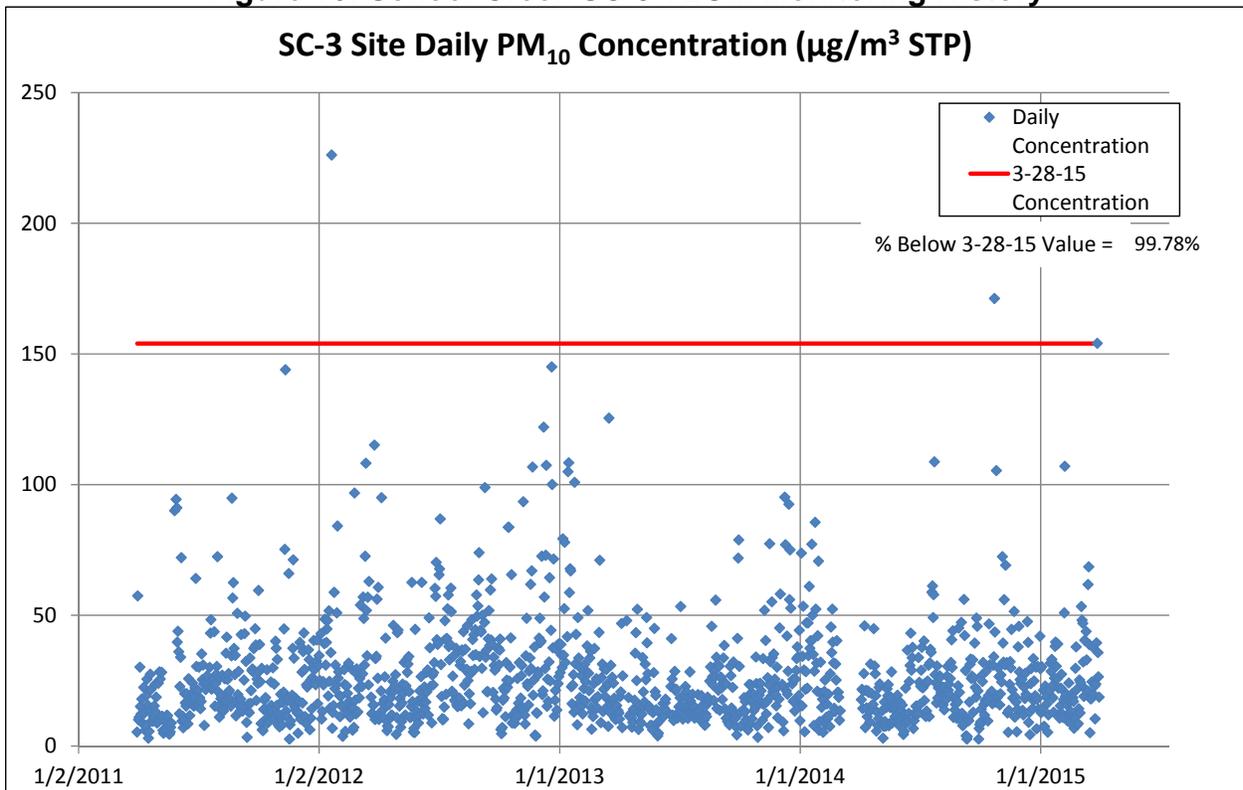


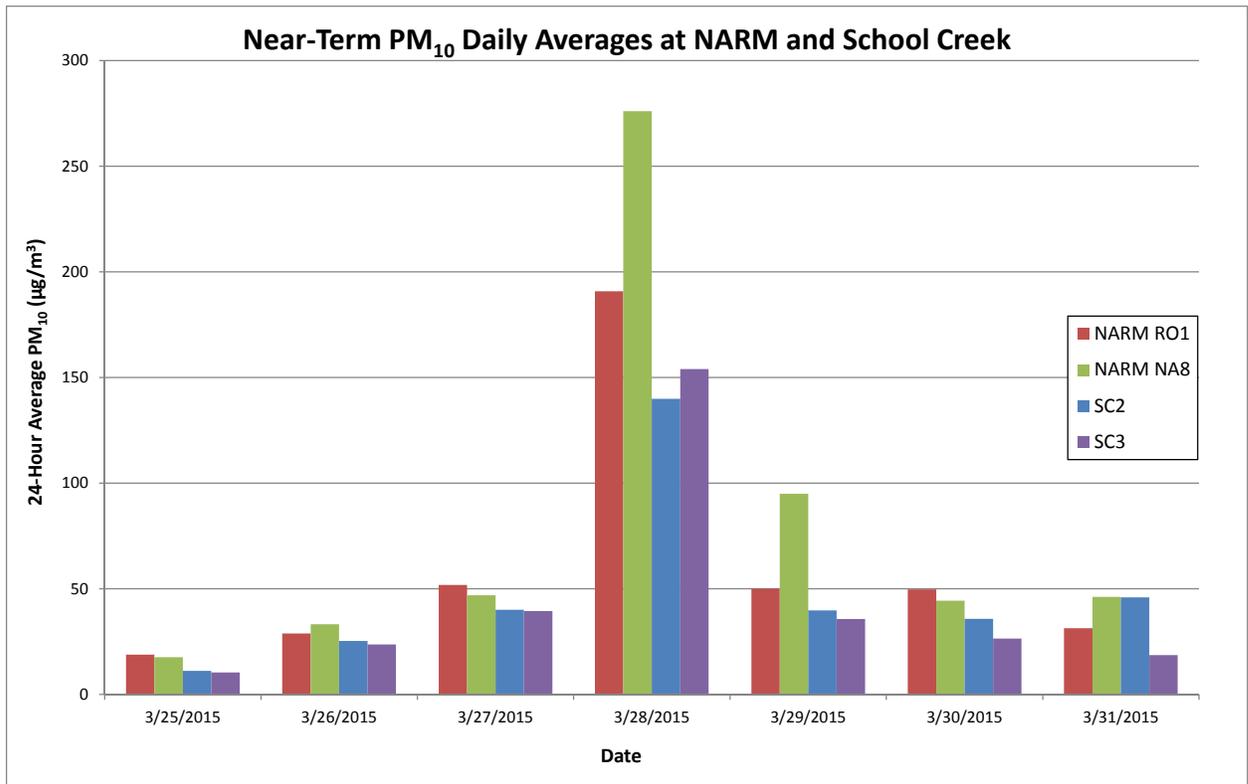
Table 6 summarizes the historical data from all six TEOM sites.

**Table 6: 24-Hr PM<sub>10</sub> Concentrations on 3/28/15 vs. Historical**

Mine	Site	Valid Days of Data	Percent Below 3/28/15 Avg.
NARM	NA-7 TEOM	2368	98.47%
NARM	NA-8 TEOM	2414	99.96%
NARM	RO-1 TEOM	2433	99.84%
School Creek	SC-1 TEOM	1430	97.69%
School Creek	SC-2 TEOM	1441	99.58%
School Creek	SC-3 TEOM	1389	99.78%

As illustrated in Figure 17, near-term comparisons support the unusual nature of the PM<sub>10</sub> levels measured on 3/28/15. On that day both NARM sites with exceedances registered three to four times the average concentrations on all other days of the week during which the exceedances occurred. The two downwind sites at School Creek also showed substantially elevated values on 3/28/15. This near-term comparison effectively eliminates differences in anthropogenic emission sources as the cause of the high PM<sub>10</sub> values, since these would not be expected to change significantly (and certainly not in unison) from day to day.

**Figure 17: NARM and School Creek TEOM Values for Week of March 28, 2015**



### 3.5 Clear Causal Relationship Between Measured Exceedance and The Event

Figure 18 graphs hourly TEOM values at both NA-8 and RO-1, along with hourly average wind speeds and peak gusts. Hourly average wind speed and hourly average PM<sub>10</sub> concentrations at both monitors peaked at 17:00 hours on March 28. Wind gusts may have exacerbated the suspension of particulate matter that led to the exceedances. The highest gust was over 62 mph, also during the hour ending at 17:00 hours.

Figure 18: NARM Hourly TEOM Values vs. Wind Speed on 3/28/15

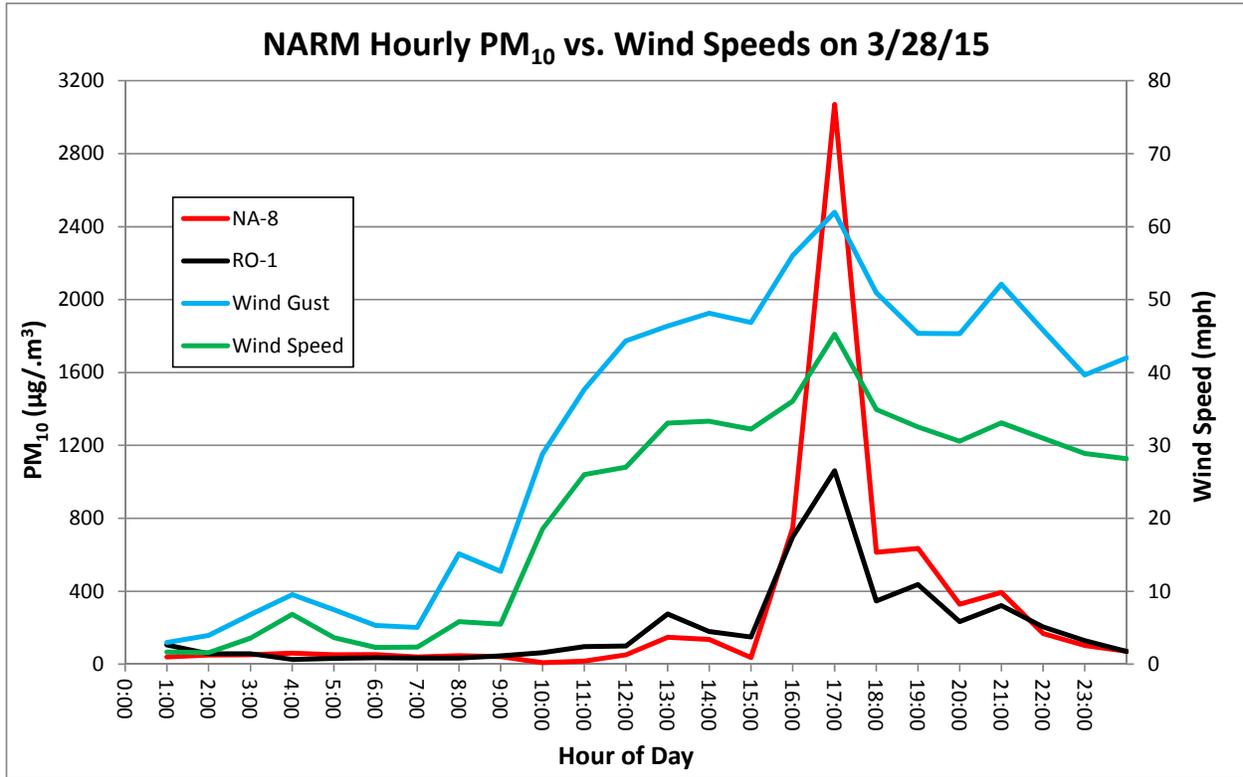
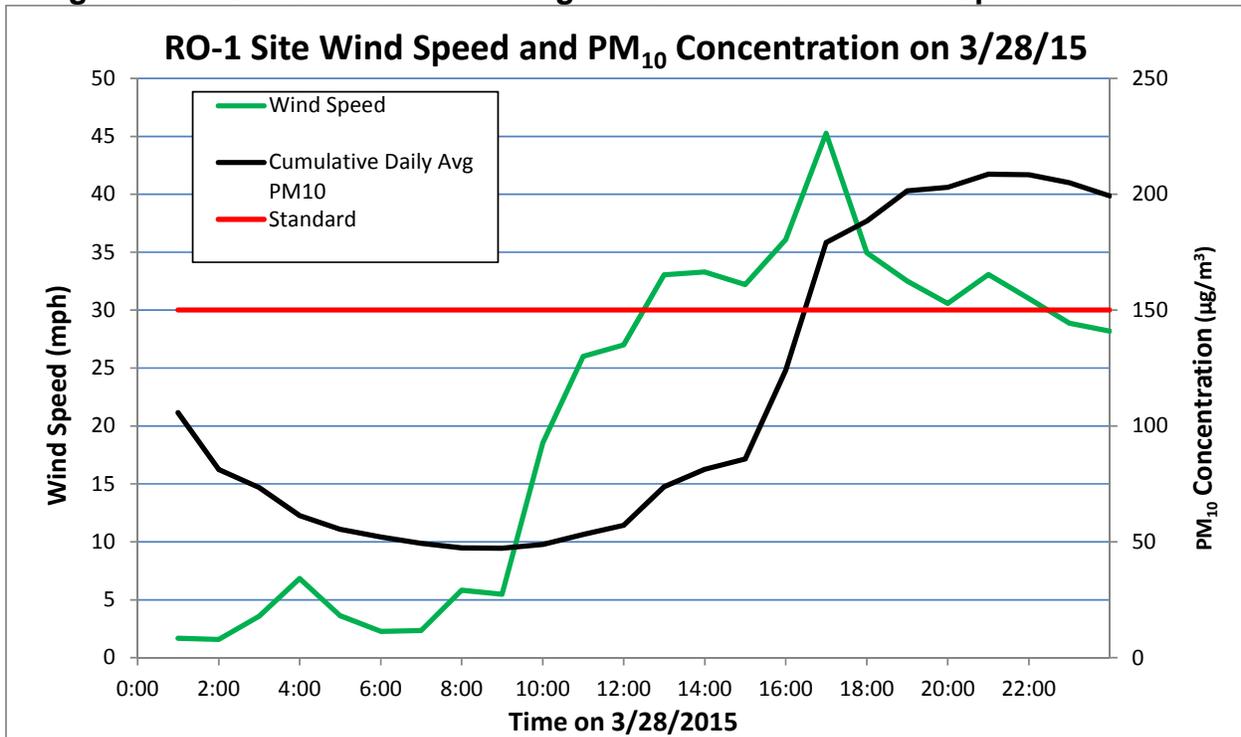


