



Janet Napolitano
Governor

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

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Stephen A. Owens
Director

Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM₁₀) Concentration Events in the Yuma Area on October 5, 2007.

Background

The Arizona Department of Environmental Quality (ADEQ) issues Dust Control Action Forecasts for the Yuma and Phoenix areas as part of the Natural Events Action Plan for these areas. On Thursday, October 4, 2007, ADEQ air quality forecasters issued the Yuma and Vicinity Dust Control Action Forecast calling for a moderate risk of exceeding the PM₁₀ National Ambient Air Quality Standards (NAAQS) in the Yuma area for Friday, October 5th. The forecast discussion can be seen in the bottom right corner of Figure 1 and is also included as an attachment. It notes the likelihood for strong southwesterly winds changing to northwesterly winds as the system passed. Wind speeds of 15 to 25 mph were anticipated throughout much of the day, and because of this, a potential for blowing dust existed in the Yuma area for Friday, October 5th. The forecasts/advisories satisfy the requirement in 40 CFR 51.920(a)(1).

During the morning hours of October 5, 2007, a trough of low pressure moved into Arizona. Strong northwesterly winds increased as the trough advanced eastward past Yuma and through Arizona. Elevated hourly average measurements of PM₁₀ first occurred at Yuma Courthouse at approximately 8:00 a.m. At that same time, wind gusts over 20 mph were first recorded. Yuma Courthouse experienced its maximum PM₁₀ concentrations during the 1:00 p.m. through 3:00 p.m. hours as winds gusted over 30 mph. The high winds and blowing dust were a region wide event that not only affected the Yuma area, but also

affected numerous locations in southeastern California. National Weather Service (NWS) data from El Centro and Imperial County Airport indicate high winds beginning in the morning, just prior to Yuma experiencing strong winds. Visibility at both California monitors began to decline during the 5:00 a.m. hour, with reports of blowing dust and haze continuing through the early afternoon. The NWS Yuma Marine Corps Air Station (MCAS) monitor recorded strong winds, reduced visibility, haze and blowing dust starting four to five hours after the first reports of blowing dust, haze, and reduced visibility at the two NWS California monitoring stations mentioned above. This wind-blown dust event continued through the afternoon and into the early evening hours in the Yuma area.

A trough of low pressure created blowing dust, originating in southeastern California, which reached the Yuma area during the morning of October 5th, 2007. On that day, high winds created a wind-blown dust event. The event brought significant wind and elevated ambient concentrations of PM₁₀ that exceeded the NAAQS at the Yuma Courthouse continuous BAM (Beta Attenuation Mass) monitor operated by ADEQ. The fact that ambient concentrations exceed the NAAQS satisfies the criteria in 40 CFR 50.1(j) that the event “affects air quality.”

The following are the key PM₁₀ monitor readings for the monitor examined in this report:

Monitor (Operator/Type)	AQS ID	24-hr Avg PM ₁₀	1-hr Max PM ₁₀	Time of Max 1-hr	Flag(A)***
YUMA AREA					
Yuma Courthouse (ADEQ/BAM)	04-027-0004*	320	995**	1300	A or RJ

* EPA Air Quality System Identification Number

** Upper range of instrument. Actual PM₁₀ concentrations likely exceeded recorded value

*** 24-hr PM₁₀ concentration influenced by natural or exceptional event to be flagged.

Type Abbreviations: BAM – Beta-Attenuation Mass Monitor (Continuous monitor)

The preliminary findings from this analysis were presented at a stakeholders meeting on November 13, 2007 and were made available for public review during a comment period that ended November 30, 2007. During that time, no comments were received from the public. ADEQ presented and discussed this final demonstration at a stakeholder

meeting on May 28, 2008. ADEQ has finalized this demonstration, which was made available for public comment from August 11, 2008 through September 10, 2008. Any comments that were received were forwarded to EPA with this documentation pursuant to 40 CFR 51.14(c)(3)(i).

NWS-EI Centro, CA							
Hr	T(F)	VR	Dust	Spd	Gust	Dir	
1	74	10		21	30	W	
2	74	10		15	15	W	
3	75	10		15	15	W	
4	73	10				8 W	
5	72	10		13	22	NW	
6	68	4	BLDU	21	34	W	
7	69	1	BLDU	33	46	W	
8	71	6	BLDU	36	48	W	
9	M	M	M	M	M	M	
10	76	M	M	24	34	W	
11	76	1	BLDU	21	28	W	
12	75	1	BLDU	21	33	SW	
1	78	4	BLDU	23	38	W	
2	78	10		28	38	W	
3	77	10		28	36	W	
4	75	10		26	34	W	
5	71	10		24	32	W	
6	67	10		23	32	W	
7	65	10		28	38	W	
8	64	10		22	36	W	
9	63	10		22	29	W	
10	63	10		21	32	W	
11	61	10		25	32	W	
12	61	10		20	26	W	

