



MONTHLY AIR QUALITY REPORT FOR
DECEMBER 2006

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 2006*

*Preliminary data

SAMPLE POLLUTANT REPORTING BOX

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

| SUN | | | MON | | | TUES | | | WED | | | THU | | | FRI | | | SAT | | |
|-----|----|-----|-----|----|-----|------|-----|----|-----|-----|----|-----|-----|----|-----|-----|----|-----|----|-----|
| | | | | | | | | | | | | | | | 1 | 28 | 31 | 2 | 34 | 41 |
| | | | | | | | | | | | | | | | | 82 | 81 | | 87 | 81 |
| 3 | 34 | 18 | 4 | 34 | 30 | 5 | 33 | 38 | 6 | 36 | 40 | 7 | 36 | 54 | 8 | 34 | 18 | 9 | 30 | 38 |
| | 68 | 30 | | 72 | 50 | | 110 | 78 | | 105 | 99 | | 110 | 91 | | 69 | 37 | | 57 | 64 |
| 10 | 34 | 42 | 11 | 29 | 24 | 12 | 28 | 31 | 13 | 24 | 38 | 14 | 21 | 41 | 15 | 25 | 42 | 16 | 26 | 41 |
| | 86 | 53 | | 76 | 61 | | 87 | 77 | | 92 | 80 | | 105 | 88 | | 112 | 89 | | 86 | 74 |
| 17 | 32 | 19 | 18 | 26 | 19 | 19 | 25 | 24 | 20 | 23 | 22 | 21 | 20 | 34 | 22 | 18 | 36 | 23 | 20 | 26 |
| | 47 | 44 | | 53 | 40 | | 61 | 46 | | 58 | 56 | | 73 | 83 | | 62 | 77 | | 33 | 109 |
| 24 | 32 | 40 | 25 | 33 | 58 | 26 | 27 | 36 | 27 | 24 | 40 | 28 | 23 | 11 | 29 | 18 | 22 | 30 | 20 | 30 |
| | 48 | 140 | | 54 | 157 | | 55 | 82 | | 84 | 71 | | 34 | 48 | | 24 | 64 | | 30 | 97 |
| 31 | 23 | 39 | | | | | | | | | | | | | | | | | | |
| | 44 | 125 | | | | | | | | | | | | | | | | | | |

Calendar of High Pollution Advisories and Health Watches issued during December 2006

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

Exceedance days during DEC 2006-

| Total= 6 | <u>Date</u> | <u>Max AQI</u> | <u>Pollutant</u> | <u>Site/s</u> |
|----------|-------------|----------------|------------------|------------------|
| | 12/05 | 110 | PM-10 | West Forty Third |
| | 12/06 | 105 | PM-10 | Durango |
| | | 103 | PM-10 | West Forty Third |
| | 12/07 | 110 | PM-10 | Durango |
| | | 103 | PM-10 | West Forty Third |
| | 12/14 | 105 | PM-10 | West Forty Third |
| | 12/15 | 112 | PM-10 | West Forty Third |
| | 12/25 | 157 | PM-2.5 | West Phoenix |
| | | 157 | PM-2.5 | South Phoenix |
| | | 153 | PM-2.5 | Durango |