Figure 19 shows a causal relationship between cumulative daily average PM<sub>10</sub> values and wind speeds on the day of the exceedance at RO-1. As wind speeds increased above 30 mph the cumulative PM<sub>10</sub> average began a steep rise, exceeding the standard when the wind speed surpassed 35 mph. Prior to this point in time the cumulative daily average PM<sub>10</sub> concentration remained relatively flat, at approximately 50  $\mu\text{g}/\text{m}^3$ .

Figures 18 and 19 both suggest a wind speed threshold, above which both hourly and cumulative average PM<sub>10</sub> concentrations increased dramatically. These graphs further suggest that attempts to control fugitive emissions were somewhat effective below the threshold, but were overwhelmed by suspended dust above the threshold.

Figure 19: RO-1 Cumulative Average TEOM Values vs. Wind Speed on 3/28/15



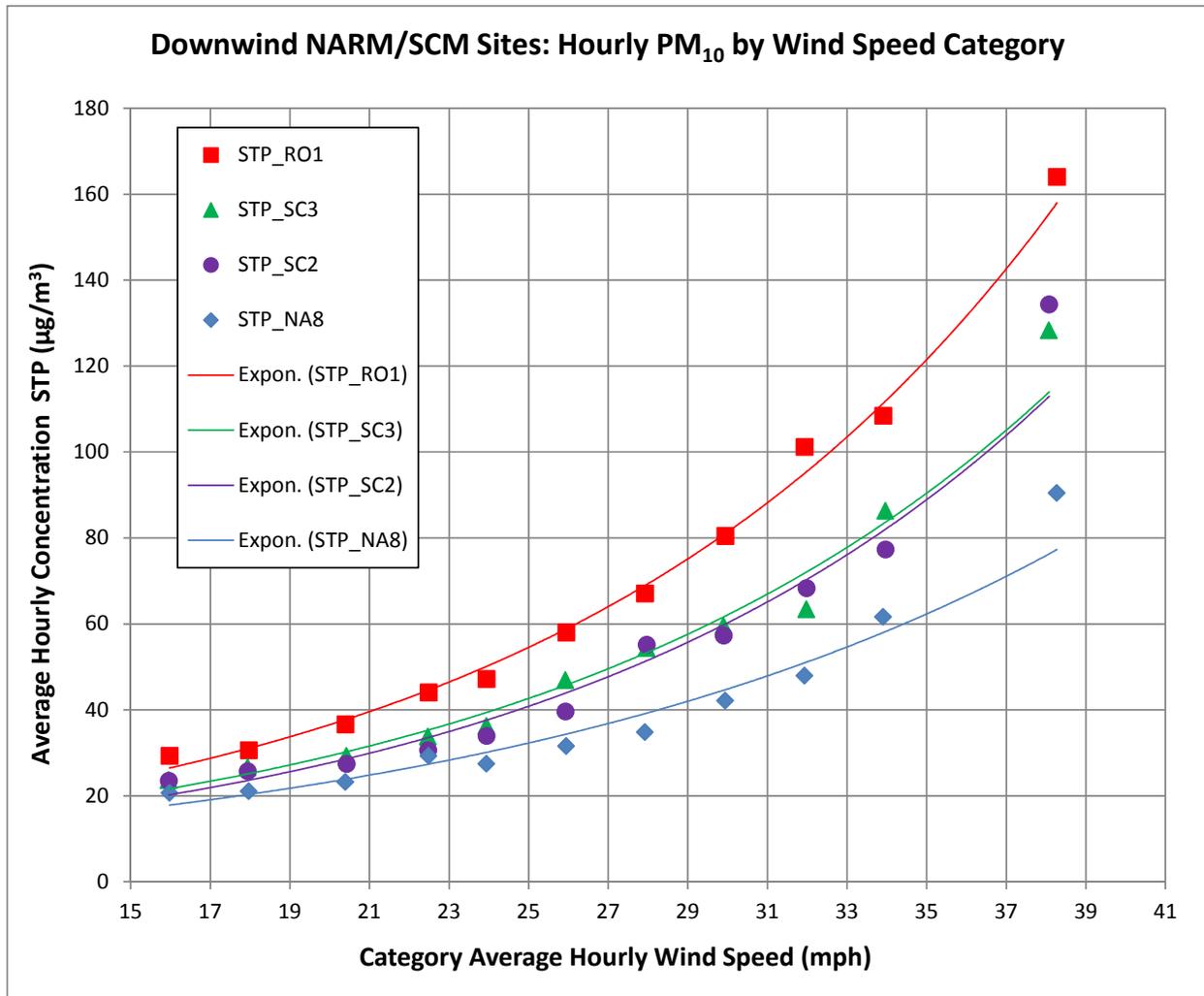
Aside from a clear relationship on March 28, 2015, a general causal relationship can be shown between elevated PM<sub>10</sub> values and high wind speeds at NARM. For this purpose, hourly wind speed and PM<sub>10</sub> data were synchronized for the last 7 years. These data were filtered to eliminate lower wind speeds which do not correlate positively with PM<sub>10</sub> concentrations (in fact they correlate negatively at very low wind speeds due to poor atmospheric mixing). This produced approximately 8,000 data points from the each site.

With extremely large data sets in which the random variation is dominant over the systematic or predictable variation, it is instructive to categorize the data. For this purpose, hourly wind speeds were classified into 2-mph increments beginning with 16 mph. The mean wind speed and mean PM<sub>10</sub> concentration were computed for each of these wind speed categories. This produced a more manageable data set with 11 wind speed categories and an average PM<sub>10</sub> concentration for each category.

Categorization of hourly wind data enables the clear demonstration of a predictable relationship between average wind speeds and average PM<sub>10</sub> concentrations. Figure 20 reveals that this relationship is exponential at both NARM downwind sites as well as at the SCM downwind sites. The R<sup>2</sup> values for this exponential fit range from 0.96 to 0.99,

indicating the relationship is very strong. Since the causal factors behind wind speed (i.e., atmospheric pressure and/or temperature differences) have no direct effect on air particulates, the wind speed itself must be the causal factor behind the strong relationship demonstrated in Figure 20.

**Figure 20: NARM and SCM Historical Hourly TEOM Values vs. Wind Speed**



At all four downwind sites, PM<sub>10</sub> concentration showed low sensitivity to wind speed in the classes with central values of 16 mph and 18 mph. At 20 mph and above, however, the sensitivity of PM<sub>10</sub> concentrations to wind speed increased progressively. This relationship has been previously demonstrated for the entire Powder River Basin (PRB), as the basis for wind speed thresholds in the Natural Events Action Plan (NEAP). The causal relationship between high winds and high ambient concentrations of PM<sub>10</sub> has also been inferred by EPA, which states, “For purposes of qualifying for the exclusion of data affected by wind events with sustained wind speeds above 25 miles per hour (or

above another threshold determined to be appropriate for a particular area), the demonstration of reasonable controls applied to disturbed landscapes and other anthropogenic sources of dust could be less rigorous because: (1) the contribution from natural undisturbed lands is likely to be high and, (2) at such high wind speeds many available controls would have been ineffective in significantly reducing wind-generated dust emissions” (EPA 2013a).

EPA reinforces this threshold in its Interim High Winds Guidance. “If an agency is unable to develop an area-specific high wind threshold, the EPA generally will accept a threshold of a sustained wind of 25 mph for areas in the west provided the agencies support this as the level at which they expect stable surfaces (i.e., controlled anthropogenic and undisturbed natural surfaces) to be overwhelmed” (EPA 2013b). For the PRB, a threshold wind speed of 20 mph was established in the NEAP for surface coal mines (WDEQ 2007). Above this threshold, wind speed tends to be the most consistent factor influencing ambient PM<sub>10</sub> concentrations.

The exceedances at NARM on 3/28/15 corresponded to hourly average wind speeds significantly higher than the PRB threshold of 20 mph and the EPA default threshold of 25 mph. High hourly PM<sub>10</sub> concentrations at NARM occurred during a 12-hour period when the wind speed averaged 33 mph. Even the NARM background monitoring site recorded four hourly PM<sub>10</sub> concentrations above the 24-hour standard, all of which corresponded to hourly average wind speeds in excess of 30 mph. It is therefore reasonable to assume (1) the contribution from natural undisturbed lands was high and, (2) at such high wind speeds the available controls were ineffective in significantly reducing wind-generated dust emissions from anthropogenic sources.

