ADEQ
Arizona Department of Environmental Quality

MONTHLY AIR QUALITY REPORT FOR
OCTOBER 2009

AQI COLOR SCALE

GOOD	MODERATE	UNHEALTHY FOR SENSITIVE GROUPS	UNHEALTHY
0-50	51-100	101-150	151-200

Calendar of maximum AQI values & their corresponding color for October 2009*

*Preliminary data

SAMPLE POLLUTANT REPORTING BOX

1 (day of month)	O3	CO
	PM10	PM2.5

SUN		MON		TUES		WED		THU		FRI		SAT	
								1 — O3 45, CO 14, PM10 53, PM2.5 30		**2** — O3 44, CO 11, PM10 50, PM2.5 29		**3** — O3 38, CO 07, PM10 31, PM2.5 23	
4 — O3 36, CO 07, PM10 47, PM2.5 19		**5** — O3 41, CO 07, PM10 64, PM2.5 36		**6** — O3 42, CO 13, PM10 55, PM2.5 37		**7** — O3 40, CO 09, PM10 46, PM2.5 31		**8** — O3 46, CO 13, PM10 46, PM2.5 31		**9** — O3 50, CO 15, PM10 57, PM2.5 41		**10** — O3 49, CO 19, PM10 57, PM2.5 46	
11 — O3 43, CO 23, PM10 49, PM2.5 38		**12** — O3 35, CO 08, PM10 39, PM2.5 26		**13** — O3 37, CO 10, PM10 29, PM2.5 21		**14** — O3 39, CO 13, PM10 42, PM2.5 27		**15** — O3 42, CO 15, PM10 54, PM2.5 40		**16** — O3 44, CO 19, PM10 56, PM2.5 46		**17** — O3 47, CO 22, PM10 62, PM2.5 47	
18 — O3 44, CO 20, PM10 44, PM2.5 31		**19** — O3 33, CO 15, PM10 47, PM2.5 31		**20** — O3 39, CO 07, PM10 62, PM2.5 21		**21** — O3 40, CO 09, PM10 38, PM2.5 25		**22** — O3 40, CO 11, PM10 60, PM2.5 41		**23** — O3 44, CO 15, PM10 71, PM2.5 44		**24** — O3 45, CO 16, PM10 55, PM2.5 47	
25 — O3 44, CO 11, PM10 45, PM2.5 29		**26** — O3 41, CO 11, PM10 57, PM2.5 41		**27** — O3 39, CO 15, PM10 133, PM2.5 60		**28** — O3 34, CO 07, PM10 38, PM2.5 12		**29** — O3 30, CO 10, PM10 49, PM2.5 27		**30** — O3 33, CO 19, PM10 55, PM2.5 38		**31** — O3 34, CO 23, PM10 58, PM2.5 66	

Calendar of High Pollution Advisories and Health Watches issued during October 2009

SUN	MON	TUE	WED	THU	FRI	SAT
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27 A	28	29	30	31

Calendar of Meteorological Conditions observed in Metro Phoenix during October 2009

SUN	MON	TUE	WED	THU	FRI	SAT
				1	2 B	3
4 D	5 E	6	7 B	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24 E
25 E	26	27 D	28 E	29	30 E	31 E

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Exceedance days during OCT 2009-

