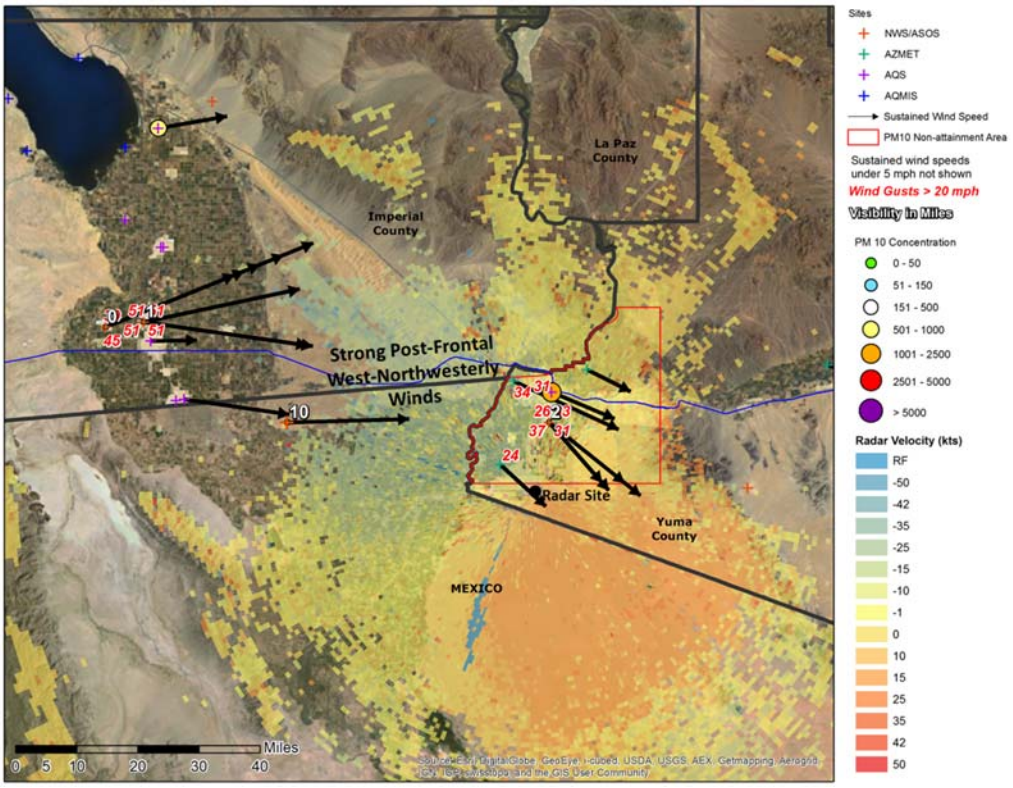
Sonoma Technology, Inc.
Air Quality Research and Innovative Solutions

State of Arizona Exceptional Event Documentation for the Event of May 25–26, 2012, for the Yuma County PM_{10} Nonattainment Area



Final Report Prepared for

Arizona Department of Environmental Quality
Phoenix, AZ

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State of Arizona Exceptional Event Documentation for the Event of May 25−26, 2012, for the Yuma County PM_{10} Nonattainment Area

Final Report
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May 29, 2013

Cover graphic illustrates hourly air quality and meteorological conditions in the Yuma, Arizona, region during the May 25-26, 2012, event. See Section 3 for more information.

Acknowledgments

The authors would like to acknowledge the Arizona Department of Environmental Quality and the Environmental Protection Agency, Region 9, for helpful discussion and feedback during the preparation of this document.

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1. Introduction

On May 25 and 26, 2012, the Yuma Supersite monitor recorded 24-hr average PM_{10} concentrations of 240 and 216 µg/m^3, respectively. These values are in exceedance of the National Ambient Air Quality Standard (NAAQS) of 150 µg/m^3 for 24-hr PM_{10}. This report demonstrates that these exceedances were caused by naturally occurring windblown dust, were not reasonably controllable or preventable, were historically unusual, and would not have occurred "but for" the windblown dust and, therefore, the event is an exceptional event as defined by the U.S. Environmental Protection Agency's (EPA) Exceptional Events Rule (EER).

1.1 Report Contents

Section 2 of this assessment contains a conceptual model of the post-frontal windblown dust event that occurred on May 25 and 26, 2012, providing a background narrative of the exceptional event and an overall explanation that the event affected air quality. Section 2 also provides evidence that the event was a natural event.

Section 3 of this assessment establishes a clear causal connection between the natural event on May 25 and 26, 2012, and the exceedances of the 24-hr PM_{10} standard at the monitoring station. The evidence in this section also confirms that the event in question both affected air quality and was the result of natural events.

Section 4 of this assessment contains data summaries and time-series graphs that help illustrate that the event of May 25−26, 2012, produced PM_{10} concentrations in excess of normal historical fluctuations.

Section 5 of this assessment details the existing dust control measures and demonstrates that despite the presence and enforcement of these controls, the event of May 25−26, 2012, was not reasonably controllable or preventable.

Section 6 of this assessment builds upon the demonstration, showing a clear causal connection between the natural event and the exceedances, and concludes that the exceedances of the 24-hr PM_{10} standard on May 25 and 26, 2012, would not have occurred but for the event.

Appendix A contains time-series graphs and data tables to supplement Section 3. **Appendix B** contains air quality forecasts issued by the Arizona Department of Environmental Quality (ADEQ) and weather statements and warnings issued by the National Weather Service (NWS).

1.2 Exceptional Event Rule Requirements

In addition to the technical requirements that are contained within the EER, procedural requirements must also be met in order for the EPA to concur with the flagged air quality monitoring data. This section of the report contains the requirements of the EER and associated guidance, and discusses how ADEQ addressed those requirements.

1.2.1 Public Notification That the Event Was Occurring (40 CFR 50.14(c)(1)(i))

ADEQ issued Air Quality Forecasts for the Greater Yuma area with a PM_{10} Health Watch advising citizens of the potential for high wind dust events during the May 25-26, 2012, time frame. More information on ADEQ's forecasting program can be found in Section 5.2 of this report. The forecast products that were issued during the period May 25-26, 2012, are included in Appendix B.

1.2.2 Place Informal Flag on Data in AQS (40 CFR 50.14(c)(2)(ii))

ADEQ and other operating air quality agencies in Arizona submit data into the EPA's Air Quality System (AQS), the official repository of ambient air quality data. This data submittal to AQS includes particulate matter (PM) data from both filter-based and continuous monitors operated in Arizona.

When ADEQ and/or another agency operating monitors in Arizona suspect that data may be influenced by an exceptional event, ADEQ and/or the other operating agency expedites analysis of the filters collected from the potentially affected filter-based air monitoring instruments, quality-assures the results, and submits the data into AQS. ADEQ and/or other operating agencies also submit data from continuous monitors into AQS after quality assurance is complete.

If ADEQ and/or other operating air quality agencies have determined that the potential exists for a monitor's reading(s) to have been influenced by an exceptional event, a preliminary flag is submitted for the measurement in AQS. The data are not official until they undergo more thorough quality assurance and quality control, leading to certification by May 1 of the year following the calendar year in which the data were collected (40 CFR 58.15(a)(2)). The presence of the flag can be confirmed in AQS.

1.2.3 Notify EPA of Intent to Flag Through Submission of Initial Event Description by July 1 of Calendar Year Following Event (40 CFR 50.14(c)(2)(iii))

ADEQ held informal conversations with EPA during September, 2012, to discuss all the days in calendar year 2012 that ADEQ intended to analyze under the EER. The PM_{10} exceedances that occurred at the Yuma Supersite monitor on May 25 and 26, 2012, in the Yuma PM_{10} Nonattainment Area were included in the discussions. This assessment report demonstrates support for the flagging of these data.

1.2.4 Document That the Public Comment Process Was Followed for Event Documentation (40 CFR 50.14(c)(3)(iv))

ADEQ posted this assessment report on the ADEQ webpage and placed a hard copy of the report in the ADEQ Records Management Center for public review. ADEQ opened a 30-day public comment period on July 15, 2013. A copy of the public notice certification, along with any comments received, will be submitted to EPA, consistent with the requirements of 40 CFR 50.14(c)(3)(iv).

1.2.5 Submit Demonstration Supporting Exceptional Event Flag (40 CFR 50.14(a)(1-2))

At the close of the public comment period, and after ADEQ has had the opportunity to consider any comments submitted on this document, ADEQ will submit this document, the comments received, and ADEQ's responses to those comments to EPA Region 9 headquarters in San Francisco, California. The deadline for the submittal of this package is June 30, 2015.

1.2.6 Documentation Requirements (40 CFR 50.14(c)(3)(iii))

The EER states that in order to justify the exclusion of air quality monitoring data, evidence must be provided for the following elements:

1. The event satisfies the criteria set forth in 40 CFR 501(j) that
    a. the event affected air quality,
    b. the event was not reasonably controllable or preventable, and
    c. the event was caused by human activity unlikely to recur in a particular location or was a natural event;
2. There is a clear causal relationship between the measurement(s) under consideration and the event;
3. The event is associated with a measured concentration(s) in excess of normal historical fluctuations; and
4. There would have been no exceedance or violation but for the event.

2. Conceptual Model

This section provides a narrative background and summarizes the meteorological and air quality conditions in place on May 25-26, 2012, in Yuma. Elements described in this section include

- A description and map of the geographic setting of the air quality and meteorological monitors.
- A description of Yuma's climate.
- An overall description of meteorological and air quality conditions on the event day.

2.1 Geographic Setting and Monitor Locations

Yuma is located in the Sonoran Desert and Lower Colorado River Valley in extreme southwestern Arizona at an elevation of 138 feet above sea level. The Yuma Metropolitan Statistical Area is defined as Yuma County, which reported a population of 195,751 in the 2010 census. Yuma County is bordered by Imperial County, California, to the north and northwest and by the Mexican state of Baja California to the west and south (**Figure 2-1**). Yuma lies just west of the confluence of the Colorado and Gila Rivers. Most of Yuma is located in the Colorado River Floodplain, commonly known as the Yuma Valley. The Yuma Valley follows the course of the Colorado River southward to the Sea of Cortez. Part of Yuma is built on the Yuma Mesa, a prominent land feature extending to the east of Yuma. The Gila Mountains, located roughly 15 to 20 miles east and southeast of Yuma, have a peak elevation of 3,156 feet. Directly west-northwest of Yuma in Imperial County, California, are the Algodones Dunes, an elongated, extensive region of open sand dunes (**Figure 2-2**). West-northwesterly winds can transport dust and sand from these dunes into the Yuma region. North of the sand dunes are the Chocolate Mountains, which rise to over 2,000 feet in elevation and may locally enhance wind speeds over the Algodones Dunes due to channeling effects.

The air quality and meteorological monitors used in this analysis are shown in Figure 2-1. AQS monitors measure air quality and meteorological data; Arizona Meteorological Network (AZMET) and NWS monitors measure meteorological data only. The PM_{10} exceedances on May 25 and 26, 2012, were recorded at the Yuma Supersite monitor, which is located in central Yuma and has been operational since January 1, 2010. The Yuma Courthouse monitor shown in Figure 2-1 is inactive but measured PM_{10} prior to January 1, 2010. Data from the Yuma Courthouse monitor were used to supplement the Yuma Supersite data record for the Historical Norm section of this demonstration. Three AZMET sites are in operation in the Yuma area, located northeast, west, and southwest of the city. A NWS monitor is located at the Yuma Marine Corps Air Station (MCAS). Additional air quality and meteorological monitors with data relevant to this dust storm event are located in adjacent southeastern California and northwestern Mexico (**Figure 2-3**).

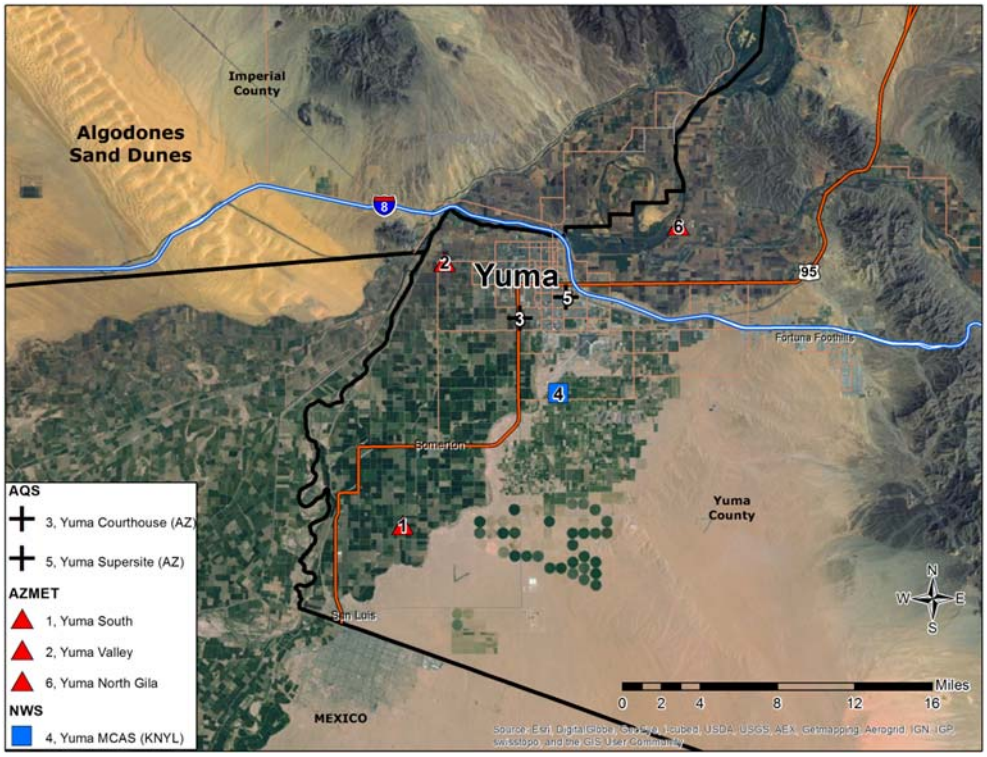

Figure 2-1. Air quality and meteorological monitors in the immediate Yuma region.

Figure 2-2. The Algodones sand dunes in Imperial County, with the Chocolate Mountains in the background.

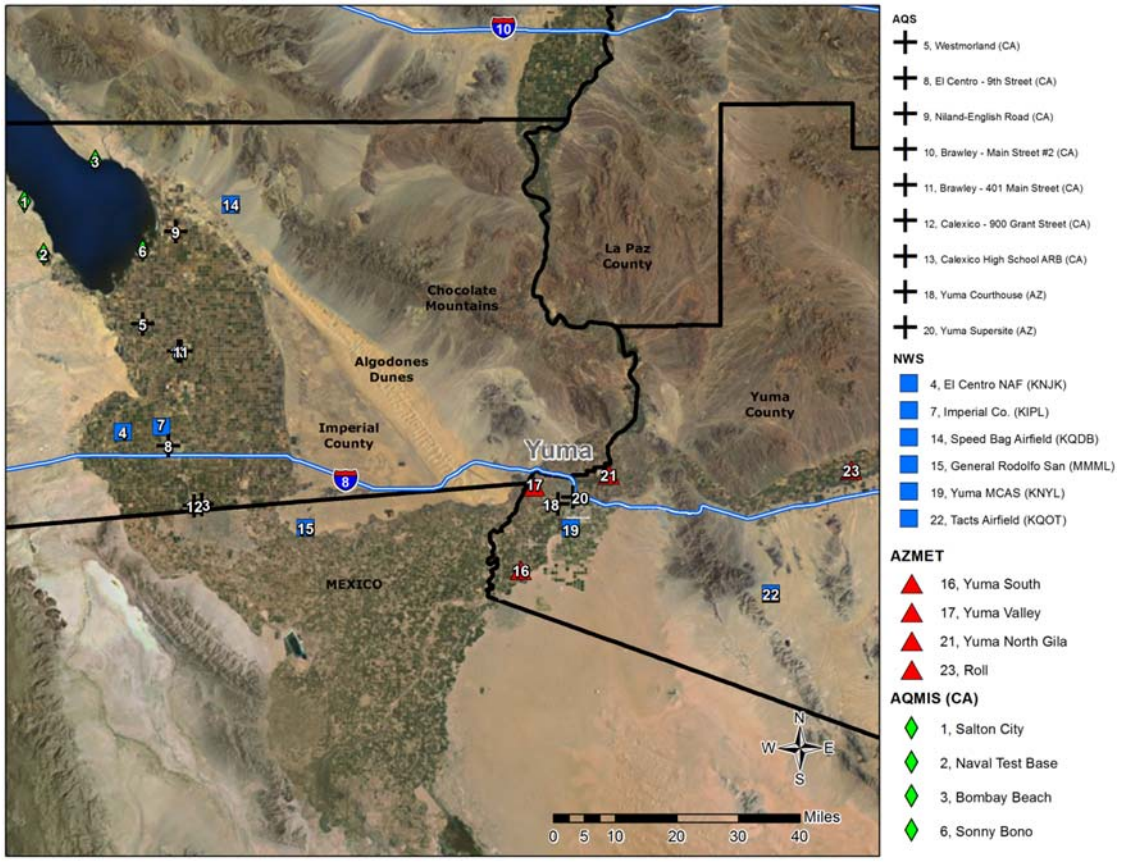

Figure 2-3. Location of air quality and meteorological monitors and relevant geographical features in the Yuma area.

2.2 Climate

Yuma is one of the hottest cities of any size in the United States, with average high temperatures around 107°F in July and around 70°F in January (**Figure 2-4**). Yuma receives roughly 90% of possible sunshine each year. Yuma is one of the driest cities in the United States, with an average annual rainfall of just over 3 inches. The bulk of this rain usually falls during the December-March and July-August time periods. During the December-March period, winter storms originating from the Pacific Ocean can produce significant rains in southwestern Arizona. During the July-August time period, monsoonal moisture originating from the Gulf of California, Gulf of Mexico, and large thunderstorm complexes over the Sierra Madre Occidental Mountains in Mexico move northward into Arizona.

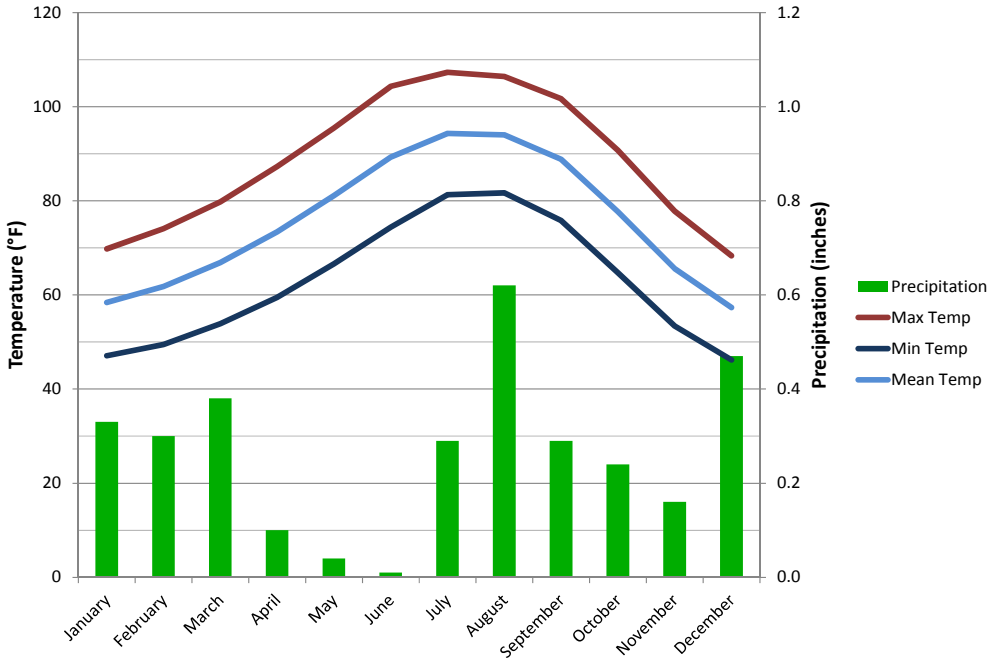

Figure 2-4. Average monthly temperatures and precipitation at Yuma MCAS, 1981–2010.