NWS-Imperial, CA							
Hr	T(F)	VR	Dust	Spd	Gust	Dir	
1	74	10		16	16	W	
2	74	10		11	11	W	
3	74	10		9	9	NW	
4	73	10		6	6	W	
5	70	10		10	10	W	
6	70	3	HZ	16	28	W	
7	70	4	HZ	28	37	W	
8	72	5	HZ	33	45	W	
9	75	9		29	39	W	
10	76	4	HZ	39	51	W	
11	78	2	HZ	26	39	W	
12	77	1	HZ	28	41	W	
1	79	5	HZ	22	30	W	
2	79	10		24	32	W	
3	77	10		24	33	W	
4	75	10		21	31	W	
5	72	10		24	32	W	
6	68	10		25	30	W	
7	65	10		20	29	W	
8	65	10		15	26	W	
9	64	10		9	21	W	
10	62	10		18	18	W	
11	61	10		16	16	W	
12	61	10		11	11	NW	

NWS-Yuma MCAS							
Hr	T(F)	VR	Dust	Spd	Gust	Dir	
1	76	10		0	0	N	
2	76	10		6	6	N	
3	75	10		5	5	N	
4	74	9		3	3	NW	
5	71	9		3	3	W	
6	70	10		7	7	NW	
7	74	10		7	7	N	
8	73	10		11	23	N	
9	73	8		14	22	NW	
10	74	7		18	29	NW	
11	77	6	HZ	20	28	NW	
12	79	7		21	30	NW	
1	80	7		22	30	NW	
2	80	2	HZ	23	31	W	
3	78	1	HZ	15	34	NW	
4	77	1	BLDU	20	31	NW	
5	76	3	BLDU	21	29	NW	
6	73	6	BLDU	25	30	W	
7	70	6	BLDU	18	26	W	
8	67	10		15	28	NW	
9	65	10		21	31	W	
10	63	10		22	29	W	
11	62	10		11	25	NW	
12	61	10		9	9	NW	

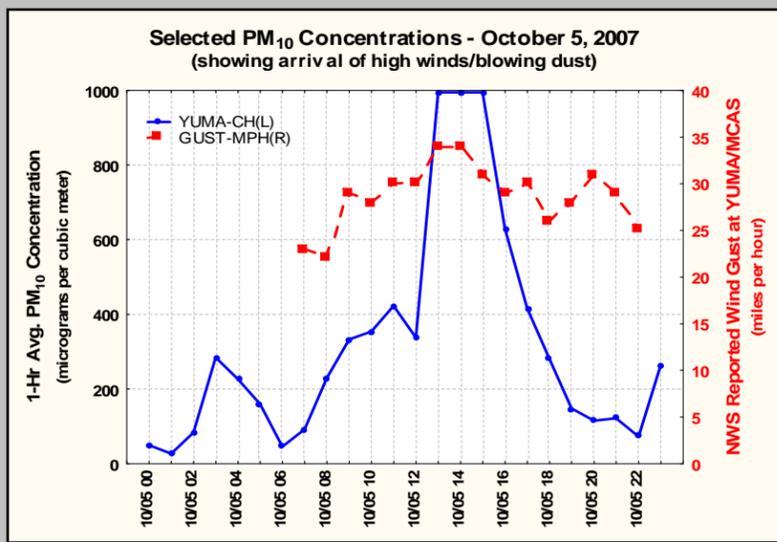
Event Contrib. Analysis		
Hourly PM ₁₀ Conc. (µg/m ³)		
MONITORS:	Hr	1
1-YUMA CH	1	50
	2	27
	3	83
	4	285
	5	227
	6	159
	7	46
	8	92
	9	230
	10	333
	11	354
	12	423
24-Hr. Avg PM₁₀		
with w/o		
Monitor: Event	320	130
1-YUMA CH		
> NAAQS	< NAAQS	
Pink=Event Contrib.		
Conclusion: As shown above, the PM ₁₀ concentration would have been below the NAAQS "BUT FOR" the event contribution (hours highlighted in pink).		



Figure 1. Key Data for Event of October 5, 2007

MISC DATA	KEY	PM10 PLOT
CEN. AZ WINDS		SAT IMAGES
SO AZ WINDS		YUMA MAP & FORECAST

SUMMARY OF EVENT
A trough of low pressure forecast to move into Arizona on October 5th arrived in the Yuma area shortly after 6:00 a.m. A major dust storm was observed in El Centro and Imperial County with wind gusts to 54 mph. The major dust event in Yuma began a few hours later.