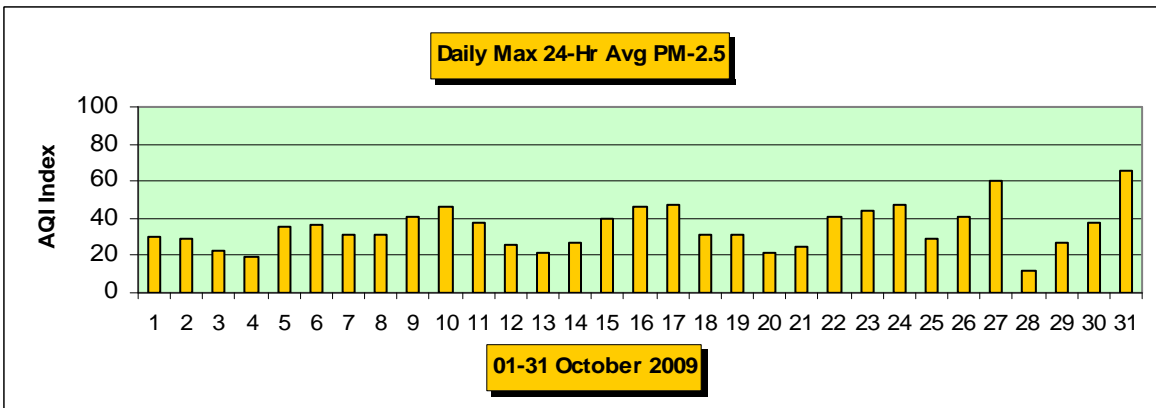|	Total= 1	Date	Max AQI	Pollutant	Site/s
		10/27	133	PM-10	West Chandler
			118	PM-10	West Forty Third
			112	PM-10	Higley
			107	PM-10	Buckeye
			102	PM-10	Durango

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Health Watches issued during OCT 2009-

	Total= 0	Date	Max AQI	Pollutant	Site/s

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High Pollution Advisories issued during OCT 2009-

	Total= 1	Date	Max AQI	Pollutant	Site/s
		10/27	133	PM-10	West Chandler

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Concentration Recap:

Days in the Good category:	15
Days in the Moderate category:	15
Days in the Unhealthy for Sensitive Groups category:	1
Days in the Unhealthy category:	0
Total Forecast Days:	31

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Daily Max 8-Hr Avg Ozone

01-31 October 2009

Daily Max 8-Hr Avg Carbon Monoxide

01-31 October 2009

Daily Max 24-Hr Avg PM-10

01-31 October 2009
(Striping Indicates Unhealthy Concentrations)