### **3.6 The Exceedance Would Not Have Occurred But For the High Wind Event**

Figures 18 and 19 above clearly show that high dust concentrations followed high winds, and PM<sub>10</sub> concentrations did not exceed the 24-hour standard until sustained wind speeds well over 25 mph occurred. To account for the exponential relationship demonstrated above, the natural logarithm of hourly PM<sub>10</sub> concentration was graphed against hourly wind speed for all three NARM TEOM sites on March 28, 2015 (Figures 21 - 23). All of the hourly concentrations in excess of the 24-hour standard coincided with hourly average wind speeds above 30 mph.

Figure 21: NA-7 Hourly TEOM Values vs. Wind Speed on 3/28/15

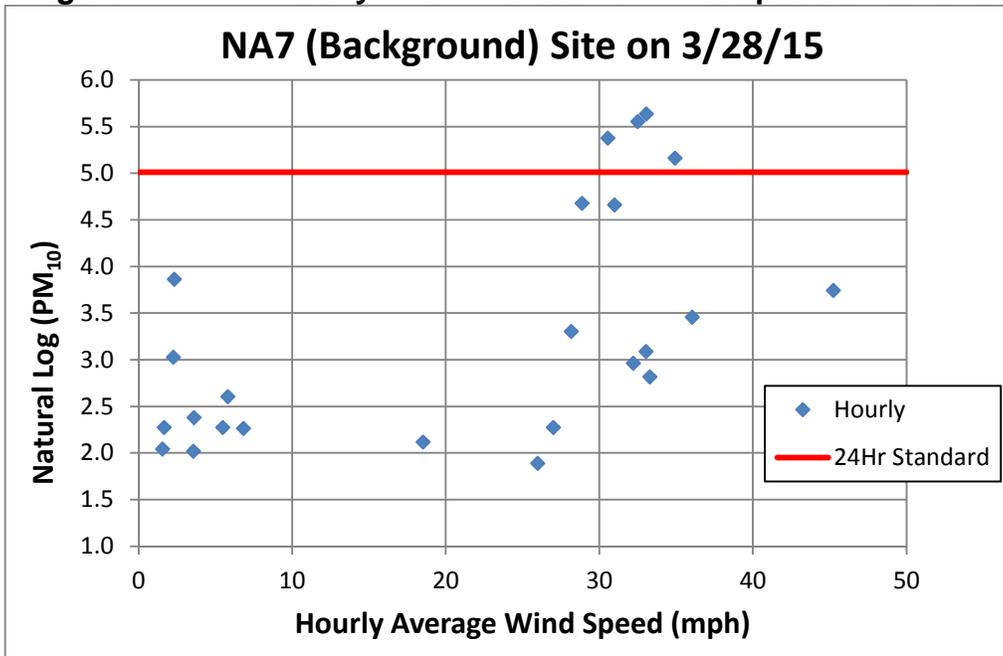


Figure 22: NA-8 Hourly TEOM Values vs. Wind Speed on 3/28/15

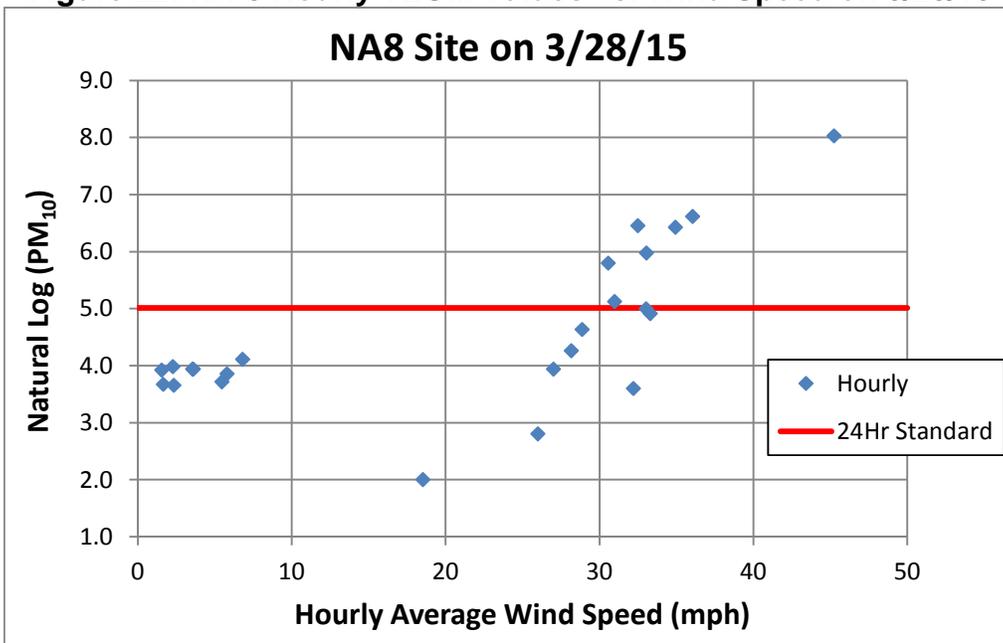
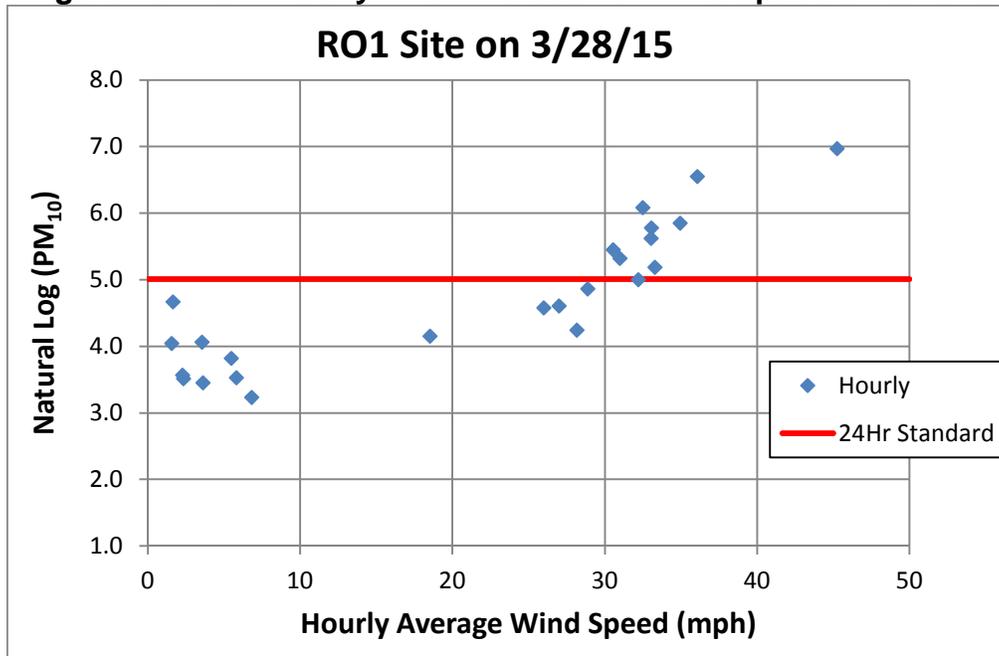


Figure 23: RO-1 Hourly TEOM Values vs. Wind Speed on 3/28/15



Since each hourly value exceeding the 24-hour standard on 3/28/15 was associated with a high wind speed, and since the lower hourly wind speeds on that day corresponded to PM<sub>10</sub> values below the standard, it is clear that the high 24-hour PM<sub>10</sub> concentrations would not have occurred without the high winds. Figure 19 demonstrates that the cumulative daily average PM<sub>10</sub> concentration on 3/28/15 did not exceed the standard until the onset of an extremely high hourly average wind speed (37 mph).

## 4.0 CONCLUSION

The North Antelope Rochelle Mine was in compliance with its air quality permit conditions and employed every reasonable means to avoid the exceedance on March 28, 2015. Unusually high wind speeds on that day overwhelmed these control measures. Therefore, Peabody requests that the RO-1 exceedance be flagged as an exceptional event.

Peabody's compliance with Air Quality Permit MD-16282 on and before March 28 is supported by the responsive actions discussed above, the Real-Time Emission Monitoring Program (dust action plan Appendix A), the documented opacity observations for 1<sup>st</sup> quarter of 2014 (Appendix E and F), and the 2014 Annual Inspection Report (WDEQ 2014b). Correspondence between NARM and the Air Quality Division regarding the March 28, 2015 exceedance is documented in Appendix C. The dust suppression report is contained in Appendix D.

The evidence arising from an objective assessment of (1) the reduction and ultimate cessation of operations in all NARM pits on March 28, 2015, (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, supports a conclusion that reasonable controls were applied to anthropogenic sources of dust at NARM that impacted monitor RO-1. Despite such controls, sustained high winds unavoidably led to that day's PM<sub>10</sub> NAAQS exceedance.

## 5.0 REFERENCES

- EPA 2013a, Memorandum on Interim Guidance to Implement Requirements for the Treatment of Air Quality Monitoring Data Influenced by Exceptional Events, USEPA, May 2013.
- EPA 2013b, Interim Guidance on the Preparation of Demonstrations in Support of Requests to Exclude Ambient Air Quality Data Affected by High Winds Under the Exceptional Events Rule, USEPA, May 2013.
- NOAA 2015, Friendly Forecast website, Historical Hazards, March 28, 2015;  
[http://www.friendlyforecast.com/usa/archive/archive.php?region=WY&id=326283  
&?-Forecast-Wright-Wyoming&date=20150328000000&sort=hour#Hazard](http://www.friendlyforecast.com/usa/archive/archive.php?region=WY&id=326283&?-Forecast-Wright-Wyoming&date=20150328000000&sort=hour#Hazard)
- WDEQ 2014a, North Antelope Rochelle Mine Air Quality Permit MD-16282, Wyoming Department of Environmental Quality, Air Quality Division, September 5, 2014.
- WDEQ 2014b, 2014 Annual Inspection Report, Peabody Powder River Mining, LLC North Antelope Rochelle Mine, Wyoming Department of Environmental Quality, Air Quality Division, Inspected August 28, 2014.
- WDEQ 2007, Natural Events Action Plan for the Coal Mines of the Powder River Basin of Campbell & Converse Counties, Revision 1/23/07, Wyoming Department of Environmental Quality, Air Quality Division.

## **APPENDIX A – NARM REAL-TIME EMISSION MONITORING PROGRAM**

### 4.3.2 Real-Time Emission Monitoring Program

NARM voluntarily replaced PM<sub>10</sub> monitors with continuous tapered element oscillating microbalance (TEOM) samplers. This new system became operational in February 2002. One of the major reasons for this replacement strategy included enhancing the mine's ability to determine the immediate sources of emissions and respond to high levels of fugitive particulate emissions based on real time data. The mine has installed an automated system that triggers an alarm at the NARM Security Office when monitored emissions elevate to a level of concern. These levels have been set low enough that emission sources can be proactively determined and appropriate measures can be implemented in a timely fashion. At times NARM may elect to operate with lower threshold levels without compromising or revising this plan. Threshold levels above these values will not be implemented without approval from AQD.