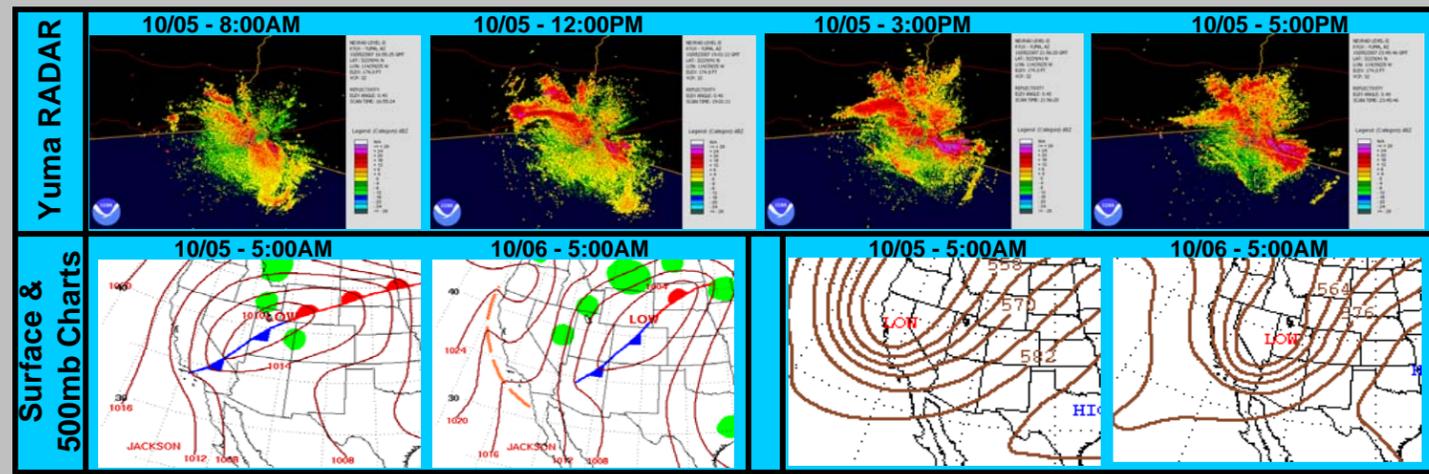


PARKER							
Hr	T(F)	RH	Rn	Spd	Max	Dir	
1	76	24	-	11	17	SW	
2	74	29	-	10	15	S	
3	73	30	-	6	13	S	
4	69	37	-	4	8	E	
5	69	37	-	10	18	SW	
6	68	36	-	11	16	S	
7	64	48	-	5	13	SE	
8	68	35	-	10	19	S	
9	74	28	-	14	20	S	
10	77	25	-	19	25	SW	
11	78	24	-	19	24	S	
12	81	21	-	19	26	S	
1	83	18	-	19	26	S	
2	84	16	-	19	29	SW	
3	83	18	-	21	27	SW	
4	81	21	-	19	25	SW	
5	79	22	-	18	25	SW	
6	75	23	-	16	22	SW	
7	70	29	-	14	18	SW	
8	67	32	-	13	19	SW	
9	67	29	-	8	15	W	
10	68	23	-	14	22	NW	
11	66	25	-	17	24	NW	
12	65	23	-	18	25	NW	

BUCKEYE							
Hr	T(F)	RH	Rn	Spd	Max	Dir	
1	73	55	-	1	4	SE	
2	73	53	-	2	4	E	
3	73	48	-	2	4	E	
4	71	51	-	1	6	N	
5	69	56	-	3	6	E	
6	68	59	-	4	6	E	
7	68	60	-	4	6	E	
8	73	53	-	4	6	E	
9	79	46	-	3	6	SE	
10	81	38	-	4	10	S	
11	83	31	-	5	11	S	
12	85	26	-	8	18	SW	
1	86	25	-	11	18	SW	
2	87	25	-	13	22	SW	
3	86	26	-	14	24	SW	
4	86	24	-	13	19	SW	
5	84	28	-	12	19	SW	
6	80	29	-	12	19	W	
7	77	23	-	9	15	W	
8	72	26	-	6	10	W	
9	69	30	-	4	8	W	
10	70	29	-	6	11	W	
11	65	33	-	7	13	W	
12	63	30	-	8	13	W	

MARICOPA							
Hr	T(F)	RH	Rn	Spd	Max	Dir	
1	74	51	-	4	8	S	
2	73	51	-	3	6	SW	
3	71	55	-	4	6	SE	
4	73	53	-	6	9	S	
5	72	55	-	6	8	S	
6	70	59	-	5	9	SE	
7	68	65	-	4	7	SE	
8	73	53	-	9	15	S	
9	78	41	-	13	18	S	
10	82	32	-	15	20	S	
11	86	24	-	13	20	S	
12	88	24	-	14	21	S	
1	90	18	-	13	21	SW	
2	91	16	-	15	25	SW	
3	92	13	-	16	28	SW	
4	91	14	-	16	23	SW	
5	90	14	-	16	23	SW	
6	86	16	-	13	21	SW	
7	81	20	-	9	17	SW	
8	78	20	-	11	17	W	
9	75	20	-	9	15	W	
10	70	29	-	9	15	W	
11	70	25	-	6	11	W	
12	67	27	-	4	11	W	

Historical Distribution		
5-Yr. Dist. of Values (µg/m ³)		
MONITORS:	Column Index	
1-YUMA CH	Yr	All Data (5-Yrs)
	Sea	Data for Autumn season only (5-Yrs)
Cum. Freq.	Mon 1	
Min	8	12
0.5%	12	13
1.0%	14	15
2.5%	16	20
5%	19	22
10%	23	26
25%	31	34
50%	42	46
75%	57	58
90%	77	73
95%	96	86
97.5%	127	94
99.0%	186	131
99.5%	211	204
Max	349	320
Flagged Value	320	
Conclusion:	Flagged Value is exceptional in nature (eg. greater than 95% of all data)	



