



MONTHLY AIR QUALITY REPORT FOR
DECEMBER 2009

AOI 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 December 2009*

*Preliminary data

SAMPLE POLLUTANT REPORTING BOX

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

SUN		MON		TUES		WED		THU		FRI		SAT	
				1	26 16	2	32 19	3	34 22	4	36 20	5	31 26
					51 39		55 50		51 46		46 36		52 84
6	36 28	7	31 11	8	32 11	9	35 16	10	35 24	11	32 25	12	31 30
	45 70		89 47		47 35		41 61		45 78		52 90		47 88
13	27 22	14	36 24	15	35 19	16	35 20	17	31 23	18	36 22	19	38 25
	31 68		33 64		48 57		56 54		54 63		54 67		44 73
20	36 25	21	32 27	22	32 23	23	25 09	24	32 24	25	34 38	26	35 24
	42 61		72 75		52 54		46 30		49 111		55 168		34 84
27	34 18	28	33 20	29	29 14	30	32 15	31	34 23				
	32 69		66 63		50 56		47 62		51 54				

Calendar of High Pollution Advisories and Health Watches issued during December 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		

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 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			28			29			30			31								

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 DEC 2009-

Total=	<u>Date</u>	<u>Max AQI</u>	<u>Pollutant</u>	<u>Site/s</u>
2	12/24	111	PM-2.5	West Phoenix
	12/25	125	PM-2.5	Durango
		130	PM-2.5	Phoenix Supersite
		168	PM-2.5	West Phoenix

