



MONTHLY AIR QUALITY REPORT FOR
JUNE 2008

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 June 2008*

*Preliminary data

SAMPLE POLLUTANT REPORTING BOX

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

| | SUN | | | MON | | | TUES | | | WED | | | THU | | | FRI | | | SAT | |
|----|-----|----|----|-----|----|----|------|----|----|-----|----|----|-----|----|----|-----|----|----|-----|----|
| 1 | 104 | 15 | 2 | 87 | 08 | 3 | 106 | 09 | 4 | 87 | 08 | 5 | 97 | 06 | 6 | 106 | 08 | 7 | 51 | 08 |
| | 34 | 47 | | 58 | 40 | | 68 | 41 | | 125 | 57 | | 89 | 67 | | 51 | 34 | | 60 | 48 |
| 8 | 64 | 05 | 9 | 114 | 08 | 10 | 109 | 14 | 11 | 74 | 06 | 12 | 122 | 07 | 13 | 124 | 13 | 14 | 101 | 14 |
| | 50 | 47 | | 54 | 49 | | 69 | 52 | | 58 | 39 | | 54 | 47 | | 59 | 55 | | 62 | 50 |
| 15 | 80 | 08 | 16 | 61 | 10 | 17 | 80 | 08 | 18 | 64 | 08 | 19 | 101 | 08 | 20 | 119 | 17 | 21 | 90 | 08 |
| | 44 | 48 | | 56 | 49 | | 53 | 51 | | 54 | 43 | | 63 | 48 | | 60 | 47 | | 55 | 46 |
| 22 | 80 | 03 | 23 | 71 | 07 | 24 | 74 | 06 | 25 | 58 | 06 | 26 | 97 | 06 | 27 | 77 | 06 | 28 | 61 | 06 |
| | 72 | 55 | | 74 | 47 | | 64 | 48 | | 72 | 46 | | 59 | 67 | | 44 | 35 | | 39 | 42 |
| 29 | 71 | 04 | 30 | 100 | 07 | | | | | | | | | | | | | | | |
| | 55 | 44 | | 65 | 44 | | | | | | | | | | | | | | | |

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

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

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 June 2008

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

LEGEND

ELECTROMETEORS

- A** = Thunderstorm

HYDROMETEORS

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

LITHOMETEORS

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

Non-Ozone Exceedance days during JUN 2008-

| Total= | <u>Date</u> | <u>Max AQI</u> | <u>Pollutant</u> | <u>Site/s</u> |
|--------|-------------|----------------|------------------|------------------|
| 1 | 06/04 | 125 | PM-10 | Buckeye |
| | | 120 | PM-10 | West Forty Third |
| | | 116 | PM-10 | Coyote Lakes |