YUMA							
Hr	T(F)	RH	Rn	Spd	Max	Dir	
1	78	22	-	6	12	N	
2	76	25	-	10	19	N	
3	75	25	-	13	21	NW	
4	75	25	-	13	19	NW	
5	73	25	-	5	15	NW	
6	72	23	-	5	12	N	
7	71	25	-	4	17	N	
8	72	21	-	19	29	NW	
9	71	28	-	20	33	NW	
10	73	28	-	20	29	NW	
11	75	25	-	19	33	NW	
12	78	21	-	19	26	NW	
1	78	21	-	20	30	NW	
2	78	22	-	21	31	NW	
3	77	23	-	21	30	NW	
4	76	23	-	21	28	NW	
5	76	22	-	21	30	NW	
6	73	23	-	22	30	NW	
7	70	24	-	17	27	W	
8	67	26	-	18	30	NW	
9	65	29	-	17	24	NW	
10	63	34	-	15	24	NW	
11	61	36	-	14	20	NW	
12	61	32	-	12	25	NW	

PALOMA							
Hr	T(F)	RH	Rn	Spd	Max	Dir	
1	76	47	-	9	15	SW	
2	74	54	-	6	10	S	
3	74	53	-	7	10	S	
4	73	53	-	6	9	S	
5	74	53	-	9	13	S	

Assessment Under the Technical Criteria Document (TCD)

1. Properly qualify and validate the air quality measurement to be flagged. As this was not a filter sampling date (1-in-6 run day), only data from the continuous analyzers were examined. The air quality monitoring data were reviewed by the agency responsible for operation of the monitor. All hourly PM₁₀ readings from the Yuma Courthouse monitor were valid for October 5th. There were, however, three hours in which extremely high concentrations of PM₁₀ were measured. During these hours, it is likely that the maximum range of the instrument was reached. These measured values were recorded as 995 µg/m³ by the BAMS, but it is likely that the actual PM₁₀ concentrations exceeded these recorded values. Audits of the analyzers revealed operations were within acceptable tolerance. No local sources were reported as significantly contributing to the air quality episode.

2. Review suspected contributing sources. The Arizona Meteorological Network (AzMET) and NWS surface data from southwestern Arizona and southeastern California provide a good explanation as to what meteorological conditions were in place throughout the day of October 5th. Strong winds and dry conditions throughout the region allowed for loose soils to be easily picked up and transported. While no visibility network exists for the Yuma area, observational reports of blowing dust and haze throughout southwestern Arizona and southeastern California in conjunction with clear air mode radar images are further proof that strong winds suspended and transported dust causing elevated PM₁₀ concentrations in the Yuma area. The plot of hourly PM₁₀ concentration data located in the upper right corner of Figure 1, in conjunction with the Yuma wind data, confirms the identical timing of the maximum winds and elevated PM₁₀ concentrations.

3. Examine all air quality monitoring information. Data from all monitors in the network were reviewed. Monitors from the Yuma area are summarized in the table in the Background section of this assessment. Pursuant to 40 CFR 50.14(c)(3)(iii)(C), the “Historical Distribution” Table in Figure 1 has been included to demonstrate that the event is associated with a measured concentration in excess of normal historical fluctuations, including background (i.e., concentrations greater than the 95th percentile). Monitors with readings greater than that of the NAAQS, which should be flagged, include the Yuma Courthouse PM₁₀ monitor.

4. Examine the meteorological conditions before and during the event. The AzMET meteorological data are

summarized in Figure 1. The wind data are highlighted yellow if the max wind speed in the hour exceeds 15 mph and orange if it exceeds 25 mph. In Yuma, hourly max wind speeds exceeding 15 mph began during the 8:00 a.m. hour. Readings continued at or well above that level through 11:00 p.m. with a majority of hourly maximum gusts being in the orange category. Portions of California recorded strong winds lasting even longer. Blowing dust, first reported in areas west of Yuma in California and then later in the Yuma area, can be attributed to westerly and northwesterly winds associated with the passing of a frontal boundary. As the frontal boundary reached the Yuma area, winds increased, shifted to the northwest and wind-blown dust entered southwestern Arizona causing elevated PM₁₀ values in the Yuma area. This can be seen in the NWS data tables in the upper left corner of Figure 1, where blowing dust and haze were reported first in California during the 5:00-6:00 a.m. hours and then began approximately four to five hours later in Yuma.

5. Perform a qualitative attribution to emission source(s). All evidence indicates the elevated PM₁₀ concentrations in the Yuma area can be attributed to soil emissions in the area west and northwest of Yuma that were transported over a broad area. No source specific emission allocation is possible based on the data available for analysis. The hourly concentration data do not show any significant source other than the major wind-blown dust event for the October 5, 2007 episode. Observational reports of haze and blowing dust from trained officials are proof that elevated PM₁₀ concentrations were attributed to soil emissions.

6. Estimation of Contribution from Source or Event. The primary source appears to be wind-blown dust over a wide geographic region for which there is not an effective or efficient method to estimate the relative contributions from specific sources. The demonstration analysis contained in this report establishes the linkage between the measurements to be flagged and the event, thus satisfying the requirement in 40 CFR 50.14(c)(3)(iii)(B). Pursuant to 40 CFR 50.14(c)(3)(iii)(D), the “Event Contrib. Analysis” Table in Figure 1 has been included to demonstrate that there would have been no exceedance or violation but for the event (i.e., the contribution during the event overwhelmed the 24-hour average).

