MONTHLY AIR QUALITY REPORT FOR NOVEMBER 2008

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 November 2008*

*Preliminary data

SAMPLE POLLUTANT REPORTING BOX

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

SUN	MON	TUES	WED	THU	FRI	SAT
						1 49 24 61 69
2 38 27 52 45	3 34 08 54 34	4 37 08 60 33	5 35 07 69 29	6 37 10 61 43	7 42 15 147 68	8 38 20 61 61
9 40 22 147 61	10 36 11 79 58	11 33 14 53 48	12 35 13 52 51	13 29 14 61 52	14 40 15 67 55	15 40 17 56 32
16 39 17 44 38	17 37 23 71 56	18 38 25 79 75	19 39 22 73 38	20 37 25 76 71	21 34 27 68 45	22 41 27 60 70
23 43 33 60 81	24 41 26 81 75	25 36 30 79 56	26 31 16 48 40	27 27 09 10 30	28 29 11 19 43	29 31 14 30 74
30 32 20 29 81						

Calendar of High Pollution Advisories and Health Watches issued during November 2008

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

LEGEND

HIGH POLLUTION ADVISORIES
A = PM-10 High Pollution Advisory
B = PM-2.5 High Pollution Advisory
C = Ozone High Pollution Advisory

HEALTH WATCHES
D = PM-10 Health Watch
E = PM-2.5 Health Watch
F = Ozone Health Watch

Calendar of Meteorological Conditions observed in Metro Phoenix during November 2008

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

LEGEND

ELECTROMETEORS
A = Thunderstorm

HYDROMETEORS
B = Rain/Drizzle/Hail/Snow
C = Fog

LITHOMETEORS
D = Blowing Dust
E = Haze (vsby <10SM)
F = Smoke

Exceedance days during NOV 2008-

Total= 2	Date	Max AQI	Pollutant	Site/s
	11/07	147	PM-10	Durango
	11/09	147	PM-10	West Forty Third
		138	PM-10	South Phoenix
		108	PM-10	Durango