While windblown dust events in Arizona during the summer monsoon season are often due to outflow winds from thunderstorms, windblown dust events in the fall, winter, and spring are usually due to strong winds associated with low-pressure systems and cold fronts moving southeast across California and Arizona. These winds are the result of strong surface pressure gradients between the approaching low-pressure system (or cold front) and higher pressure ahead of it. As the low-pressure system (or cold front) approaches and passes, gusty southwesterly winds typically shift to northwesterly. The strong winds can loft dust into the air and transport it over long distances, especially if soils in the region are dry.

2.3 Event Day Summary

On the afternoon of May 25, 2012, winds generated by a departing cold front transported dust westward into the Yuma area (**Figure 2-5**; cold front depicted in blue). The windblown dust resulted in 24-hr average PM_{10} concentrations of 240 µg/m^3 on May 25 and 216 µg/m^3 on May 26 at the Yuma Supersite monitor (**Tables 2-1 and 2-2**); these values are in exceedance of the NAAQS. While very high PM_{10} concentrations were observed in Yuma for only a few hours, this event happened to span two calendar days; thus, exceedances of the NAAQS occurred on both May 25 and May 26. The hourly and 24-hr average PM_{10} concentrations measured at the Yuma Supersite monitor were in excess of normal historical fluctuations. The dust was naturally occurring and likely originated over undeveloped lands of southeastern California outside the city of Yuma, including the Algodones Dunes; wind gusts in excess of 35 mph overwhelmed reasonable dust control measures. PM_{10} monitors in southeastern California also recorded high PM_{10} concentrations as the dust storm moved through, illustrating the regional nature of this event. The Yuma MCAS and Imperial County Airport surface meteorological sites reported

haze (HZ) and the El Centro, California, meteorological site reported blowing dust (BLDU) and blowing sand (BLSA) for several hours on May 25 and 26, coincident with peak PM_{10} concentrations (see Appendix A).

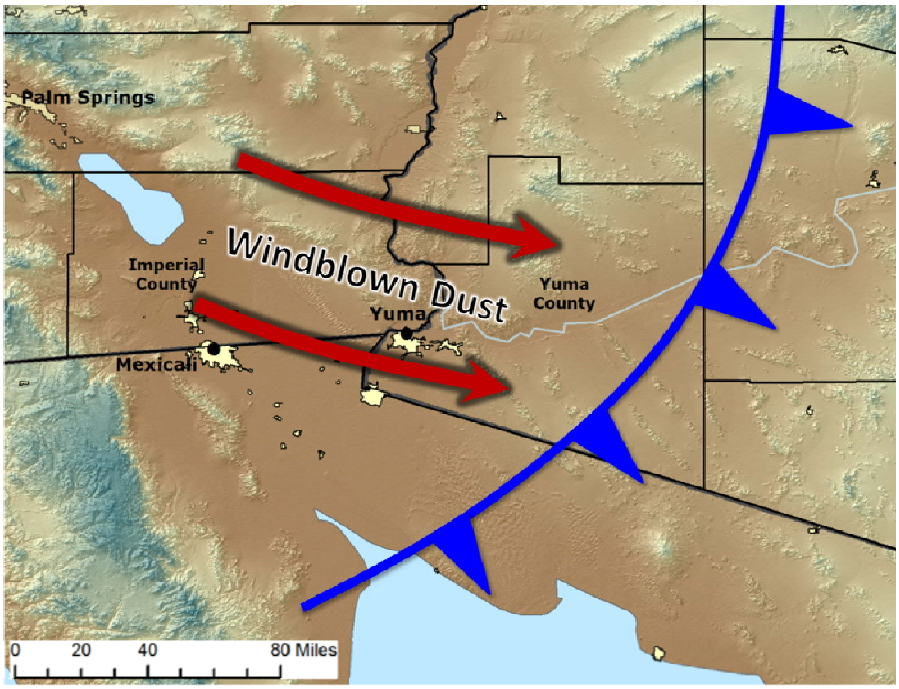

Figure 2-5. West-northwesterly winds associated with a departing cold front transported dust from undeveloped lands in southeastern California southwestward to the Yuma area on May 25-26, 2012.

Table 2-1. PM_{10} measurements collected in Arizona, southeastern California, and southern Nevada on May 25, 2012. Data from the Yuma Supersite monitor are shown in **bold green**.

Monitor	Monitor Type	Operator	AQS Monitor ID	24-hr Avg PM_{10} ($\mu g/m^3$)	1-hr Max PM_{10} ($\mu g/m^3$)	Time of Max 1-hr PM_{10} (MST)	AQS Qualifier Flag
ARIZONA							
Apache County							
N/A	TEOM	WMAT	04-001-1003-81102-1	59	131	0400	
Cochise County							
Paul Spur Chemical Lime Plant	TEOM	ADEQ	04-003-0011-81102-3	35	149	0200	
Gila County							
Hayden Old Jail	TEOM	ADEQ	04-007-1001-81102-3	82	163	1300	IJ
Maricopa County							
West Phoenix	TEOM	MCAQD	04-013-0019-81102-1	57	237	1900	
North Phoenix	BAM	MCAQD	04-013-1004-81102-1	65	210	1900	
Glendale	TEOM	MCAQD	04-013-2001-81102-1	79	293	1800	
Central Phoenix	TEOM	MCAQD	04-013-3002-81102-4	62	168	2000	
Greenwood	TEOM	MCAQD	04-013-3010-81102-1	52	170	1900	
South Phoenix	TEOM	MCAQD	04-013-4003-81102-1	63	151	0800	
West Chandler	TEOM	MCAQD	04-013-4004-81102-1	59	195	1300	
Tempe	TEOM	MCAQD	04-013-4005-81102-1	63	203	1200	
Higley	TEOM	MCAQD	04-013-4006-81102-1	59	183	1500	
West 43rd Ave	TEOM	MCAQD	04-013-4009-81102-1	37	86	2000	
Dysart	TEOM	MCAQD	04-013-4010-81102-1	97	431	1700	
Buckeye	TEOM	MCAQD	04-013-4011-81102-1	139	544	1600	
Zuni Hills	TEOM	MCAQD	04-013-4016-81102-1	104	424	1800	
Durango Complex	TEOM	MCAQD	04-013-9812-81102-1	48	123	2000	
JLG Supersite	BAM	ADEQ	04-013-9997-81102-3	53	206	1900	
JLG Supersite	TEOM	ADEQ	04-013-9997-81102-4	50	199	2000	
Navajo County							
N/A	TEOM	WMAT	04-017-1002-81102-1	54	145	0000	
Pima County							
Ajo	TEOM	ADEQ	04-019-0001-81102-3	49	173	1100	IJ
Orange Grove	FRM	PCDEQ	04-019-0011-81102-2	44	N/A	N/A	
Rillito	TEOM	ADEQ	04-019-0020-81102-3	95	338	0900	IJ
South Tucson	FRM	PCDEQ	04-019-1001-81102-1	46	N/A	N/A	
Green Valley	TEOM	PCAQCD	04-019-1030-81102-1	33	65	0800	
Geronimo	TEOM	PCAQCD	04-019-1113-81102-1	43	78	1500	

Table 2-1. PM_{10} measurements collected in Arizona, southeastern California, and southern Nevada on May 25, 2012. Data from the Yuma Supersite monitor are shown in **bold green**.

Monitor	Monitor Type	Operator	AQS Monitor ID	24-hr Avg PM_{10} ($\mu g/m^3$)	1-hr Max PM_{10} ($\mu g/m^3$)	Time of Max 1-hr PM_{10} (MST)	AQS Qualifier Flag
Pinal County							
Casa Grande Downtown	TEOM	PCAQCD	04-021-0001-81102-3	79	238	1400	
Apache Junction Fire Station	TEOM	PCAQCD	04-021-3002-81102-3	58	108	1700	
Stanfield	TEOM	PCAQCD	04-021-3008-81102-3	90	240	1600	
Combs	TEOM	PCAQCD	04-021-3009-81102-3	73	170	1500	
Maricopa	TEOM	PCAQCD	04-021-3010-81102-3	89	271	1300	
Pinal County Housing	TEOM	PCAQCD	04-021-3011-81102-3	100	295	0800	
Cowtown	TEOM	PCAQCD	04-021-3013-81102-3	318	1882	1300	RJ
Santa Cruz County							
Nogales Post Office	BAM	ADEQ	04-023-0004-81102-3	62	151	0800	
Yuma County							
Yuma Supersite	**TEOM**	**ADEQ**	**04-027-8011-81102-3**	**240**	**1288**	**1900**	**RJ**
CALIFORNIA							
Imperial County							
Niland-English Road	BAM	ICAPCD	06-025-4004-85101-3	221	692	1700	
Riverside County							
Riverside-Magnolia	BAM	SCAQMD	06-065-1003-81102-5	25	37	0100 0800	
Torres-Martinez Admin Site	BAM	TMIR	06-065-1999-81102-1	128	877	1800	IJ
Indio-Jackson Street	TEOM	SCAQMD	06-065-2002-81102-3	108	445	1800	IJ, RJ
Palm Springs-Fire Station	TEOM	SCAQMD	06-065-5001-81102-3	19	35	0000	
Riverside-Rubidoux	BAM	SCAQMD	06-065-8001-81102-9	30	50	1600	
Mira Loma-Van Buren	BAM	SCAQMD	06-065-8005-81102-3	35	61	1700	
Lake Elsinore-W Flint Street	TEOM	SCAQMD	06-065-9001-81102-3	15	26	1600	
San Bernardino County							
San Bernadino-4th Street	TEOM	SCAQMD	06-071-9004-81102-3	24	38	1400	

TEOM: Tapered Element Oscillating Microbalance
BAM: Beta Attenuation Monitor
FRM: Federal Reference Method
WMAT: White Mountain Apache Tribe
ADEQ: Arizona Department of Environmental Quality
MCAQD: Maricopa County Air Quality Department
PCAQCD: Pinal County Air Quality Control District
PCDEQ: Pima County Department of Environmental Quality
ICAPCD: Imperial County Air Pollution Control District
SCAQMD: South Coast Air Quality Management District

TMIR: Torres-Martinez Indian Reservation IJ: qualifier flag for high winds (for information only)
RJ: qualifier flag for high winds (for data exclusion)

Table 2-2. PM_{10} measurements collected in Arizona, southeastern California, and southern Nevada on May 26, 2012. Data from the Yuma Supersite monitor are shown in **bold green**.

Monitor	Monitor Type	Operator	AQS Monitor ID	24-hr Avg PM_{10} ($\mu g/m^3$)	1-hr Max PM_{10} ($\mu g/m^3$)	Time of Max 1-hr PM_{10} (MST)	AQS Qualifier Flag
ARIZONA							
Apache County							
N/A	TEOM	WMAT	04-001-1003-81102-1	45	147	1100	
Cochise County							
Paul Spur Chemical Lime Plant	TEOM	ADEQ	04-003-0011-81102-3	21	44	1400	
Gila County							
Hayden Old Jail	TEOM	ADEQ	04-007-1001-81102-3	33	71	1000	
Maricopa County							
West Phoenix	TEOM	MCAQD	04-013-0019-81102-1	54	207	0600	
North Phoenix	BAM	MCAQD	04-013-1004-81102-1	48	212	0600	
Glendale	TEOM	MCAQD	04-013-2001-81102-1	69	336	0400	
Central Phoenix	TEOM	MCAQD	04-013-3002-81102-4	45	142	0600	
Greenwood	TEOM	MCAQD	04-013-3010-81102-1	50	184	0600	
South Phoenix	TEOM	MCAQD	04-013-4003-81102-1	47	117	0600	
West Chandler	TEOM	MCAQD	04-013-4004-81102-1	34	105	0700	
Tempe	TEOM	MCAQD	04-013-4005-81102-1	35	105	0700	
Higley	TEOM	MCAQD	04-013-4006-81102-1	35	100	0700	
West 43rd Ave	TEOM	MCAQD	04-013-4009-81102-1	46	139	0600	
Dysart	TEOM	MCAQD	04-013-4010-81102-1	75	337	0500	
Buckeye	TEOM	MCAQD	04-013-4011-81102-1	78	388	0300	
Zuni Hills	TEOM	MCAQD	04-013-4016-81102-1	75	349	0500	
Fort McDowell/ Yuma Frank	TEOM	FMIR	04-013-5100-81102-3	46	N/A	N/A	
Durango Complex	TEOM	MCAQD	04-013-9812-81102-1	47	142	0600	
JLG Supersite	BAM	ADEQ	04-013-9997-81102-3	48	197	0600	
JLG Supersite	TEOM	ADEQ	04-013-9997-81102-4	42	138	0600	
Navajo County							
N/A	TEOM	WMAT	04-017-1002-81102-1	33	64	1100	
Pima County							
Ajo	TEOM	ADEQ	04-019-0001-81102-3	51	200	0500	
Orange Grove	FRM	PCDEQ	04-019-0011-81102-2	27	N/A	N/A	
Rillito	TEOM	ADEQ	04-019-0020-81102-3	36	99	0000	
South Tucson	FRM	PCDEQ	04-019-1001-81102-1	29	N/A	N/A	
Green Valley	TEOM	PCAQCD	04-019-1030-81102-1	17	33	1200	

Geronimo	TEOM	PCAQCD	04-019-1113-81102-1	29	50	1000	

Table 2-2. PM_{10} measurements collected in Arizona, southeastern California, and southern Nevada on May 26, 2012. Data from the Yuma Supersite monitor are shown in **bold green**.

Monitor	Monitor Type	Operator	AQS Monitor ID	24-hr Avg PM_{10} ($\mu g/m^3$)	1-hr Max PM_{10} ($\mu g/m^3$)	Time of Max 1-hr PM_{10} (MST)	AQS Qualifier Flag
Pinal County							
Casa Grande Downtown	TEOM	PCAQCD	04-021-0001-81102-3	52	163	0800	
Apache Junction Fire Station	TEOM	PCAQCD	04-021-3002-81102-3	35	117	2200	
Stanfield	TEOM	PCAQCD	04-021-3008-81102-3	60	172	0800	
Combs	TEOM	PCAQCD	04-021-3009-81102-3	46	142	0800	
Maricopa	TEOM	PCAQCD	04-021-3010-81102-3	53	185	0600	
Pinal County Housing	TEOM	PCAQCD	04-021-3011-81102-3	54	157	0800	
Cowtown	TEOM	PCAQCD	04-021-3013-81102-3	96	292	0700	
Santa Cruz County							
Nogales Post Office	BAM	ADEQ	04-023-0004-81102-3	28	39	1000	
Yuma County							
Yuma Supersite	**TEOM**	**ADEQ**	**04-027-8011-81102-3**	**216**	**1709**	**0000**	**RJ**
CALIFORNIA							
Imperial County							
Brawley-Main Street #2	BAM	ICAPCD	06-025-0007-85101-3	71	621	0100	
Niland-English Road	BAM	ICAPCD	06-025-4004-85101-3	87	885	0000	
Riverside County							
Riverside-Magnolia	BAM	SCAQMD	06-065-1003-81102-5	19	39	0200	
Torres-Martinez Admin Site	BAM	TMIR	06-065-1999-81102-1	167	995	0300	IJ
Indio-Jackson Street	TEOM	SCAQMD	06-065-2002-81102-3	22	48	1900	
Palm Springs-Fire Station	TEOM	SCAQMD	06-065-5001-81102-3	17	25	2200	
Riverside-Rubidoux	BAM	SCAQMD	06-065-8001-81102-9	26	42	1700	
Mira Loma-Van Buren	BAM	SCAQMD	06-065-8005-81102-3	33	59	0600	
Lake Elsinore-W Flint Street	TEOM	SCAQMD	06-065-9001-81102-3	15	20	2100	
San Bernardino County							
San Bernadino-4th Street	TEOM	SCAQMD	06-071-9004-81102-3	23	31	2200	
Jean	BAM	CCDAQEM	32-003-1019-81102-1	15	27	0200	
JD Smith	BAM	CCDAQEM	32-003-2002-81102-1	21	67	1000	

TEOM: Tapered Element Oscillating Microbalance
BAM: Beta Attenuation Monitor
FRM: Federal Reference Method
WMAT: White Mountain Apache Tribe
ADEQ: Arizona Department of Environmental Quality
MCAQD: Maricopa County Air Quality Department
FMIR: Fort McDowell Indian Reservation
PCAQCD: Pinal County Air Quality Control District
PCDEQ: Pima County Department of Environmental Quality
ICAPCD: Imperial County Air Pollution Control District
SCAQMD: South Coast Air Quality Management District
TMIR: Torres-Martinez Indian Reservation
RJ: qualifier flag for high winds (for data exclusion)
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3. Causal Relationship

3.1 Discussion

Meteorological and air quality observations indicate that dust carried by gusty winds accompanied by an unseasonably strong cold front approaching Arizona was directly responsible for high PM_{10} concentrations observed in Yuma on May 25 and 26, 2012. On the afternoon of May 25, a cold front moved southeastward across California and into western Arizona (**Figure 3-1**). A strong pressure gradient associated with this front led to the development of a prolonged period of widespread, gusty west-northwesterly winds across much of southeastern California and western Arizona, including the Yuma area. The likely source regions for PM_{10} during the May 25 and 26, 2012, event was the desert of southeastern California, including the Algodones Dunes, which largely consist of natural, undisturbed desert. The last time Yuma recorded any measurable rainfall leading up to the May 25 and 26, 2012, high-wind event was on April 26, when showers associated with a cold front produced 0.05 inches of rain at the Yuma MCAS. This combination of geography and lack of rainfall preceding the event resulted in a large fetch of soils that were particularly vulnerable to particulate suspension.

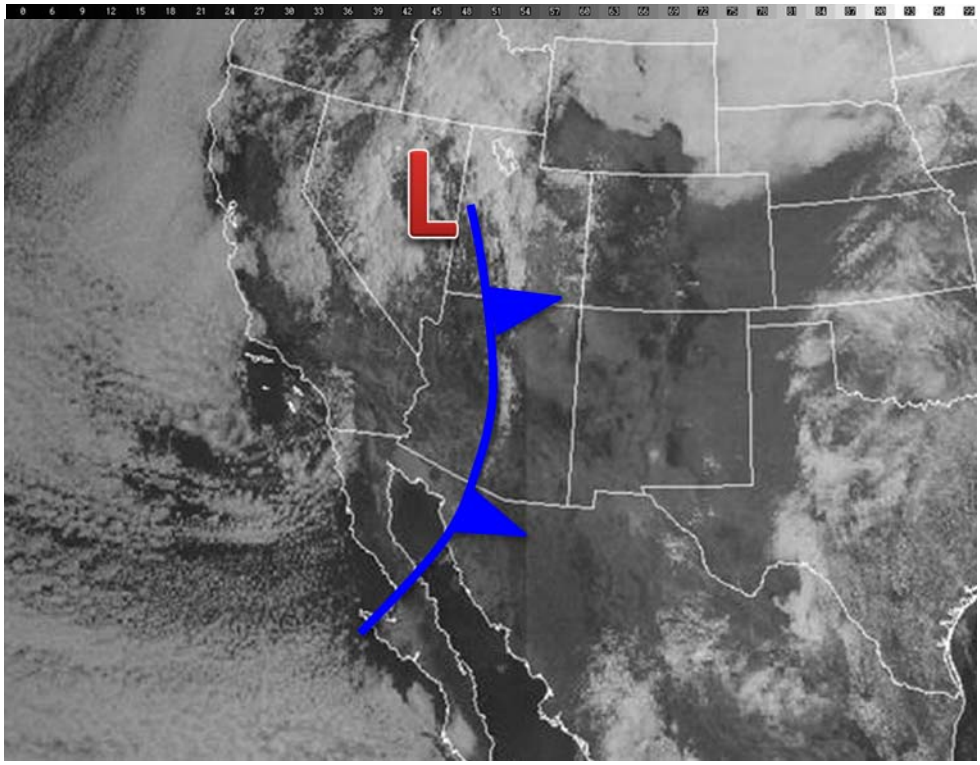

Figure 3-1. Visible satellite image from 7:30 mountain standard time (MST) on May 26, 2012 (GOES-West). An unseasonably strong cold front was moving eastward across Arizona. Strong west-northwesterly winds behind this front transported dust and PM_{10} into the Yuma area.