7. Determination that a Natural or Exceptional Event Contributed To an Exceedance. Based on this analysis, the event satisfies the requirement in 40 CFR 50.1(j) that the elevated concentrations at Yuma Courthouse were attributed to a natural event.

Conclusion

Long-range transport of dust from soils. The region wide elevated PM₁₀ event on October 5, 2007 in Yuma County was a result of long-range transport of dust and soils from high winds that suspended natural soils and soils from areas where Best Available Control Measures are in place and should be flagged for air quality planning

purposes. The “high wind” flag (A or RJ) should be applied to the monitor readings indicated in the summary table at the beginning of this report, as monitors would have been below the NAAQS but for the contribution of the event.



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**YUMA AND VICINITY
 DUST CONTROL ACTION FORECAST
 ISSUED THURSDAY, OCTOBER 4, 2007**

Three-day weather outlook:

Low pressure is beginning to edge closer to the region from the west as noted by the variable clouds Thursday morning. There continues to be a slight chance for rain across the region Thursday, but as the trough moves into Arizona on Friday, it's the winds that will be the main factor. They will strengthen out of the southwest on Friday, turning out of the northwest on Saturday as the trough moves into New Mexico. The winds will decrease Sunday as the system continues to move away from the forecast area and high pressure increases. The risk of wind-blown dust in Yuma will be "Moderate" on Friday and Saturday, dropping back to "Low" on Sunday.

	<u>WINDS</u>	<u>WIND BLOWN DUST RISK</u>
Day #1: Fri 10/05/2007	Southwest winds 15 to 25 mph are expected much of the day.	MODERATE
Day #2: Sat 10/06/2007	Northwest winds 15 to 25 mph are expected much of the day.	MODERATE
Day #3: Sun 10/07/2007	North winds 10 to 20 mph are likely much of the day.	LOW

PM-10 & PM-2.5 (PARTICLES)

Description – The term “particulate matter” (PM) includes both solid particles and liquid droplets found in air. Many manmade and natural sources emit PM directly or emit other pollutants that react in the atmosphere to form PM. Particles less than 10 micrometers in diameter tend to pose the greatest health concern because they can be inhaled into and accumulate in the respiratory system. Particles less than 2.5 micrometers in diameter are referred to as “fine” particles and are responsible for many visibility degradations (brown cloud). Particles with diameters between 2.5 and 10 micrometers are referred to as “coarse”.

Sources – Fine = All types of combustion (motor vehicles, power plants, wood burning, etc.) and some industrial processes. Coarse = crushing or grinding operations and dust from paved or unpaved roads.

Potential health impacts – PM can increase susceptibility to respiratory infections and can aggravate existing respiratory diseases, such as asthma and chronic bronchitis.

Units of measurement – Micrograms per cubic meter (ug/m3)

Averaging interval – 24 hours (midnight to midnight).

Reduction tips – Stabilize loose soils, minimize travel on dirt roads, utilize tarps on haul trucks, limit use of leaf-blowers, and on high-wind days reduce outdoor activities.

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

**QUALITY CONTROLLED LOCAL
CLIMATOLOGICAL DATA**
(may be updated)
HOURLY OBSERVATIONS TABLE
YUMA MCAS (03145)
YUMA , AZ
(10/2007)