Health Watches issued during DEC 2009-

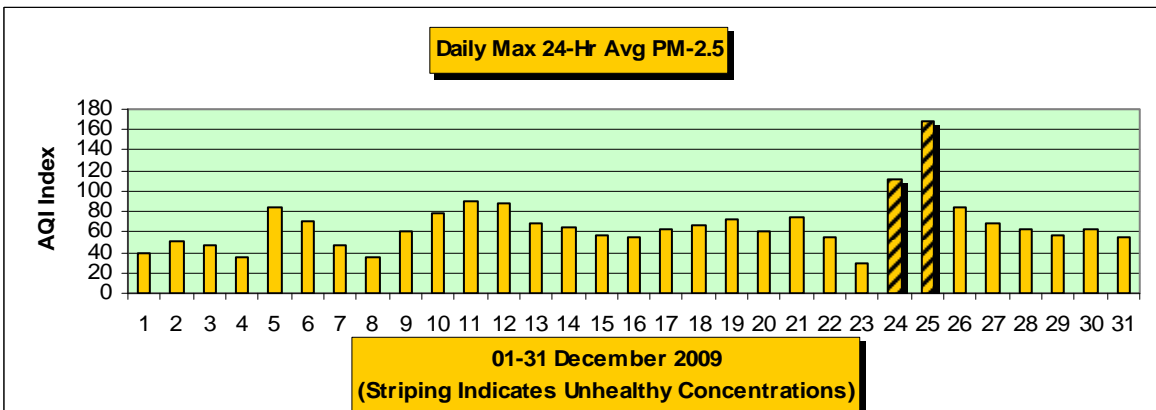
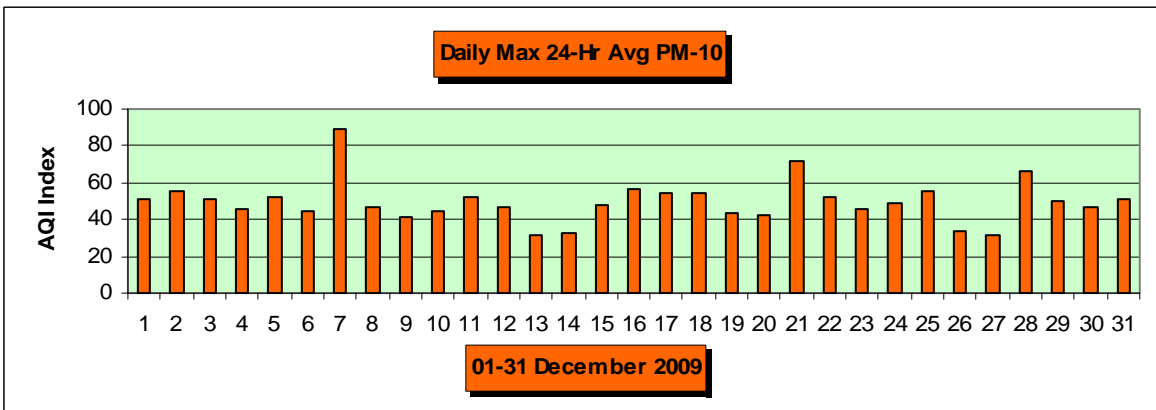
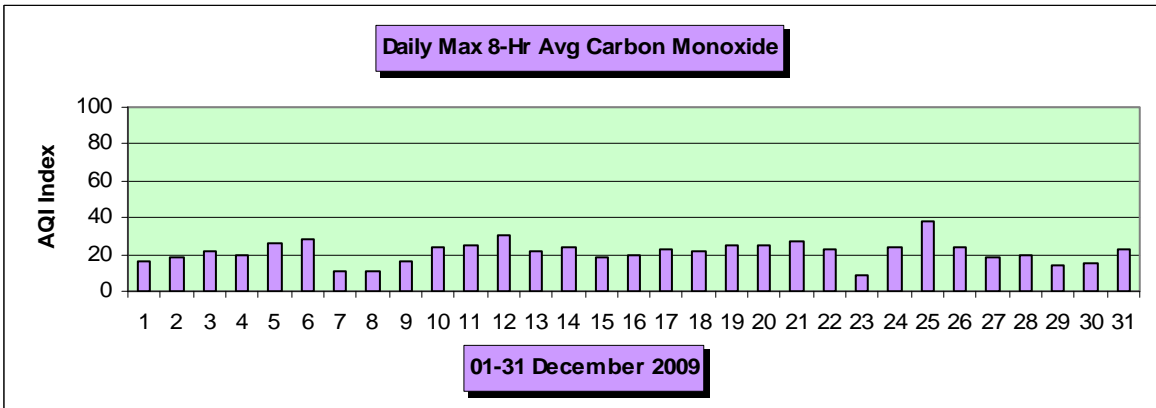
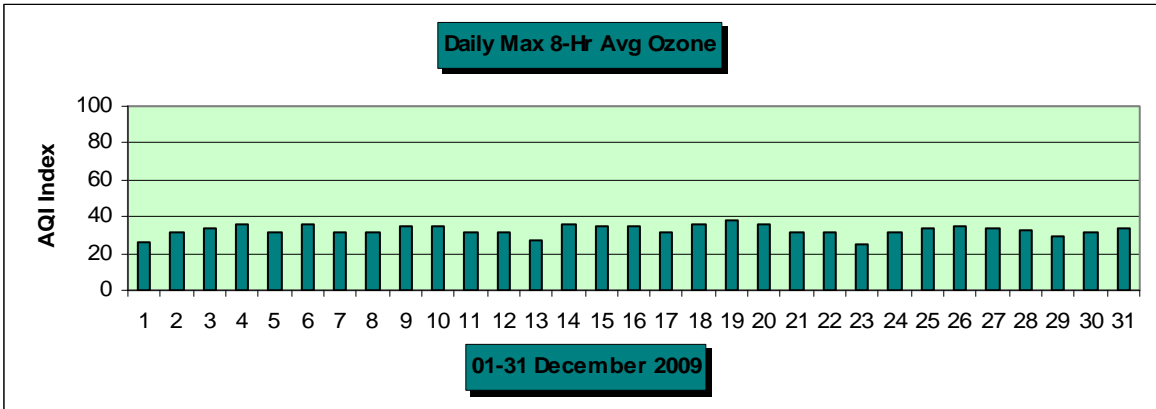
Total=	<u>Date</u>	<u>Max AQI</u>	<u>Pollutant</u>	<u>Site/s</u>
5	12/19	73	PM-2.5	Durango
	12/20	61	PM-2.5	West Phoenix
	12/22	52	PM-10	West Forty Third
	12/24	111	PM-2.5	West Phoenix
	12/25	168	PM-2.5	West Phoenix