When hourly values are found to be above 250 µg/m<sup>3</sup> but below 500 µg/m<sup>3</sup> or the 24-hour values are above 75 µg/m<sup>3</sup> but below the 100 µg/m<sup>3</sup> alarm level, operations personnel will determine possible emission source areas at and surrounding the mine in addition to monitoring hourly reading trends. Certain factors such as the weather forecast and actual wind speed and direction will be checked. Preparatory actions will be implemented when necessary. These actions may include determining the availability and staffing of water trucks, the nature and location of any contractor activities, or optional digging or haulage plans. Pertinent records generated from the mine's response to elevated readings will be kept at the mine.

When a one-hour concentration exceeds 500 µg/m<sup>3</sup> or the 24-hour value exceeds 100 µg/m<sup>3</sup>, the response to these alarms will include, but may not be limited to,

inspection of the immediate vicinity of the monitors, focused chemical and water treatment in active mine areas, and if necessary, temporary realignment or suspension of certain mine activities that are determined to contribute to the levels of concern. If the source(s) is not at NARM and continues to be a significant contributor of emissions, NARM personnel will document the source(s) and contact AQD, when possible. All associated records will be filed at the mine as a demonstration of NARM's proactive approach to controlling excessive fugitive particulate. Because of the automated data collection and alarm system coupled with immediate notification and involvement of operations personnel, this plan has been shown to be workable and effective 24 hours per day.

## **APPENDIX B – HIGH WIND WARNING AND AIR QUALITY ALERT**

## **High Wind Warning**

- With Gusts As High As 60 Mph. Northern Campbell-southern Campbell-western Crook-weston- Including The Cities Of - Gillette - Wright - Moorcroft - Hulett - Newcastle  
1007 Am Mdt Sat Mar 28 2015

A High Wind Warning Remains In Effect From 3 Pm This Afternoon To Midnight Mdt Tonight.

\* Timing - Late This Afternoon And Evening.

\* Winds - Northwest 30 To 40 Mph With Gusts Up To 60 Mph.

\* Impacts - High Winds Can Blow Down Large Trees - And Damage Roofs - Small Outbuildings - And Signs. Sudden Wind Gusts Can Cause Drivers To Lose Control - Especially In Lightweight Or High Profile Vehicles. Strong Winds Can Cause Blowing Dust - Reduced Visibility - And Flying Debris.

## **Air Quality Alert**

- Blowing Dust Health Alert In Effect For All Of Powder River Basin Of Northeastern Wyoming From 3 Pm This Afternoon Until Midnight Tonight -

West Wind Of 20 To 35 Mph Early This Afternoon Will Shift To The Northwest And Increase To 30 To 40 Mph - With Gusts To 60 Mph. The Winds Will Decrease Around Midnight.

The Wyoming Air Quality Division Recommends The Elderly - Young Children - And Individuals With Respiratory Problems Avoid Excessive Physical Exertion And Minimize Outdoor Activities During This Time. Although These People Are Most Susceptible To Health Impacts - The Air Quality Division Also Advises That Everyone Should Avoid Prolonged Exposure To The Poor Air Quality Conditions.

<http://www.friendlyforecast.com/usa/archive/archive.php?region=WY&id=326283&?-Forecast-Echeta-Wyoming&date=20150328000000&sort=hour#Hazard>

All weather information, data and some images is courtesy and copyright of NOAA.

**APPENDIX C – WDEQ AQD COMMUNICATION LOG**

**From:** "Hansen, Bryan" <[BHansen@PeabodyEnergy.com](mailto:BHansen@PeabodyEnergy.com)>  
**Date:** March 30, 2015 at 9:32:22 AM MDT  
**To:** Tanner Shatto <[tanner.shatto@wyo.gov](mailto:tanner.shatto@wyo.gov)>  
**Cc:** "Basko, Rose" <[RBasko@peabodyenergy.com](mailto:RBasko@peabodyenergy.com)>, "Kezar, Cyrus" <[CKezar@peabodyenergy.com](mailto:CKezar@peabodyenergy.com)>, "Knezovich, Rena J." <[RKnezovich@peabodyenergy.com](mailto:RKnezovich@peabodyenergy.com)>  
**Subject:** RE: Air Pollution Alert (3/28/2015)

NA-8 exceeded: 276  
RO-1 exceeded: 190  
SC-3 did not exceed: 154

BWH

**From:** Tanner Shatto [<mailto:tanner.shatto@wyo.gov>]  
**Sent:** Monday, March 30, 2015 7:13 AM  
**To:** Hansen, Bryan  
**Subject:** Re: Air Pollution Alert (3/28/2015)

How did Saturday turn out?

On Sat, Mar 28, 2015 at 8:23 PM, Hansen, Bryan <[BHansen@peabodyenergy.com](mailto:BHansen@peabodyenergy.com)> wrote:

Tanner: SC-3, RO-1 and NA-8 may exceed; high wind event no doubt. Both School Creek and NARM have suspended operations.

BWH

Sent from my iPhone

On Mar 28, 2015, at 9:07 AM, Tanner Shatto <[tanner.shatto@wyo.gov](mailto:tanner.shatto@wyo.gov)> wrote:

----- Forwarded message -----

**From:** Kyle Carstens - NOAA Federal <[kyle.carstens@noaa.gov](mailto:kyle.carstens@noaa.gov)>  
**Date:** Sat, Mar 28, 2015 at 3:37 AM  
**Subject:** Air Pollution Alert (3/28/2015)  
**To:** Tanner Shatto <[tanner.shatto@wyo.gov](mailto:tanner.shatto@wyo.gov)>

AIR QUALITY ALERT MESSAGE  
WYOMING AIR QUALITY DIVISION  
RELAYED BY NATIONAL WEATHER SERVICE RAPID CITY SD  
310 AM MDT SAT MAR 28 2015

...BLOWING DUST HEALTH ALERT IN EFFECT FOR ALL OF POWDER RIVER BASIN OF NORTHEASTERN WYOMING FROM 3 PM THIS AFTERNOON UNTIL MIDNIGHT TONIGHT...

WEST WIND OF 20 TO 35 MPH EARLY THIS AFTERNOON WILL SHIFT TO THE

NORTHWEST AND INCREASE TO 30 TO 40 MPH...WITH GUSTS TO 60 MPH.  
THE WINDS WILL DECREASE AROUND MIDNIGHT.

THE WYOMING AIR QUALITY DIVISION RECOMMENDS THE ELDERLY...YOUNG CHILDREN...AND INDIVIDUALS WITH RESPIRATORY PROBLEMS AVOID EXCESSIVE PHYSICAL EXERTION AND MINIMIZE OUTDOOR ACTIVITIES DURING THIS TIME. ALTHOUGH THESE PEOPLE ARE MOST SUSCEPTIBLE TO HEALTH IMPACTS...THE AIR QUALITY DIVISION ALSO ADVISES THAT EVERYONE SHOULD AVOID PROLONGED EXPOSURE TO THE POOR AIR QUALITY CONDITIONS.

Tanner B. Shatto  
District 3 Engineer  
Wyoming Department of Environmental Control  
Air Quality Division  
Direct: (307)675-5626  
Office: (307)673-9337  
Fax: (307)672-2213  
[tanner.shatto@wyo.deq](mailto:tanner.shatto@wyo.deq)



**APPENDIX D – NARM 2014 DUST SUPPRESSION REPORT**



North Antelope Rochelle Mine

Caller Box 3035  
Gillette, Wyoming 82717-3035  
(307) 464-4730 Fax: (307) 464-4706

March 31, 2015

Mr. Tanner Shatto  
Division Engineer  
WDEQ/AQD  
2100 West 5th St.  
Sheridan, WY 82801

CERTIFIED MAIL :

RE: MD-16282 North Antelope Rochelle Mine 2014 Summary Report

Mr. Shatto,

North Antelope Rochelle Mine (NARM) hereby submits the annual summary report addressing road dust control measures employed during the past year and a disturbed acreage report for 2014 in accordance with Permit MD-16282, conditions 15 and 17.

NARM is requesting an extension of thirty days to allow additional preparation of the Network Justification Report due to the complexities associated with siting of a monitor in the southern area of the mine.

Please contact Bryan Hansen with any questions at 307-464-4772.

Thank you,

Rose Basko  
Sr. Environmental Analyst

cc: Fred Dilella, AQD Cheyenne  
Cara Keslar, AQD Cheyenne

**2014 North Antelope Rochelle Mine  
Annual Summary Report  
Permit MD-16282**

Please see the attached map for 2014 which includes roads existing at the end of 2014 which have been treated with water and/or dust suppressant, locations of active operations, treated disturbed areas (including treated pre-strip acres, temporary seeded acres and topsoil treated lay down area) and reclaimed areas (permanent seeded acres).

Condition 22 of MD-16282 to justify the locations of current monitoring locations for the coming year will be sent at a later time due to the complexities involving monitor siting.

**Mine Production Rates**

North Antelope Rochelle Mine produced 104,292,043 tons of coal, shipped 104,393,533 tons of coal and moved 437,866,424 cubic yards of overburden in 2014.

**Control Measures: Acreage**

2014 Control Measures (ACRES)						
TIMING	TREATMENT	1 QTR	2 QTR	3 QTR	4 QTR	TOTAL
2014	Permanent seed acres	0	837	0	0	837
2014	Treated pre-strip acres*	480	849	1405	1167	3901
2014	Temporary seed acres	128	0	0	201	329
2014	Topsoil treated lay down acres*	149	208	96	272	725
	Active Area acres					5,613
2014	TOTAL OPEN ACRES					9,054

\*Treated by ripping/scarifying

**2014 Percent of Treated Open Acres**

<u>Treated Acres</u>	=	5,067	<b>55.1%</b>
Total Open Acres		9,054	

**Dust Suppression: Chemical Suppressant and Water Application**

North Antelope Rochelle applied 1,152,792 gallons of 30% Magnesium Chloride solution to the roads and facility areas in 2014. The chemical was mixed at a ratio of 1/2 gallon per square yard per application of road section. Haul roads and facility areas were prepared using blades, scrapers and dozers. Mine and contractor water trucks were used to wet the prepared areas before and after application. Chemical was applied to 318.7 acres of haul roads, rail loop, and facilities areas in 2014.

TIMING	TREATMENT	1 QTR	2 QTR	3 QTR	4 QTR
2014	Chemical treated haul roads	0	0	345.52	0
End of 2014	Chemical treated light duty roads**	0	0	55.57	0

Please note that haul roads and light duty roads receive water treatment year-round in addition to the chemical treatment. Various roads in the pits are temporary and short-lived, and therefore, are treated only with water.

North Antelope Rochelle Mine logged 12,818 equipment hours, applying 308,222,800 gallons of water to haul roads for dust suppression in 2014. Topsoil contractors applied an additional 11,198,400 gallons of water to topsoil removal and lay-down areas in 2014.

Nine water trucks operated in 2014 and are listed below according to unit number, gallons of capacity and hours of operation.