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

Elevation: 213 ft. above sea level
Latitude: 32.650
Longitude: -114.617
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
05	0051	5	CLR	10.00		76	24.4	56	13.4	38	3.3	25	0	000		29.43			29.65	AA		29.66
05	0151	5	CLR	10.00		76	24.4	56	13.4	38	3.3	25	6	350		29.44	3	001	29.66	AA		29.67
05	0251	5	CLR	10.00		75	23.9	57	13.6	40	4.4	28	5	340		29.43			29.65	AA		29.66
05	0351	5	CLR	9.00		74	23.3	56	13.3	40	4.4	29	3	330		29.44			29.66	AA		29.67
05	0451	5	CLR	9.00		71	21.7	55	12.7	40	4.4	33	3	280		29.44	3	001	29.66	AA		29.67
05	0551	5	CLR	10.00		70	21.1	53	11.8	37	2.8	30	7	300		29.45			29.67	AA		29.68
05	0651	5	FEW150	10.00		74	23.3	53	11.6	31	-0.6	21	7	340		29.48			29.70	AA		29.71
05	0751	5	FEW150	10.00		73	22.8	52	11.2	30	-1.1	20	11	340	23	29.50	3	021	29.72	AA		29.73
05	0851	5	FEW050	8.00		73	22.8	55	12.9	39	3.9	29	14	330	22	29.53			29.75	AA		29.76
05	0951	5	FEW050	7.00		74	23.3	56	13.4	40	4.4	29	18	330	29	29.54			29.76	AA		29.77
05	1051	5	CLR	6.00	HZ	77	25.0	56	13.4	37	2.8	24	20	310	28	29.54	1	014	29.76	AA		29.77
05	1151	5	CLR	7.00		79	26.1	57	13.7	36	2.2	21	21	310	30	29.54			29.76	AA		29.77
05	1251	5	CLR	7.00		80	26.7	57	13.7	35	1.7	20	22	310	30	29.53			29.75	AA		29.76
05	1307	5	SCT001	3.00	HZ	81	27.0	57	14.1	36	2.0	20	21	300	28	29.53			M	SP		29.76
05	1315	5	BKN001	3.00	HZ	81	27.0	57	14.1	36	2.0	20	23	300	29	29.53			M	SP		29.76
05	1333	5	CLR	2.50	HZ	81	27.0	58	14.3	37	3.0	21	21	300	34	29.52			M	SP		29.75
05	1343	5	CLR	2.00	HZ	81	27.0	59	14.7	39	4.0	22	21	300	32	29.52			M	SP		29.75
05	1349	5	OVC001	2.00	HZ	81	27.0	58	14.3	37	3.0	21	22	290	29	29.52			M	SP		29.75
05	1351	5	CLR	2.00	HZ	80	26.7	58	14.3	38	3.3	22	23	290	31	29.52			M	SP		29.75
05	1451	5	CLR	1.00	HZ	78	25.6	57	14.0	39	3.9	25	15	310	34	29.51	8	009	29.74	AA		29.75
05	1458	5	CLR	1.00	HZ	79	26.0	58	14.2	39	4.0	24	20	310	31	29.51			M	SP		29.74
05	1513	5	CLR	2.00	BLDU	79	26.0	58	14.2	39	4.0	24	21	320	30	29.51			M	SP		29.74
05	1540	5	CLR	1.00	BLDU	79	26.0	57	13.7	36	2.0	21	21	310	29	29.51			M	SP		29.74
05	1551	5	CLR	1.00	BLDU	77	25.0	56	13.2	36	2.2	23	20	300	31	29.51			M	SP		29.74
05	1649	5	CLR	3.00	BLDU	75	24.0	55	12.8	36	2.0	24	17	310	29	29.54			M	SP		29.77
05	1651	5	CLR	3.00	BLDU	76	24.4	55	12.8	35	1.7	23	21	300	29	29.54			M	SP		29.77
05	1751	5	CLR	6.00	BLDU	73	22.8	54	11.9	34	1.1	24	25	290	30	29.55			M	SP		29.78
05	1851	5	CLR	6.00	BLDU	70	21.1	51	10.7	31	-0.6	24	18	290	26	29.57			M	SP		29.80
05	1951	5	CLR	10.00		67	19.4	50	10.1	32	0.0	27	15	300	28	29.59			M	SP		29.82
05	2051	5	CLR	10.00		65	18.3	50	10.0	34	1.1	32	21	290	31	29.60			M	SP		29.83
05	2151	5	CLR	10.00		63	17.2	50	9.9	36	2.2	37	22	290	29	29.63			M	SP		29.86
05	2251	5	CLR	10.00		62	16.7	49	9.7	36	2.2	38	11	310	25	29.66			M	SP		29.89
05	2351	5	CLR	5.00	HZ	61	16.1	48	8.8	33	0.6	35	9	310		29.67	3	022	29.88	AA		29.90

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

**QUALITY CONTROLLED LOCAL
CLIMATOLOGICAL DATA**
(may be updated)
HOURLY OBSERVATIONS TABLE
NAF (23199)
EL CENTRO , CA
(10/2007)