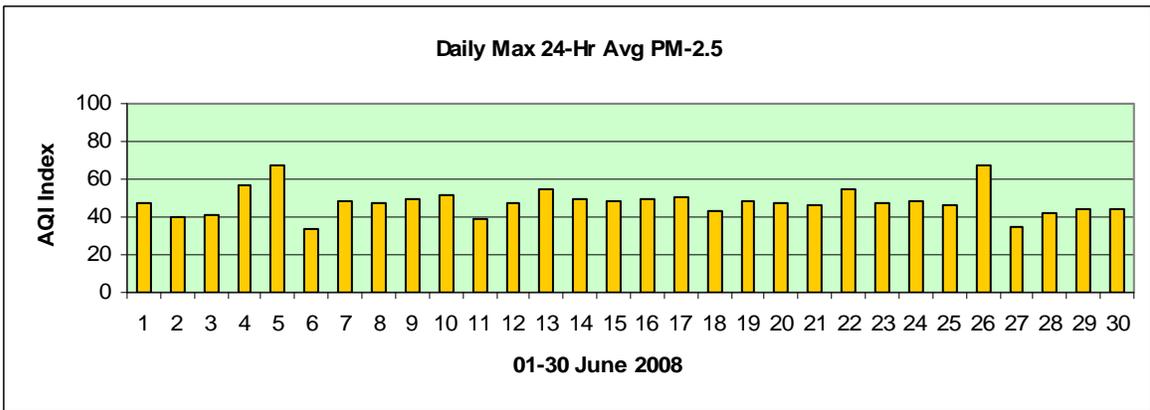
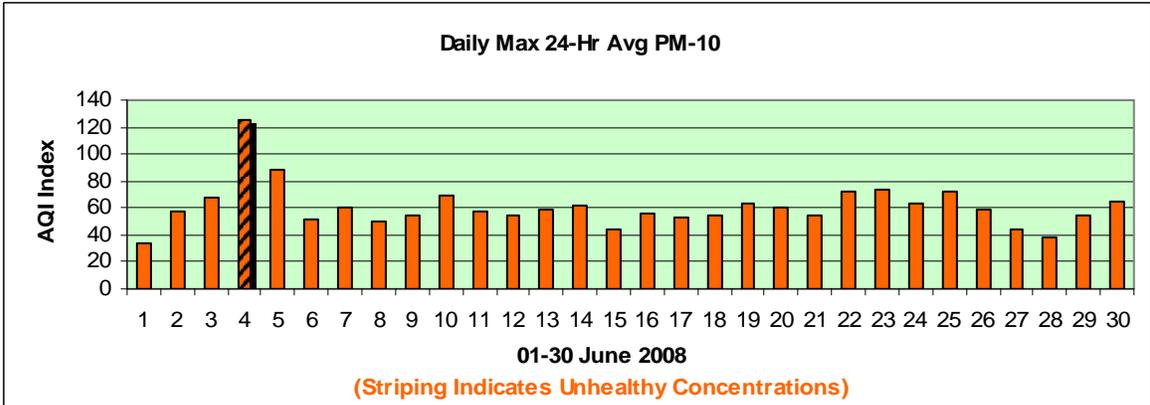
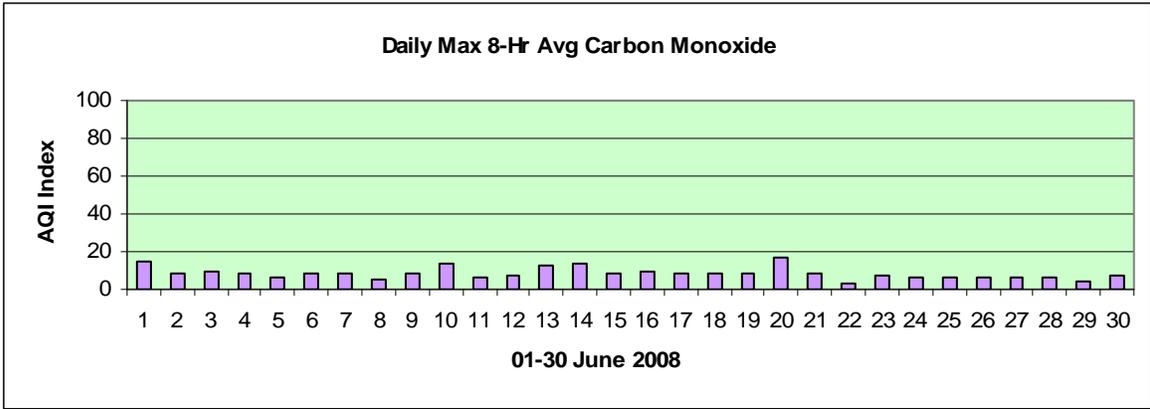
Non-Ozone Health Watches issued during JUN 2008-

| Total= | <u>Date</u> | <u>Max AQI</u> | <u>Pollutant</u> | <u>Site/s</u> |
|--------|-------------|----------------|------------------|---------------|
| 1 | 06/04 | 125 | PM-10 | Buckeye |

Non-Ozone High Pollution Advisories issued during JUN 2008-

| Total= | <u>Date</u> | <u>Max AQI</u> | <u>Pollutant</u> | <u>Site/s</u> |
|--------|-------------|----------------|------------------|---------------|
| 0 | | | | |

| | | |
|------------------------------------|---|----------|
| <u>Concentration Recap:</u> | Days in the Good category: | 0 |
| (All pollutants) | Days in the Moderate category: | 19 |
| | Days in the Unhealthy for Sensitive Groups category: | 11 |
| | Days in the Unhealthy category: | <u>0</u> |
| | Total Forecast Days: | 30 |