UNIT #	Gallons	Hours
702	20,000	796
704	20,000	1,425
705	20,000	1,479
710	40,000	1,428
711	40,000	1,006
712	40,000	1,393
713	40,000	1,399
714	40,000	2,382
715	40,000	1,510

**APPENDIX E – METHOD 9 OPACITY OBSERVATION REPORT**

## EPA METHOD 9 (40 CFR 60 – APPENDIX A) VISIBLE EMISSION OBSERVATION FORM

COMPANY NAME POWDER RIVER COAL COMPANY		
LOCATION NORTH ANTELOPE ROCHELLE MINE		
ADDRESS 339 ANTELOPE ROAD		
CITY WRIGHT	STATE WY	ZIP 82730
PROCESS EQUIPMENT TRUCK DUMP		
CONTROL EQUIPMENT STILLING SHED		
DESCRIBE EMISSION POINT STILLING SHED DOOR		
HEIGHT OF EMISSION POINT <i>80'</i>		
HEIGHT RELATIVE TO OBSERVER <i>80'</i>		
DISTANCE OF EMISSION POINT <i>150'</i>		
DIRECTION TO EMISSION POINT <i>E</i>		
DESCRIBE EMISSIONS COAL DUST		
EMISSION COLOR BLACK		
DESCRIBE PLUME BACKGROUND SKY		
BACKGROUND COLOR <i>Blue sky</i>		
AMBIENT TEMPERATURE <i>45° F</i>		
WIND SPEED <i>8 mph</i>		
WIND DIRECTION <i>S/SW (189°)</i>		
SKY CONDITIONS <i>clear</i>		
<div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="text-align: center;"> <p>Source Layout Sketch</p> </div> <div style="text-align: right;"> <p>Draw North Arrow <input type="checkbox"/> TN <input type="checkbox"/> MN</p> </div> </div> <div style="margin-top: 10px;"> <p>Side View</p> <p>Stack with Plume</p> <p>Sun</p> <p>Wind</p> </div>		
ADDITIONAL INFORMATION		

DATE <i>1-29-15</i>	START TIME <i>3:15</i>	END TIME <i>3:21</i>
------------------------	---------------------------	-------------------------

SEC MIN	0	15	30	45	COMMENTS
1	<i>0</i>	<i>5</i>	<i>15</i>	<i>5</i>	<i>#271</i>
2	<i>10</i>	<i>0</i>	<i>5</i>	<i>40</i>	<i>#289</i>
3	<i>30</i>	<i>0</i>	<i>5</i>	<i>5</i>	<i>#237</i>
4	<i>10</i>	<i>5</i>	<i>5</i>	<i>0</i>	
5	<i>0</i>	<i>0</i>	<i>5</i>	<i>5</i>	<i>#261</i>
6	<i>5</i>	<i>5</i>	<i>5</i>	<i>0</i>	
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

SUM OF OPACITY READINGS:	<i>160</i>
NUMBER OF READINGS:	<i>24</i>
AVERAGE OPACITY (SUM ÷ NUMBER):	<i>6.7 %</i>
OBSERVER'S NAME (PRINT) <i>Rose Basko</i>	
OBSERVER'S SIGNATURE <i>Rose Basko</i>	DATE <i>1-29-15</i>
ORGANIZATION <i>Peabody</i>	
CERTIFIED BY <i>C. Koontz</i>	DATE <i>October 2014</i>

### EPA METHOD 9 (40 CFR 60 – APPENDIX A) VISIBLE EMISSION OBSERVATION FORM

COMPANY NAME POWDER RIVER COAL COMPANY		
LOCATION NORTH ANTELOPE ROCHELLE MINE		
ADDRESS 339 ANTELOPE ROAD		
CITY WRIGHT	STATE WY	ZIP 82730
PROCESS EQUIPMENT TRUCK DUMP		
CONTROL EQUIPMENT STILLING SHED		
DESCRIBE EMISSION POINT STILLING SHED DOOR		
HEIGHT OF EMISSION POINT <i>80'</i>		
HEIGHT RELATIVE TO OBSERVER <i>80'</i>		
DISTANCE OF EMISSION POINT <i>200-250'</i>		
DIRECTION TO EMISSION POINT <i>E</i>		
DESCRIBE EMISSIONS COAL DUST		
EMISSION COLOR BLACK		
DESCRIBE PLUME BACKGROUND SKY		
BACKGROUND COLOR <i>Blue Sky</i>		
AMBIENT TEMPERATURE <i>45°F</i>		
WIND SPEED <i>7 mph</i>		
WIND DIRECTION <i>S/SW (193°)</i>		
SKY CONDITIONS <i>Clear</i>		
<div style="border: 1px solid black; padding: 5px;"> <p>Source Layout Sketch</p> <div style="display: flex; justify-content: space-between;"> <div> <p>Draw North Arrow</p> <input type="checkbox"/> TN <input type="checkbox"/> MN         </div> <div style="text-align: right;"> </div> </div> <div style="margin-top: 10px;"> </div> <div style="margin-top: 10px;"> <p>Stack with Plume </p> <p>Sun </p> <p>Wind </p> </div> </div>		
ADDITIONAL INFORMATION		

DATE <i>1-29-15</i>	START TIME <i>2:25</i>	END TIME <i>2:31</i>
------------------------	---------------------------	-------------------------

SEC MIN	0	15	30	45	COMMENTS
1	<i>0</i>	<i>0</i>	<i>5</i>	<i>10</i>	<i>#837</i>
2	<i>5</i>	<i>5</i>	<i>0</i>	<i>0</i>	
3	<i>0</i>	<i>0</i>	<i>5</i>	<i>5</i>	<i>#816</i>
4	<i>5</i>	<i>0</i>	<i>0</i>	<i>5</i>	<i>#290</i>
5	<i>0</i>	<i>5</i>	<i>5</i>	<i>15</i>	
6	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

SUM OF OPACITY READINGS:	<i>70</i>
NUMBER OF READINGS:	<i>24</i>
AVERAGE OPACITY (SUM ÷ NUMBER):	<i>2.9</i> %
OBSERVER'S NAME (PRINT) <i>Rose Basko</i>	
OBSERVER'S SIGNATURE <i>Rose Basko</i>	DATE <i>1-29-15</i>
ORGANIZATION <i>Peabody</i>	
CERTIFIED BY <i>C. Koontz</i>	DATE <i>October 2014</i>

## EPA METHOD 9 (40 CFR 60 – APPENDIX A) VISIBLE EMISSION OBSERVATION FORM

COMPANY NAME POWDER RIVER COAL COMPANY		
LOCATION NORTH ANTELOPE ROCHELLE MINE		
ADDRESS 339 ANTELOPE ROAD		
CITY WRIGHT	STATE WY	ZIP 82730
PROCESS EQUIPMENT TRUCK DUMP		
CONTROL EQUIPMENT STILLING SHED		
DESCRIBE EMISSION POINT STILLING SHED DOOR		
HEIGHT OF EMISSION POINT <i>80'</i>		
HEIGHT RELATIVE TO OBSERVER <i>80'</i>		
DISTANCE OF EMISSION POINT <i>150-200'</i>		
DIRECTION TO EMISSION POINT <i>W</i>		
DESCRIBE EMISSIONS COAL DUST		
EMISSION COLOR BLACK		
DESCRIBE PLUME BACKGROUND SKY		
BACKGROUND COLOR <i>Light gray</i>		
AMBIENT TEMPERATURE <i>29°F</i>		
WIND SPEED <i>7 mph</i>		
WIND DIRECTION <i>W 278°</i>		
SKY CONDITIONS <i>mostly cloudy</i>		
<div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="text-align: center;"> <p>Source Layout Sketch</p> </div> <div style="text-align: right;"> <p>Draw North Arrow</p> <input type="checkbox"/> TN <input type="checkbox"/> MN  </div> </div>		
ADDITIONAL INFORMATION		

DATE <i>2-24-15</i>	START TIME <i>9:10</i>	END TIME <i>9:16</i>
------------------------	---------------------------	-------------------------

SEC MIN					COMMENTS
	0	15	30	45	
1	<i>0</i>	<i>5</i>	<i>10</i>	<i>20</i>	<i>#209</i>
2	<i>10</i>	<i>5</i>	<i>0</i>	<i>35</i>	<i>#208</i>
3	<i>25</i>	<i>5</i>	<i>5</i>	<i>5</i>	
4	<i>0</i>	<i>20</i>	<i>35</i>	<i>25</i>	<i>#289</i>
5	<i>20</i>	<i>10</i>	<i>10</i>	<i>5</i>	
6	<i>5</i>	<i>5</i>	<i>5</i>	<i>5</i>	
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

SUM OF OPACITY READINGS:	<i>270</i>
NUMBER OF READINGS:	<i>24</i>
AVERAGE OPACITY (SUM ÷ NUMBER):	<i>11.3</i> %
OBSERVER'S NAME (PRINT) <i>Rose Basko</i>	
OBSERVER'S SIGNATURE <i>Rose Basko</i>	DATE <i>2-24-15</i>
ORGANIZATION <i>Peabody</i>	
CERTIFIED BY <i>C. Koontz</i>	DATE <i>October 2014</i>

**EPA METHOD 9 (40 CFR 60 – APPENDIX A)  
VISIBLE EMISSION OBSERVATION FORM**

COMPANY NAME POWDER RIVER COAL COMPANY		
LOCATION NORTH ANTELOPE ROCHELLE MINE		
ADDRESS 339 ANTELOPE ROAD		
CITY WRIGHT	STATE WY	ZIP 82730
PROCESS EQUIPMENT TRUCK DUMP		
CONTROL EQUIPMENT STILLING SHED		
DESCRIBE EMISSION POINT STILLING SHED DOOR		
HEIGHT OF EMISSION POINT <span style="float:right">80'</span>		
HEIGHT RELATIVE TO OBSERVER <span style="float:right">200'</span>		
DISTANCE OF EMISSION POINT <span style="float:right">200'</span>		
DIRECTION TO EMISSION POINT <span style="float:right">E</span>		
DESCRIBE EMISSIONS COAL DUST		
EMISSION COLOR BLACK		
DESCRIBE PLUME BACKGROUND SKY		
BACKGROUND COLOR <span style="float:right">Blue sky</span>		
AMBIENT TEMPERATURE <span style="float:right">45° F</span>		
WIND SPEED <span style="float:right">7 mph</span>		
WIND DIRECTION <span style="float:right">S/SW</span>		
SKY CONDITIONS <span style="float:right">clear</span>		
<div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="text-align: center;"> <p>Source Layout Sketch</p> <p>Observer's Position</p> <p>Observation Point</p> <p>Sun Location Line</p> <p>40°</p> </div> <div style="text-align: center;"> <p>Draw North Arrow</p> <p><input type="checkbox"/> TN <input type="checkbox"/> MN</p> </div> <div style="text-align: center;"> <p>Side View</p> <p>Stack with Plume</p> <p>Sun</p> <p>Wind</p> </div> </div>		
ADDITIONAL INFORMATION		

DATE <span style="font-size: 1.2em;">1-29-15</span>	START TIME <span style="font-size: 1.2em;">2:45</span>	END TIME <span style="font-size: 1.2em;">2:51</span>
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SEC MIN					COMMENTS
	0	15	30	45	
1	0	5	30	30	#287
2	30	20	0	0	
3	0	0	5	20	#209
4	25	5	25	0	
5	0	0	0	15	#208
6	30	10	0	0	
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