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

Elevation: -43 ft. below sea level
Latitude: 32.817
Longitude: -115.667
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
05	0056	5	CLR	10.00		74	23.3	57	14.0	43	6.1	33	21	270	30	29.69	1	004	29.70	AA		29.65
05	0156	5	CLR	10.00		74	23.3	55	13.0	38	3.3	27	15	290		29.69			29.69	AA		29.65
05	0256	5	CLR	10.00		75	23.9	54	12.1	32	0.0	21	15	280		29.69			29.70	AA		29.65
05	0356	5	CLR	10.00		73	22.8	52	11.0	28	-2.2	19	8	290		29.71	3	006	29.71	AA		29.67
05	0456	5	CLR	10.00		72	22.2	52	11.2	31	-0.6	22	13	300	22	29.72			29.72	AA		29.68
05	0556	5	CLR	4.00	BLDU	68	20.0	55	12.7	43	6.1	41	21	290	34	29.74			29.75	AA		29.70
05	0611	5	FEW005	2.50	BLDU	68	20.0	56	13.1	45	7.0	44	30	270	37	29.73			M	SP		29.69
05	0628	5	FEW005	4.00	BLDU	68	20.0	55	12.7	43	6.0	41	31	270	41	29.74			M	SP		29.70
05	0652	5	FEW003	1.75	BLDU	70	21.0	56	13.1	43	6.0	38	30	280	43	29.76			M	SP		29.72
05	0654	5	VV004	1.00	BLDU	70	21.0	56	13.1	43	6.0	38	30	270	43	29.76			M	SP		29.72
05	0656	5	VV003	0.75	BLDU	69	20.6	55	12.7	42	5.6	38	33	270	46	29.76	3	017	29.76	AA		29.72
05	0703	5	SCT003	1.25	BLDU	70	21.0	55	12.7	41	5.0	35	38	270	47	29.77			M	SP		29.73
05	0707	5	FEW003	3.00	BLDU	72	22.0	55	12.7	39	4.0	30	37	270	54	29.77			M	SP		29.73
05	0756	5	CLR	6.00	BLDU	71	21.7	56	13.1	42	5.6	35	36	260	48	29.79				AA		29.75
05	0856	5	M	M	nulls	M	M	M	M	M	M	M	M	M		29.84				AA		29.80
05	0956	5	M	M		76	24.4	58	14.5	43	6.1	31	24s	260	34	29.86	1	035	29.86	AA		29.82
05	1024	5	BKN013	2.50	BLDU	75	24.0	58	14.3	43	6.0	32	20	260	33	29.87			M	SP		29.83
05	1044	5	OVC011	1.50	BLDU	75	24.0	58	14.3	43	6.0	32	17	260	26	29.87			M	SP		29.83
05	1054	5	OVC009	1.25	BLDU	75	24.0	58	14.3	43	6.0	32	15	260	25	29.86			M	SP		29.82
05	1056	5	OVC009	1.25	BLDU	76	24.4	57	14.0	41	5.0	29	21	260	28	29.86			29.86	AA		29.82
05	1123	5	VV007	0.75	BLDU	75	24.0	57	13.8	41	5.0	30	21	240	33	29.86			M	SP		29.82
05	1154	5	VV006	1.00	BLDU	75	24.0	57	13.8	41	5.0	30	23	250	34	29.85			M	SP		29.81
05	1156	5	BKN006	1.25	BLDU	76	24.4	57	14.0	41	5.0	29	23	250	34	29.85			29.85	AA		29.81
05	1217	5	BKN010	2.00	BLDU	77	25.0	58	14.3	41	5.0	28	26	250	36	29.84			M	SP		29.80
05	1225	5	SCT010	3.00	BLDU	77	25.0	57	13.9	39	4.0	26	24	270	36	29.83			M	SP		29.79
05	1256	5	CLR	4.00	BLDU	78	25.6	57	14.1	39	3.9	25	23	260	38	29.82				AA		29.78
05	1356	5	FEW060	10.00		78	25.6	57	13.7	37	2.8	23	28	250	38	29.80				AA		29.76
05	1456	5	FEW060	10.00		77	25.0	55	12.9	34	1.1	21	28	250	36	29.83				AA		29.79
05	1556	5	FEW060	10.00		75	23.9	54	12.3	33	0.6	22	26	250	34	29.83				AA		29.79
05	1656	5	CLR	10.00		71	21.7	52	11.2	32	0.0	24	24	250	32	29.86	3	004	29.86	AA		29.82
05	1756	5	FEW060	10.00		67	19.4	50	10.2	32	0.0	27	23	260	32	29.88				AA		29.84
05	1856	5	FEW060	10.00		65	18.3	52	10.8	38	3.3	37	28	250	38	29.87				AA		29.83
05	1956	5	FEW060	10.00		64	17.8	51	10.6	38	3.3	38	22	260	36	29.89	0	014	29.88	AA		29.85
05	2056	5	FEW060	10.00		63	17.2	49	9.5	34	1.1	34	22	280	29	29.93				AA		29.89
05	2156	5	CLR	10.00		63	17.2	50	9.7	35	1.7	35	21	290	32	29.94				AA		29.90
05	2256	5	CLR	10.00		61	16.1	49	9.4	36	2.2	39	25	270	32	29.95	1	021	29.94	AA		29.91
05	2356	5	CLR	10.00		61	16.1	49	9.4	36	2.2	39	20	270	26	29.96				AA		29.92

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

**QUALITY CONTROLLED LOCAL
CLIMATOLOGICAL DATA**
(final)
HOURLY OBSERVATIONS TABLE
IMPERIAL COUNTY AIRPORT (03144)
IMPERIAL , CA
(10/2007)