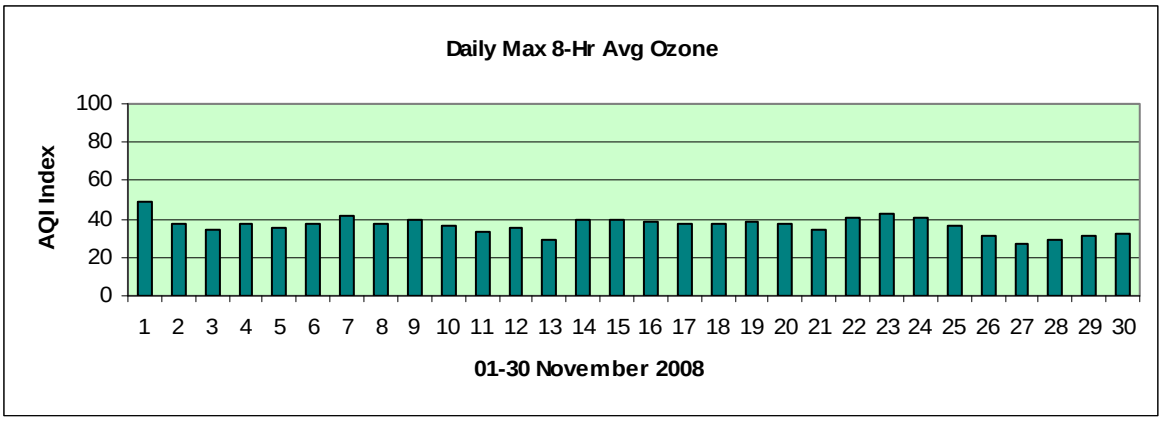
Health Watches issued during NOV 2008-

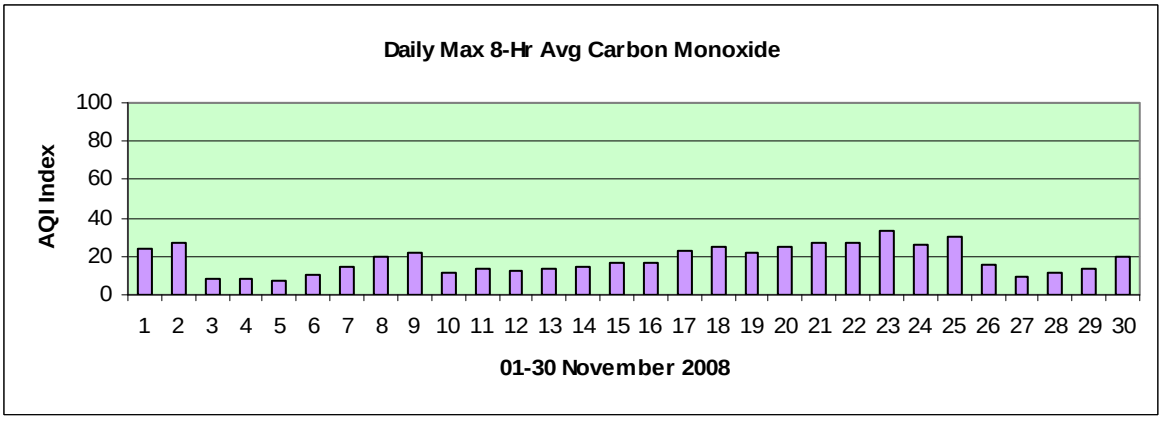
Total= 6	Date	Max AQI	Pollutant	Site/s
	11/09	147	PM-10	West Forty Third
	11/11	53	PM-10	West Forty Third
	11/17	71	PM-10	West Forty Third
	11/19	73	PM-10	Durango
	11/20	76	PM-10	Durango
	11/25	56	PM-2.5	Durango

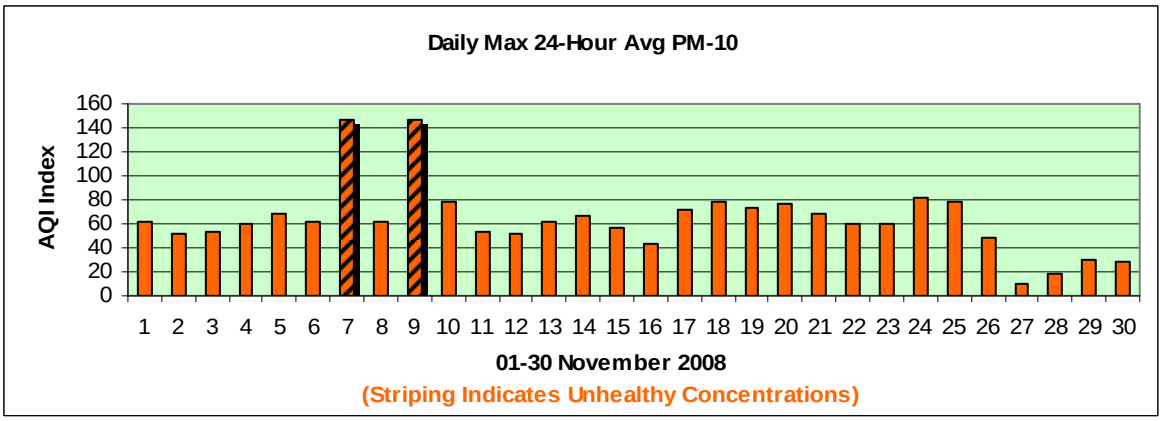
High Pollution Advisories issued during NOV 2008-