SUM OF OPACITY READINGS:	<span style="font-size: 1.2em;">250</span>
NUMBER OF READINGS:	<span style="font-size: 1.2em;">24</span>
AVERAGE OPACITY (SUM ÷ NUMBER):	<span style="font-size: 1.2em;">10.4</span> %
OBSERVER'S NAME (PRINT) <span style="font-size: 1.2em;">Rose Basko</span>	
OBSERVER'S SIGNATURE <span style="font-size: 1.2em;">Rose Basko</span>	DATE <span style="font-size: 1.2em;">1-29-15</span>
ORGANIZATION <span style="font-size: 1.2em;">Peabody</span>	
CERTIFIED BY <span style="font-size: 1.2em;">O. Koontz</span>	DATE <span style="font-size: 1.2em;">October 2014</span>

**EPA METHOD 9 (40 CFR 60 -- APPENDIX A)  
VISIBLE EMISSION OBSERVATION FORM**

COMPANY NAME POWDER RIVER COAL COMPANY		
LOCATION NORTH ANTELOPE ROCHELLE MINE		
ADDRESS 339 ANTELOPE ROAD		
CITY WRIGHT	STATE WY	ZIP 82730
PROCESS EQUIPMENT TRUCK DUMP		
CONTROL EQUIPMENT STILLING SHED		
DESCRIBE EMISSION POINT STILLING SHED DOOR		
HEIGHT OF EMISSION POINT <u>160'</u>		
HEIGHT RELATIVE TO OBSERVER <u>160'</u>		
DISTANCE OF EMISSION POINT <u>200'</u>		
DIRECTION TO EMISSION POINT <u>N-NE</u>		
DESCRIBE EMISSIONS COAL DUST		
EMISSION COLOR BLACK		
DESCRIBE PLUME BACKGROUND SKY		
BACKGROUND COLOR <u>Blue sky</u>		
AMBIENT TEMPERATURE <u>40°</u>		
WIND SPEED <u>19 mph</u>		
WIND DIRECTION <u>N 356°</u>		
SKY CONDITIONS <u>Clear</u>		
<div style="display: flex; justify-content: space-between;"> <div> <p>Source Layout Sketch</p> </div> <div> <p>Draw North Arrow <input type="checkbox"/> TN <input type="checkbox"/> MN</p> </div> </div>		
ADDITIONAL INFORMATION		

DATE <u>2-2-15</u>	START TIME <u>2:00</u>	END TIME <u>2:06</u>
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SEC MIN	0	15	30	45	COMMENTS
1	0	10	20	5	#201
2	5	0	0	0	
3	0	0	0	5	#218
4	5	5	0	0	
5	0	5	25	5	#239
6	0	0	0	0	
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

SUM OF OPACITY READINGS:	<u>90</u>
NUMBER OF READINGS:	<u>24</u>
AVERAGE OPACITY (SUM ÷ NUMBER):	<u>3.75</u> %
OBSERVER'S NAME (PRINT) <u>Rose Basko</u>	
OBSERVER'S SIGNATURE <u>Rose Basko</u>	DATE <u>2-2-15</u>
ORGANIZATION <u>Peabody</u>	
CERTIFIED BY <u>C. Koontz</u>	DATE <u>October 2014</u>

## APPENDIX F – METHOD 22 OPACITY OBSERVATION REPORT





# METHOD 22- FUGITIVE EMISSION INSPECTION FORM OUTDOOR LOCATION

POWDER RIVER COAL LLC  
 NORTH ANTELOPE ROCHELLE MINE  
 341A ANTELOPE ROAD  
 WRIGHT, WY 82717  
 PERMIT NO. MD-6375

EMISSION POINT: **CIRCUIT 2 SLOT STORAGE**

PROCESS: **COAL CRUSHING**

CONTROL EQUIPMENT: **# 884 ATOMIZER 32105**

HEIGHT ABOVE GROUND: 80' HEIGHT RELATIVE TO OBSERVER: 150'

DISTANCE TO OBSERVER: 200' DIRECTION FROM OBSERVER: SE

OBSERVATION DATE: 3-23-15 TIME: 10:05

EMISSION COLOR: None

BACKGROUND COLOR: Blue

SKY CONDITIONS: mostly sunny

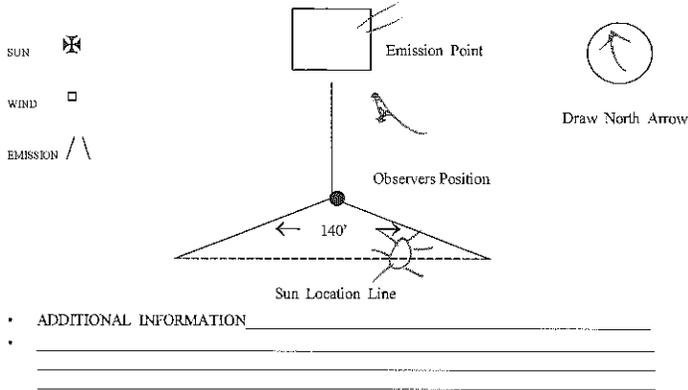
PRECIPITATION: None

WIND SPEED: 19

WIND DIRECTION: 100 SE

AMBIENT TEMP.: 52

READERS SIGNATURE: Rose Byrd CERTIFIED BY: C. Kuntz DATE: Nov 2014



OBSERVATION SEGMENT/NUMBER	START TIME	END TIME	OBSERVATION DURATION	TOTAL EMISSION DURATION
1	10:05	10:06	1 min	∅

# METHOD 22- FUGITIVE EMISSION INSPECTION FORM OUTDOOR LOCATION

POWDER RIVER COAL LLC  
 NORTH ANTELOPE ROCHELLE MINE  
 341A ANTELOPE ROAD  
 WRIGHT, WY 82717  
 PERMIT NO. MD-6375

EMISSION POINT: **CIRCUIT 2 TRANSFER HOUSE**  
 PROCESS: **COAL CRUSHING**  
 CONTROL EQUIPMENT: **ATOMIZER 32028**

HEIGHT ABOVE GROUND: 6' HEIGHT RELATIVE TO OBSERVER: 1'  
 DISTANCE TO OBSERVER: 15' DIRECTION FROM OBSERVER: S

OBSERVATION DATE: 3-23-15 TIME: 10:10

EMISSION COLOR: None

BACKGROUND COLOR: Blue

SKY CONDITIONS: mostly sunny

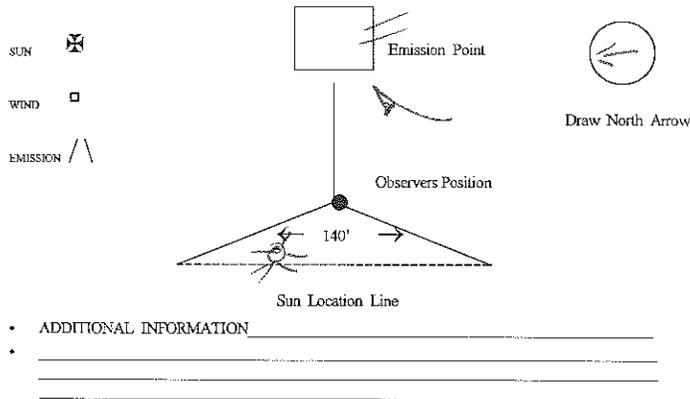
PRECIPITATION: No

WIND SPEED: 19

WIND DIRECTION: 160 SE

AMBIENT TEMP.: 52

READERS SIGNATURE: Rae Bester CERTIFIED BY: C. Kanitz DATE: Nov 2014



OBSERVATION SEGMENT/NUMBER	START TIME	END TIME	OBSERVATION DURATION	TOTAL EMISSION DURATION
1	10:10	10:11	1 min	0

# METHOD 22- FUGITIVE EMISSION INSPECTION FORM OUTDOOR LOCATION

POWDER RIVER COAL LLC  
 NORTH ANTELOPE ROCHELLE MINE  
 341A ANTELOPE ROAD  
 WRIGHT, WY 82717  
 PERMIT NO. MD-6375

EMISSION POINT: **CIRCUIT 3**  
 PROCESS: **COAL CRUSHING**

CONTROL EQUIPMENT: **#ATOMIZER 33661**

HEIGHT ABOVE GROUND: 5' HEIGHT RELATIVE TO OBSERVER: 5'  
 DISTANCE TO OBSERVER: 10' DIRECTION FROM OBSERVER: NE

OBSERVATION DATE: 3-30-75 TIME: 8:57

EMISSION COLOR: None

BACKGROUND COLOR: Gray

SKY CONDITIONS: Partly Cloudy

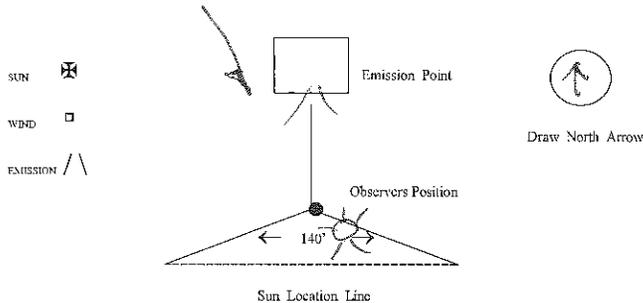
PRECIPITATION: None

WIND SPEED: 19

WIND DIRECTION: 339 NW

AMBIENT TEMP.: 52

READERS SIGNATURE: Paul Rasko CERTIFIED BY: C. Kowitz DATE: Nov 2014



• ADDITIONAL INFORMATION \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

OBSERVATION SEGMENT/NUMBER	START TIME	END TIME	OBSERVATION DURATION	TOTAL EMISSION DURATION
1	9:51	9:52	1 minute	φ

# METHOD 22- FUGITIVE EMISSION INSPECTION FORM OUTDOOR LOCATION

POWDER RIVER COAL LLC  
 NORTH ANTELOPE ROCHELLE MINE  
 341A ANTELOPE ROAD  
 WRIGHT, WY 82717  
 PERMIT NO. MD-6375

EMISSION POINT: **CIRCUIT 3 - 4 TRANSFER**

CONTROL EQUIPMENT: #33549

HEIGHT ABOVE GROUND: 80' HEIGHT RELATIVE TO OBSERVER: 80'

DISTANCE TO OBSERVER: 30' DIRECTION FROM OBSERVER: SE

OBSERVATION DATE: 3-30-16 TIME: 9:59

EMISSION COLOR: None

BACKGROUND COLOR: White

SKY CONDITIONS: Partly Cloudy

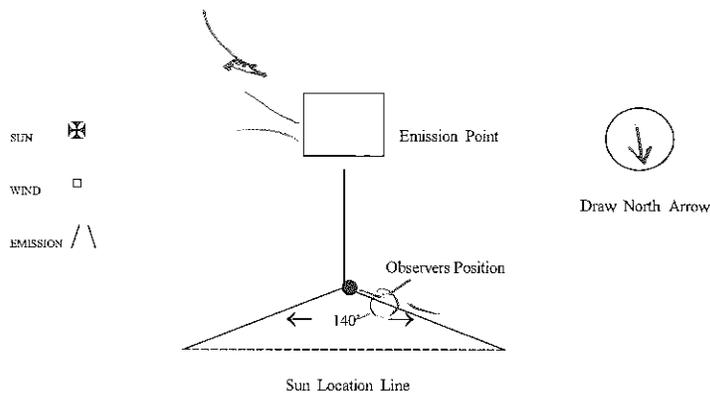
PRECIPITATION: None

WIND SPEED: 20 mph

WIND DIRECTION: NW-339

AMBIENT TEMP.: 55

READERS SIGNATURE: Rae Davis CERTIFIED BY: A. Koontz DATE: Nov. 2014



• ADDITIONAL INFORMATION \_\_\_\_\_  
 • \_\_\_\_\_  
 \_\_\_\_\_

OBSERVATION SEGMENT/NUMBER	START TIME	END TIME	OBSERVATION DURATION	TOTAL EMISSION DURATION
1	9:59	10:00	1 minute	∅

# METHOD 22- FUGITIVE EMISSION INSPECTION FORM OUTDOOR LOCATION

POWDER RIVER COAL LLC  
 NORTH ANTELOPE ROCHELLE MINE  
 341A ANTELOPE ROAD  
 WRIGHT, WY 82717  
 PERMIT NO. MD-6375

EMISSION POINT: CIRCUIT 4 530 HEAD CHUTE

PROCESS: COAL TRANSFER

CONTROL EQUIPMENT: # 33590

HEIGHT ABOVE GROUND: 100' HEIGHT RELATIVE TO OBSERVER: 100'