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

Elevation: -59 ft. below sea level
Latitude: 32.834
Longitude: -115.579
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
05	0053	12	CLR	10.00		74	23.3	58	14.2	44	6.7	34	16	280		29.71						29.65
05	0153	12	CLR	10.00		74	23.3	56	13.2	39	3.9	28	11	290		29.71	3	003	29.65	AA		29.65
05	0253	12	CLR	10.00		74	23.3	54	12.2	34	1.1	23	9	300		29.71			29.65	AA		29.65
05	0353	12	CLR	10.00		73	22.8	52	11.3	30	-1.1	20	6	260		29.72	3	004	29.66	AA		29.66
05	0453	12	CLR	10.00		70	21.1	51	10.4	29	-1.7	22	10	270		29.73			29.67	AA		29.67
05	0539	12	SCT006	2.50	HZ	70	21.0	53	11.8	37	3.0	30	16	290	28	29.76			M	SP		29.70
05	0545	12	BKN008	1.75	HZ	70	21.0	53	11.8	37	3.0	30	14	290		29.77			M	SP		29.71
05	0550	12	SCT008 SCT012	2.00	HZ	70	21.0	53	11.8	37	3.0	30	11	310	20	29.77			M	SP		29.71
05	0553	12	FEW006 SCT010	2.50	HZ	70	21.1	54	12.0	38	3.3	31	11	320	20	29.77			M	AA		29.71
05	0600	12	FEW004 SCT010	3.00	HZ	70	21.0	54	12.2	39	4.0	32	24	290	32	29.76			M	SP		29.70
05	0609	12	SCT008	2.00	HZ	70	21.0	56	13.1	43	6.0	38	21	280	32	29.76			M	SP		29.70
05	0627	12	FEW008	3.00	HZ	70	21.0	57	13.6	45	7.0	41	23	270	31	29.76			M	SP		29.70
05	0653	12	CLR	4.00	HZ	70	21.1	56	13.1	43	6.1	38	28	280	37	29.76	0	014	M	AA		29.70
05	0700	12	FEW006	2.00	HZ	72	22.0	57	13.6	43	6.0	35	28	270	36	29.77			M	SP		29.71
05	0704	12	SCT004	1.25	HZ	72	22.0	55	12.7	39	4.0	30	34	260	39	29.77			M	SP		29.71
05	0713	12	FEW004	2.00	HZ	72	22.0	55	12.7	39	4.0	30	29	270	41	29.78			M	SP		29.72
05	0721	12	FEW004	6.00	HZ	72	22.0	56	13.1	41	5.0	33	32	270	41	29.78			M	SP		29.72
05	0753	12	CLR	5.00	HZ	72	22.2	57	13.6	43	6.1	35	33	270	45	29.79			M	AA		29.73
05	0853	12	CLR	9.00		75	23.9	57	13.6	40	4.4	28	29	280	39	29.83			M	AA		29.77
05	0953	12	CLR	4.00	HZ	76	24.4	58	14.5	43	6.1	31	39	270	51	29.80	0	012	M	AA		29.74
05	1038	12	BKN015	3.00	HZ	77	25.0	58	14.3	41	5.0	28	28	260	41	29.84			M	SP		29.78
05	1043	12	BKN013	2.50	HZ	77	25.0	58	14.3	41	5.0	28	26	250	38	29.85			M	SP		29.79
05	1053	12	OVC013	2.00	HZ	78	25.6	58	14.5	41	5.0	27	26	250	39	29.84			M	AA		29.78
05	1100	12	OVC013	1.50	HZ	79	26.0	59	14.7	41	5.0	26	29	260	37	29.85			M	SP		29.79
05	1140	12	OVC009	1.25	HZ	79	26.0	59	14.7	41	5.0	26	30	250	38	29.84			M	SP		29.78
05	1151	12	VV006	0.50s	HZs	77	25.0	57	13.9	39	4.0	26	30	260	41	29.84			M	SP		29.78
05	1153	12	VV006	0.50s	HZs	77	25.0	57	14.1	40	4.4	27	28	250	41	29.84			M	AA		29.78
05	1202	12	VV005	0.50s	HZs	77	25.0	57	13.9	39	4.0	26	28	260	39	29.84			M	SP		29.78
05	1224	12	OVC007	1.25	HZ	79	26.0	59	14.7	41	5.0	26	25	260	32	29.84			M	SP		29.78
05	1230	12	OVC009	2.00	HZ	79	26.0	58	14.3	39	4.0	24	24	250	32	29.84			M	SP		29.78
05	1234	12	BKN011	3.00	HZ	79	26.0	58	14.3	39	4.0	24	23	250	31	29.84			M	SP		29.78
05	1251	12	SCT015	5.00	HZ	79	26.0	58	14.3	39	4.0	24	22	250	30	29.83			M	SP		29.77
05	1253	12	SCT015	5.00	HZ	79	26.1	58	14.3	39	3.9	24	22	270	30	29.83	7	004	M	AA		29.77
05	1353	12	CLR	10.00		79	26.1	57	14.1	38	3.3	23	24	250	32	29.83			M	AA		29.77
05	1453	12	CLR	10.00		77	25.0	56	13.1	35	1.7	22	24	250	33	29.83			M	AA		29.77
05	1553	12	CLR	10.00		75	23.9	55	12.5	34	1.1	22	21	260	31	29.84	3	003	M	AA		29.78
05	1653	12	CLR	10.00		72	22.2	52	11.2	31	-0.6	22	24	250	32	29.86			M	AA		29.80
05	1753	12	CLR	10.00		68	20.0	51	10.4	32	0.0	26	25	250	30	29.87			M	AA		29.81
05	1853	12	CLR	10.00		65	18.3	52	10.8	38	3.3	37	20	250	29	29.90	3	020	M	AA		29.84
05	1953	12	CLR	10.00		65	18.3	52	10.9	38	3.3	37	15	250	26	29.93			M	AA		29.87
05	2053	12	CLR	10.00		64	17.8	50	9.8	34	1.1	33	9	290	21	29.95			M	AA		29.89
05	2153	12	CLR	10.00		62	16.7	50	9.7	36	2.2	38	18	250		29.95	1	015	M	AA		29.89

05	2253	12	CLR	10.00		61	16.1	49	9.4	36	2.2	39	16	270	29.96		29.90	AA	29.90
05	2353	12	CLR	10.00		61	16.1	49	9.4	36	2.2	39	11	310	29.96		29.90	AA	29.90

Dynamically generated Tue Oct 30 09:57:04 EST 2007 via <http://cdo.ncdc.noaa.gov/qclcd/QCLCD>