Health Watches issued during DEC 2006-

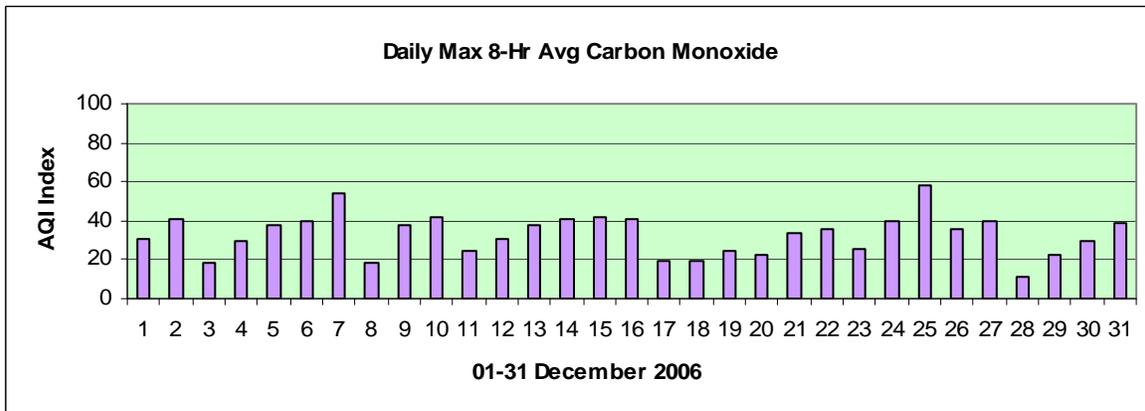
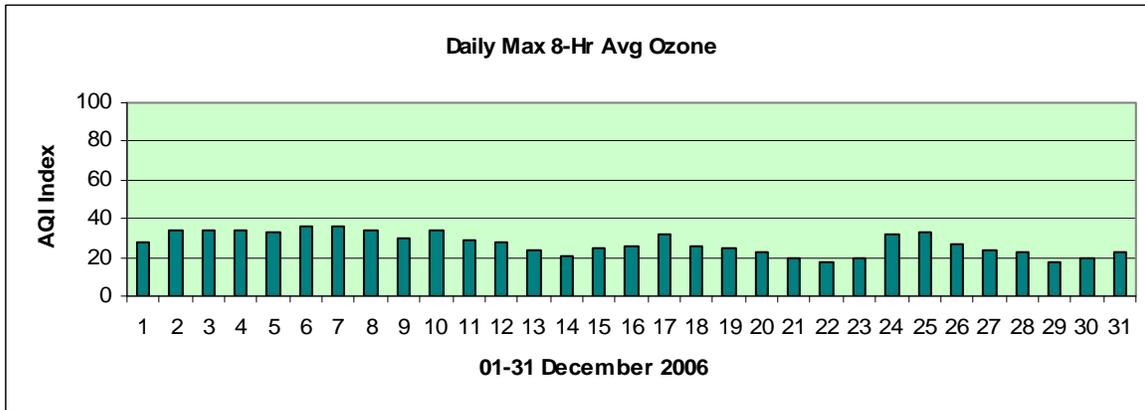
| Total= 7 | <u>Date</u> | <u>Max AQI</u> | <u>Pollutant</u> | <u>Site/s</u> |
|----------|-------------|----------------|------------------|-------------------|
| | 12/01 | 82 | PM-10 | Durango |
| | 12/08 | 69 | PM-10 | Buckeye |
| | 12/14 | 88 | PM-2.5 | West Phoenix |
| | 12/15 | 89 | PM-2.5 | Durango |
| | 12/16 | 86 | PM-10 | West Forty Third |
| | 12/25 | 157 | PM-2.5 | West Phoenix |
| | | 157 | PM-2.5 | South Phoenix |
| | 12/26 | 82 | PM-2.5 | Phoenix Supersite |