DISTANCE TO OBSERVER: 200' DIRECTION FROM OBSERVER: W-SW

OBSERVATION DATE: 3-30-15 TIME: 9:13

EMISSION COLOR: None

BACKGROUND COLOR: Light gray

SKY CONDITIONS: partly cloudy

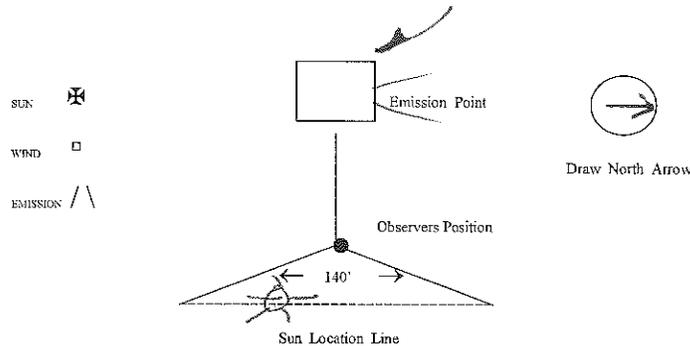
PRECIPITATION: no

WIND SPEED: 19

WIND DIRECTION: 339 NW

AMBIENT TEMP.: 52

READERS SIGNATURE: Rose Badier CERTIFIED BY: P. Koontz DATE: Nov. 2014



• ADDITIONAL INFORMATION \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

OBSERVATION SEGMENT/NUMBER	START TIME	END TIME	OBSERVATION DURATION	TOTAL EMISSION DURATION
1	9:13	9:14	1 minute	∅

# METHOD 22- FUGITIVE EMISSION INSPECTION FORM OUTDOOR LOCATION

POWDER RIVER COAL LLC  
 NORTH ANTELOPE ROCHELLE MINE  
 341A ANTELOPE ROAD  
 WRIGHT, WY 82717  
 PERMIT NO. MD-6375

EMISSION POINT: CIRCUIT 4 IN PIT  
 PROCESS: COAL CRUSHING

CONTROL EQUIPMENT: #33536 Atomizer

HEIGHT ABOVE GROUND: 15' HEIGHT RELATIVE TO OBSERVER: 5'

DISTANCE TO OBSERVER: 10' DIRECTION FROM OBSERVER: W

OBSERVATION DATE: 3-30-15 TIME: 9:21

EMISSION COLOR: \_\_\_\_\_

BACKGROUND COLOR: Blue + white

SKY CONDITIONS: Blue Partly Cloudy

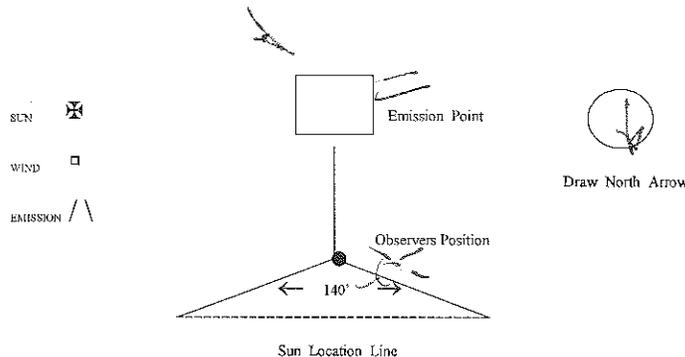
PRECIPITATION: 0

WIND SPEED: 19

WIND DIRECTION: 339 NW

AMBIENT TEMP.: 52

READERS SIGNATURE: Reed Baskin CERTIFIED BY: C. Koontz DATE: Nov 2014



• ADDITIONAL INFORMATION \_\_\_\_\_  
 • \_\_\_\_\_  
 \_\_\_\_\_

OBSERVATION SEGMENT/NUMBER	START TIME	END TIME	OBSERVATION DURATION	TOTAL EMISSION DURATION
<del>9:21</del> 1	9:21	9:22	1 minute	0

# METHOD 22- FUGITIVE EMISSION INSPECTION FORM OUTDOOR LOCATION

POWDER RIVER COAL LLC  
 NORTH ANTELOPE ROCHELLE MINE  
 341A ANTELOPE ROAD  
 WRIGHT, WY 82717  
 PERMIT NO. MD-6375

EMISSION POINT: **CIRCUIT 4 AT TRUCK DUMP**  
 PROCESS: **COAL CRUSHING**  
 CONTROL EQUIPMENT: **ATOMIZER 33595**

HEIGHT ABOVE GROUND: 5' HEIGHT RELATIVE TO OBSERVER: Even  
 DISTANCE TO OBSERVER: 15' DIRECTION FROM OBSERVER: N

OBSERVATION DATE: 3-30-15 TIME: 9:34

EMISSION COLOR: None

BACKGROUND COLOR: Blue + white

SKY CONDITIONS: Partly cloudy

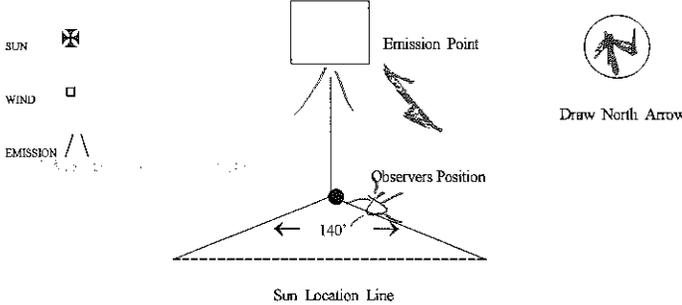
PRECIPITATION: None

WIND SPEED: 19

WIND DIRECTION: 339 NW

AMBIENT TEMP.: 52

READERS SIGNATURE: Roe Bader CERTIFIED BY: C. Koontz DATE: Nov. 2014



• ADDITIONAL INFORMATION \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

OBSERVATION SEGMENT/NUMBER	START TIME	END TIME	OBSERVATION DURATION	TOTAL EMISSION DURATION
1	9:34	9:35	1 minute	0



# METHOD 22- FUGITIVE EMISSION INSPECTION FORM OUTDOOR LOCATION

POWDER RIVER COAL LLC  
 NORTH ANTELOPE ROCHELLE MINE  
 341A ANTELOPE ROAD  
 WRIGHT, WY 82717  
 PERMIT NO. MD-6375

EMISSION POINT: **D-A-B WEST TRANSFER ATOMIZER**

CONTROL EQUIPMENT: **34391 Atomizers**

HEIGHT ABOVE GROUND: 5' HEIGHT RELATIVE TO OBSERVER: 4'

DISTANCE TO OBSERVER: 15' DIRECTION FROM OBSERVER: W

OBSERVATION DATE: 7-30-15 TIME: 10:42

EMISSION COLOR: ∅

BACKGROUND COLOR: Blue

SKY CONDITIONS: Clear mostly

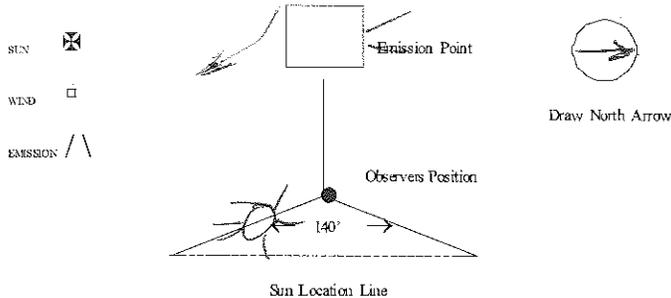
PRECIPITATION: ∅

WIND SPEED: 20

WIND DIRECTION: 339 NW

AMBIENT TEMP.: 55

READERS SIGNATURE: Roe Bader CERTIFIED BY: C. Koontz DATE: Nov. 2014

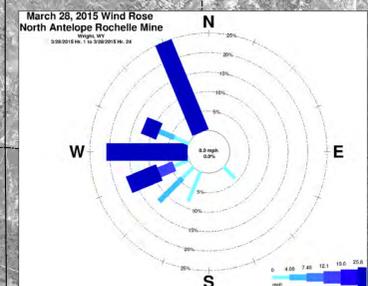
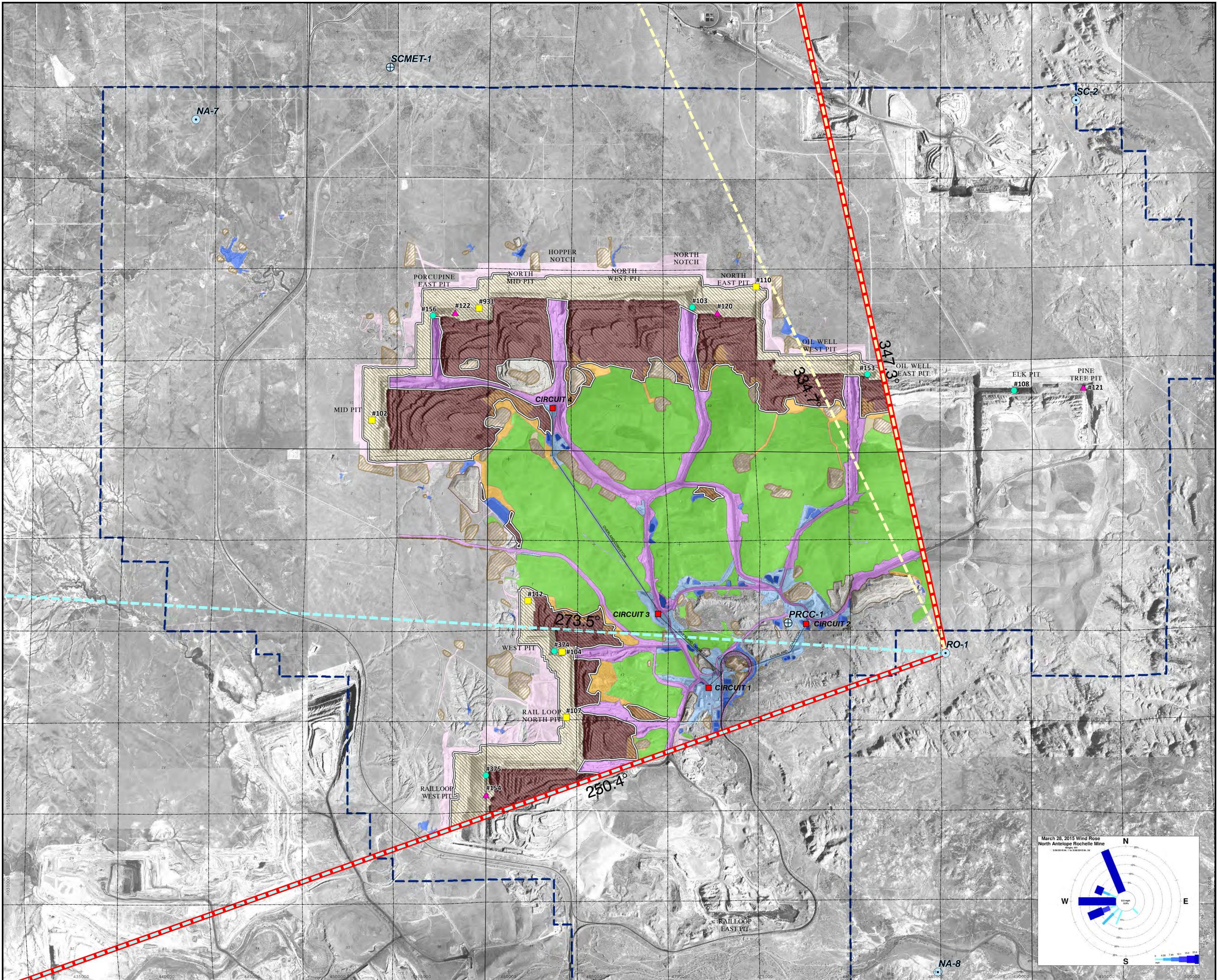