As the cold front moved through the Yuma area, gusty southerly winds shifted to west-northwesterly. **Figures 3-2 through 3-5** illustrate radar velocity, wind, visibility, and PM_{10} data in southern California and southwestern Arizona, including Yuma before, during, and after passage of the cold front. Radar velocity and surface wind measurement data at 16:00 MST on May 25 (Figure 3-2) clearly indicate a wind shift from southerly to west-northwesterly directly west of Yuma. At 19:00 MST on May 25 (Figure 3-3) and 0:00 MST on May 26 (Figure 3-4), radar velocity and surface wind measurements showed strong west-northwesterly winds regionwide, with reduced visibilities and high PM_{10} concentrations in Yuma.

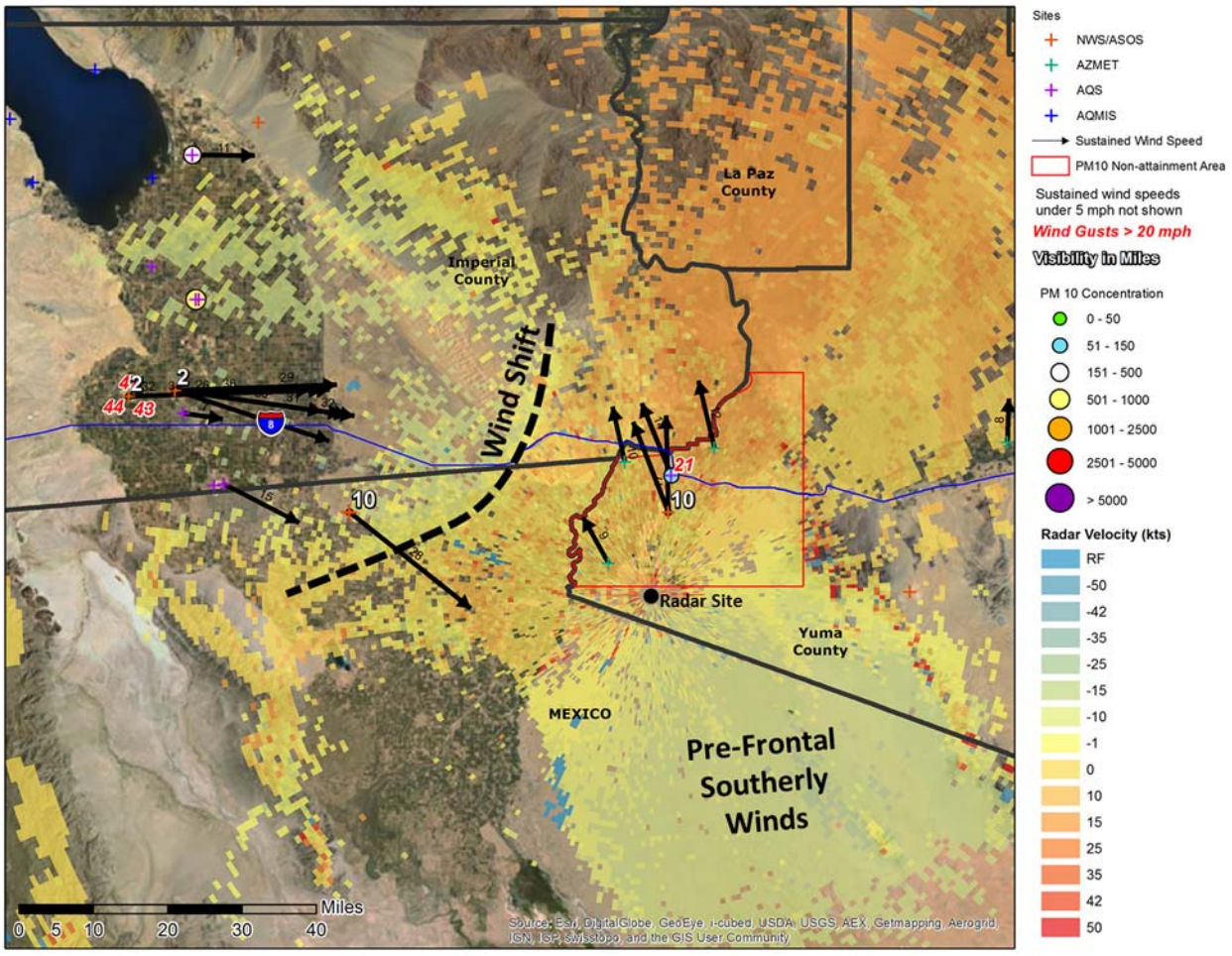

Figure 3-2. Hourly PM_{10} concentrations (colored circles), wind speed and direction (arrows), maximum wind gusts (red numbers), and minimum visibility (white numbers) observations at Yuma and Imperial County monitors between 16:00 MST and 17:00 MST on May 25, 2012. Doppler radar velocity data are shown for 16:24 MST; greens indicate motion toward the radar and oranges/reds indicate motion away from the radar. A cold front and associated wind shift was located west of Yuma.

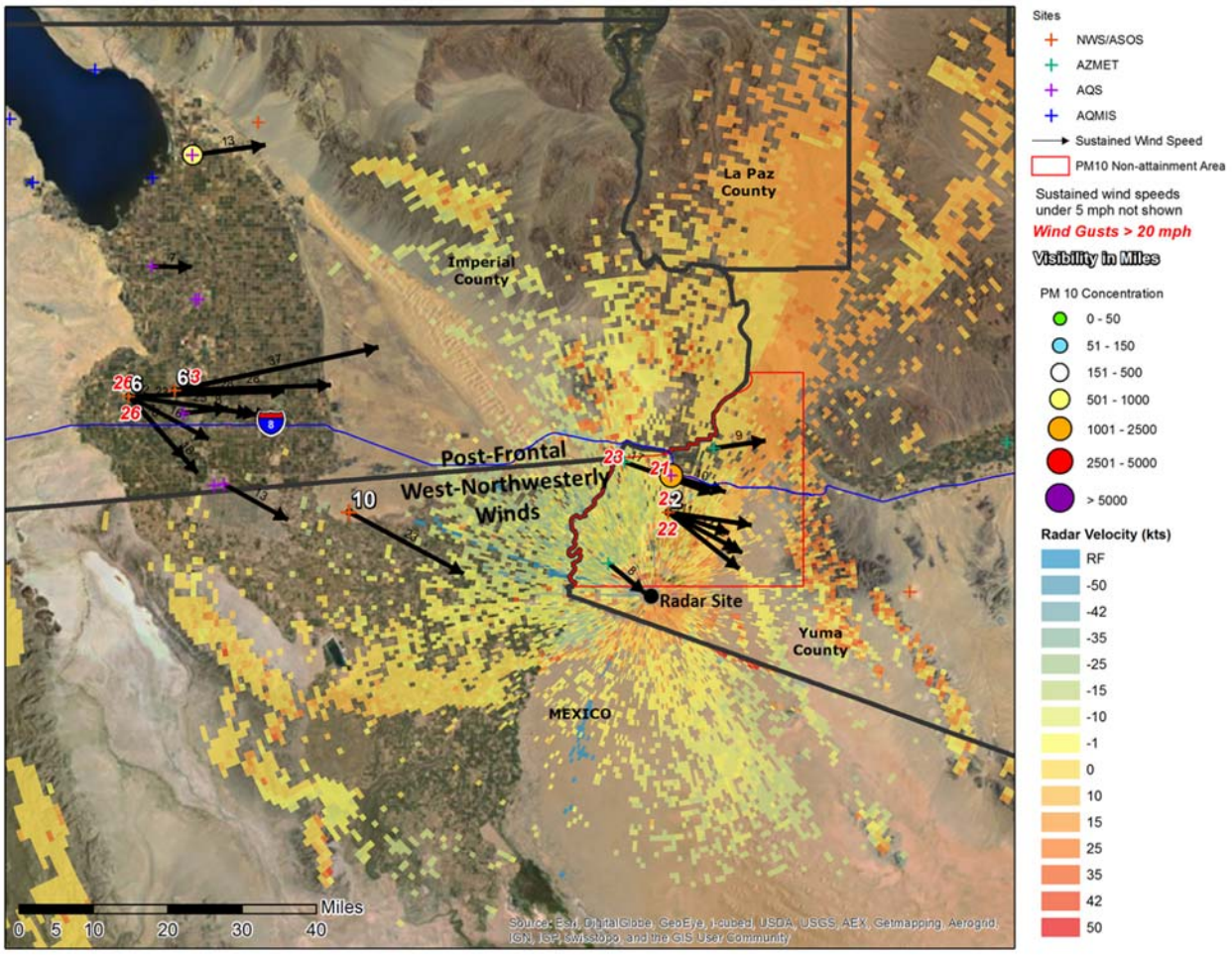

Figure 3-3. Hourly PM_{10} concentrations (colored circles), wind speed and direction (arrows), maximum wind gusts (red numbers), and minimum visibility (white numbers) observations at Yuma and Imperial County monitors between 19:00 MST and 20:00 PST on May 25, 2012. Doppler radar velocity data are shown for 19:09 MST; greens indicate motion toward the radar and oranges/reds indicate motion away from the radar. Gusty west-northwesterly winds transported dust and PM_{10} into the Yuma area

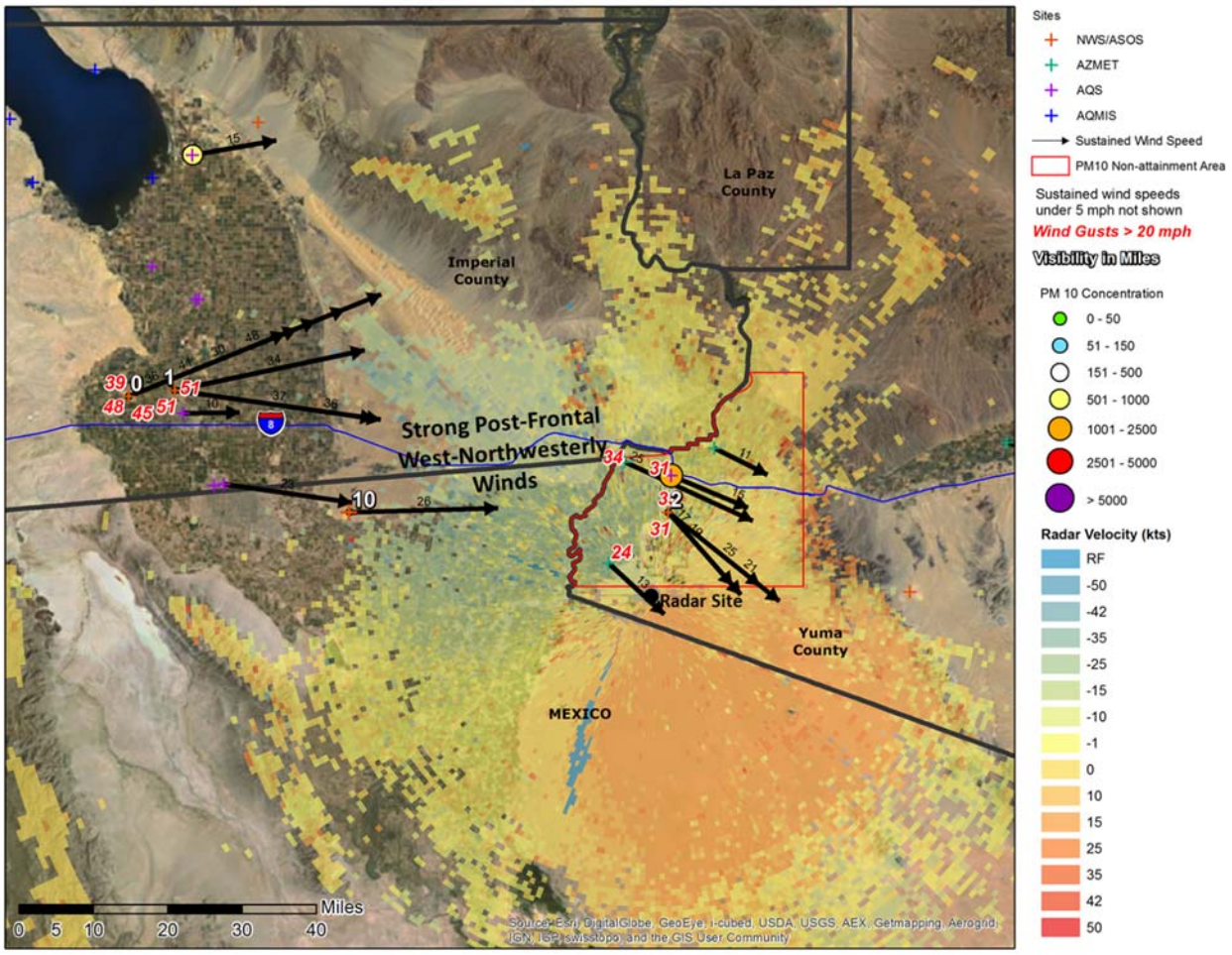

Figure 3-4. Hourly PM_{10} concentrations (colored circles), wind speed and direction (arrows), maximum wind gusts (red numbers), and minimum visibility (white numbers) observations at Yuma and Imperial County monitors between 0:00 MST and 1:00 MST on May 26, 2012. Doppler radar velocity data are shown for 0:02 MST; greens indicate motion toward the radar and oranges/reds indicate motion away from the radar. Gusty west-northwesterly winds transported dust and PM_{10} into the Yuma area.

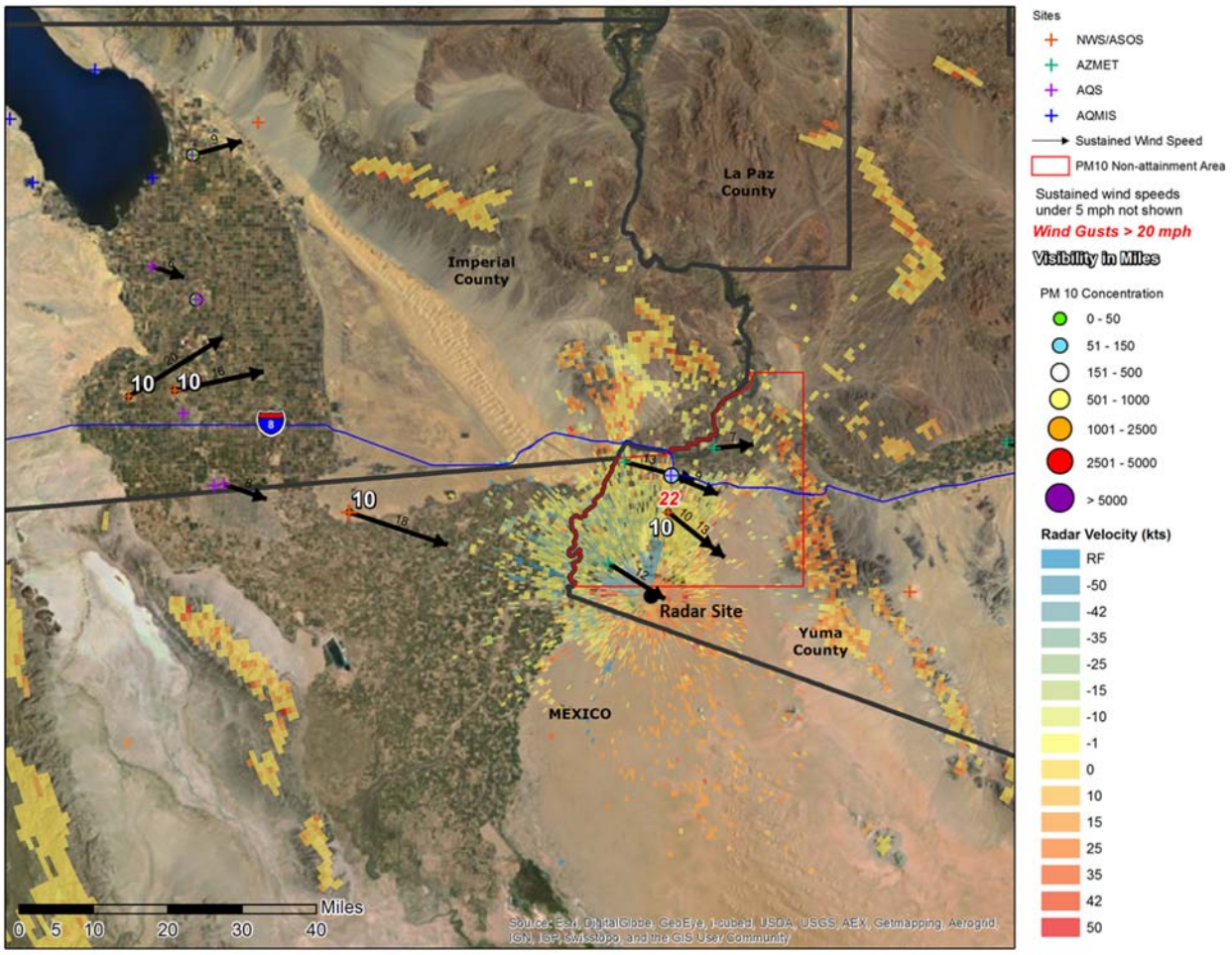

Figure 3-5. Hourly PM_{10} concentrations (colored circles), wind speed and direction (arrows), maximum wind gusts (red numbers), and minimum visibility (white numbers) observations at Yuma and Imperial County monitors between 7:00 MST and 8:00 MST on May 26, 2012. Doppler radar velocity data are shown for 19:29 MST; greens indicate motion toward the radar and oranges/reds indicate motion away from the radar. West-northwesterly winds diminished, resulting in lower PM_{10} concentrations and improved visibilities in the Yuma area.

A summary of maximum sustained winds and peak wind gusts at monitors in Yuma and Imperial counties is shown in **Table 3-1**, including a peak gust of 62 mph at the El Centro Naval Air Facility (NAF). Monitors in the local Yuma area measured sustained winds of up to 30 mph and wind gusts of up to 38 mph coincident with the peak PM_{10} concentrations (**Figures 3-6 and 3-7** and Appendix A). Visibility at the Yuma MCAS also decreased significantly with the arrival of the dust (**Figure 3-8**), prompting the NWS office in Phoenix, Arizona, to issue a Wind Advisory and Blowing Dust Advisory for Yuma and Imperial counties (see Appendix B). Furthermore, haze was also reported at the Yuma MCAS and Imperial County Airport sties, and blowing dust and blowing sand were reported at the El Centro NAF. Wind gusts of over 20 mph were also reported for several hours preceding the arrival of the windblown dust in Yuma, but the wind direction during those hours was not conducive to transport of dust into the Yuma area. **Figure 3-9** demonstrates the important relationship between the wind shift to west-northwesterly

associated with cold frontal passage and the sharp increase in PM_{10} concentrations, as west-northwesterly winds are conducive to transport of dust and PM_{10} into Yuma from the Algodones Dunes in Imperial County.

Table 3-1. Observed wind speeds and wind gusts at Yuma and Imperial County monitors on May 25 and 26, 2012. The Yuma Supersite monitor reported a PM_{10} concentration of 1709 µg/m^3 at 0:00 MST on May 26, 2012, coincident with the peak wind gust reported at that monitor.