Daily Max 24-Hr Avg PM-2.5

01-31 October 2009

4
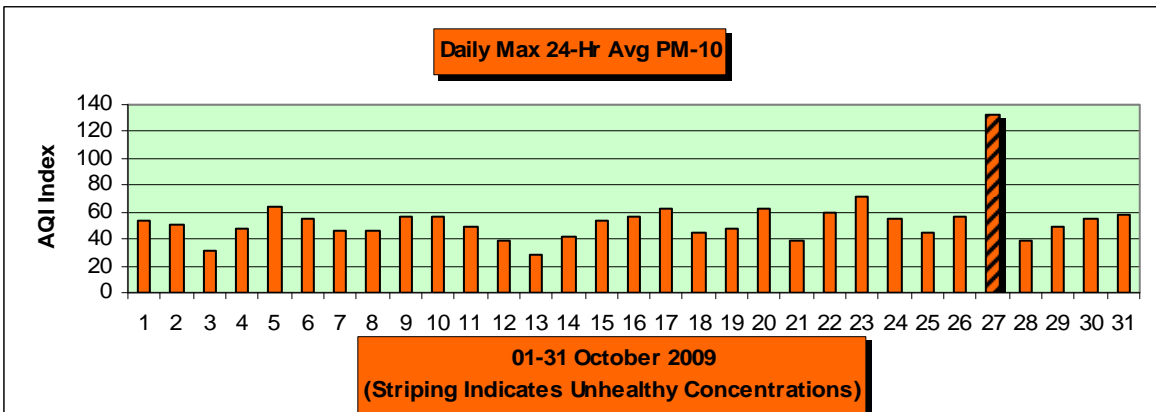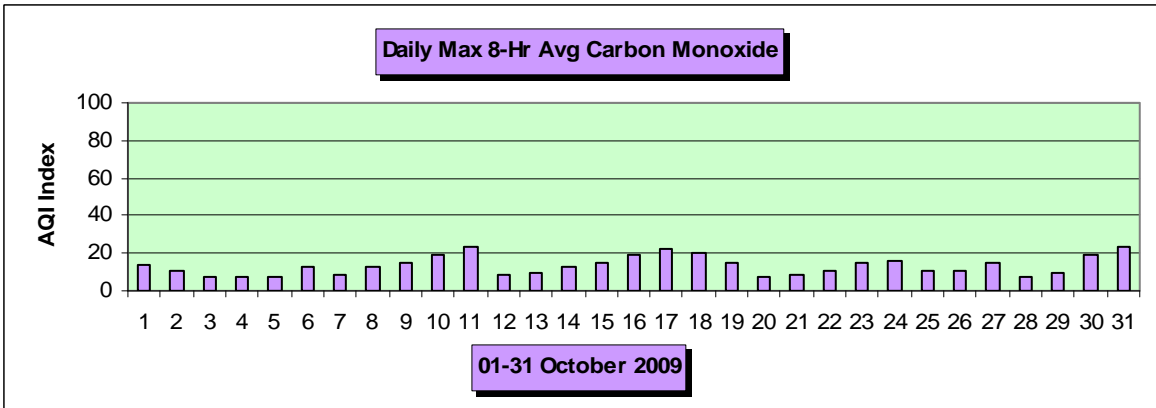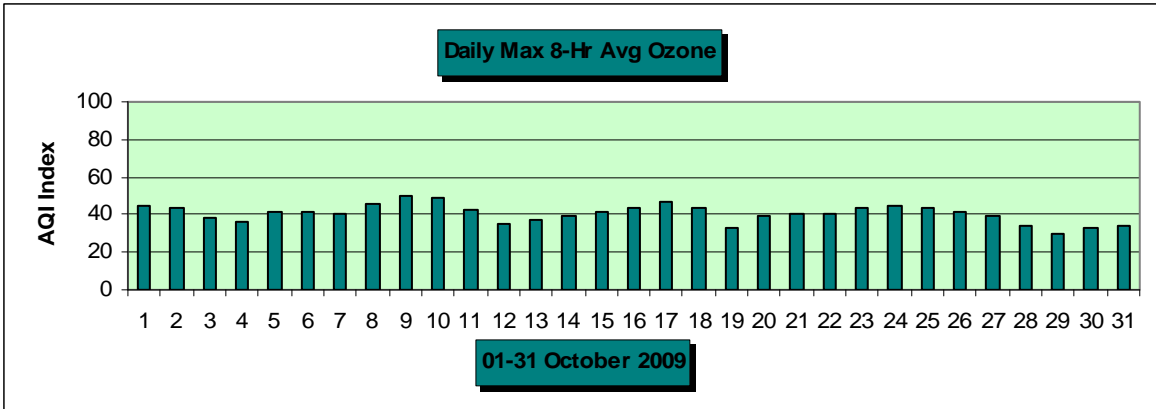
Narrative:
During the month of October 2009 the mid-latitude storm track was quite progressive with a series of trough and ridges over the western U.S. Most of these features remained north of AZ, although a passing trough on the 4th brought wind gusts up to 36 mph to the Phoenix metro area. This resulted in areas of blowing dust that lowered visibilities to as low as four miles. Rainfall was reported locally on the 2nd and 7th due to weak upper level disturbances, but totals were mostly trace amounts. With virtually no rainfall of consequence since mid-August, the entire desert SW was highly susceptible to fugitive dust emissions. Thus, antecedent soil conditions were a contributing factor to the severe dust event that occurred on the 27th. The catalyst to this event was the arrival of an intense but mostly dry upper level low and surface cold front that originated in the Gulf of Alaska. The 500mb analysis chart below for October 27 illustrates the magnitude of this system:
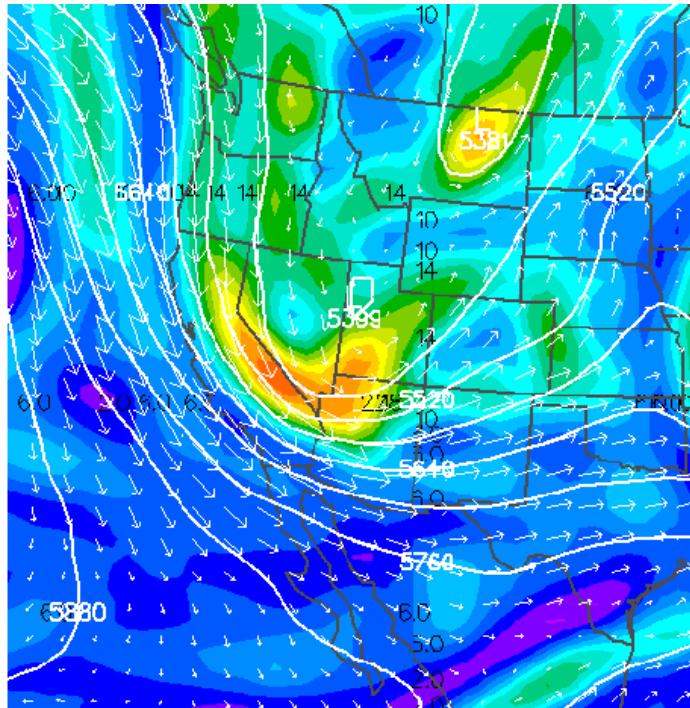
The impressive nature of this feature and its potential impacts on Valley weather conditions prompted the Phoenix national Weather Service Office to issue the following climate statement:

.CLIMATE...
VERY COOL WEATHER...TYPICAL FOR A COOL WINTER DAY IS EXPECTED ACROSS
THE AREA WEDNESDAY AFTERNOON. THESE TEMPERATURES WILL BE 20 TO 30
DEGREES COOLER THAN TUESDAY. A QUICK CHECK OF DAILY DATA FOR PHOENIX
FOUND THAT THERE HAVE ONLY BEEN THREE INSTANCES OF TEMPERATURES
DROPPING 20 DEGREES OR MORE IN A TWO-DAY PERIOD DURING OCTOBER.

- A 24 DEGREE DROP (28TH-29TH) IN OCTOBER 1971
- A 21 DEGREE DROP (30TH-31ST) IN OCTOBER 1975
- A 21 DEGREE DROP (9TH-10TH) IN OCTOBER 1930

BELOW IS THE RECORD LOW MAXIMUM TEMPERATURES FOR THE DATE...
**OCTOBER 28 (WHICH IS WEDNESDAY):**

LOCATION	RECORD LOW MAXIMUM	PERIOD OF RECORD	FORECAST
PHOENIX	**64 IN 1911**	**1896-PRESENT**	**63**

As it turned out, the high temperature at Sky Harbor Airport dropped from 85 deg F on the 27th to 64 deg F on the 28th.

As can be seen from the map below, in advance of this major storm's arrival, numerous wind statements were issued not only for the Phoenix metro area but for a large geographical area upwind of the Valley:

Last map update: Oct, 26th 2009 at 10:42:22 am MST

Since it appeared that widespread blowing dust was a certainty and that unhealthy concentrations of coarse particles were a strong possibility, ADEQ issued a PM-10 High Pollution Advisory for Maricopa County as did the Air Quality Department for adjoining Pinal County:
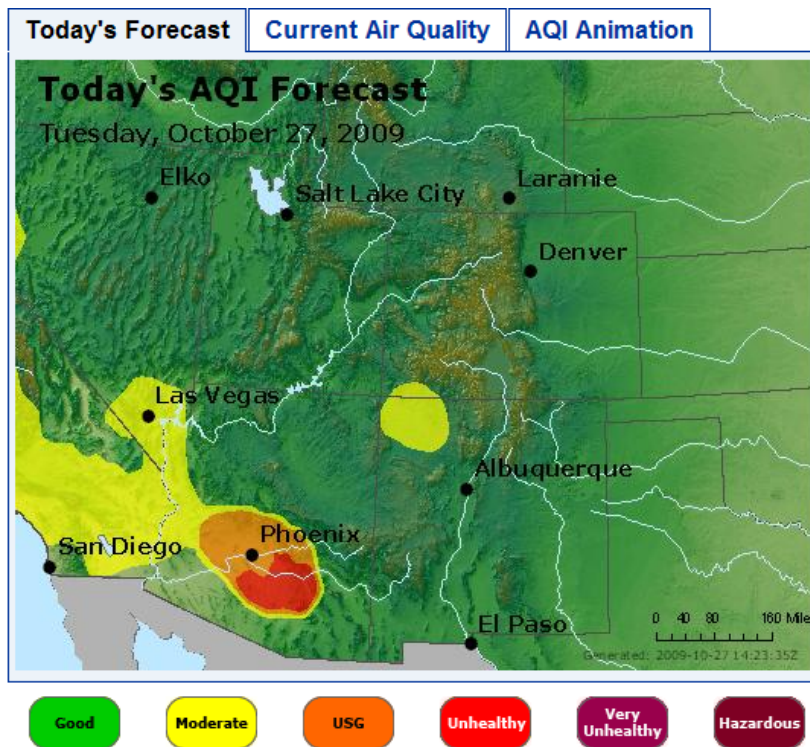
These actions were soon to be applauded since numerous site exceedances of the PM-10 standard occurred in both jurisdictions. The highest local hourly PM-10 concentration of the event occurred at the West Forty Third monitoring site where the 3:00 p.m. reading reached 1,576.2ug/m3. The time-series graph for this station can be seen below:
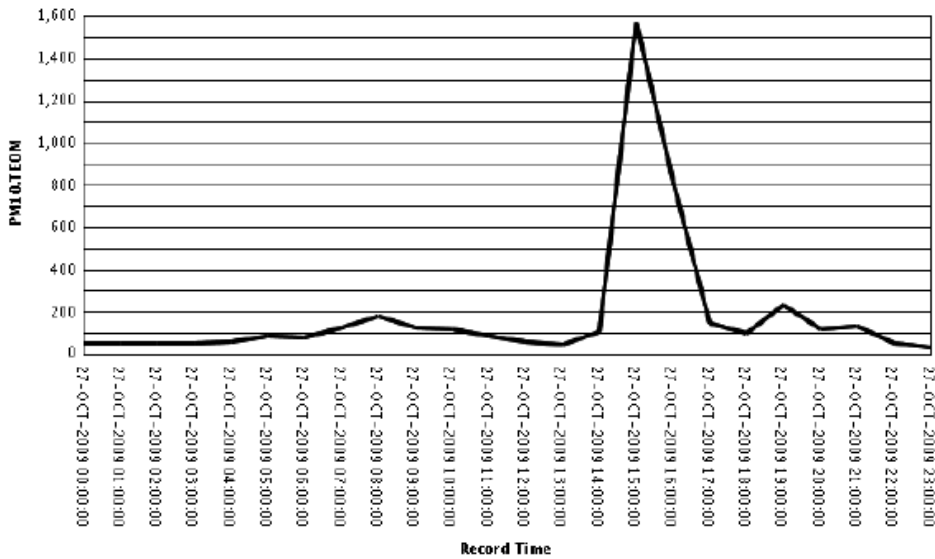
Arizona Department of Environmental Quality
AIR QUALITY DIVISION
PM10.TEOM Daily Concentration Report (ug/m3)
For 10/27/2009
Preliminary Data QA LEVEL - 2

AAATEOM_GRAPH
11/19/2009

Place ID: 16659
Name: WEST FORTY THIRD

Wind gusts over the forecast area reached 45 mph and, as illustrated by the local VISNET camera array photo below, visibilities at local airports dropped to as low as 1/2 mile at times. -Reith

10/27/2009 03:15 PM