• ADDITIONAL INFORMATION \_\_\_\_\_  
 • \_\_\_\_\_  
 \_\_\_\_\_

OBSERVATION SEGMENT/NUMBER	START TIME	END TIME	OBSERVATION DURATION	TOTAL EMISSION DURATION
1	10:42	10:43	1 min.	∅



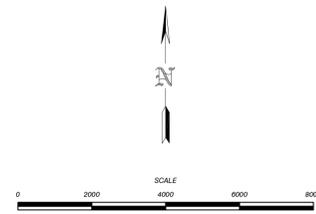




- Circuit (Truck Dump, Crusher, Conveyor)
- Coal Shovel
- Dragline
- Overburden Shovel
- ⊕ MET Station
- TEOM Location
- LNCM Boundary
- Uncontrolled Areas
- Railroad

- Legend**
- Revegetated (held for release) - 5,480/5,480 acres controlled
  - Overburden stockpiles - 358/358 acres controlled
  - Topsoil stockpiles - 838/838 acres controlled
  - Roads and Road Slopes - 1,581/1,581 acres controlled
  - Railroads - 40/40 acres controlled
  - Facilities - 526/526 acres controlled
  - Dams, ditches, ponds - 277/277 acres controlled
  - Land Status 3/28/15 - 10,659/15,628 acres controlled
  - Topsoil removed - 1,214/1,214 acres controlled
  - Benches - 0/1,884 acres controlled
  - To be backfilled - 0/2,773 acres controlled
  - To be graded - 0/313 acres controlled
  - Graded (to be topsoiled) - 327/327 acres controlled
  - Topsoiled (to be revegetated) - 18/18 acres controlled

- ▶ High Wind Event Reverse Trace from RO-1 250.4° - 347.3°
- ▶ Exceptionally High Wind Event Reverse Trace from RO-1 334.7° - 347.3°
- ▶ Exceptionally High Wind Event Reverse Trace from RO-1 250.4° - 273.5°



Revision	Date

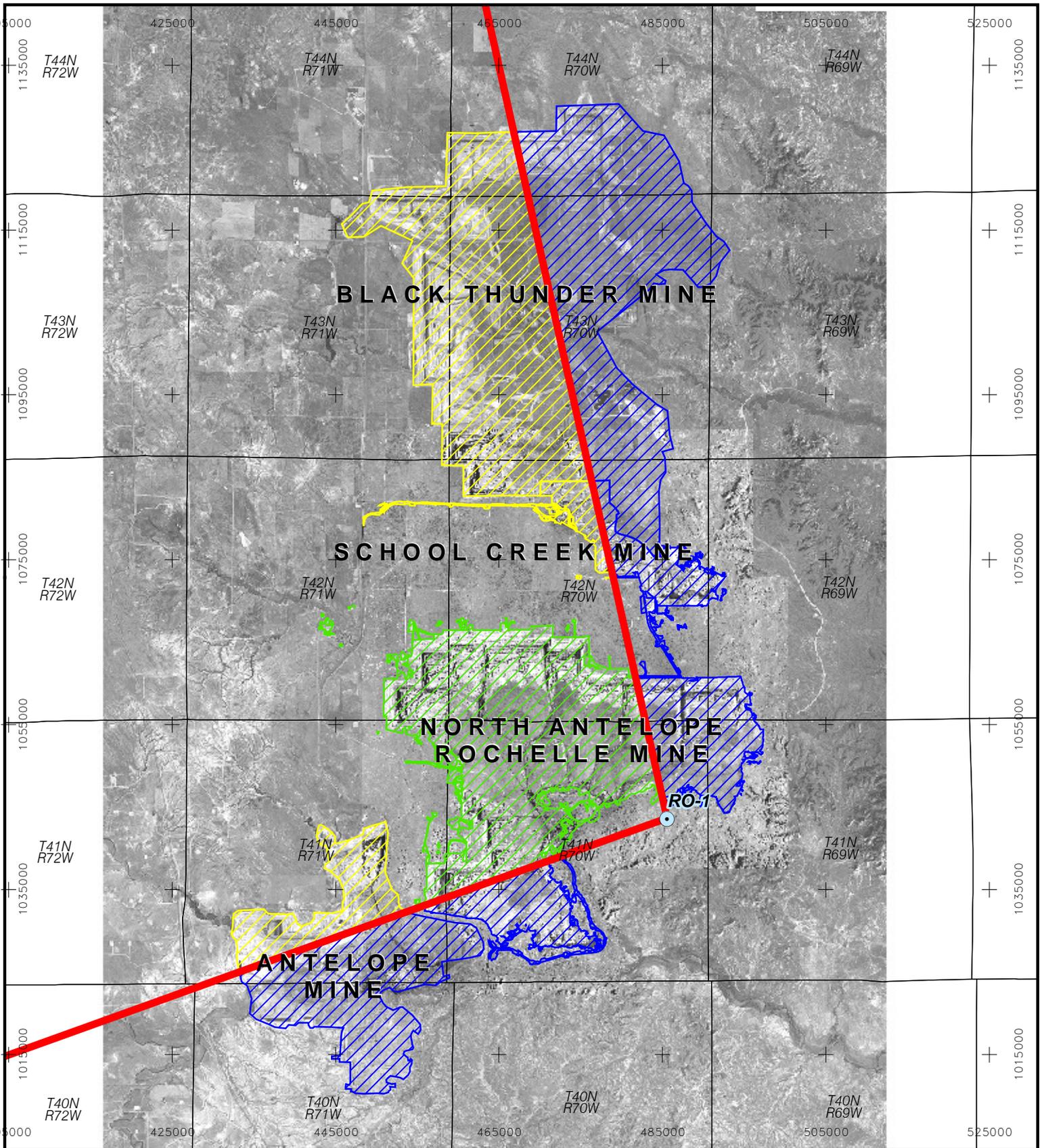
**NORTH ANTELOPE ROCHELLE MINE**  
 Caller Box 3034 Gillette, WY 82717

**MARCH 28, 2015 RO-1 HIGH WIND EVENT**  
 EXHIBIT 1

**EQUIPMENT LOCATIONS AND**  
**DISTURBED AREAS**

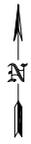
Permit No. MD-16282

Designed By: ACH/PCD	Scale: 1" = 2000'
Drawn By: ACH	C.I.: N/A
Checked By: PCD	Sheet: 1 of 1
Date Drawn: 6/11/15	File: n_aqr_hwe_ro1_ex01_150328.mxd



**Legend**

-  NARM disturbance within backtrace area
-  Other mine disturbance within backtrace area
-  Disturbance outside of backtrace area
-  TEOM Location
-  RO-1 Backtrace



Revision	Date

**NORTH ANTELOPE ROCHELLE MINE**

Caller Box 3034 Gillette, WY 82717

MARCH 28, 2015 RO-1 HIGH WIND EVENT EXHIBIT 2

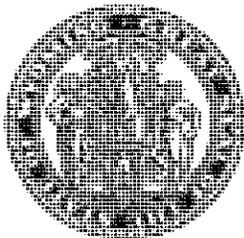
**LOCATION OF OTHER MINES VERSUS WIND DIRECTION**

Permit No. MD-16282



Designed By: ACH  
 Drawn By: ACH  
 Checked By: PCD  
 Date Drawn: 6/15/15

Scale: 1" = 3 miles  
 C.I.: N/A  
 Sheet: 1 of 1  
 File: n\_aqd\_hwe\_ro1\_ex02\_150328.mxd



# Department of Environmental Quality

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



Matthew H. Mead, Governor

Todd Parfitt, Director

July 16, 2015

Mr. Cyrus Kezar  
Peabody Powder River Mining, LLC  
Caller Box 3035  
Gillette, WY 82717-3035

**RE: July 1, 2015 Request for Flag under the Exceptional Event Rule for PM<sub>10</sub>, March 28, 2015 Exceedance- RO-1**

Dear Mr. Kezar,

On March 28, 2015, the Peabody Powder River Mining, LLC (Peabody) RO-1 TEOM recorded an exceedance of the 24-hour PM<sub>10</sub> standard, with a final average concentration of 190.8 µg/m<sup>3</sup>.

On July 1, 2015 the Air Quality Division (AQD) received a request that data for the RO-1 TEOM on this day be flagged under 40 CFR Part 50.14 "Treatment of Data Influenced by Exceptional Events" due to high winds.

After review of the submitted materials, the AQD has decided to pursue Peabody's request to flag the PM<sub>10</sub> data collected at the RO-1 TEOM on March 28, 2015 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.

Peabody's final packet is requested on or before August 17, 2015. Please email it to [daniel.sharon@wyo.gov](mailto:daniel.sharon@wyo.gov).

Herschler Building • 122 West 25th Street • Cheyenne, WY 82002 • <http://deq.state.wy.us>

ADMIN/OUTREACH (307) 777-7758 FAX 777-7682	ABANDONED MINES (307) 777 6145 FAX 777-6462	AIR QUALITY (307) 777-7391 FAX 777-5516	INDUSTRIAL SITING (307) 777-7369 FAX 777-5973	LAND QUALITY (307) 777-7756 FAX 777-5864	SOLID & HAZ. WASTE (307) 777-7752 FAX 777-5973	WATER QUALITY (307) 777-7781 FAX 777-5973
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Please contact Daniel Sharon at (307) 777-7104 or [daniel.sharon@wyo.gov](mailto:daniel.sharon@wyo.gov) if you have any questions regarding this matter.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Cara Keslar', with a stylized flourish at the end.

Cara Keslar  
Monitoring Section Supervisor

Cc: Daniel Sharon, Monitoring Project manager  
NARM Monitoring File  
Tanner Shatto, District 3 Engineer