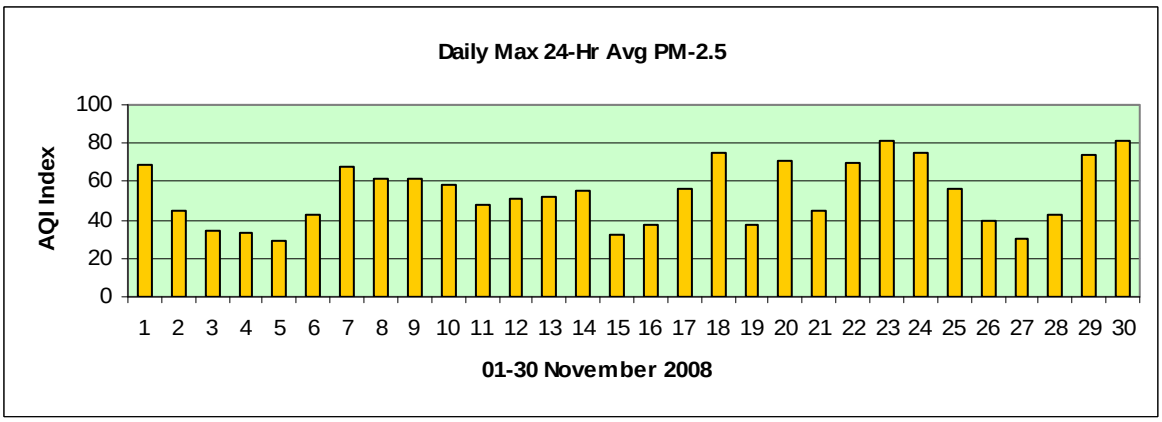
Total= 0	Date	Max AQI	Pollutant	Site/s

Concentration Recap:		
	Days in the Good category:	4
	Days in the Moderate category:	24
	Days in the Unhealthy for Sensitive Groups category:	2
	Days in the Unhealthy category:	0
	Total Forecast Days:	30


Daily Max 8-Hr Avg Ozone
AQI Index
100
80
60
40
20
0
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 28 29 30
01-30 November 2008

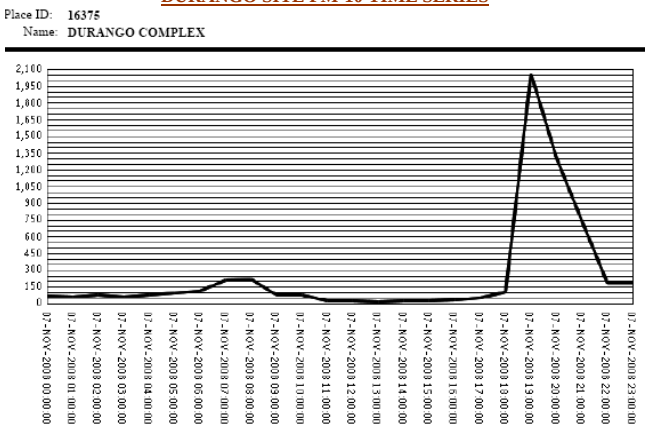

Daily Max 8-Hr Avg Carbon Monoxide
AQI Index
100
80
60
40
20
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
01-30 November 2008


Daily Max 24-Hour Avg PM-10
AQI Index
160
140
120
100
80
60
40
20
0
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 28 29 30
01-30 November 2008
(Striping Indicates Unhealthy Concentrations)


Daily Max 24-Hr Avg PM-2.5
AQI Index
100
80
60
40
20
0
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 28 29 30
01-30 November 2008