High Pollution Advisories issued during DEC 2009-

Total=	<u>Date</u>	<u>Max AQI</u>	<u>Pollutant</u>	<u>Site/s</u>
3	12/26	84	PM-2.5	Phoenix Supersite
	12/27	69	PM-2.5	Phoenix Supersite
	12/31	54	PM-2.5	Durango

Concentration Recap:

Days in the Good category:	4
Days in the Moderate category:	25
Days in the Unhealthy for Sensitive Groups category:	1
Days in the Unhealthy category:	<u>1</u>
Total Forecast Days:	31

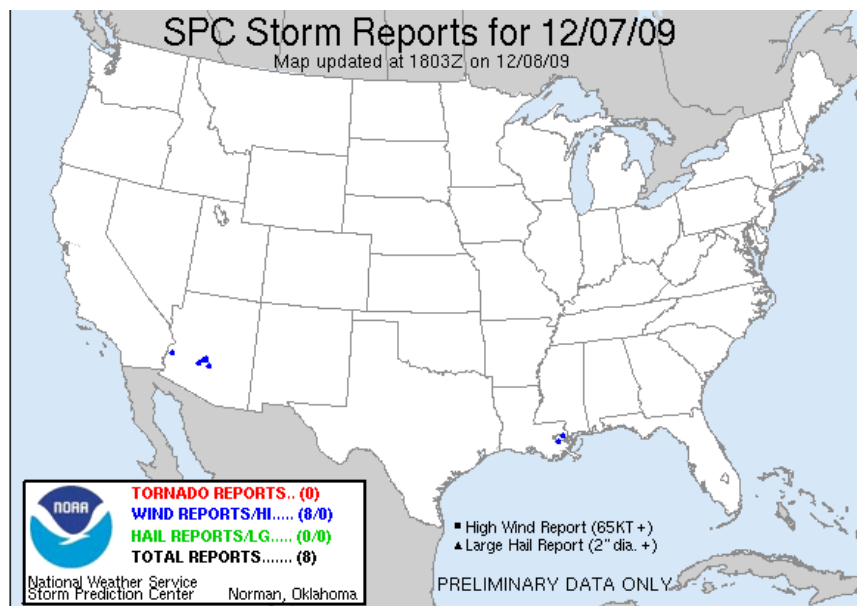


Narrative:

December 2009 was a month of extremes – both in the weather and air quality arenas. The few five days of the month was characterized by the close proximity of an upper level ridge that contributed to a rather stagnant air mass over the Valley. This in turn led to an accumulation of airborne particle pollution – mainly of the fine variety (PM-2.5) – that produced visibility impairments on several days. The photo below from the ADEQ VISNET camera array illustrates what morning conditions were like on December 3:



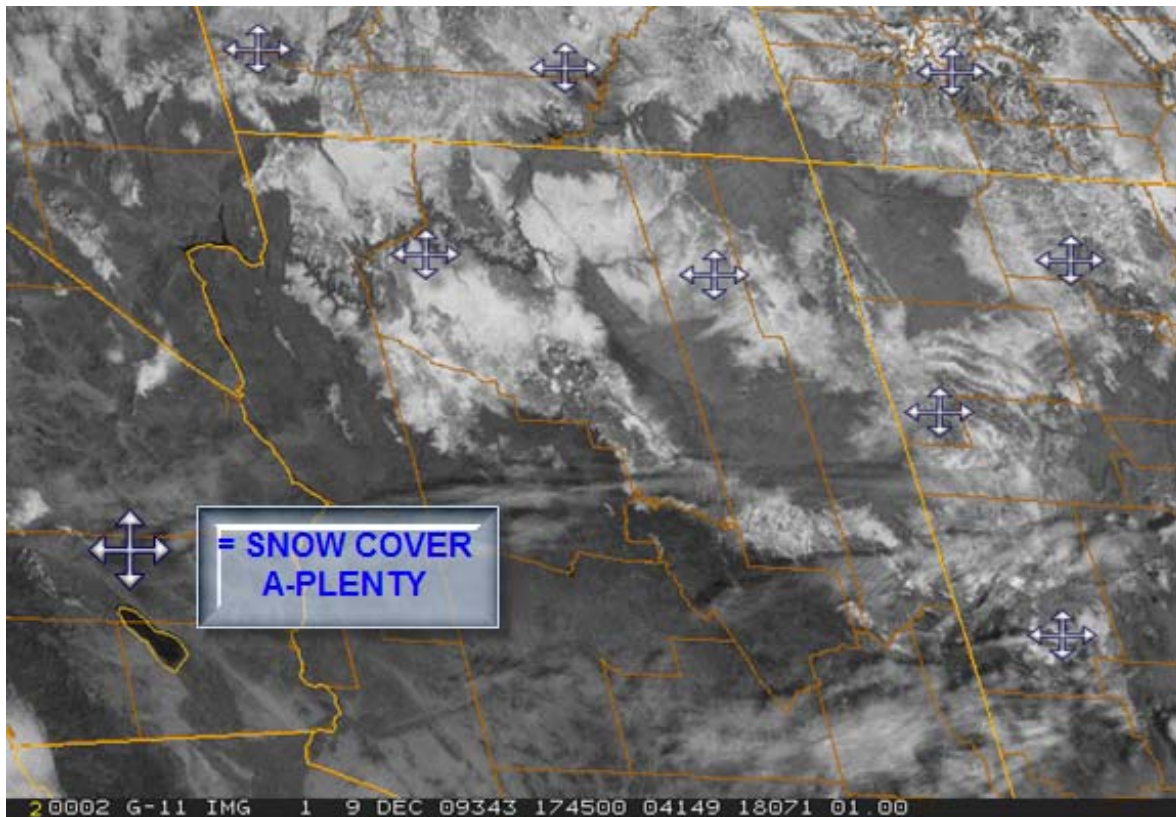
This stable weather pattern was quickly replaced by the arrival of an intense trough and frontal passage in the mid-latitude storm track that a wide variety of weather conditions to the Phoenix metro area on December 7th. Heavy rainfall, thunderstorms, and fog shared the same six-hour period with wind gusts up to 74 mph and visibilities as low as 1 1/2 miles due to dense blowing dust. A National Weather Service Wind Advisory was in effect from 7:00 p.m. thru midnight and this severe event also contributed to a number of property damage reports as can be seen from the following graphics:



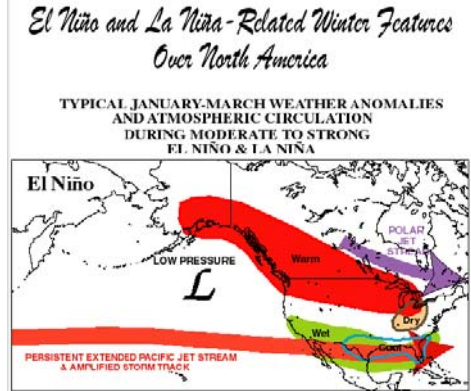
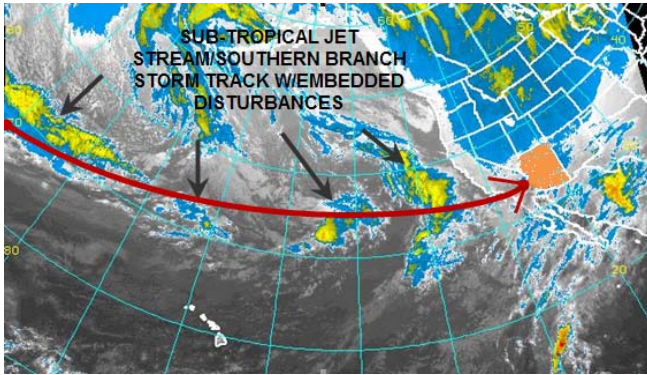
Note: All data are considered preliminary