Monitor	Maximum Wind Speed (mph)	Wind Direction (degrees)	Date/Time (MST)	Maximum Wind Gust (mph)	Date/Time (MST)
Imperial County Airport	37	280	5/25/2012 2351	53	5/25/2012 2351
El Centro NAF	49	260	5/25/2012 2356	62	5/25/2012 2356
Niland-English Road	35	262	5/26/2012 0000	-	-
Yuma North Gila	15	152	5/25/2012 0000	25	5/25/2012 0000
Yuma Valley	25	296	5/26/2012 0000	36	5/26/2012 0100
Yuma Supersite	16	288	5/26/2012 0100	31	5/26/2012 0000
Yuma South	14	305	5/26/2012 0100	24	5/26/2012 0000 0100
Yuma MCAS	30	300	5/26/2012 0131	38	5/26/2012 0131
Roll	10	293	5/26/2012 0900	20	5/25/2012 1500

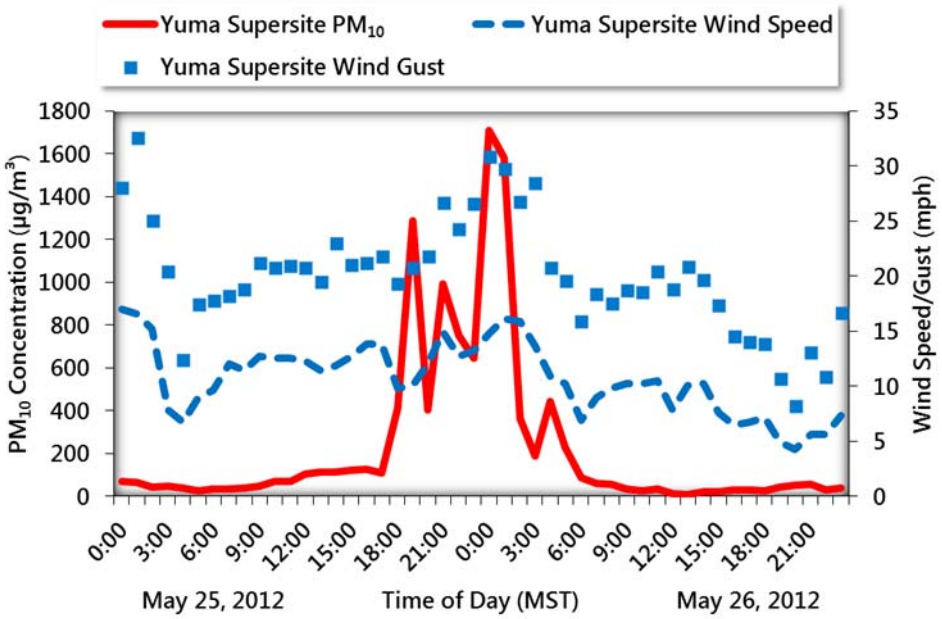

Figure 3-6. Hourly PM_{10} concentrations, wind speeds, and wind gusts at the Yuma Supersite monitor on May 25 and 26, 2012. PM_{10} concentrations and wind speeds increased sharply after 18:00 MST on May 25, indicating the arrival of windblown dust.

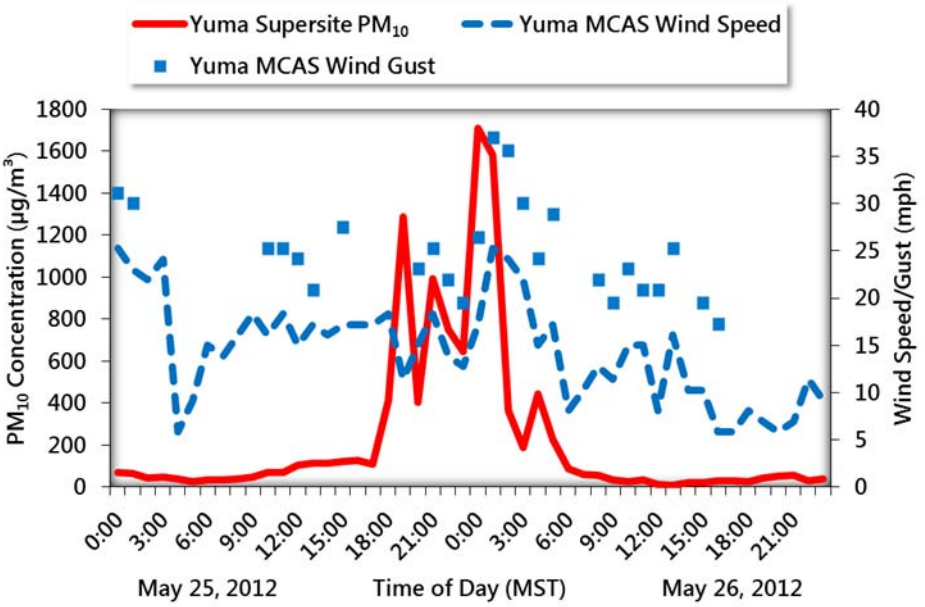

Figure 3-7. Hourly PM_{10} concentrations at the Yuma Supersite monitor and wind speeds and gusts at the Yuma MCAS monitor on May 25 and 26, 2012. PM_{10} concentrations increased at 18:00 MST on May 25, indicating the arrival of windblown dust. Wind gusts also peaked at 38 mph coincident with high PM_{10} concentrations after midnight on May 26.

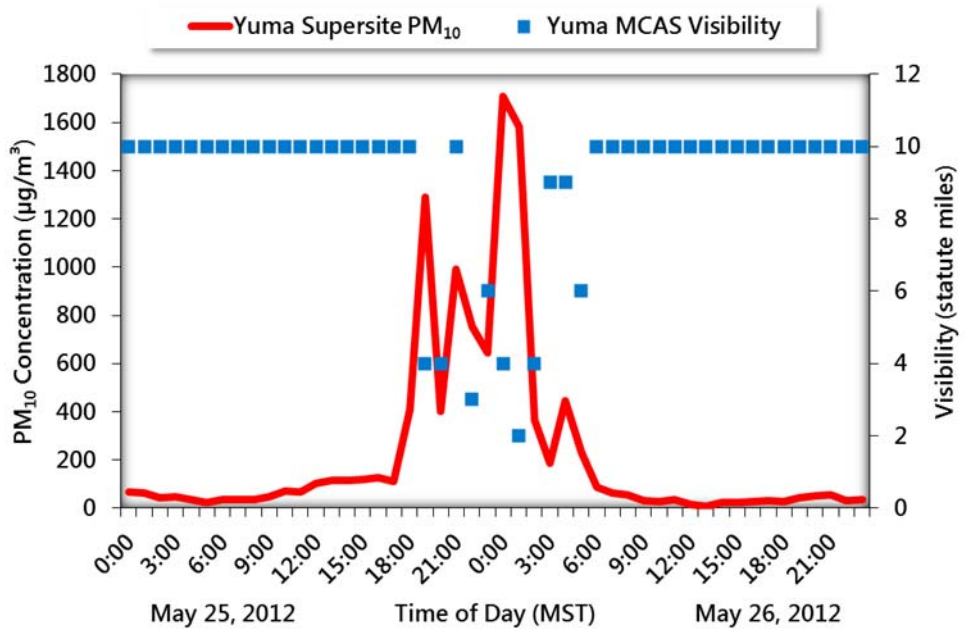

Figure 3-8. Hourly PM_{10} concentrations at the Yuma Supersite monitor and visibility at Yuma MCAS on May 25 and 26, 2012. Visibility was greatly reduced after 18:00 MST on May 25 coincident with the sharp increase in PM_{10} concentrations at the Yuma Supersite monitor, indicating the arrival of windblown dust.

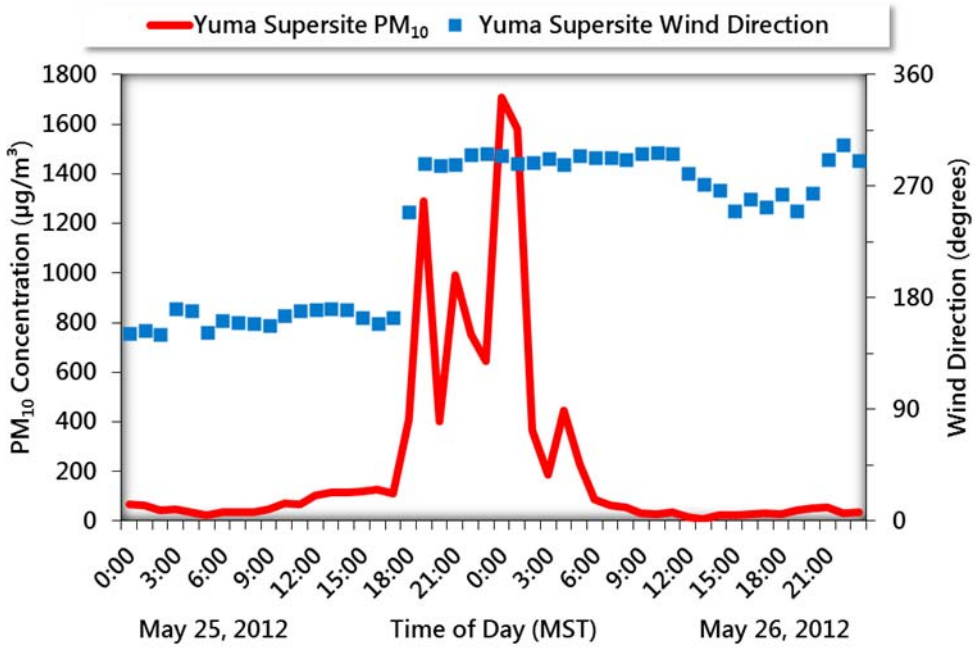

Figure 3-9. Hourly PM_{10} concentrations and wind direction at the Yuma Supersite monitor on May 25 and 26, 2012. PM_{10} concentrations increased dramatically after 18:00 MST, coincident with an abrupt wind shift from southerly to west-northwesterly.

Air quality monitors in neighboring Imperial County, California, also reported very strong winds, reductions in visibility, and sharp increases in PM_{10} concentrations, illustrating the widespread nature of this dust storm event (**Figures 3-10 through 3-12**). Please note that PM_{10} data are unavailable from the Brawley monitor during the height of this event, likely because the PM_{10} readings were well above the monitor's valid reporting range. No rainfall was reported across southwestern Arizona and southeastern California with the passage of this cold front and the associated dust. PM_{10} concentrations in the Yuma and Imperial counties decreased considerably after 6:00 MST on May 26 as winds gradually diminished.

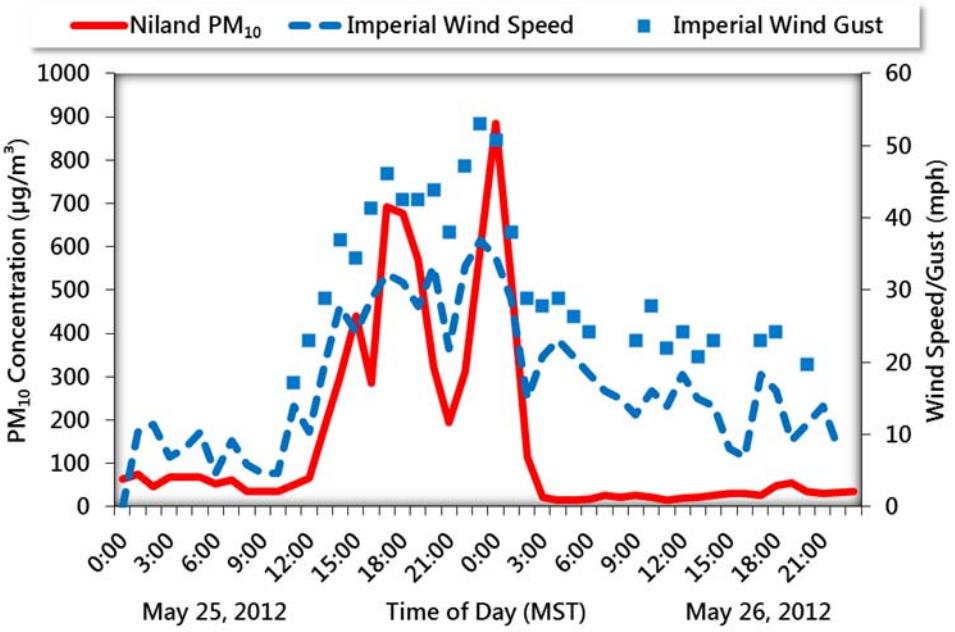

Figure 3-10. Hourly PM_{10} concentrations at the Niland AQS monitor and wind speed and gusts at the Imperial County airport on May 25 and 26, 2012. PM_{10} concentrations and wind speeds sharply increased in the early afternoon on May 25, 2012, indicating the arrival of windblown dust.

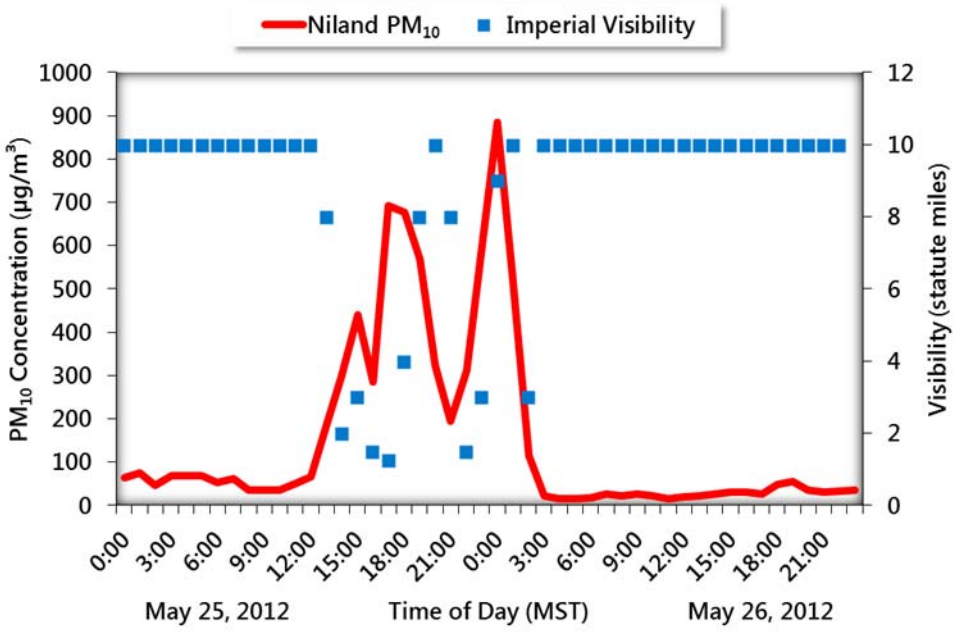

Figure 3-11. Hourly PM_{10} concentrations at the Niland AQS monitor and visibility at the Imperial County airport on May 25 and 26, 2012. Visibility decreased coincident with a sharp increase in PM_{10} concentrations, indicating the arrival of windblown dust.

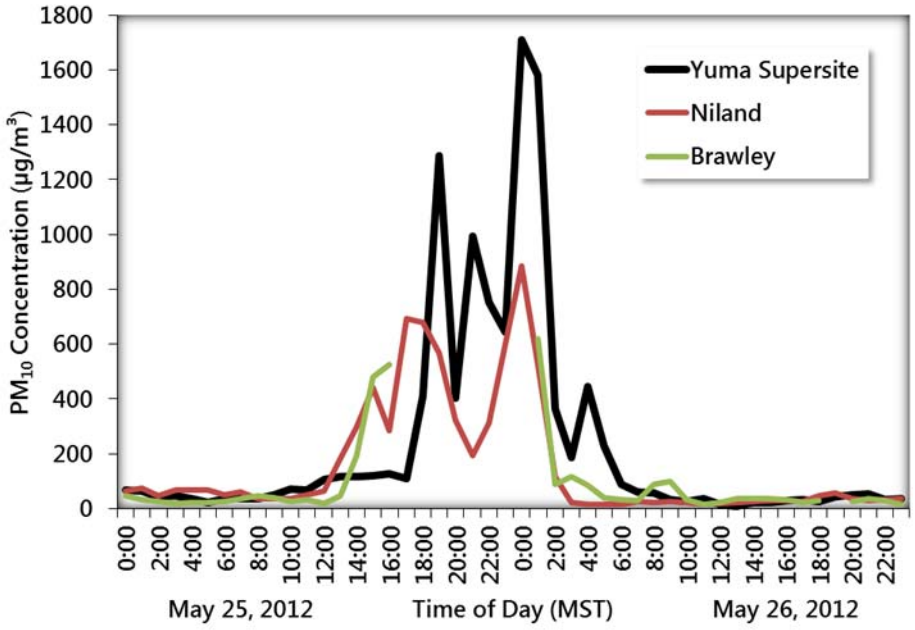

Figure 3-12. Hourly PM_{10} concentrations at the Yuma and Imperial County AQS monitors on May 25 and 26, 2012. High PM_{10} concentrations were reported at all three monitors late on May 25 and early May 26 due to windblown dust. Data are unavailable for several hours at the Brawley monitor, possibly because PM_{10} concentrations were above the valid reporting range of the monitor.

3.2 Summary

The information presented in this section demonstrates a clear causal relationship between the windblown dust and the PM_{10} exceedances measured at the Yuma Supersite monitor on May 25 and 26, 2012. The PM_{10}, wind, and visibility data shown in this section illustrate the spatial and temporal representation of the dust storm as it moved through southeastern California and southwestern Arizona. Strong winds likely lofted large amounts of dust and PM_{10} into the lower atmosphere. This dust likely originated in open desert areas of Imperial County, including the Algodones Dunes, and was transported into Yuma following passage of the cold front. In addition, the time-series plots of air quality and meteorological data found in this section and in Appendix A show that the sharp increase in PM_{10} concentrations coincided with high wind speeds and a wind shift from southerly to west-northwesterly, and that the strong winds were experienced over a large area.

4. Historical Norm

4.1 Analysis

PM_{10} concentrations measured at the Yuma Supersite monitor on May 25 and 26, 2012, were unusual and in excess of normal historical fluctuations. The PM_{10} concentrations measured on May 25 and 26, 2012, were some of the highest hourly and 24-hr averages measured over the last five years, with hourly concentrations exceeding 1,000 µg/m^3. To establish the severity of this event, PM_{10} concentrations measured on May 25 and 26, 2012, were compared to a historical 2008–2012 5-year annual data set. Time-series plots of the 24-hr average PM_{10} concentrations for the period January 1, 2008, through December 31, 2012, provide a historical perspective of PM_{10} concentrations (**Figure 4-1**). The 24-hr average PM_{10} concentrations on May 25 and 26, 2012, are the 5th and 9th highest daily averages in the last 5 years, respectively.

Additionally, time-series plots of the daily maximum 1-hr PM_{10} concentrations were created to provide a deeper understanding of the frequency with which short-term particulate concentrations affect the Yuma area **(Figure 4-2)**. The daily maximum 1-hr PM_{10} concentrations on May 25 and 26, 2012, are the 14th and 7th highest concentrations observed in the last 5 years.

Historical daily cumulative distributions of the 24-hr average and daily maximum 1-hr PM_{10} concentrations were created for the Yuma County monitor for the 2008−2012 period to provide additional evidence that establishes the severity of this event. **Figures 4-3 and 4-4** show histograms of 24-hr average PM_{10} concentrations and daily maximum 1-hr PM_{10} concentrations at the Yuma County monitor and the corresponding 95th percentile lines. The 24-hr average PM_{10} concentrations and daily maximum 1-hr PM_{10} concentrations on May 25 and 26, 2012, were above the 95th percentile at the Yuma Supersite monitor. Concentrations in excess of the 95th percentile are considered to be unusual.[1]

4.2 Summary

Given the recorded values and using similar methodology to the one accepted by EPA, it is clear that the PM_{10} levels on May 25 and 26, 2012, were outside of normal historical fluctuations. This analysis provides evidence that the event affected air quality on a historic scale.

[1] Excluding days on which concentrations caused by exceptional events exceed the 95th percentile threshold employs a general test of statistical significance and has the effect of ensuring that such concentrations would clearly fall beyond the range of normal expectations for air quality during a particular time of year. Source: “The treatment of Data Influenced by Exceptional Events,” 71 FR 12598.