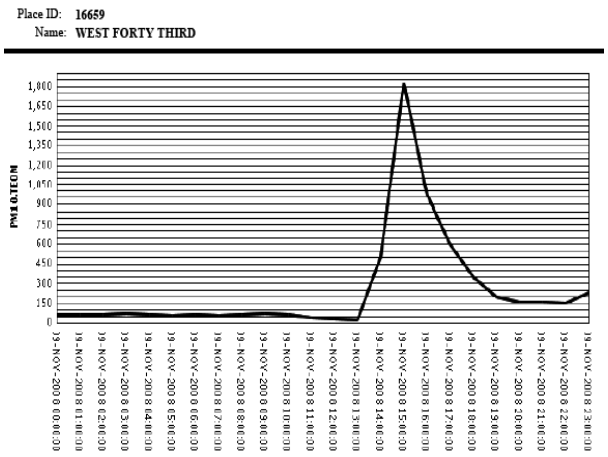
Narrative: Particle pollutants – both coarse (PM-10) and fine (PM-2.5) – presented air quality challenges to Valley residents during the month of November. The PM-10 situation was exacerbated by a prolonged dry spell – 89 days without significant rainfall – that did not end until the 26th, and an increasingly stagnant air mass contributed to high PM-2.5 levels at times during the second half of the month. A stagnant air mass also apparently played a role in the PM-10 exceedance that occurred on the 7th. On that date hourly coarse particle levels at the Durango monitoring site rose from 101.8ug/m3 at 1800 hrs to 2006.7ug/m3 at 1900 hrs and took several more hours to return to "normal" levels. Airport winds were <15 mph and frequently light or calm the entire day, the best calculated mixing depth using ACARS soundings was 3300', and dispersion was fair but bordering on marginal. The source of the sudden rise in PM-10 emissions was not officially identified, but speculation was that it may have been associated with dust produced by participants and/or spectators attending an auto event at a local race track located in relatively close proximity to the monitoring site.

