



**MONTHLY AIR QUALITY REPORT FOR**  
**DECEMBER 2007**

AOI COLOR SCALE

<b>GOOD</b>  <b>0-50</b>	<b>MODERATE</b>  <b>51-100</b>	<b>UNHEALTHY FOR SENSITIVE GROUPS</b>  <b>101-150</b>	<b>UNHEALTHY</b>  <b>151-200</b>
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Calendar of maximum AQI values & their corresponding color for December 2007\*

\*Preliminary data

SAMPLE POLLUTANT REPORTING BOX

<b>1</b> (day of month)	<b>O3</b>	<b>CO</b>
	<b>PM10</b>	<b>PM2.5</b>

SUN		MON		TUE		WED		THU		FRI		SAT	
												1	30 11 15 19
2	34 20 36 49	3	33 26 64 75	4	24 32 65 78	5	22 25 70 105	6	30 26 70 108	7	25 26 80 59	8	32 13 19 31
9	34 14 20 48	10	30 15 22 41	11	30 14 25 34	12	29 19 35 63	13	31 23 58 75	14	32 14 44 51	15	33 18 34 68
16	32 19 35 67	17	30 28 64 83	18	29 28 59 76	19	24 31 65 82	20	25 22 57 78	21	32 22 65 44	22	30 18 28 57
23	27 27 38 101	24	28 31 57 129	25	34 47 56 154	26	30 22 39 58	27	30 27 48 35	28	27 16 43 43	29	25 23 41 75
30	29 26 43 106	31	34 31 57 118										

**Calendar of High Pollution Advisories and Health Watches issued during December 2007**

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

**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 December 2007**

SUN			MON			TUE			WED			THU			FRI			SAT			
																		1	A	B	
2		C			4			C			C			C			C	7	D	B	C
	E			E			E			E			E			D	E	C	8		B
9	B			B	C		B	C			C		E	C			C	14			C
16																		21	A	B	
23		E								E			E					28			
30				E																	

**LEGEND**

**ELECTROMETEORS**  
**A** = Thunderstorm

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

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

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**Exceedance days during DEC 2007-**

Total= 7	<u>Date</u>	<u>Max AQI</u>	<u>Pollutant</u>	<u>Site/s</u>
	12/05	105	PM-2.5	West Phoenix
		104	PM-2.5	Durango
	12/06	108	PM-2.5	Durango
	12/23	101	PM-2.5	West Phoenix
	12/24	129	PM-2.5	West Phoenix
		108	PM-2.5	Phoenix Supersite
	12/25	154	PM-2.5	West Phoenix
		111	PM-2.5	Phoenix Supersite
	12/30	106	PM-2.5	West Phoenix
		101	PM-2.5	Phoenix Supersite
	12/31	118	PM-2.5	West Phoenix
		111	PM-2.5	Durango
		106	PM-2.5	Phoenix Supersite

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**Health Watches issued during DEC 2007-**

Total= 5	<u>Date</u>	<u>Max AQI</u>	<u>Pollutant</u>	<u>Site/s</u>
	12/04	78	PM-2.5	Phoenix Supersite
	12/05	105	PM-2.5	West Phoenix
	12/07	80	PM-10	Higley
	12/21	65	PM-10	West Forty Third
	12/24	129	PM-2.5	West Phoenix