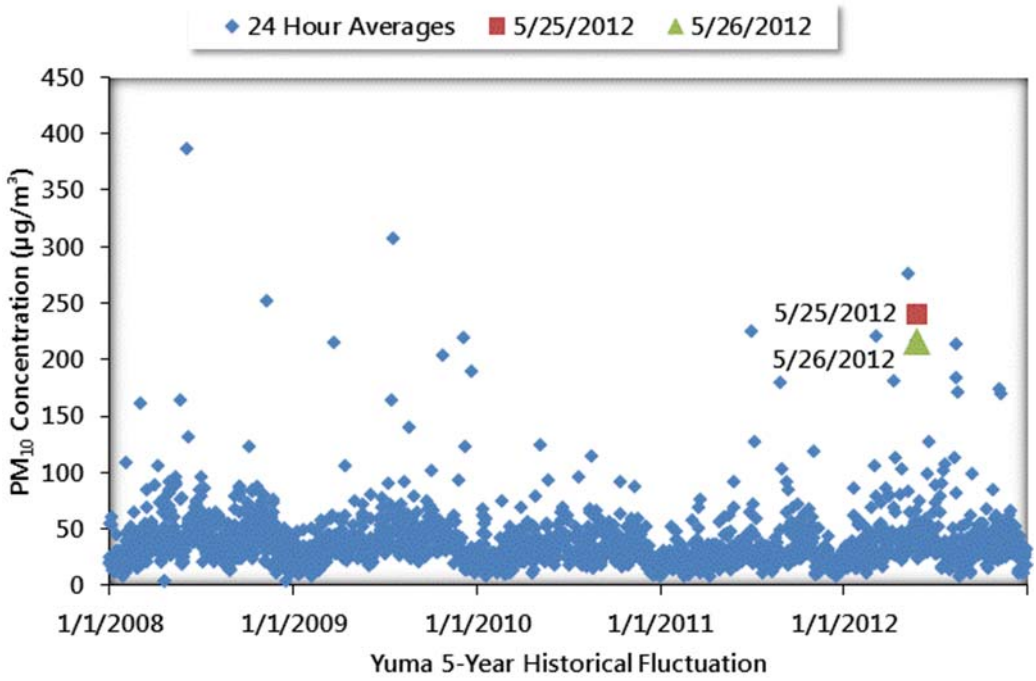

Figure 4-1. 24-hr average PM_{10} concentrations at the Yuma Supersite monitor (2008-2012). The 24-hr average PM_{10} concentrations on May 25 and 26, 2012, are highlighted by the red square and green triangle, respectively.

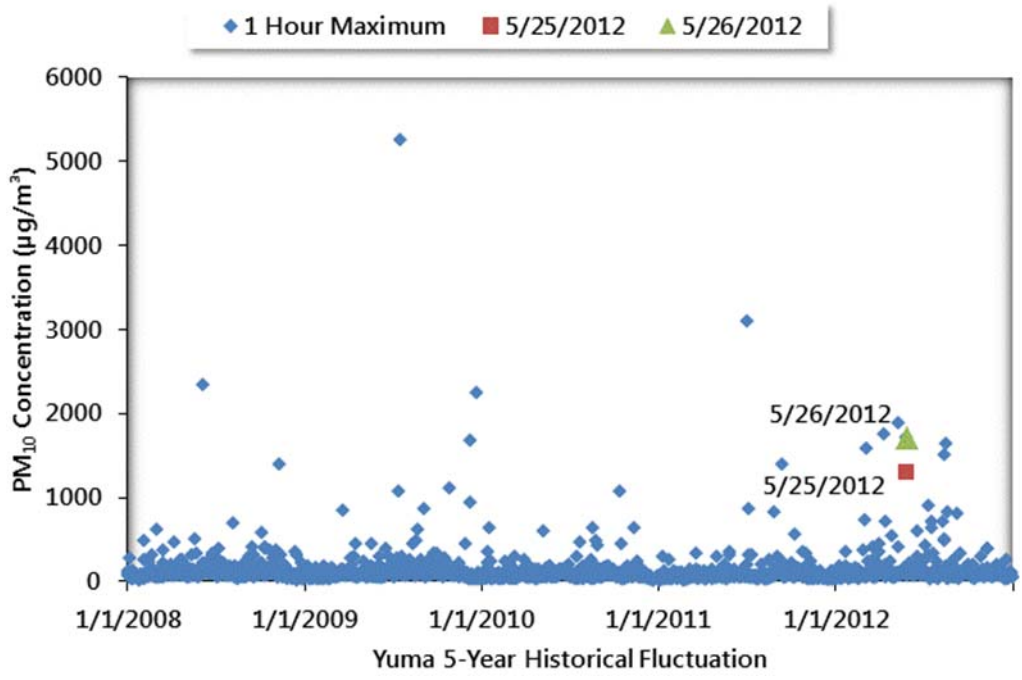

Figure 4-2. Daily maximum 1-hr PM_{10} concentrations at the Yuma Supersite monitor (2008–2012). The daily maximum 1-hr PM_{10} concentrations on May 25 and 26, 2012, are highlighted by the red square and green triangle, respectively.

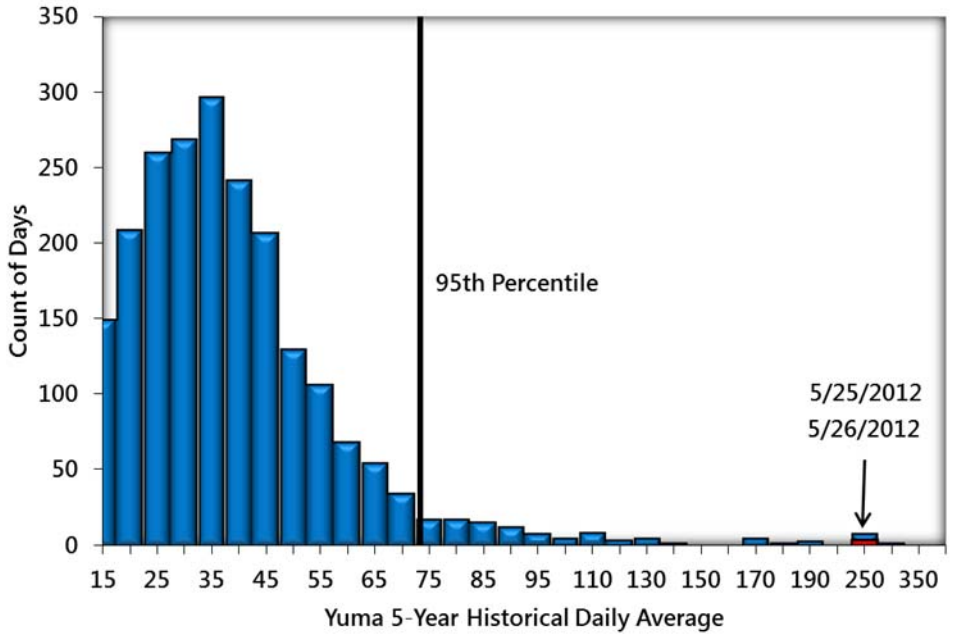

Figure 4-3. 24-hr average PM_{10} concentrations at the Yuma Supersite monitor for 2008-2012. The 24-hr average PM_{10} concentrations on May 25 and 26, 2012, were in excess of the 95th percentile.

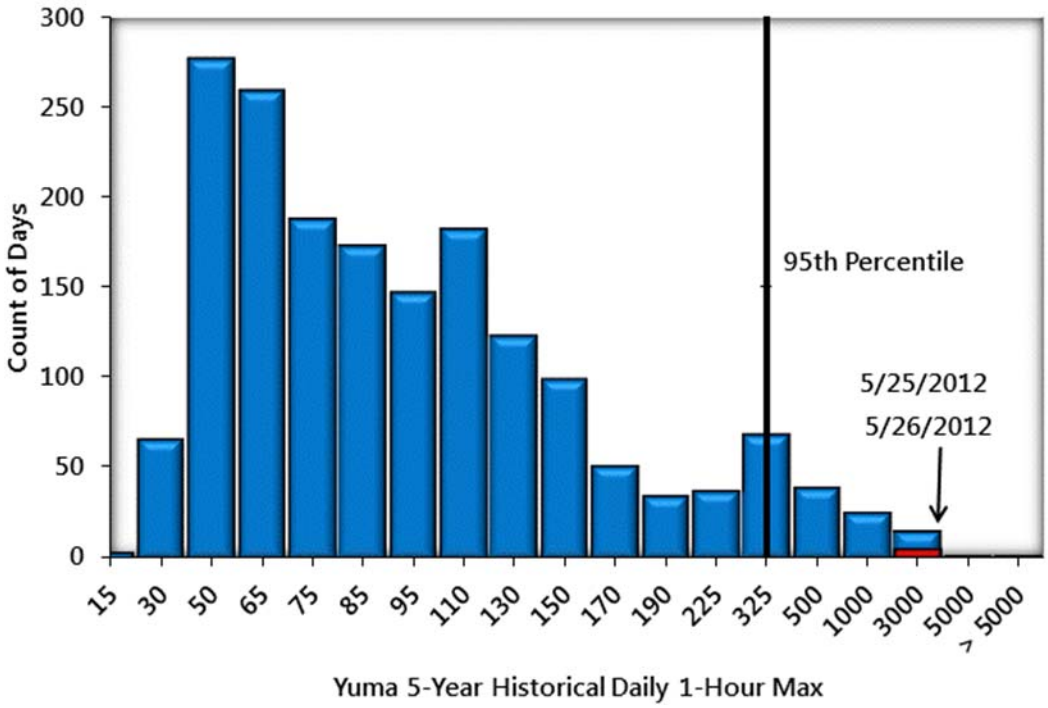

Figure 4-4. Daily maximum 1-hr PM_{10} concentrations at the Yuma Supersite monitor for 2008–2012. The daily maximum 1-hr PM_{10} concentrations on May 25 and 26, 2012, were in excess of the 95th percentile.

5. Not Reasonably Controllable or Preventable

5.1 Background

Yuma was designated as a moderate PM_{10} nonattainment area by operation of the 1990 Clean Air Act. The nonattainment area is defined in 40 CFR 481.303. ADEQ completed a state implementation plan (SIP) for the area in 1991; however, the plan was found to be incomplete and in 1994 ADEQ updated the plan, identifying additional reasonably available control measures (RACM). In 2001, due to several years of "clean data" and the existence of permanent and enforceable measures, ADEQ began the development of a maintenance plan and request for redesignation of the area to attainment. The maintenance plan was submitted to EPA in August 2006.

5.1.1 Control Measures

Details of the control measures implemented from 1994-2001 are in Appendix G of the 2006 Yuma PM_{10} Maintenance Plan. The control measures are listed in **Table 5-1**.

Table 5-1. Control measures implemented in the Yuma PM_{10} Nonattainment Area, 1994-2001.

Implementing Agency	Reasonably Available Control Measure
City of Yuma	Paving unpaved roads
	Closing unpaved roads
	Chemically stabilizing unpaved roads
	Paving or stabilizing parking lots
	Re-routing traffic or rapid cleanup of temporary sources of dust and spills
	Covering haul trucks
	Dust control plans for land clearing, construction projects
	Stabilizing soil; controlling dust on open lands
	Amending building codes
Town of Somerton	Re-routing traffic or rapid cleanup of temporary sources of dust and spills
	Covering haul trucks
	Dust control plans for land clearing, construction projects
	Stabilizing soil
Yuma County	Paving unpaved roads
	Stabilizing unpaved roads
	Re-routing traffic or rapid cleanup of temporary sources of dust and spills
	Covering haul trucks
	Open Burn Permit Program (rural metro)
Irrigation Districts	Reducing traffic on unpaved roads
AZ Dept. of Transportation	Requiring contractors to adhere to local dust control plans

RACM for 2000 through 2004 can be found in Table 6.3 of the 2006 Yuma PM_{10} Maintenance Plan and are reproduced in part in **Table 5-2**. Chapter 7 of the maintenance plan also contains a list of contingency measures that could be implemented promptly should any violation of the NAAQS for PM_{10} occur.

Table 5-2. Control measures implemented in the Yuma area, 2000-2004.

Implementing Agency	Reasonably Available Control Measure
City of Yuma	Pave unpaved roads
	Pave unpaved alleys
	Pave unpaved vacant land
	Chemically stabilize unpaved roads
	Water shoulders
	Street sweep paved roads
	Install curbs and sidewalks
	Landscape median
	Magnesium chloride on alleys
	Magnesium chloride on city property
Town of Somerton	Water unpaved roads
	Water unpaved shoulders
	Pave unpaved roads
	Weekly cleanup of paved roads, mud, trackout, spills
	Pave unpaved lots
	Landscape shoulders
	Install curbs
	Pave/stabilize unpaved roads
	Chip/seal
	Magnesium chloride on unpaved roads
	Street sweeping
Yuma County	Pave unpaved roads
	Developers add new paved roads
	Chip/seal unpaved roads
	Magnesium chloride unpaved roads
	Street sweeping

Table 5-2. Control measures implemented in the Yuma area, 2000-2004.

Implementing Agency	Reasonably Available Control Measure
Immigration & Naturalization	Water drag roads
	Pipelined
	Maintain 350 “No Trespassing” signs and 50 barricades
	Patrol and water unpaved canal roads
	3 mi posted/barricaded
	Paved 2.5 mi
	2.5 mi fenced off
	Abandoned 3/8 mi
	Lined 8 mi of canal
N. Gila Irrigation District	20 miles posted
Unit B Irrigation District	3 mi posted/barricaded
Bureau of Reclamation	Water 960 miles of canal banks
Marine Corps Air Station	Remove 26 gas vehicles
	Remove 25 gas scooters
	Pave 240,329-ft roadway
	Pave 102,112-ft parking
	Sweeping 717,221-yd runway
	Sweeping 388,952-yd taxiway
	Sweeping 401,090-yd aprons and 121,380-yd other
	Stabilize desert

In 2010, the Yuma Metropolitan Planning Organization (YMPO) updated the Transportation Improvement Plan (TIP) as required to comply with the requirements for transportation conformity under Section 176(c)(2) of the Clean Air Act. The update required a review of control measures included in the 2006 Yuma PM_{10} Maintenance Plan to assure that emissions were within the limits found in both plans for the current review years through the 2016 projected maintenance period. Yuma’s plans related to transportation improvements can be found under “Plans and Reports” at ympo.org.

5.1.2 Additional Measures

On August 18, 2002, Yuma recorded a 24-hr average PM_{10} concentration of 170 $\mu g/m^3$, which is in exceedance of the NAAQS. A Natural Events Action Plan (NEAP) was created to address and potentially implement any measures that could prevent future violations of the NAAQS. The option to develop a NEAP is no longer available; however, Yuma reviewed existing measures and developed additional measures that were later incorporated into the 2006 PM_{10} Maintenance Plan. These included (1) a public notification and education program, still in place today, and augmented recently by a pilot flag program for public schools and facilities based on the Yuma Dust Control Action Forecast (Appendices D, E, and F of the 2006

Yuma PM_{10} Maintenance Plan); (2) an analysis of best available control measures (BACM) normally reserved for serious nonattainment areas; and (3) a review of existing control measures for construction sources, street sweepers, paved roads, covered trucks, off-highway vehicles, stationary source opacity limits, other stationary source control measures, and agricultural best management practices (Appendix H of the 2006 Yuma PM_{10} Maintenance Plan). In 2002, ADEQ met with Yuma stakeholders and began work on the development of a Yuma Agricultural Best Management Practices (AgBMP) rule. The rule became effective July 18, 2005, as R18-2-613 of the Arizona Administrative Code, and was submitted to EPA on August 16, 2006.

5.1.3 Review of Source-Permitted Inspections and Public Complaints

ADEQ's Arizona Unified Repository for Information Tracking of the Environment (AZURITE) database was queried to compile a list of inspections for the permitted sources in the Yuma area around the time of the May 25 and 26, 2012, PM_{10} exceedances. An evaluation of all inspection reports, air quality complaints, compliance reports, and other documentation indicated no evidence of unusual anthropogenic-based PM_{10} emissions. During the time period of May 22 through May 28, 2012, ADEQ inspectors conducted one routine inspection of a permitted source.

5.2 Forecasts and Warnings

Dust forecasts were released prior to the event by both ADEQ and the NWS office in Phoenix (Appendix B). The ADEQ Yuma and Vicinity Dust Control Action Forecast issued on Thursday, May 25, 2012, called for a period of gusty winds beginning the afternoon of Friday, May 25, and possibly continuing into the morning of Saturday, May 26, and the "potential for periods of dense blowing dust." As a result, ADEQ issued a PM_{10} Health Watch for Friday, May 25. ADEQ's forecast issued on Friday, May 25, again predicted that period of blowing dust were likely in the Yuma area through the morning of May 26. The NWS issued Wind Advisories and Blowing Dust Advisories for Yuma and Imperial counties in relation to this post-frontal windblown dust event, warning of the potential for strong winds of 20 to 35 mph, wind gusts of up to 50 mph, and visibilities reduced to one mile in dust-prone areas.

5.3 Wind Observations

Wind data during the event were available at five Yuma-area monitors, including one AQS site, one NWS site, and three AZMET sites (Figure 3-3 and Appendix A). Sustained wind speeds of up to 30 mph were reported at the Yuma MCAS, and wind gusts of over 30 mph were reported at Yuma Supersite, Yuma Valley, and Yuma MCAS. Gusty winds were reported in the Yuma area over an extended duration, beginning at roughly 19:00 MST on May 25 and continuing through 5:00 MST on May 26. Winds were even stronger in neighboring Imperial County, where sustained winds of up to 49 mph and wind gusts of 62 mph were reported at the El Centro NAF. These winds were strong enough to overcome most PM_{10} control measures.

5.4 Summary

The weather and air quality forecasts and warnings outlined in this section demonstrate that strong winds behind a departing cold front caused uncontrollable PM_{10} emissions. The RACM outlined in the Yuma PM_{10} Maintenance Plan were in place at the time of the event. These control measures are required for areas designated as Moderate non-attainment for PM_{10}, such as Yuma County. Thus, the RACM in place at the time of the event were reasonable. In addition, surface wind measurements in the Yuma area during the event were high enough (at or above 30 mph) that most reasonable PM_{10} control measures would have been overwhelmed.

6. But-For Analysis

6.1 Discussion

Section 50.14(c)(3)(iv)(D) in 40 CFR Part 50 requires that an exceptional event demonstration satisfies that "[t]here would have been no exceedance or violation but for the event." The prior sections of this submittal have provided detailed information that in regard to the PM_{10} exceedances at the Yuma Supersite monitor on May 25 and 26, 2012,

- the exceedances were not reasonably controllable or preventable, and
- there was a clear causal relationship between PM_{10} transported by west-northwesterly winds from desert areas to the northwest of the Yuma PM_{10} Nonattainment Area and the measured PM_{10} exceedances in Yuma.

The weight of evidence in these sections demonstrates that, but for the existence of dust emissions generated by strong winds behind a departing cold front and the associated transport of PM_{10}, there would have been no exceedances of the NAAQS for 24-hr average PM_{10}.

As shown in Section 3, time-series plots of PM_{10} and wind speeds establish a clear causal relationship between the arrival of dust-laden winds and elevated PM_{10} concentrations at the Yuma Supersite monitor. Multiple independent measurements of wind speed, wind direction, and visibility all point to the presence of west-northwesterly winds as the mechanism for transport of PM_{10} into the Yuma PM_{10} Nonattainment Area. High PM_{10} concentrations and gusty winds were also reported in other parts of Arizona and southeastern California, illustrating the widespread, regional nature of this event. In addition, PM_{10} concentrations were well below the NAAQS on days immediately before and after the windblown dust event. The source regions for the PM_{10} are clearly identified as open desert areas in Imperial County, including the Algodones Dunes, located west-northwest of the Yuma PM_{10} Nonattainment Area. The weight of evidence presented in this submittal provides no alternative that could tie the exceedances of May 25 and 26, 2012, to any causal source except PM_{10} transported by west-northwesterly winds, confirming that there would have been no exceedances but for the presence of these uncontrollable natural events.