DURANGO SITE PM-10 TIME SERIES

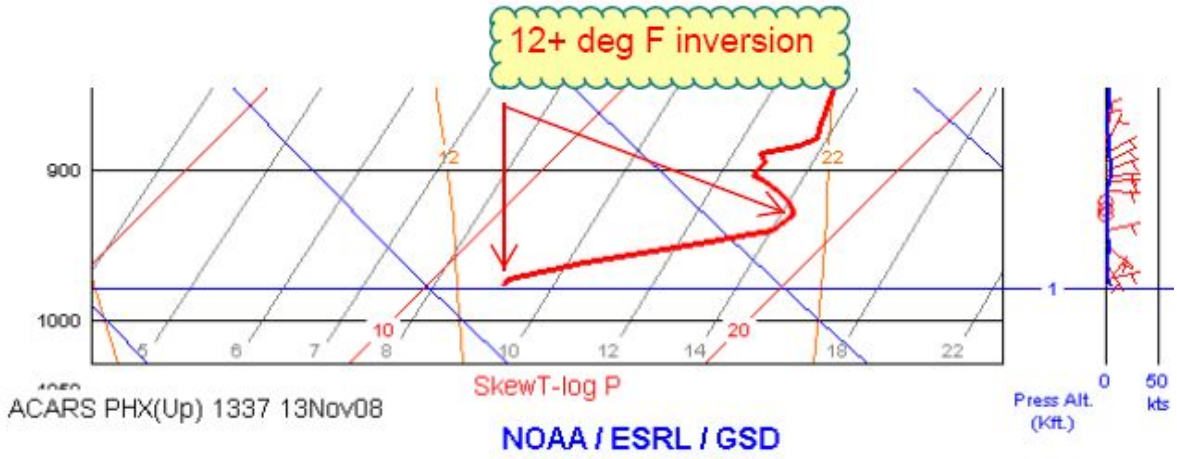


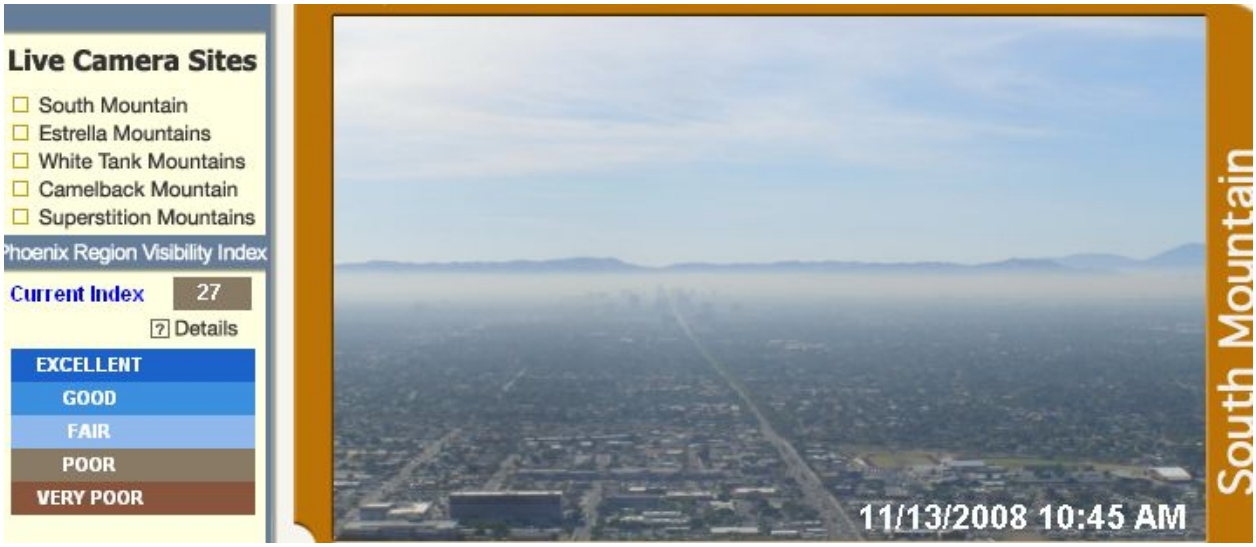
There was no doubt as to the contributing factors for the second PM-10 exceedance that occurred just two days later. A major upper level short wave trough and surface frontal passage that produced westerly winds gusting to 30-40 mph from 1300-1900 hrs also generated widespread blowing dust that lowered local visibilities to as low as three miles at times between 1400 and 1800 hrs. The National Weather Service had issued a Wind Advisory that included the Phoenix area and it obviously verified. As a result, three Valley monitoring sites exceeded the EPA PM-10 health standard on November 9.

WEST FORTY THIRD SITE PM-10 TIME SERIES



From the 10th thru the 25th of the month a rather stable weather pattern was in place, interrupted only by very breezy conditions all day on the 15th and during the a.m. on the 16th due to a temporary increase in gradient winds. Since high pressure aloft was in control most of this period, significant warming aloft occurred – 23 deg F at the 5K' level and 27 deg F at the 10K' level – by the 18th. Even though ground-level temperatures reached the upper 80's by the 17th and daytime highs set records at Sky Harbor Airport both then and on the 18th, the air mass became increasingly stagnant with strong overnight inversion formation. Between the 17th and the 25th both coarse (PM-10) and fine (PM-2.5) particle levels rose well into the mid-moderate range of the Air Quality Index, the latter likely in part due to smoke emissions from fireplace use. The combination of steep inversions and elevated concentrations of fine particles commonly resulted in the formation of the "Valley Brown Cloud", a local phenomenon that was very evident during many days this month. The graphics below illustrate – using local ACARS sounding diagrams – this situation which was in full effect on the 13th and on the 24th:





Another aspect of interest regarding particle pollution in the Phoenix area is the discrepancy between the magnitudes of weekday versus weekend day particle emissions. The graphic below aptly illustrates this relationship at 0600 hrs on the 16th and 24 hours later on the 17th:

PHOENIX METRO WEEKEND vs. WEEKDAY PM EMISSIONS

Particulate Matter 10 micrometers (PM 10)

Date & Time: 11-17-2008 6 AM

Current Readings

AQI*: 55

Units: µg/m3

Time	Interval Readings	
6:00 AM	24 Hour Average	55.3042
6:00 AM	Hourly Average	256.2000