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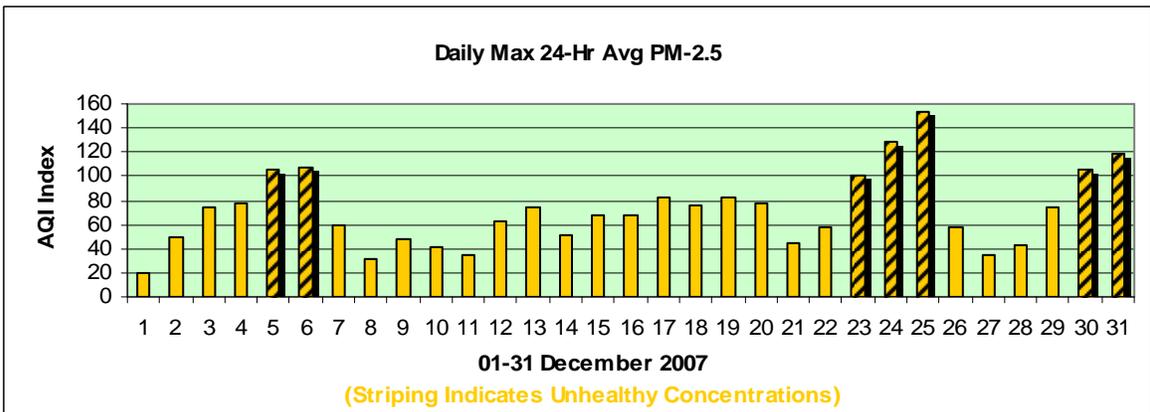
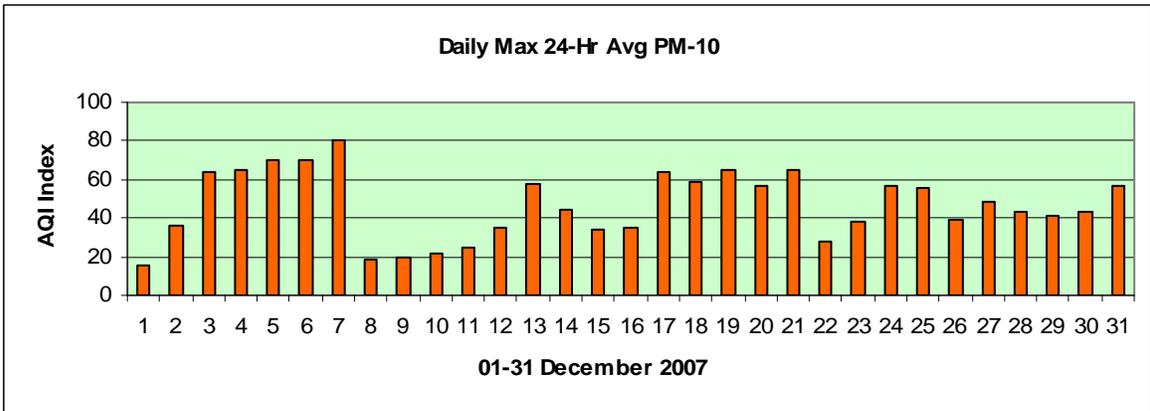
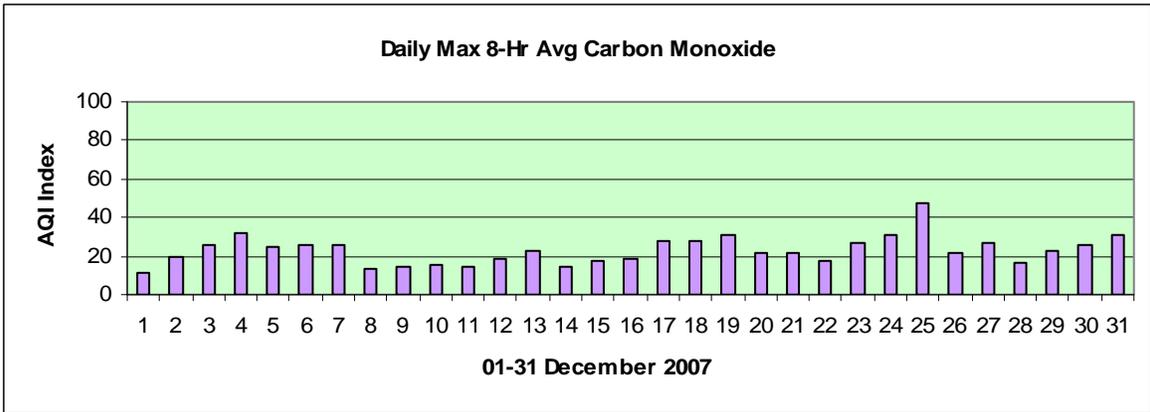
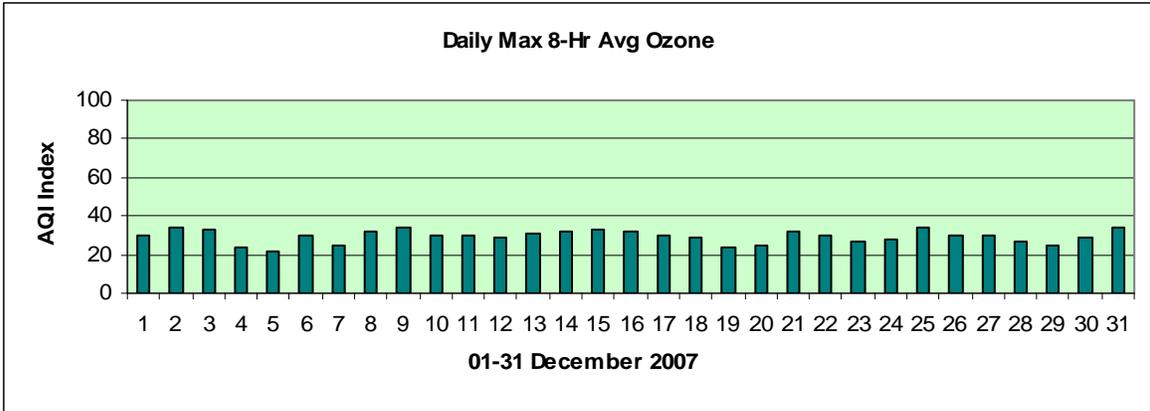
**High Pollution Advisories issued during DEC 2007-**