As detailed in Section 5, all reasonable control measures were in place and/or implemented on a continual basis. Air quality-related inspection and compliance data revealed no violations or complaints within three days before and after the time of the event. Local regulatory agencies, industry, and the general public were alerted to the possibility of dust storms due to strong winds via daily forecasts and media reports.

6.2 Summary

The weight of evidence presented in this submittal provides no alternative that could tie the exceedances of May 25 and 26, 2012, to any causal source except PM_{10} transported by west-northwesterly winds, confirming that there would have been no exceedances but for the presence of these uncontrollable natural events.

7. Conclusions

The PM_{10} exceedances that occurred on May 25 and 26, 2012, satisfy the criteria of the EER, which states that in order to justify the exclusion of air quality monitoring data, evidence must be provided for the following elements:

1. The event satisfies the criteria set forth in 40 CFR 501 (j) that
   a. the event affected air quality,
   b. the event was not reasonably controllable or preventable, and
   c. the event was caused by human activity unlikely to recur in a particular location or was a natural event;
2. There is a clear causal relationship between the measurement(s) under consideration and the event;
3. The event is associated with a measured concentration(s) in excess of normal historical fluctuations; and
4. There would have been no exceedance or violation but for the event.

7.1 Affects Air Quality

As stated in the preamble to the EER, the event in question is considered to have affected air quality if it can be shown that there is a clear causal relationship between the monitored exceedance and the event, and that the event is associated with a measured concentration in excess of normal historical fluctuations. Given the information presented in Sections 2, 3, 4, and 5, we can reasonably conclude that the event in question affected air quality.

7.2 Not Reasonably Controllable or Preventable

Section 50.1(j) of 40 CFR Part 50 requires that an event must be “not reasonably controllable or preventable” in order to be defined as an exceptional event. This requirement is met by demonstrating that despite reasonable control measures in place within Yuma County, high winds overwhelmed all reasonably available controls. The PM_{10} exceedances discussed in this report was caused by naturally occurring west-northwesterly winds that transported dust into Yuma County from areas largely outside the Yuma PM_{10} Nonattainment Area. These facts provide strong evidence that the PM_{10} exceedances on May 25 and 26, 2012, were not reasonably controllable or preventable (Section 5).

7.3 Natural Event

As discussed above, the PM_{10} exceedances in Yuma on May 25 and 26, 2012, were shown to be caused by transport of PM_{10} into Yuma by west-northwesterly winds behind a departing cold front. The event therefore qualifies as a natural event.

7.4 Clear Causal Relationship

The following points demonstrate that the high PM_{10} concentrations were caused by windblown dust:

- Time-series graphs of PM_{10} concentrations show that the timing of high PM_{10} at the Yuma Supersite was consistent with gusty winds and low visibilities at Yuma-area meteorological stations (Section 3).
- High PM_{10} concentrations and gusty winds were reported in Yuma County, Arizona, and Imperial County, California, illustrating the widespread, regional, and uncontrollable nature of this event (Section 3).
- PM_{10} concentrations were well below the NAAQS on days immediately before and after the windblown dust event.
- Dry conditions preceding the event resulted in soils that were particularly susceptible to particulate suspension by high winds (Section 3).

7.5 Historical Norm

The 24-hr average and daily 1-hr maximum PM_{10} values measured at the Yuma Supersite monitor were historically unusual compared to a multi-year data set (Section 4).

7.6 But For

On the basis of the weight of evidence described above and in Section 6, the exceedances of the federal 24-hr PM_{10} standard on May 25 and 26, 2012, at the Yuma Supersite monitor would not have occurred but for the prolonged period of west-northwesterly winds that transported dust from open desert areas of Imperial County, including the Algodones Dunes, into the Yuma PM_{10} Nonattainment Area.

Appendix A:
Air Quality and Meteorological Data for Yuma County

This section contains time-series graphs of air quality and meteorological data for Yuma and other regional monitors on May 25 and 26, 2012. The data show a regionwide increase in wind speeds and wind gusts coincident with the arrival of dust and high PM_{10} concentrations in Yuma.

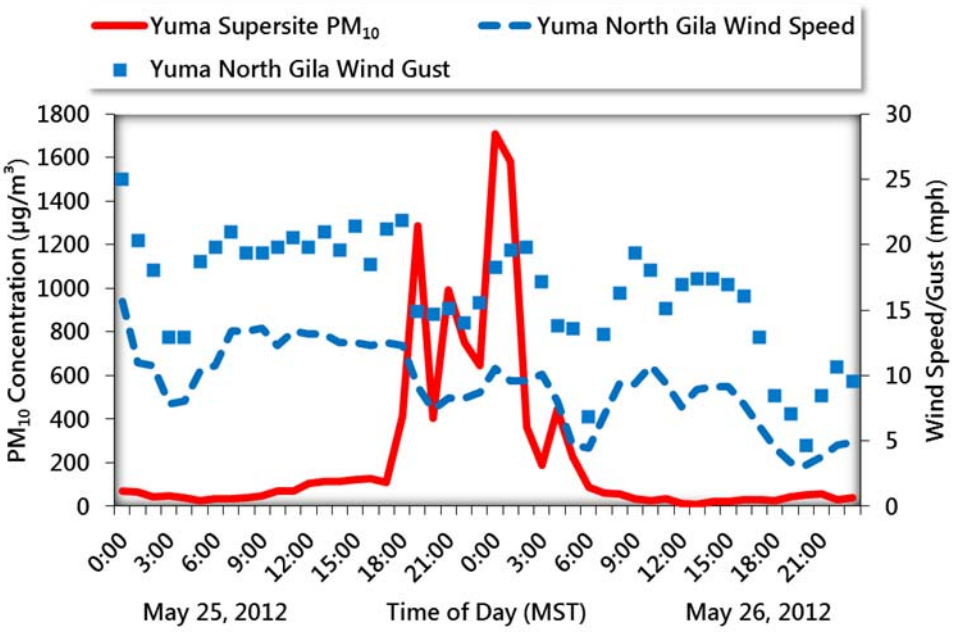

Figure A-1. Hourly PM_{10} concentrations at the Yuma Supersite monitor and wind speed and gusts at the Yuma North Gila monitor on May 25 and 16, 2012.

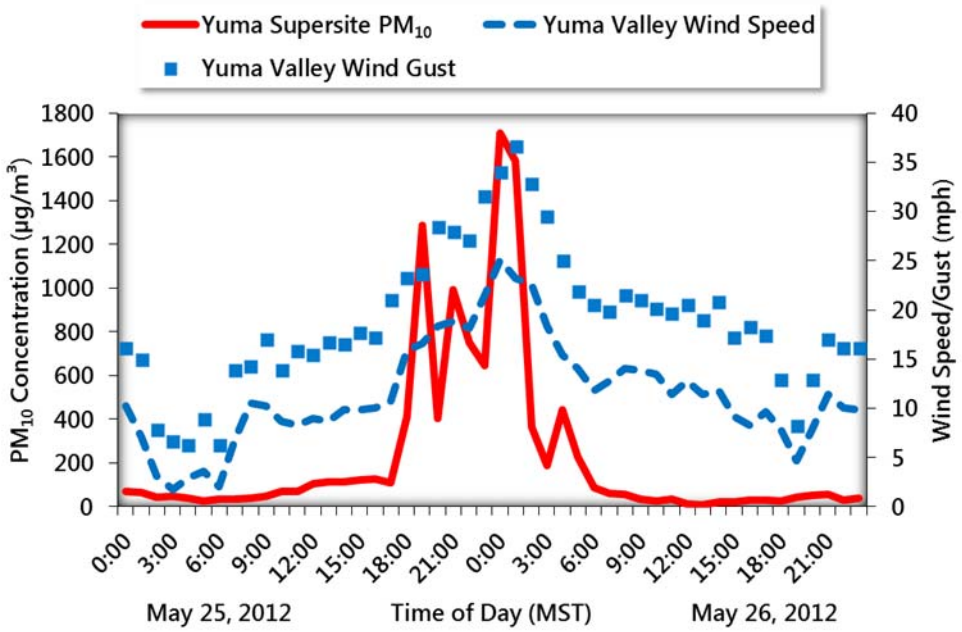

Figure A-2. Hourly PM_{10} concentrations at the Yuma Supersite monitor and wind speed and wind gusts at the Yuma Valley monitor on May 25 and 26, 2012.

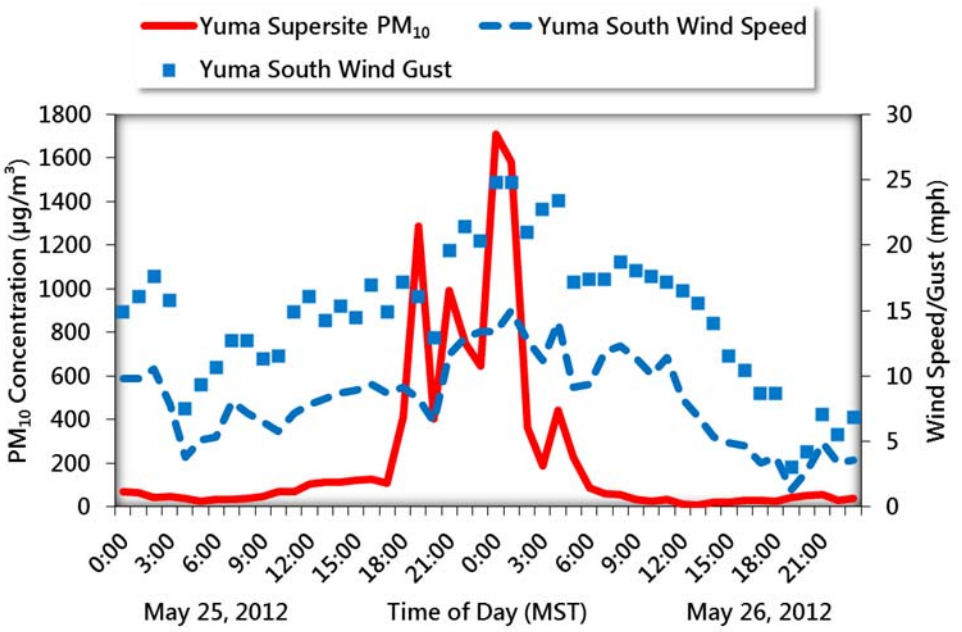

Figure A-3. Hourly PM_{10} concentrations at the Yuma Supersite monitor and wind speed and wind gusts at the Yuma South monitor on May 25 and 26, 2012.

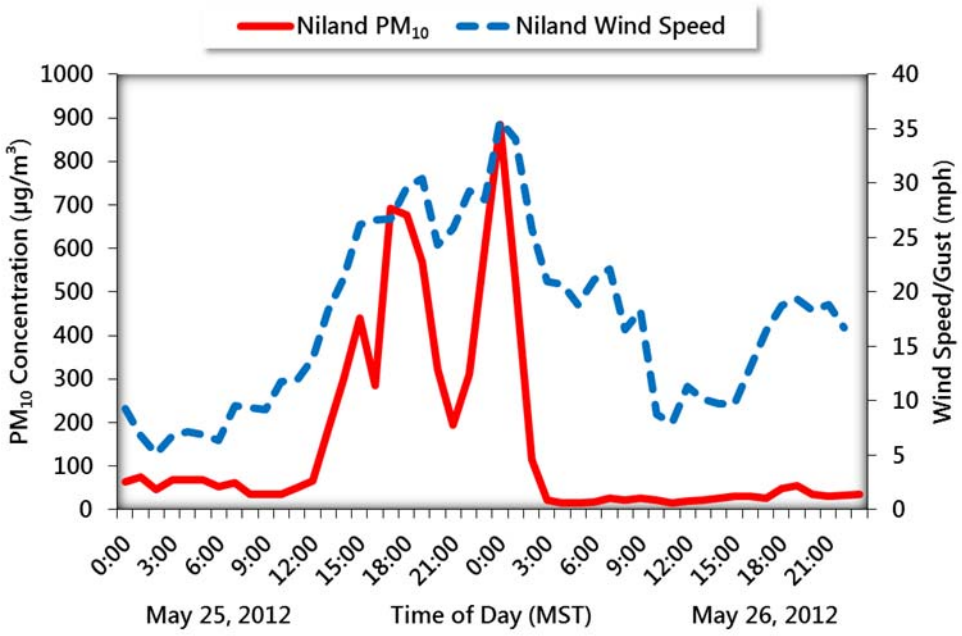

Figure A-4. Hourly PM_{10} concentrations and wind speeds at the Niland monitor in Imperial County, California, on May 25 and 26, 2012.

U.S. Department of Commerce
National Oceanic &
Atmospheric Administration

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA
HOURLY OBSERVATIONS TABLE
YUMA MCAS (03145), YUMA, AZ (05/25/2012)

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 213 ft. above sea level **Latitude:** 32.65 **Longitude:** -114.616 **Data Version:** VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
25	0055	5	CLR	10.00		73	22.8	64	17.7	58	14.4	59	23	150	30	29.30			29.52	AA		29.53
25	0155	5	CLR	10.00		71	21.7	63	17.3	58	14.4	64	22	160		29.30	0	001	29.52	AA		29.53
25	0255	5	CLR	10.00		70	21.1	62	16.8	57	13.9	64	24	160		29.30			29.52	AA		29.53
25	0355	5	CLR	10.00		69	20.6	61	16.3	56	13.3	63	6	VR		29.35			29.57	AA		29.58
25	0455	5	CLR	10.00		68	20.0	61	16.0	56	13.3	66	9	170		29.36	3	021	29.58	AA		29.59
25	0555	5	CLR	10.00		68	20.0	60	15.7	55	12.8	63	15	150		29.36			29.58	AA		29.59
25	0655	5	CLR	10.00		69	20.6	61	16.0	55	12.8	61	14	160		29.38			29.60	AA		29.61
25	0755	5	CLR	10.00		71	21.7	62	16.4	55	12.8	57	16	160		29.40	3	015	29.62	AA		29.63
25	0855	5	CLR	10.00		74	23.3	62	16.7	54	12.2	50	18	170	25	29.41			29.63	AA		29.64
25	0955	5	CLR	10.00		78	25.6	63	17.3	53	11.7	42	16	170	25	29.41			29.62	AA		29.64
25	1055	5	CLR	10.00		80	26.7	63	17.1	51	10.6	37	18	160	24	29.41	1	004	29.63	AA		29.64
25	1155	5	CLR	10.00		83	28.3	63	17.2	49	9.4	31	15	190	21	29.41			29.63	AA		29.64
25	1255	5	CLR	10.00		84	28.9	63	17.2	48	8.9	29	17	170		29.39			29.61	AA		29.62
25	1355	5	CLR	10.00		86	30.0	63	17.3	47	8.3	26	16	190	28	29.38	8	011	29.60	AA		29.61
25	1455	5	CLR	10.00		88	31.1	64	17.7	47	8.3	24	17	180		29.37			29.59	AA		29.60
25	1555	5	CLR	10.00		88	31.1	64	17.5	46	7.8	23	17	180		29.35			29.57	AA		29.58
25	1655	5	CLR	10.00		87	30.6	64	17.5	47	8.3	25	17	160		29.34	6	014	29.56	AA		29.57
25	1755	5	CLR	10.00		84	28.9	62	16.5	45	7.2	26	18	170		29.34			29.57	AA		29.57
25	1855	5	CLR	4.00	HZ	79	26.1	57	13.8	37	2.8	22	11	290		29.38			29.60	AA		29.61
25	1914	5	CLR	2.00	HZ	79	26.0	57	13.8	37	3.0	22	15	280	22	29.38			M	SP		29.61
25	1941	5	CLR	1.75	HZ	75	24.0	55	13.0	37	3.0	25	14	300	23	29.39			M	SP		29.62
25	1951	5	CLR	3.00	HZ	75	24.0	55	13.0	37	3.0	25	16	310	23	29.40			M	SP		29.63
25	1955	5	CLR	4.00		75	23.9	55	12.8	36	2.2	24	15	300	25	29.40	3	021	29.62	AA		29.63
25	2055	5	CLR	10.00		71	21.7	54	12.0	37	2.8	29	18	300	22	29.43			29.65	AA		29.66
25	2155	5	CLR	3.00		69	20.6	54	12.0	39	3.9	34	14	290	20	29.45			29.67	AA		29.68
25	2255	5	CLR	6.00		66	18.9	52	10.8	37	2.8	34	13	300	26	29.48	3	027	29.70	AA		29.71
25	2355	5	CLR	4.00		64	17.8	50	9.9	35	1.7	34	17	320		29.50			29.72	AA		29.73

Figure A-5. Quality-controlled local climatological data hourly observations table for Yuma MCAS (03145), Yuma, AZ (05/25/2012). Note in the Weather Type column that HZ (haze) was reported for several hours coincident with gusty winds and a wind shift from southerly to west-northwesterly. Dynamically generated via http://cdo.ncdc.noaa.gov/qclcd/QCLCD.