Narrative: During the month of June 2008 Valley residents had a lot to contend with in the realms of both air quality and weather conditions. In addition to ten days with unhealthy concentrations of ground-level ozone – detailed later on in this report – there was a wind-driven PM-10 (coarse particle) exceedance on the 4th of the month. Gradients associated with a strong upper level trough and surface frontal passage on that date generated wind gusts between 25 and 40 mph from 11:00 a.m. right thru midnight that in turn produced areas of dense blowing dust. Visibilities dropped to as low as four miles at times; hourly PM-10 levels of up to 644.9ug/m3 occurred at the West Forty Third monitoring site and 771.6ug/m3 at Buckeye. A thunderstorm associated with the initial stage of the summer monsoon produced cloud-to-ground lightning strikes that ignited vegetation in a dry river bottom located in the far southwest Valley on the 25th. The subsequently named “Ethan” brush fire eventually grew in size to nearly 6K acres and a smoke layer produced by it lingered over the metro area thru the 29th; surprisingly, visibility and air quality impacts were relatively minimal, mainly due to 14K’+ mixing depths and very good to excellent dispersion. And, of course it was hot; 27 days with 100+ deg F temps, 14 days with 110+ deg F – including the 14th thru the 24th – and a record 115 deg F on the 21st. -Reith

DETAILED OZONE SECTION

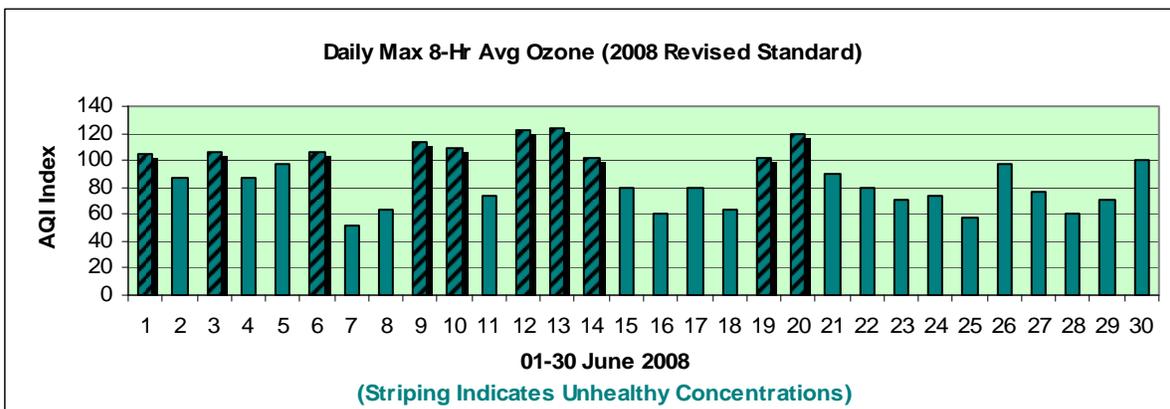
(Based on the 2008 EPA Revised 8-Hour Ozone Standard)

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

SUMMARY OF MAXIMUM 8-HR OZONE AQI VALUES FOR JUNE 2008*

*Preliminary data

| SUN | | MON | | TUES | | WED | | THU | | FRI | | SAT | |
|-----|-----|-----|-----|------|-----|-----|----|-----|-----|-----|-----|-----|-----|
| 1 | 104 | 2 | 87 | 3 | 106 | 4 | 87 | 5 | 97 | 6 | 106 | 7 | 51 |
| 8 | 64 | 9 | 114 | 10 | 109 | 11 | 74 | 12 | 122 | 13 | 124 | 14 | 101 |
| 15 | 80 | 16 | 61 | 17 | 80 | 18 | 64 | 19 | 101 | 20 | 119 | 21 | 90 |
| 22 | 80 | 23 | 71 | 24 | 74 | 25 | 58 | 26 | 97 | 27 | 77 | 28 | 61 |
| 29 | 71 | 30 | 100 | | | | | | | | | | |
| | | | | | | | | | | | | | |