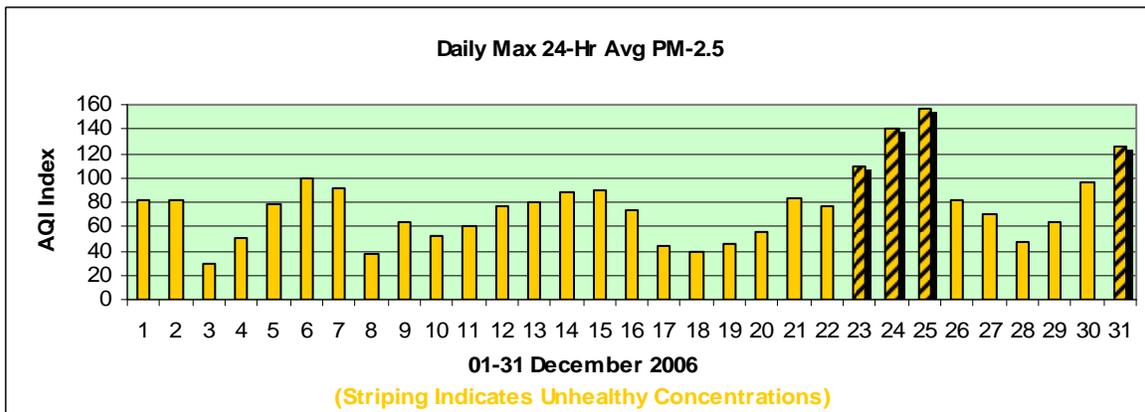
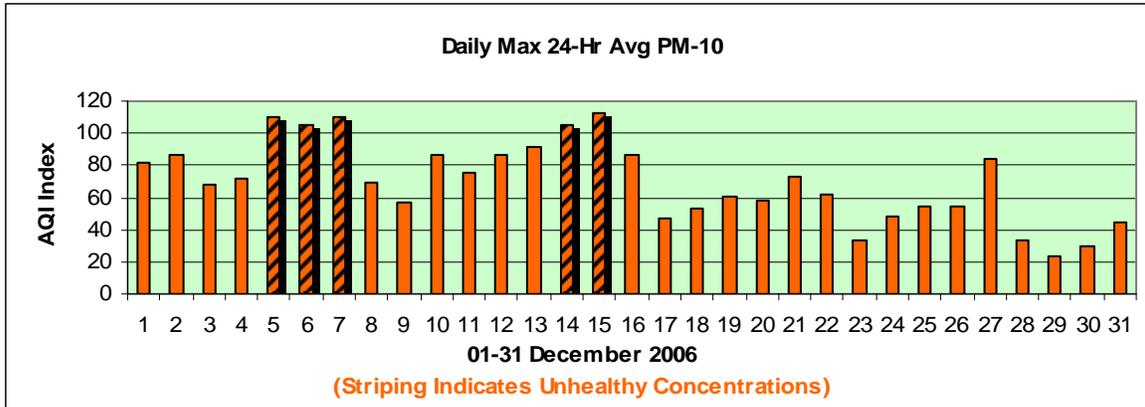
High Pollution Advisories issued during DEC 2006-

| Total= | Date | Max AQI | Pollutant | Site/s |
|--------|-------|---------|-----------|------------------|
| 5 | 12/07 | 110 | PM-10 | Durango |
| | 12/12 | 87 | PM-10 | West Forty Third |
| | 12/13 | 92 | PM-10 | West Forty Third |
| | 12/14 | 105 | PM-10 | West Forty Third |
| | 12/15 | 112 | PM-10 | West Forty Third |

Concentration Recap:

| | |
|---|----------|
| Days in the Good category: | 2 |
| Days in the Moderate category: | 20 |
| Days in the Unhealthy for Sensitive Groups category: | 8 |
| Days in the Unhealthy category: | <u>1</u> |
| Total Forecast Days: | 31 |





Narrative:

Particle pollutants were the source of poor air quality at times during December and an overview of the two most significant episodes will be given later in this narrative. Except for weak and dry trough passages on the 3rd and 10th, stagnant weather conditions were the rule during the first half of the month (see table one below). Shallow mixing depths and strong inversions contributed to PM-10 exceedance episodes from the 5th through the 7th and again on the 14th and 15th. (The NWS issued **Air Stagnation Advisories** for the 13th, 14th, and 15th). During the latter half of the month the mid-latitude storm track delivered a series of rather weak Pacific storms that nevertheless managed to deliver the first measurable rain to the Phoenix metro area since October—the lack of rain being another prime factor in the number of PM-10 exceedances during November and December; PM-10 levels remained relatively low after the 16th but PM-2.5 concentrations approached or surpassed exceedance levels on several occasions.

Interesting episode #1: Forecasters recognized that a potentially lengthy period of high PM-10 levels was poised to begin on the 12th and as a result issued the first of four consecutive-day High Pollution Advisories on the 11th. (When a local PM-10 HPA is issued, a series of measures are activated—such as trip reduction and carpool programs—in an effort to reduce emissions and avoid exceeding the EPA standard). Despite these efforts, highest PM-10 levels trended upward each of the next four days, exceeded the EPA standard by day three (the 14th), and peaked on day four (the 15th) with the highest PM-10 level of the entire month. On that day the West Forty Third site had a peak hourly reading of 464.2ug/m³ at 8:00 a.m.