U.S. Department of Commerce
National Oceanic &
Atmospheric Administration

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA
HOURLY OBSERVATIONS TABLE
NAF (23199), EL CENTRO, CA (05/25/2012)

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: -42 ft. above sea level **Latitude:** 32.816 **Longitude:** -115.683 **Data Version:** VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
25	0056	5	CLR	10.00		70	21.1	58	14.3	48	8.9	46	21	250	28	29.56	1	005	29.57	AA		29.52
25	0156	5	CLR	10.00		69	20.6	57	13.8	47	8.3	46	16	260		29.57			29.57	AA		29.53
25	0256	5	CLR	10.00		68	20.0	57	13.6	47	8.3	47	17	250		29.59			29.59	AA		29.55
25	0356	5	CLR	10.00		68	20.0	57	13.6	47	8.3	47	16	260		29.60	3	013	29.60	AA		29.56
25	0456	5	CLR	10.00		67	19.4	57	13.6	48	8.9	51	10	250		29.62			29.62	AA		29.58
25	0556	5	CLR	10.00		67	19.4	57	13.9	49	9.4	53	9	220		29.65			29.65	AA		29.61
25	0656	5	CLR	10.00		70	21.1	61	16.2	55	12.8	59	0	000		29.66	1	020	29.66	AA		29.62
25	0756	5	CLR	10.00		74	23.3	62	16.5	53	11.7	48	7	140		29.66			29.66	AA		29.62
25	0856	5	CLR	10.00		78	25.6	60	15.3	45	7.2	31	11	250	17	29.66			29.67	AA		29.62
25	0956	5	CLR	10.00		80	26.7	60	15.5	44	6.7	28	11	270		29.66	0	002	29.67	AA		29.62
25	1056	5	CLR	10.00		84	28.9	61	16.1	43	6.1	24	24	260		29.65			29.65	AA		29.61
25	1156	5	CLR	10.00		87	30.6	63	17.1	45	7.2	23	26	270	33	29.63			29.64	AA		29.59
25	1256	5	SCT020	7.00		86	30.0	62	16.5	43	6.1	22	32	270	39	29.63	6	010	29.64	AA		29.59
25	1305	5	BKN018	5.00	HZ	84	29.0	62	16.6	45	7.0	26	32	260	39	29.64			M	SP		29.60
25	1312	5	BKN016	1.75	BLDU BLSA	84	29.0	61	16.1	43	6.0	24	32	260	40	29.64			M	SP		29.60
25	1319	5	OVC014	1.50	BLDU BLSA	84	29.0	60	15.7	41	5.0	22	33	260	41	29.64			M	SP		29.60
25	1341	5	BKN015	1.75	BLDU BLSA	84	29.0	61	16.1	43	6.0	24	26	270	40	29.64			M	SP		29.60
25	1354	5	CLR	1.75	HZ	84	29.0	61	16.1	43	6.0	24	33	270	39	29.63			M	SP		29.59
25	1356	5	CLR	1.75	HZ	84	28.9	61	15.9	42	5.6	23	31	260	39	29.62			29.63	AA	T	29.58
25	1403	5	CLR	2.50	HZ	84	29.0	60	15.7	41	5.0	22	29	260	39	29.62			M	SP		29.58
25	1417	5	CLR	2.00	HZ	84	29.0	60	15.3	39	4.0	20	31	250	41	29.62			M	SP		29.58
25	1449	5	CLR	4.00	HZ	82	28.0	59	14.9	39	4.0	22	36	260	43	29.62			M	SP		29.58
25	1456	5	CLR	4.00	HZ	82	27.8	60	15.3	41	5.0	23	32	270	44	29.63			29.63	AA		29.59
25	1501	5	CLR	3.00	HZ	82	28.0	60	15.7	43	6.0	25	34	270	44	29.62			M	SP		29.58
25	1534	5	CLR	1.50	BLSA BLDU	81	27.0	60	15.5	43	6.0	26	32	270	43	29.62			M	SP		29.58
25	1556	5	CLR	1.50	BLSA BLDU	78	25.6	59	14.9	43	6.1	29	36	270	47	29.62	6	005	29.62	AA		29.58
25	1614	5	CLR	1.00	BLSA BLDU	77	25.0	58	14.7	43	6.0	30	39	260	51	29.62			M	SP		29.58
25	1656	5	CLR	1.50	BLSA BLDU	74	23.3	57	13.8	42	5.6	32	40	270	53	29.62			29.62	AA		29.58
25	1716	5	CLR	3.00	BLSA BLDU	73	23.0	57	13.8	43	6.0	34	40	270	47	29.63			M	SP		29.59
25	1756	5	CLR	6.00	BLSA BLDU	71	21.7	55	12.9	41	5.0	34	33	270	44	29.66			29.66	AA		29.62
25	1803	5	BKN019	10.00	BLSA BLDU	72	22.0	56	13.1	41	5.0	33	28	270	41	29.66			M	SP		29.62
25	1811	5	SCT021	10.00	BLSA BLDU	72	22.0	55	12.7	39	4.0	30	23	280	36	29.66			M	SP		29.62
25	1822	5	BKN021	10.00	BLSA BLDU	70	21.0	54	12.2	39	4.0	32	25	280	37	29.67			M	SP		29.63
25	1829	5	SCT021	10.00	BLSA BLDU	70	21.0	54	12.2	39	4.0	32	22	280	37	29.67			M	SP		29.63
25	1841	5	BKN017	6.00	BLSA BLDU	70	21.0	54	12.2	39	4.0	32	16	300	26	29.67			M	SP		29.63
25	1854	5	SCT019	10.00	BLSA BLDU	70	21.0	55	12.7	41	5.0	35	18	320	26	29.69			M	SP		29.65
25	1856	5	BKN019	10.00	BLSA BLDU	69	20.6	54	12.4	41	5.0	36	15	320	26	29.69	3	022	29.69	AA		29.65

25	1910	5	SCT019	9.00	BLSA BLDU	66	19.0	53	11.7	41	5.0	40	28	260	34	29.69			M	SP		29.65
25	1956	5	CLR	10.00	BLSA BLDU	66	18.9	52	11.3	39	3.9	37	37	260	45	29.71			29.72	AA		29.67
25	2053	5	FEW006	4.00	BLSA BLDU	64	18.0	51	10.4	37	3.0	37	23	260	48	29.74			M	SP		29.70
25	2056	5	SCT006	4.00	BLSA BLDU	65	18.3	52	10.8	38	3.3	37	33	260	47	29.73			29.73	AA		29.69
25	2156	5	SCT008	5.00	BLSA BLDU	63	17.2	51	10.6	39	3.9	41	25	290	38	29.75	1	011	29.75	AA		29.71
25	2208	5	BKN010	5.00	BLSA BLDU	63	17.0	51	10.6	39	4.0	41	34	270	45	29.73			M	SP		29.69
25	2216	5	SCT008	5.00	BLSA BLDU	63	17.0	51	10.6	39	4.0	41	34	260	47	29.75			M	SP		29.71
25	2224	5	BKN006	2.50	BLSA BLDU	63	17.0	50	10.1	37	3.0	38	38	250	49	29.74			M	SP		29.70
25	2229	5	BKN004	1.25	BLSA BLDU	63	17.0	50	10.1	37	3.0	38	45	260	54	29.73			M	SP		29.69
25	2239	5	VV003	0.75	BLSA BLDU	63	17.0	50	10.1	37	3.0	38	48	270	60	29.73			M	SP		29.69
25	2246	5	OVC002	1.50	BLSA BLDU	61	16.0	49	9.6	37	3.0	41	47	260	60	29.74			M	SP		29.70
25	2256	5	OVC002	1.75	BLSA BLDU	61	16.1	49	9.6	37	2.8	41	49	260	62	29.75			29.76	AA		29.71
25	2307	5	VV002	0.25s	BLSAs	61	16.0	49	9.6	37	3.0	41	48	250	62	29.77			M	SP		29.73
25	2335	5	OVC001	1.25	BLSA BLDU	61	16.0	49	9.4	36	2.0	39	41	250	55	29.83			M	SP		29.79
25	2342	5	BKN001	3.00	BLSA BLDU	61	16.0	49	9.4	36	2.0	39	36	250	48	29.84			M	SP		29.80
25	2354	5	SCT001	5.00	BLSA BLDU	59	15.0	48	8.9	36	2.0	42	30	250	45	29.85			M	SP		29.81
25	2356	5	SCT003	5.00	BLSA BLDU	59	15.0	48	8.9	36	2.2	42	32	250	39	29.86			29.86	AA		29.82

Figure A-6. Quality controlled local climatological data hourly observations table for the NAF (23199), El Centro, CA (05/25/2012). Note in the Weather Type column that HZ (haze), BLDU (blowing dust), and BLSA (blowing sand) were reported for much of the day, coincident with gusty very strong winds and low visibilities. Dynamically generated via http://cdo.ncdc.noaa.gov/qclcd/QCLCD.

U.S. Department of Commerce
National Oceanic &
Atmospheric Administration

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA
HOURLY OBSERVATIONS TABLE
IMPERIAL COUNTY AIRPORT (03144), IMPERIAL, CA (05/25/2012)

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: -58 ft. above sea level **Latitude:** 32.834 **Longitude:** -115.578 **Data Version:** VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
25	0053	12	CLR	10.00		68	20.0	57	13.9	48	8.9	49	10	270		29.58	1	003	29.52	AA		29.52
25	0153	12	CLR	10.00		67	19.4	56	13.4	47	8.3	49	11	260		29.59			29.54	AA		29.53
25	0253	12	CLR	10.00		66	18.9	56	13.1	47	8.3	51	7	250		29.61			29.54	AA		29.55
25	0353	12	CLR	10.00		66	18.9	56	13.4	48	8.9	52	8	290		29.62	2	013	29.56	AA		29.56
25	0453	12	CLR	10.00		64	17.8	55	12.9	48	8.9	56	10	270		29.63			29.57	AA		29.57
25	0553	12	CLR	10.00		67	19.4	57	13.9	49	9.4	53	5	220		29.66			29.60	AA		29.60
25	0653	12	CLR	10.00		72	22.2	63	16.9	56	13.3	57	9	160		29.67	1	018	29.61	AA		29.61
25	0753	12	CLR	10.00		74	23.3	61	16.2	52	11.1	46	6	210		29.68			29.62	AA		29.62
25	0853	12	CLR	10.00		76	24.4	61	16.1	50	10.0	40	5	270		29.68			29.62	AA		29.62
25	0953	12	CLR	10.00		80	26.7	60	15.5	44	6.7	28	5	VR		29.68	0	004	29.62	AA		29.62
25	1053	12	CLR	10.00		82	27.8	61	15.9	44	6.7	26	14	270	17	29.68			29.62	AA		29.62
25	1153	12	CLR	10.00		85	29.4	62	16.8	45	7.2	25	10	300	23	29.66			29.60	AA		29.60
25	1253	12	FEW032	8.00		87	30.6	63	16.9	44	6.7	22	20	270	29	29.64	8	013	29.58	AA		29.58
25	1305	12	BKN024	4.00	HZ	84	29.0	62	16.6	45	7.0	26	25	270	36	29.64			M	SP		29.58
25	1323	12	OVC016	1.75	HZ	84	29.0	61	16.1	43	6.0	24	29	270	34	29.64			M	SP		29.58
25	1328	12	OVC014	1.25	HZ	84	29.0	61	16.1	43	6.0	24	26	270	36	29.64			M	SP		29.58
25	1335	12	FEW007 OVC012	1.00	HZ	82	28.0	60	15.7	43	6.0	25	29	270	36	29.64			M	SP		29.58
25	1346	12	OVC009	1.25	HZ	82	28.0	60	15.7	43	6.0	25	25	270	37	29.64			M	SP		29.58
25	1351	12	OVC009	1.75	HZ	82	28.0	60	15.7	43	6.0	25	25	270	37	29.64			M	SP		29.58
25	1353	12	OVC009	2.00	HZ	83	28.3	61	15.9	43	6.1	24	28	270	37	29.64			29.58	AA		29.58
25	1400	12	OVC011	3.00	HZ	82	28.0	60	15.7	43	6.0	25	25	270	36	29.64			M	SP		29.58
25	1434	12	OVC015	2.50	HZ	82	28.0	60	15.3	41	5.0	23	28	290	36	29.64			M	SP		29.58
25	1443	12	OVC017	3.00	HZ	82	28.0	60	15.3	41	5.0	23	24	280	34	29.63			M	SP		29.57
25	1453	12	OVC017	3.00	HZ	82	27.8	59	15.1	40	4.4	22	24	280	34	29.63			29.57	AA		29.57
25	1508	12	OVC015	1.75	HZ	81	27.0	59	15.1	41	5.0	24	32	280	40	29.63			M	SP		29.57
25	1516	12	OVC013	2.50	HZ	81	27.0	59	15.1	41	5.0	24	31	280	40	29.63			M	SP		29.57
25	1523	12	OVC013	3.00	HZ	81	27.0	60	15.5	43	6.0	26	29	270	38	29.63			M	SP		29.57
25	1531	12	OVC013	2.00	HZ	81	27.0	59	15.1	41	5.0	24	30	280	39	29.63			M	SP		29.57
25	1541	12	OVC013	1.75	HZ	79	26.0	59	15.1	43	6.0	28	26	280	41	29.63			M	SP		29.57
25	1553	12	OVC013	1.50	HZ	78	25.6	59	15.1	44	6.7	30	29	290	41	29.63	6	004	29.57	AA		29.57
25	1618	12	OVC015	2.00	HZ	75	24.0	59	14.7	45	7.0	34	25	290	36	29.64			M	SP		29.58
25	1635	12	OVC013	1.50	HZ	75	24.0	58	14.2	43	6.0	32	28	270	43	29.63			M	SP		29.57
25	1642	12	OVC013	1.25	HZ	75	24.0	58	14.2	43	6.0	32	32	280	46	29.62			M	SP		29.56
25	1651	12	FEW007 OVC011	1.25	HZ	73	23.0	57	13.8	43	6.0	34	31	280	45	29.62			M	SP		29.56
25	1653	12	FEW007 OVC011	1.25	HZ	74	23.3	57	14.0	43	6.1	33	32	270	46	29.62			29.56	AA		29.56

25	1701	12	OVC011	1.50	HZ	73	23.0	57	13.8	43	6.0	34	36	270	47	29.62			M	SP		29.56
25	1718	12	OVC009	1.75	HZ	73	23.0	57	13.8	43	6.0	34	37	260	49	29.62			M	SP		29.56
25	1727	12	OVC009	2.00	HZ	72	22.0	57	13.6	43	6.0	35	37	260	47	29.61			M	SP		29.55
25	1751	12	BKN007	4.00	HZ	72	22.0	57	13.6	43	6.0	35	33	260	49	29.62			M	SP		29.56
25	1753	12	BKN007	4.00	HZ	71	21.7	56	13.1	42	5.6	35	31	260	43	29.62			29.56	AA		29.56
25	1814	12	SCT009	6.00	HZ	70	21.0	55	12.7	41	5.0	35	37	260	45	29.63			M	SP		29.57
25	1853	12	FEW011	8.00		68	20.0	54	12.0	40	4.4	36	28	270	43	29.66	3	011	29.59	AA		29.60
25	1938	12	FEW009	8.00		66	19.0	52	11.3	39	4.0	37	23	260	41	29.69			M	SP		29.63
25	1953	12	CLR	10.00		65	18.3	52	11.3	40	4.4	40	33	260	44	29.69			29.63	AA		29.63
25	2053	12	FEW012	8.00		63	17.2	51	10.6	39	3.9	41	22	270	38	29.74			29.68	AA		29.68
25	2106	12	BKN012	5.00	HZ	63	17.0	50	10.1	37	3.0	38	23	260	32	29.75			M	SP		29.69
25	2133	12	BKN008	3.00	HZ	63	17.0	51	10.6	39	4.0	41	31	280	41	29.74			M	SP		29.68
25	2138	12	BKN006	1.75	HZ	63	17.0	51	10.6	39	4.0	41	36	270	43	29.74			M	SP		29.68
25	2151	12	OVC004	1.50	HZ	63	17.0	51	10.6	39	4.0	41	36	270	47	29.74			M	SP		29.68
25	2153	12	OVC004	1.50	HZ	63	17.2	51	10.6	39	3.9	41	33	270	47	29.75	1	031	29.68	AA		29.69
25	2204	12	OVC004	1.25	HZ	63	17.0	51	10.6	39	4.0	41	30	280	44	29.75			M	SP		29.69
25	2211	12	OVC004	2.00	HZ	63	17.0	51	10.6	39	4.0	41	37	270	49	29.75			M	SP		29.69
25	2220	12	BKN004	4.00	HZ	63	17.0	50	10.1	37	3.0	38	33	280	49	29.75			M	SP		29.69
25	2231	12	BKN006	5.00	HZ	63	17.0	50	10.1	37	3.0	38	29	280	47	29.77			M	SP		29.71
25	2251	12	BKN004 OVC010	3.00	HZ	63	17.0	50	9.9	36	2.0	37	37	280	53	29.76			M	SP		29.70
25	2253	12	BKN004 OVC010	3.00	HZ	62	16.7	49	9.7	36	2.2	38	37	280	53	29.76			29.70	AA		29.70
25	2313	12	OVC004	2.00	HZ	61	16.0	49	9.6	37	3.0	41	36	280	51	29.77			M	SP		29.71
25	2318	12	OVC004	1.25	HZ	61	16.0	49	9.4	36	2.0	39	36	280	51	29.77			M	SP		29.71
25	2327	12	OVC004	2.00	HZ	61	16.0	49	9.4	36	2.0	39	37	280	51	29.77			M	SP		29.71
25	2353	12	SCT002	9.00		59	15.0	48	8.7	35	1.7	41	34	260	51	29.80			29.74	AA		29.74

Figure A-7. Quality controlled local climatological data hourly observations table for the Imperial County Airport (03144), Imperial, CA (05/25/2012). Note in the Weather Type column that HZ (haze) was reported for several hours, coincident with gusty winds and low visibilities. Dynamically generated via http://cdo.ncdc.noaa.gov/qclcd/QCLCD

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QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA
HOURLY OBSERVATIONS TABLE
YUMA MCAS (03145), YUMA, AZ (05/26/2012)

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 213 ft. above sea level **Latitude:** 32.65 **Longitude:** -114.616 **Data Version:** VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
26	0002	5	OVC012	4.00		64	18.0	50	10.1	36	2.0	36	20	320	31	29.50			M	SP		29.73
26	0047	5	OVC012	2.50		63	17.0	49	9.5	34	1.0	34	21	310	33	29.51			M	SP		29.74
26	0055	5	OVC012	2.00		63	17.2	49	9.3	33	0.6	33	25	310	37	29.51			29.73	AA		29.74
26	0131	5	OVC010	3.00		63	17.0	48	8.8	30	-1.0	29	30	300	38	29.52			M	SP		29.75
26	0155	5	OVC014	4.00		61	16.1	47	8.2	30	-1.1	31	24	300	36	29.53	1	016	29.75	AA		29.76
26	0245	5	SCT012	10.00		61	16.0	48	8.6	32	0.0	34	23	310	32	29.54			M	SP		29.77
26	0255	5	CLR	9.00		60	15.6	47	8.5	33	0.6	36	22	310	30	29.55			29.77	AA		29.78
26	0355	5	CLR	9.00		58	14.4	47	8.2	34	1.1	41	15	310	24	29.57			29.79	AA		29.80
26	0418	5	BKN013	7.00		57	14.0	46	7.9	34	1.0	42	16	300	22	29.57			M	SP		29.80
26	0455	5	OVC013	6.00		57	13.9	46	7.9	34	1.1	42	17	290	29	29.58	1	019	29.80	AA		29.81
26	0512	5	SCT013	8.00		57	14.0	46	7.9	34	1.0	42	13	300		29.58			M	SP		29.81
26	0555	5	CLR	10.00		57	13.9	46	7.7	33	0.6	40	8	310		29.61			29.83	AA		29.84
26	0655	5	CLR	10.00		58	14.4	47	8.2	34	1.1	41	10	310		29.64			29.86	AA		29.87
26	0755	5	CLR	10.00		62	16.7	49	9.3	34	1.1	35	13	310	22	29.66	1	026	29.88	AA		29.89
26	0855	5	CLR	10.00		65	18.3	50	9.8	33	0.6	30	11	310	20	29.68			29.90	AA		29.91
26	0955	5	CLR	10.00		69	20.6	52	10.8	33	0.6	26	15	310	23	29.68			29.91	AA		29.91
26	1055	5	CLR	10.00		71	21.7	52	11.0	31	-0.6	23	15	310	21	29.69	1	011	29.92	AA		29.92
26	1155	5	CLR	10.00		73	22.8	53	11.6	32	0.0	22	8	310	21	29.71			29.93	AA		29.94
26	1255	5	CLR	10.00		76	24.4	54	12.0	30	-1.1	18	16	290	25	29.69			29.91	AA		29.92
26	1355	5	CLR	10.00		79	26.1	54	12.2	27	-2.8	15	10	270		29.67	8	007	29.89	AA		29.90
26	1455	5	CLR	10.00		81	27.2	55	12.5	26	-3.3	13	10	280	20	29.66			29.88	AA		29.89
26	1555	5	CLR	10.00		81	27.2	54	12.4	25	-3.9	13	6	250	17	29.64			29.87	AA		29.87
26	1655	5	CLR	10.00		81	27.2	54	12.4	25	-3.9	13	6	280		29.63	6	013	29.86	AA		29.86
26	1755	5	CLR	10.00		81	27.2	55	12.5	26	-3.3	13	8	260		29.62			29.85	AA		29.85
26	1855	5	CLR	10.00		79	26.1	54	12.4	28	-2.2	15	7	290		29.62			29.85	AA		29.85
26	1955	5	CLR	10.00		76	24.4	54	12.0	30	-1.1	18	6	260		29.63	5	000	29.85	AA		29.86
26	2055	5	CLR	10.00		74	23.3	53	11.8	32	0.0	21	7	270		29.64			29.87	AA		29.87
26	2155	5	CLR	10.00		71	21.7	54	12.1	37	2.8	29	11	310		29.66			29.89	AA		29.89
26	2255	5	CLR	10.00		69	20.6	53	11.4	36	2.2	30	9	310		29.67	1	012	29.89	AA		29.90
26	2355	5	CLR	10.00		67	19.4	51	10.7	35	1.7	31	11	290		29.67			29.89	AA		29.90

Figure A-8. Quality controlled local climatological data hourly observations table for the Yuma MCAS (03145), Yuma, AZ (05/26/2012). Note that reduced visibilities and gusty west-northwesterly winds were reported between 0:00 and 5:00 MST, coincident with high PM_{10} concentrations in Yuma. Dynamically generated via http://cdo.ncdc.noaa.gov/qclcd/QCLCD.