| <u>8-hr Ozone exceedance days in JUN:</u> | Total= | <u>Date</u> | <u>Max ppb/AQI</u> | <u>Site/s</u> |
|---|--------|-------------|--------------------|------------------|
| | 10 | 6/01 | 77/104 | Queen Valley |
| | | 6/03 | 78/106 | Humbolt Mtn. |
| | | 6/06 | 78/106 | Humbolt Mtn. |
| | | 6/09 | 81/114 | Rio Verde |
| | | | 80/111 | Fountain Hills |
| | | | 80/111 | Pinnacle Peak |
| | | | 79/109 | Falcon Field |
| | | | 79/109 | North Phoenix |
| | | | 78/106 | Cave Creek |
| | | | 78/106 | Tonto Nat'l Mon |
| | | | 77/104 | Humbolt Mtn. |
| | | | 76/101 | Blue Point |
| | | | 76/101 | Phx Supersite |
| | | | 76/101 | South Scottsdale |
| | | | 76/101 | Tempe |
| | | 6/10 | 79/109 | Rio Verde |
| | | | 76/101 | Fountain Hills |
| | | 6/12 | 84/122 | Tonto Nat'l Mon |
| | | | 82/116 | Queen Valley |
| | | | 78/106 | Rio Verde |
| | | | 77/104 | Fountain Hills |
| | | | 76/101 | Apache Junction |
| | | 6/13 | 85/124 | Queen Valley |
| | | | 81/114 | North Phoenix |
| | | | 81/114 | Rio Verde |
| | | | 81/114 | Tonto Nat'l Mon |
| | | | 80/111 | Fountain Hills |
| | | | 78/106 | Apache Junction |
| | | | 78/106 | Cave Creek |
| | | | 78/106 | Phx Supersite |
| | | | 78/106 | South Scottsdale |
| | | | 78/106 | Tempe |
| | | | 77/104 | Falcon Field |
| | | | 77/104 | West Chandler |
| | | | 76/101 | Pinnacle Peak |
| | | 6/14 | 76/101 | South Scottsdale |
| | | | 76/101 | West Chandler |
| | | 6/19 | 76/101 | Tonto Nat'l Mon |
| | | 6/20 | 83/119 | North Phoenix |
| | | | 77/104 | West Chandler |
| | | | 76/101 | South Scottsdale |

Total number of exceedance days since APR 01: 16
Total number of exceedance sites since APR 01: 72

Ozone Health Watches in JUN:
(Forecast max value 72-75 ppb)

| | | | | |
|--------|----|-------------|--------------------|------------------|
| Total= | 11 | <u>Date</u> | <u>Max ppb/AQI</u> | <u>Site/s</u> |
| | | 6/02 | 71/87 | Tonto Nat'l Mon |
| | | 6/03 | 78/106 | Humbolt Mtn |
| | | 6/04 | 71/87 | Humbolt Mtn |
| | | 6/06 | 78/106 | Humbolt Mtn |
| | | 6/09 | 81/114 | Rio Verde |
| | | 6/16 | 64/63 | Fountain Hills |
| | | | | Tonto Nat'l Mon |
| | | 6/17 | 69/80 | Apache Junction |
| | | 6/19 | 76/101 | Tonto Nat'l Mon |
| | | 6/20 | 83/119 | North Phoenix |
| | | 6/22 | 69/80 | South Scottsdale |
| | | 6/30 | 75/100 | North Phoenix |

Ozone Health Watches since APR 01: Total= 25

High Pollution Advisories in JUN:
(Forecast max value 76+ppb)

| | | | | |
|--------|---|-------------|--------------------|------------------|
| Total= | 6 | <u>Date</u> | <u>Max ppb/AQI</u> | <u>Site/s</u> |
| | | 6/01 | 77/104 | Queen Valley |
| | | 6/12 | 84/122 | Tonto Nat'l Mon |
| | | 6/13 | 85/124 | Queen Valley |
| | | 6/14 | 76/101 | South Scottsdale |
| | | | | West Chandler |
| | | 6/15 | 69/80 | South Scottsdale |
| | | 6/21 | 72/90 | Cave Creek |
| | | | | Queen Creek |
| | | | | Tonto Nat'l Mon |

High Pollution Advisories since APR 01: Total= 10

Concentration Recap:
(Ozone)

| | |
|---|----|
| Days in the Good category: | 0 |
| Days in the Moderate category: | 20 |
| Days in the Unhealthy for Sensitive Groups category: | 10 |
| Days in the Unhealthy category: | 0 |
| Total Forecast Days: | 30 |

| | | | | | |
|----------------------------|-------------|-------------|--------------|----------------|------------|
| Maximum 8-Hr value: | <u>Date</u> | <u>Hour</u> | <u>Site</u> | <u>ppb/AQI</u> | <u>DOW</u> |
| | 6/13 | 1300 | Queen Valley | 85/124 | Fri |

| | | | | | |
|----------------------------|-------------|-------------|---------------|----------------|------------|
| Maximum 1-Hr value: | <u>Date</u> | <u>Hour</u> | <u>Site</u> | <u>ppb/AQI</u> | <u>DOW</u> |
| | 6/14 | 1400 | West Chandler | 99/83 | Sat |