Interesting episode #2: As of December 2006 the NAAAQ for PM-2.5 was 65ug/m³ (24-hr average). It was apparently exceeded at three local sites on Christmas Day after a two-day run-up in values prior to the holiday. Under stagnant weather conditions, a similar pattern occurred in 2005 and has been attributed to smoke from widespread fireplace use. Peak hourly PM-2.5 concentrations of 180.1 and 169.1ug/m³ were recorded at midnight on the 24th and 2:00 a.m. on the 25th respectively, and coincided with the highest December CO level. **ASA's** were issued by the NWS for the 25th and 26th. -Reith

Table One. Max PM-10 AQI levels, boundary layer air mass characteristics, and present weather for the Phoenix metro area during December 2006

| Rank/Date | PM-10 AQI | Mixing Depth (ft) | Dispersion | Inversion (deg C) | Inversion (ft) | Weather |
|-----------|-----------|-------------------|------------|-------------------|----------------|-----------|
| 1/Dec 15 | 112 | 1500 | Marginal | 7.7 | 2369 | Haze |
| 2/Dec 07 | 110 | 3400 | Good | 8.6 | 1591 | Haze |
| 3/Dec 05 | 110 | 2800 | Marginal | 5.3 | 1542 | Haze |
| 4/Dec 06 | 105 | 2100 | Marginal | 6.5 | 2070 | Haze |
| 5/Dec 14 | 105 | 2700 | Poor | 7.0 | 2881 | Haze |
| 6/Dec 13 | 92 | 2400 | Poor | 7.3 | 2612 | Haze |
| 7/Dec 02 | 87 | 2800 | Marginal | 7.3 | 2658 | Haze |
| 8/Dec 12 | 87 | 3700 | Marginal | 5.9 | 1827 | Haze |
| 9/Dec 10 | 86 | 4800 | Fair | 6.2 | 1542 | ----- |
| 10/Dec 16 | 86 | 2500 | Fair | 6.2 | 2339 | Haze Dust |
| 11/Dec 27 | 84 | 1600 | Marginal | 8.0 | 2592 | Haze |
| 12/Dec 01 | 82 | 2500 | Poor | 5.5 | 4649 | Haze |
| 13/Dec 11 | 76 | 6300 | Fair | 3.2 | 977 | Haze |
| 14/Dec 21 | 73 | 4400 | Marginal | 2.3 | 1086 | Haze |
| 15/Dec 04 | 72 | 3100 | Marginal | None | None | Haze |
| 16/Dec 08 | 69 | 4500 | Good | 2.0 | 1608 | ----- |
| 17/Dec 03 | 68 | 4500 | Good | 2.3 | 1247 | ----- |
| 18/Dec 22 | 62 | 4100 | Marginal | 1.5 | 1246 | Haze Rain |
| 19/Dec 19 | 61 | 9800 | V. Good | 1.5 | 1137 | Virga |
| 20/Dec 20 | 58 | 6000 | V. Good | 1.6 | 831 | Haze |
| 21/Dec 09 | 57 | 5800 | Fair | 2.5 | 1198 | ----- |
| 22/Dec 26 | 55 | 2500 | Marginal | 7.0 | 3930 | Haze |
| 23/Dec 25 | 54 | 3200 | Marginal | 7.5 | 1420 | Haze Fog |
| 24/Dec 18 | 53 | 8000 | Good | None | None | Rain |
| 25/Dec 24 | 48 | 2900 | Marginal | 7.3 | 2724 | ----- |
| 26/Dec 17 | 47 | 8000 | Good | None | None | Rain |
| 27/Dec 31 | 44 | 3100 | Poor | 5.1 | 1250 | Haze Fog |
| 28/Dec 28 | 34 | 4400 | Fair | None | None | Rain |
| 29/Dec 23 | 33 | 1100 | Poor | 7.1 | 2116 | Dense Fog |
| 30/Dec 30 | 30 | 3900 | Marginal | 1.8 | 2008 | Haze Fog |
| 31/Dec 29 | 24 | 4900 | Good | None | None | Rain |