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QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA
HOURLY OBSERVATIONS TABLE
NAF (23199), EL CENTRO, CA (05/26/2012)

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: -42 ft. above sea level **Latitude:** 32.816 **Longitude:** -115.683 **Data Version:** VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
26	0056	5	CLR	10.00	BLSA BLDU	58	14.4	48	8.8	37	2.8	46	17	230	26	29.86	1	038	29.86	AA		29.82
26	0112	5	BKN016	2.50	BLSA BLDU	59	15.0	48	8.9	36	2.0	42	20	230		29.86			M	SP		29.82
26	0120	5	BKN014	1.25	BLSA BLDU	59	15.0	48	8.9	36	2.0	42	13	250	22	29.86			M	SP		29.82
26	0146	5	OVC016	2.50	BLSA BLDU	59	15.0	48	8.9	36	2.0	42	11	280	25	29.86			M	SP		29.82
26	0154	5	OVC018	4.00	BLSAs	57	14.0	47	8.4	36	2.0	46	9s	230		29.86			M	SP		29.82
26	0156	5	OVC018	3.00	BLSAs	58	14.4	48	8.6	36	2.2	44	10s	240		29.86			29.86	AA		29.82
26	0204	5	OVC016	2.50	BLSA BLDU	57	14.0	47	8.4	36	2.0	46	13	240		29.85			M	SP		29.81
26	0211	5	OVC018	5.00	BLSA BLDU	57	14.0	47	8.4	36	2.0	46	11	240		29.86			M	SP		29.82
26	0239	5	SCT020	10.00	BLSA BLDU	57	14.0	47	8.4	36	2.0	46	13	260		29.85			M	SP		29.81
26	0256	5	FEW022	10.00	BLSA BLDU	58	14.4	48	8.6	36	2.2	44	11	280	23	29.86			29.86	AA		29.82
26	0356	5	CLR	10.00	BLSA BLDU	57	13.9	47	8.2	35	1.7	44	13	270	31	29.88	3	008	29.88	AA		29.84
26	0456	5	FEW050	10.00		57	13.9	47	8.4	36	2.2	46	7	270	17	29.90			29.91	AA		29.86
26	0556	5	FEW050	10.00		60	15.6	49	9.6	38	3.3	44	18	250		29.92			29.92	AA		29.88
26	0656	5	CLR	10.00		64	17.8	52	10.8	39	3.9	40	20	240		29.93	1	018	29.93	AA		29.89
26	0756	5	CLR	10.00		67	19.4	53	11.3	38	3.3	35	22	250		29.94			29.94	AA		29.90
26	0856	5	CLR	10.00		71	21.7	54	12.1	37	2.8	29	22	260	29	29.95			29.95	AA		29.91
26	0956	5	CLR	10.00		73	22.8	54	12.4	36	2.2	26	23	250	29	29.95	3	007	29.96	AA		29.91
26	1056	5	FEW070	10.00		75	23.9	55	12.5	34	1.1	22	17	250	26	29.96			29.96	AA		29.92
26	1156	5	CLR	10.00		77	25.0	55	12.8	33	0.6	20	16	220		29.95			29.95	AA		29.91
26	1256	5	CLR	10.00		77	25.0	55	12.6	32	0.0	19	11	230	22	29.93	8	008	29.93	AA		29.89
26	1356	5	CLR	10.00		80	26.7	56	13.4	33	0.6	18	13	250		29.92			29.92	AA		29.88
26	1456	5	CLR	10.00		81	27.2	56	13.3	31	-0.6	16	9	300	18	29.91			29.91	AA		29.87
26	1556	5	CLR	10.00		81	27.2	56	13.5	32	0.0	17	14	280	24	29.89	8	013	29.90	AA		29.85
26	1656	5	CLR	10.00		79	26.1	56	13.5	35	1.7	20	20	230		29.89			29.89	AA		29.85
26	1756	5	CLR	10.00		76	24.4	55	12.9	35	1.7	23	18	250	24	29.90			29.90	AA		29.86
26	1856	5	CLR	10.00		72	22.2	54	11.9	35	1.7	26	18	250		29.91	3	005	29.91	AA		29.87
26	1956	5	CLR	10.00		69	20.6	52	10.9	33	0.6	26	23	250		29.92			29.93	AA		29.88
26	2056	5	CLR	10.00		67	19.4	51	10.7	35	1.7	31	13	250		29.95			29.95	AA		29.91
26	2156	5	CLR	10.00		65	18.3	51	10.4	36	2.2	34	8	270		29.95	1	014	29.95	AA		29.91
26	2256	5	CLR	10.00		62	16.7	49	9.5	35	1.7	37	9	250		29.95			29.96	AA		29.91
26	2356	5	CLR	10.00		64	17.8	51	10.4	37	2.8	37	11	250		29.95			29.95	AA		29.91

Figure A-9. Quality controlled local climatological data hourly observations table for the NAF (23199), El Centro, CA (05/26/2012). Note in the Weather Type column that BLSA (blowing sand) and BLDU (blowing dust) were reported between 0:00 and 4:00 MST, coincident with gusty winds and low visibilities. Dynamically generated via http://cdo.ncdc.noaa.gov/qclcd/QCLCD.

U.S. Department of Commerce
National Oceanic &
Atmospheric Administration

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA
HOURLY OBSERVATIONS TABLE
IMPERIAL COUNTY AIRPORT (03144), IMPERIAL, CA (05/26/2012)

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

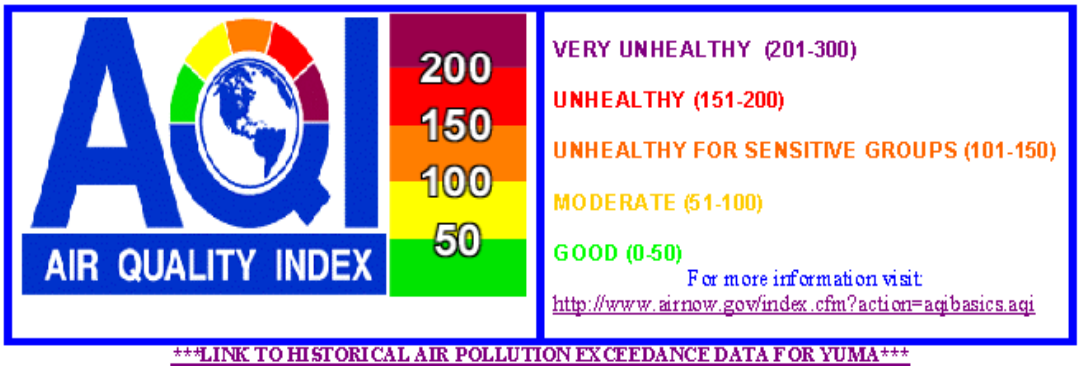
Elevation: -58 ft. above sea level **Latitude:** 32.834 **Longitude:** -115.578 **Data Version:** VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
26	0053	12	CLR	10.00		58	14.4	48	8.8	37	2.8	46	29	260	38	29.85	3	035	29.79	AA		29.79
26	0121	12	FEW009 BKN014	3.00	HZ	57	14.0	47	8.4	36	2.0	46	23	250	34	29.87			M	SP		29.81
26	0131	12	OVC014	2.00	HZ	57	14.0	47	8.4	36	2.0	46	17	250	28	29.87			M	SP		29.81
26	0153	12	OVC014	3.00	HZ	58	14.4	48	8.6	36	2.2	44	15	250	29	29.87			29.81	AA		29.81
26	0203	12	OVC018	5.00	HZ	57	14.0	47	8.4	36	2.0	46	13	260	23	29.87			M	SP		29.81
26	0253	12	FEW022	10.00		57	13.9	47	8.4	36	2.2	46	21	260	28	29.87			29.80	AA		29.81
26	0353	12	CLR	10.00		57	13.9	47	8.2	35	1.7	44	23	270	29	29.87	1	009	29.81	AA		29.81
26	0453	12	CLR	10.00		57	13.9	47	8.4	36	2.2	46	21	260	26	29.91			29.85	AA		29.85
26	0553	12	CLR	10.00		59	15.0	49	9.3	38	3.3	46	18	260	24	29.93			29.87	AA		29.87
26	0653	12	CLR	10.00		63	17.2	51	10.6	39	3.9	41	16	260		29.95	1	024	29.88	AA		29.89
26	0753	12	CLR	10.00		65	18.3	52	10.9	38	3.3	37	15	270		29.96			29.89	AA		29.90
26	0853	12	CLR	10.00		69	20.6	53	11.6	37	2.8	31	13	290	23	29.95			29.89	AA		29.89
26	0953	12	CLR	10.00		73	22.8	54	12.4	36	2.2	26	16	290	28	29.96	1	006	29.90	AA		29.90
26	1053	12	CLR	10.00		74	23.3	54	12.2	34	1.1	23	14	260	22	29.97			29.91	AA		29.91
26	1153	12	CLR	10.00		76	24.4	55	12.7	34	1.1	22	18	260	24	29.96			29.90	AA		29.90
26	1253	12	CLR	10.00		78	25.6	55	13.0	33	0.6	19	15	270	21	29.94	8	007	29.88	AA		29.88
26	1353	12	CLR	10.00		79	26.1	56	13.2	33	0.6	19	14	290	23	29.93			29.87	AA		29.87
26	1453	12	CLR	10.00		80	26.7	56	13.4	33	0.6	18	8	270		29.92			29.86	AA		29.86
26	1553	12	CLR	10.00		80	26.7	56	13.4	33	0.6	18	7	270		29.91	7	010	29.85	AA		29.85
26	1653	12	CLR	10.00		79	26.1	56	13.6	35	1.7	20	18	250	23	29.90			29.84	AA		29.84
26	1753	12	CLR	10.00		76	24.4	55	12.9	35	1.7	23	16	270	24	29.91			29.84	AA		29.85
26	1853	12	CLR	10.00		70	21.1	53	11.9	37	2.8	30	9	270		29.92	3	004	29.86	AA		29.86
26	1953	12	CLR	10.00		68	20.0	52	11.0	35	1.7	30	11	280	20	29.94			29.88	AA		29.88
26	2053	12	CLR	10.00		66	18.9	51	10.5	35	1.7	32	14	270		29.95			29.89	AA		29.89
26	2153	12	CLR	10.00		63	17.2	51	10.4	38	3.3	40	8	260		29.96	1	012	29.90	AA		29.90
26	2253	12	CLR	10.00		63	17.2	50	9.9	36	2.2	37	9	250		29.97			29.91	AA		29.91
26	2353	12	CLR	10.00		60	15.6	49	9.6	38	3.3	44	7	250		29.96			29.90	AA		29.90

Figure A-10. Quality controlled local climatological data hourly observations table for the Imperial County Airport (03144), Imperial, CA (05/26/2012). Note in the Weather Type column that HZ (haze) was reported before 3:00 MST, coincident with gusty winds and low visibilities. Dynamically generated via http://cdo.ncdc.noaa.gov/qclcd/QCLCD.

Appendix B:
ADEQ and NWS Forecast Products

ADEQ Arizona Department of Environmental Quality



LINK TO HISTORICAL AIR POLLUTION EXCEEDANCE DATA FOR YUMA

YUMA AIR QUALITY FORECAST FOR FRIDAY, MAY 25 2012

This report is updated by 1:00 p.m. Sunday thru Friday and is valid
for areas within and bordering the city of Yuma, Arizona

FORECAST DATE NOTICES (*SEE BELOW FOR DETAILS) AIR POLLUTANT	YESTERDAY WED 05/23/2012 NONE AQI Reading/Category (Preliminary data only)	TODAY THU 05/24/2012 OZONE HEALTH WATCH	TOMORROW FRI 05/25/2012 PM-10 HEALTH WATCH	EXTENDED SAT 05/26/2012 NONE
O3*	50 GOOD	90 MODERATE	42 GOOD	64 MODERATE
PM-10*	46 GOOD	42 GOOD	94 MODERATE	66 MODERATE

* O3 = Ozone PM-10 = Particles 10 microns & smaller

*"Ozone Health Watch" means that the highest concentration of OZONE may approach the federal health standard.
"PM-10 Health Watch" means that the highest concentration of PM-10 may approach the federal health standard.
"High Pollution Advisory" means that the highest concentration of OZONE or PM-10 may exceed the federal health standard.
"DUST" means that short periods of high PM-10 concentrations caused by outflow from thunderstorms are possible.

Health message for Thursday May 24: Unusually sensitive people should consider reducing prolonged or heavy exertion outdoors.

Health message for Friday May 25: Unusually sensitive people should consider reducing prolonged or heavy exertion outdoors.

Synopsis and Discussion

AN OZONE HEALTH WATCH REMAINS IN EFFECT FOR TODAY THURSDAY MAY 24
A PM-10 HEALTH WATCH HAS BEEN ISSUED FOR FRIDAY MAY 25

OZONE (O3): Local ozone concentrations dropped off significantly at the Yuma ozone monitor on Wednesday and somewhat higher wind speeds in the area was one helpful factor. Even so, low-level wind-flow remains conducive to the transport of additional ozone and/or its precursors from the northwest today so the Ozone Health Watch will remain in effect. On Friday winds will increase once again and change direction so highest ozone levels are predicted to be in the good range of the Air Quality Index but with a possible rebound on Saturday.

COARSE PARTICLES (PM-10): The approach and arrival of an unseasonably strong upper level trough and dry surface cold front in the mid-latitude storm track will lead to a period of gusty gradient winds in the Yuma area by Friday afternoon and possibly continuing thru Saturday morning. This weather system – along with the lack of recent rainfall – will greatly increase the potential for periods of dense blowing or transported dust. As a result a PM-10 Health Watch has been issued for Friday.

POLLUTION MONITOR READINGS FOR WEDNESDAY, MAY 23, 2012

O3 (OZONE)

Info on current 8-hour ozone standard: http://www.epa.gov/air/ozonepollution/pdfs/2008_03_aqi_changes.pdf
For archived AQI maps go to: http://www.airnow.gov/index.cfm?action=airnow.maps

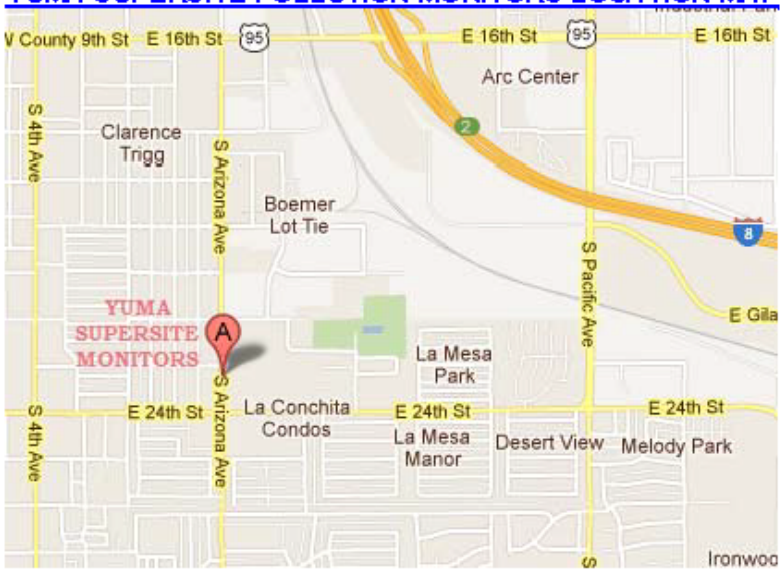
SITE NAME	MAX 8-HR VALUE (PPB)	MAX AQI	AQI COLOR CODE
Yuma Supersite	59	50	

PM-10 (PARTICLES)

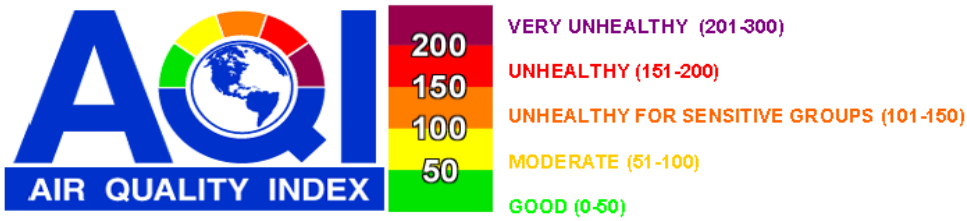
SITE NAME	MAX 24-HR VALUE (µg/m3)	MAX AQI	AQI COLOR CODE
Yuma Supersite	50	46	

Click Here to find out how the AQI forecast is used in the Yuma Air Quality Flag Program

YUMA SUPERSITE POLLUTION MONITORS LOCATION MAP



ADEQ Arizona Department of Environmental Quality



For more information visit: http://www.airnow.gov/index.cfm?action=aqibasics.aqi

LINK TO HISTORICAL AIR POLLUTION EXCEEDANCE DATA FOR YUMA

YUMA AIR QUALITY FORECAST FOR SATURDAY, MAY 26, 2012

This report is updated by 1:00 p.m. Sunday thru Friday and is valid for areas within and bordering the city of Yuma, Arizona

FORECAST DATE **NOTICES** (*SEE BELOW FOR DETAILS) AIR POLLUTANT	YESTERDAY THU 05/24/2012 OZONE HEALTH WATCH AQI Reading/Category (Preliminary data only)	TODAY FRI 05/25/2012 PM-10 HEALTH WATCH	TOMORROW SAT 05/26/2012	EXTENDED SUN 05/27/2012
O3*	43 GOOD	42 GOOD	64 MODERATE	80 MODERATE
PM-10*	57 MODERATE	94 MODERATE	55 MODERATE	35 GOOD

* O3 = Ozone PM-10 = Particles 10 microns & smaller

"Ozone Health Watch" means that the highest concentration of OZONE may approach the federal health standard.
"PM-10 Health Watch" means that the highest concentration of PM-10 may approach the federal health standard.
"High Pollution Advisory" means that the highest concentration of OZONE or PM-10 may exceed the federal health standard.
"DUST" means that short periods of high PM-10 concentrations caused by outflow from thunderstorms or frontal system passages are possible.

Health Statements	
Friday, 05/25/12	**Unusually sensitive people should consider limiting prolonged exertion outdoors.**
Saturday, 05/26/12	**Unusually sensitive people should consider limiting prolonged exertion outdoors.**

Synopsis and Discussion

...A PM10 HEALTH WATCH REMAINS IN EFFECT FOR FRIDAY, MAY 25, 2012...

A strong trough of low pressure has begun to move through the western states, increasing winds out of the southwest across Arizona. Some periods of blowing dust are likely across the deserts through Saturday morning, pushing PM10 levels towards the health standard. Dust-related air quality will improve by Sunday as winds decrease.

This trough will also bring much cooler air to the region. Saturday's high will be 15 degrees below normal (Forecast – 83°F, Normal – 98°F). Temperatures will rebound to normal by Monday and Tuesday as high pressure returns.

Another product of this trough is ozone/precursor import. With winds out of west and southwest, Arizona tends to get ozone and precursor transported from southern California. Though winds will not allow ozone precursors to set up long enough to form the invisible ozone plume on Friday and Saturday, we could see levels push into the middle part of the Moderate range on Sunday and possibly higher by Monday.

Check back on Sunday for a look ahead at next week's weather and air quality. Until then, have a great weekend! -J.Paul

POLLUTION MONITOR READINGS FOR THURSDAY, MAY 24, 2012

O3 (OZONE)

Info on current 8-hour ozone standard: http://www.epa.gov/air/ozonepollution/pdfs/2008_03_aqi_changes.pdf
For archived AQI maps go to: http://www.airnow.gov/index.cfm?action=airnow.maps

SITE NAME	MAX 8-HR VALUE (PPB)	MAX AQI	AQI COLOR CODE
Yuma Supersite	51	43	

PM-10 (PARTICLES)

SITE NAME	MAX 24-HR VALUE (µg/m3)	MAX AQI	AQI COLOR CODE
Yuma Supersite	66.3	57	

Click Here to find our how the AQI forecast is used in the Yuma Air Quality Flag Program

YUMA SUPERSITE POLLUTION MONITOR LOCATION MAP