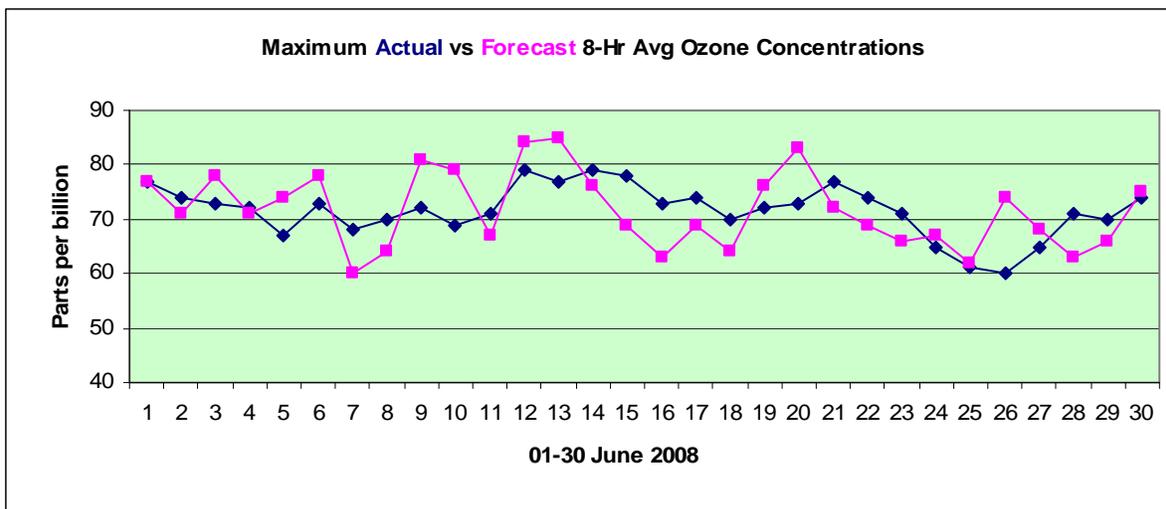
| | |
|---|------|
| Average daily max 8-Hr concentration (ppb): | 71.7 |
| Deviation from the 1996-2007 average (ppb): | -0.2 |

JUN Climatology:
(Period 1996-2007
using 1997 85ppb
standard)

| | |
|---|----------------------|
| Average number of 8-Hr exceedance days: | 3.0 |
| Maximum number of 8-Hr exceedance days: | 9 in 1998 and 2002 |
| Minimum number of 8-Hr exceedance days: | 0 in 2004 and 2007 |
| Average daily max 8-Hr concentration (ppb): | 71.9 |
| Record high max 8-Hr concentration (ppb): | 102 on the 1st, 1996 |
| Record low max 8-Hr concentration (ppb): | 45 on the 10th, 2003 |

Forecast Verification:

| | |
|---|--------|
| # of days maximum concentrations were over-forecast: | 15 |
| # of days maximum concentrations were under-forecast: | 14 |
| # of days maximum concentrations were correctly forecast: | 1 |
| June average forecast accuracy (ppb): | +/-5.5 |
| June average forecast bias (ppb): | -0.07 |



Narrative:

The number of 8-hour ozone exceedances skyrocketed during June, contributed to by the length of day, high sun angle, daytime temperatures mostly above 105 degrees F, paucity of thick cloud cover, and probable intermittent transport of additional ozone and/or its precursors from California. The latter factor, although unable to be measured directly, could be inferred by exceedances at upstream (to the west) monitoring sites at Alamo Lake in La Paz County (on the 3rd, 10th, and 12th) and at two sites in Yuma in Yuma County (on the 3rd, 11th, and 19th). Upper level trough passages were identified to have occurred on the 4th, 7th, and 11th, and upward spikes in local ozone concentrations are quite common within 24-36 hours following the trough axis moving overhead. Excessive Heat Warnings were issued by the National Weather Service for the local forecast area from the 15th thru the 21st; it was interesting to note that ozone exceedances did not occur in the Phoenix metro area during this period until the 19th – the same day Yuma had an exceedance and the day after a significant jump in ozone levels occurred at Alamo Lake. The greatest number of local monitors recorded exceedances of the new ozone standard on the 9th (12 sites) and the 12th (13 sites) – again, within relatively close temporal range of trough passages and upstream site exceedances. By the 25th of the month the weather pattern underwent a change; the mid-latitude storm track shifted to the north and high pressure aloft built to the east of Arizona. The resulting southerly flow imported sufficient moisture to initiate thunderstorm development, but thru the end of the month these storms did little more than generate strong outflow boundaries from the northeast and east. These winds are contrary to the prevailing westerly winds, and with their arrival, highest ozone concentrations began to occur closer to the city center. -Reith