Total= 0	<u>Date</u>	<u>Max AQI</u>	<u>Pollutant</u>	<u>Site/s</u>
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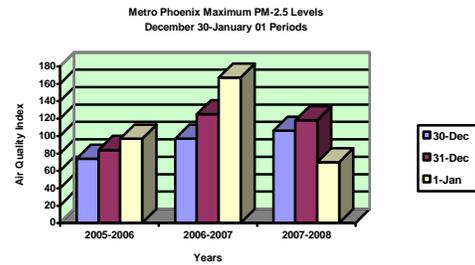
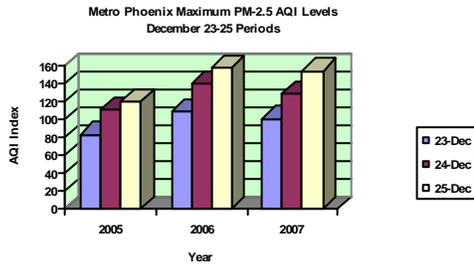
<b><u>Concentration Recap:</u></b>	Days in the <b>Good</b> category:	8
	Days in the <b>Moderate</b> category:	16
	Days in the <b>Unhealthy for Sensitive Groups</b> category:	6
	Days in the <b>Unhealthy</b> category:	<u>1</u>
	Total Forecast Days:	31

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**Narrative:**

An unsettled and wet weather pattern that began in late November continued to impact the local forecast area thru much of the first third of December. During that period rain was recorded in the Valley on six days with 1+ inch cumulative totals common. Despite there being another five mid-latitude trough passages during the remainder of the month, only one light rain event occurred and that was on the 21st. Nonetheless, the combined rainfall managed to stabilize soils to such an extent that PM-10 (coarse particle) concentrations were much lower than was the case in 2005 and 2006. On the other hand, December is becoming known as “PM-2.5 Month” in some circles within the Phoenix metro area and 2007 was no exception. Monitoring sites exceeded the 100-AQI level for PM-2.5 on 13 occasions this month, up from four in December 2006 and eight in December 2005. During that 3-year interval the vast majority of the exceedances coincided with the approach and arrival of the Christmas and New Year’s holidays. During those periods the biggest contributing factor appears to have been an exponential increase in local smoke emissions from holiday recreational fireplace use under stagnant air mass conditions. The graphs below reveal that PM-2.5 emissions showed a steady increase leading up to the holidays; then, with the exception of New Year’s Day 2008, the highest concentrations were recorded during the actually holidays.



Taking a closer look at an individual case, the graph(s) below illustrate a PM-2.5 time series for the West Phoenix monitoring site for the period of December 24-25 2007. Local boundary layer conditions on the 24th included a mixing depth of only 2900', marginal dispersion, and surface wind speeds that were frequently light or calm thru the day. As can be seen, hourly PM-2.5 concentrations were increasingly rapidly by 6:00 p.m. Christmas Eve and reached a peak of 195.6ug/m3 at 9:00 p.m. After decreasing for an hour, readings were on the increase again by 11:00 p.m. and reached a maximum of 273.8ug/m3 at 3:00 a.m. on Christmas Day. Prevailing visibilities as low as six miles were reported at Valley airports from 1:00 a.m. thru 8:00 a.m. However, an abrupt weather change then occurred with the arrival and passage of a dry upper level trough and surface cold front. By 8:00 a.m. west to north wind gusts between 30 and 45 mph were underway and blowing dust was reported in the metro area between 8:00 a.m. and 1:00 p.m.; dispersion was excellent with a mixing depth of 6200'. Despite the fact that hourly PM-2.5 concentrations fell to near 0ug/m3 at this site by 10:00 a.m., the 24-hour average for the day still reached 70.5ug/m3 or 154 AQI. -Reith