Wind Reports (in CSV format)							
Time	Speed	Location	County	State	Lat	Lon	Comments
0319	UNK	4 E QUARTZSITE	LA PAZ	AZ	3367	11415	TWO TRACTOR TRAILERS BLOWN OFF INTERSTATE TEN NEAR QUARTZITE. (PSR)
0610	UNK	GOODYEAR	MARICOPA	AZ	3342	11240	POWER POLE DAMAGED NEAR VAN BUREN AND CENTRAL. TIME OF EVENT ESTIMATED. (PSR)
0610	UNK	GLENDALE	MARICOPA	AZ	3358	11220	AWNINGS TORN FROM CEMENT ANCHORS AT MOBILE HOME PARK AT 67TH AVE AND NORTHERN AVE. (PSR)
0613	74	10 N PHOENIX	MARICOPA	AZ	3369	11207	MEASURED PEAK GUST BY DEER VALLEY ASOS. (PSR)
0618	UNK	7 NNE PHOENIX	MARICOPA	AZ	3363	11201	THREE LARGE TREES WITH TRUNK DIAMETERS OF 18-20 INCHES SNAPPED AND DOWN IN THE ROADWAY NEAR 32ND ST. AND GREENWAY. TIME OF EVENT ESTIMATED. (PSR)
0645	70	4 E CHANDLER	MARICOPA	AZ	3329	11179	WINDS ESTIMATED BASED ON DPS REPORT OF 50 FOOT VISIBILITY IN BLOWING DUST ON AZ-202 AND GILBERT. (PSR)

This storm system brought much-needed precipitation statewide that included significant snowfall to many higher terrain areas. The December 9 visible satellite image below shows the extent of this snow cover:



The synoptic weather pattern that was present during the aforementioned storm passage included a strong southern branch of the storm track that extended west across much of the Pacific Ocean. By December 9 this configuration had become even more pronounced as can be seen from the satellite image below. As can be seen on the accompanying graphic, this weather pattern was consistent with the developing moderate to strong El Niño that had been advertised for many months:



Follow-up disturbances brought light rain to the metro area on the 12th and 13th. Despite this, local fine particle (PM-2.5) levels that had begun to rise on the 9th continued to do so. An unbroken string of days with highest PM-2.5 readings mostly in the mid to upper moderate range of the Air Quality Index that lasted thru the 22nd coincided with the arrival of a ridge aloft on the 15th. This ridge brought stable and stagnant weather conditions to the area that contributed to low mixing heights and marginal or poor dispersion thru the 21st. At the same time, increasing overnight wood-burning fireplace use emitted significant amounts of smoke into the boundary layer. The following graphics from December 14 illustrate this situation to good effect, while also showing how high humidity levels exacerbate the degradation of visibilities:



Live Camera Sites

- South Mountain
- Estrella Mountains
- White Tank Mountains
- Camelback Mountain
- Superstition Mountains

Phoenix Region Visibility Index


Current Index 26

[Details](#)

EXCELLENT
GOOD
FAIR
POOR
VERY POOR

[Annual Summary](#)

Today's Air
Quality Forecast



12/14/2009 08:45 AM

Zoom In
 Refresh
 High Res Image
 Landmarks
 Map It

Temperature	Humidity
47°F 9°C	96 %

48 Hour Image Archive
 48 Hour Data Record

Live Camera Sites

- South Mountain
- Estrella Mountains
- White Tank Mountains
- Camelback Mountain
- Superstition Mountains

Phoenix Region Visibility Index


Current Index 30

[Details](#)

EXCELLENT
GOOD
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[Annual Summary](#)

Today's Air
Quality Forecast



12/14/2009 10:45 AM

Zoom In
 Refresh
 High Res Image
 Landmarks
 Map It

Temperature	Humidity
51°F 10°C	90 %

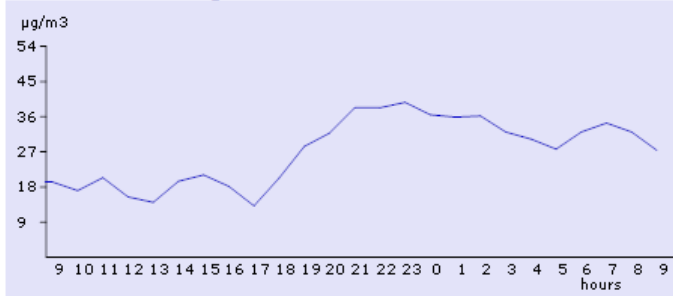
48 Hour Image Archive
 48 Hour Data Record

Particulate Matter 2.5 micrometers (PM 2.5)

Date & Time: 12-14-2009 9 AM

Last 24-Hours Readings:

WEST PHOENIX PM-2.5



Current Readings

AQI*: 81

Units: µg/m3

Time	Average	Value
9:00 AM	24 Hour Average	27.5250
9:00 AM	Hourly Average	27.4000

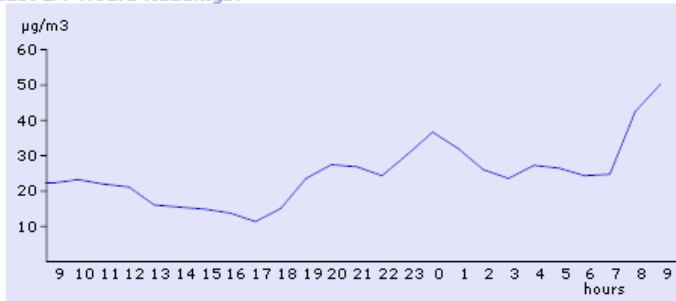
*Note: the AQI is based off of the 24-hour average.

Particulate Matter 2.5 micrometers (PM 2.5)

Date & Time: 12-14-2009 9 AM

Last 24-Hours Readings:

DURANGO PM-2.5



Current Readings

AQI*: 74

Units: µg/m3

Time	Average	Value
9:00 AM	24 Hour Average	25.0167
9:00 AM	Hourly Average	50.3000

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

On December 22 strong winds and unsettled weather associated with the passage of another strong trough and frontal passage managed to clear the local air mass of nearly all air pollution for 48 hours while bringing additional beneficial rainfall. However, with the Christmas holiday period, recreational residential recreational fireplace use went into overdrive. In the wake of the frontal passage, a rather cold and stable air mass settled in over the Phoenix area and contributed to what followed. Peak PM-2.5 AQI levels increased from 30 in the Good range on the 23rd to 111 in the Unhealthy for Sensitive Groups range on the 24th and then reached 168 in the Unhealthy range on the 25th. This was despite the issuance of Maricopa County No Burn Day restrictions for both days. Unfortunately, this continued the trend of behavior that began in during December 2005 as the following chart indicates:

RECENT VALLEY PM-2.5 MAX AQI CLIMATOLOGY				
(**preliminary data**)				
Date	2005	2006	2007	2008
23-Dec	83	109	101	54
24-Dec	111	140	129	65
25-Dec	120	157	154	57
26-Dec	59	82	58	16
27-Dec	48	71	35	66
28-Dec	57	48	43	84
29-Dec	64	64	75	82
30-Dec	74	97	106	67
31-Dec	84	125	118	115

Date	2006	2007	2008	2009
1-Jan	97	167	70	167

HIGHEST HOURLY PM-2.5 CONCENTRATIONS (UG/M3)/time/				
& 24-hour Average AQI color (**preliminary data**)				
Date	2005	2006	2007	2008
24-Dec	<u>176.3/2300</u>	<u>180.1/2300</u>	<u>195.5/2100</u>	<u>76.0/2300</u>
25-Dec	<u>179.7/2400</u>	<u>180.1/2400</u>	<u>273.8/0300</u>	<u>64.9/0200</u>
31-Dec	<u>102.7/2300</u>	<u>171.4/2300</u>	<u>97.5/1500</u>	<u>201.6/2300</u>

Date	2006	2007	2008	2009
1-Jan	<u>105.5/0100</u>	<u>180.1/2400</u>	<u>66.3/1900</u>	<u>249.1/0200</u>

In addition to the unhealthy air quality and exceedances of the PM-2.5 standard, local visibilities were poor both days as can be seen from the following VISNET photographs. -Reith

Live Camera Sites

- South Mountain
- Estrella Mountains
- White Tank Mountains
- Camelback Mountain
- Superstition Mountains

Phoenix Region Visibility Index

Current Index **29**

[? Details](#)

EXCELLENT
GOOD
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12/24/2009 10:00 AM

Mixing Depth: 4300'
Dispersion: Marginal



12/24/2009 11:45 AM



Image Updated Every 15 Minutes

Live Camera Sites

- South Mountain
- Estrella Mountains
- White Tank Mountains
- Camelback Mountain
- Superstition Mountains

Phoenix Region Visibility Index

Current Index **34**

[? Details](#)

EXCELLENT
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