Official Primary Standards

Interval Readings	
24-hour Average	150 µg/m3
Annual Average	50 µg/m3

Last 24-Hours Readings:

Particulate Matter 2.5 micrometers (PM 2.5)

Date & Time: 11-17-2008 6 AM

Current Readings

AQI*: 41

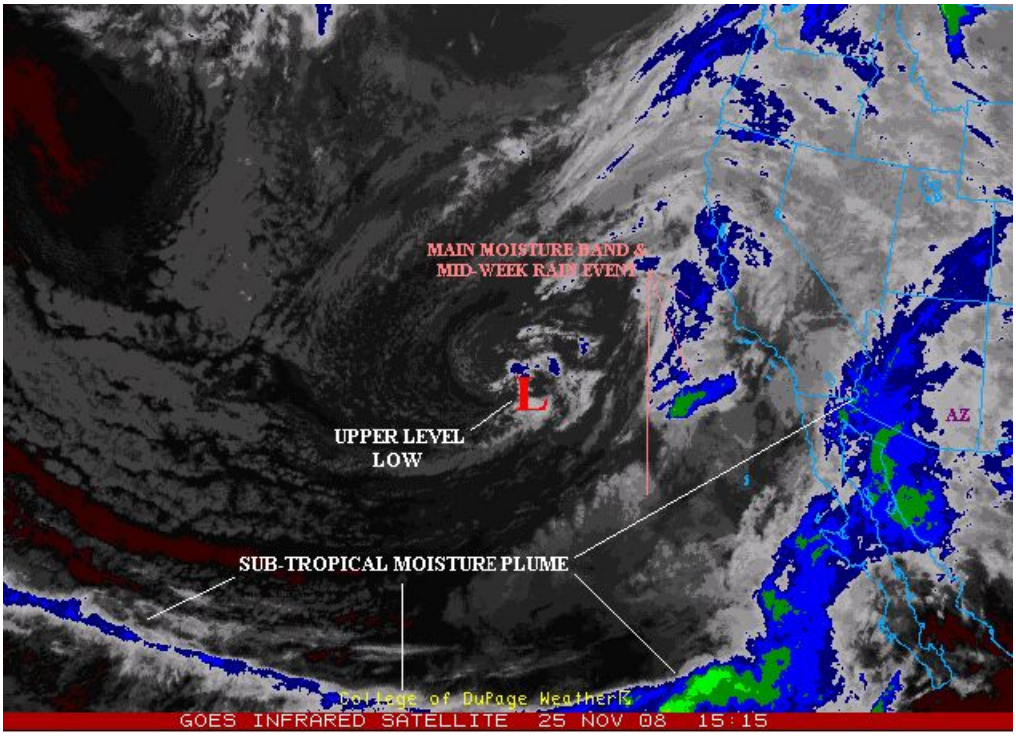
Units: µg/m3

Time	Interval Readings	
6:00 AM	24 Hour Average	12.7458
6:00 AM	Hourly Average	34.2000

Last 24-Hours Readings:

*Note: the AQI is based off of the 24-hour average.

Fortunately, this string of elevated but not unhealthy particle pollution days was brought to an end by the 26th due to a significant synoptic weather pattern change in the form of a major short wave trough in the mid-latitude storm track that was able to tap into deep sub-tropical moisture. The overlay graphic below from the 25th shows to good effect how this episode unfolded:



Over the course of the 26th and 27th rainfall totals of up to 3/4" had fallen over most of the metropolitan area and PM-10 levels were in the good range of the AQI thru the end of the month. Apparently and unfortunately, the ensuing colder weather conditions (highs in the 60's and lows in the 40's) prompted a heavy increase in fireplace usage as evidenced by the sudden jump in fine particle levels by the 29th. Looking ahead to December, fireplace smoke emissions can be troublesome – particularly during the holidays – as the graphic below demonstrates. –Reith