



MONTHLY AIR QUALITY REPORT FOR **MAY 2011**

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 May 2011*

*Preliminary data

SAMPLE POLLUTANT REPORTING BOX

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

SUN			MON			TUES			WED			THU			FRI			SAT		
1	49	03	2	58	06	3	74	06	4	90	13	5	93	08	6	101	07	7	84	08
	19	14		28	19		40	28		61	56		52	48		52	51		42	49
8	51	03	9	67	11	10	64	03	11	51	07	12	71	07	13	49	08	14	49	06
	53	43		39	41		52	39		35	35		43	23		39	34		39	33
15	46	05	16	80	05	17	51	03	18	45	03	19	64	07	20	67	06	21	84	06
	35	37		44	37		47	26		52	42		45	64		30	36		43	42
22	67	06	23	77	05	24	116	03	25	122	08	26	80	08	27	77	08	28	41	06
	30	36		47	37		52	52		50	51		46	47		42	43		51	37
29	58	03	30	97	05	31	93	09												
	67	48		43	39		48	41												

Calendar of High Pollution Advisories and Health Watches issued during May 2011

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

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 May 2011

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

Non-Ozone Exceedance days during MAY 2011-

Total= 0 Date Max AQI Pollutant Site/s

Non-Ozone Health Watches issued during MAY 2011-

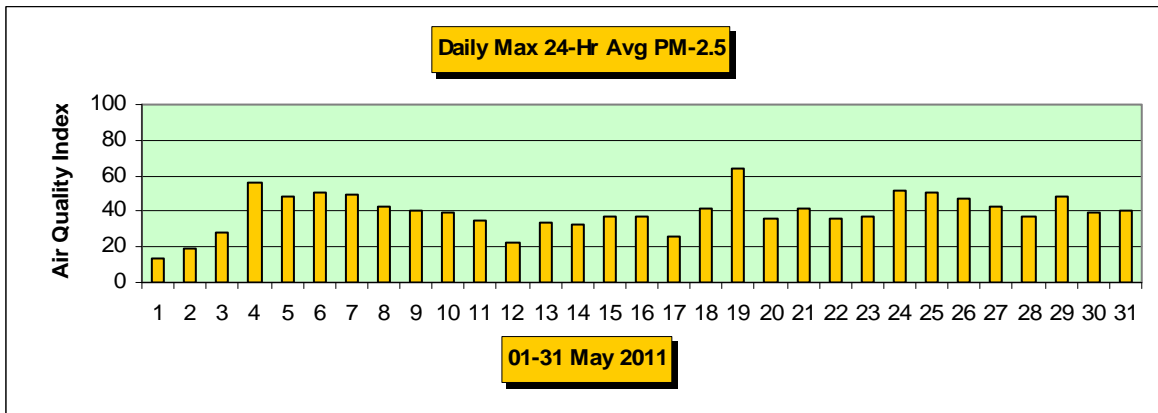
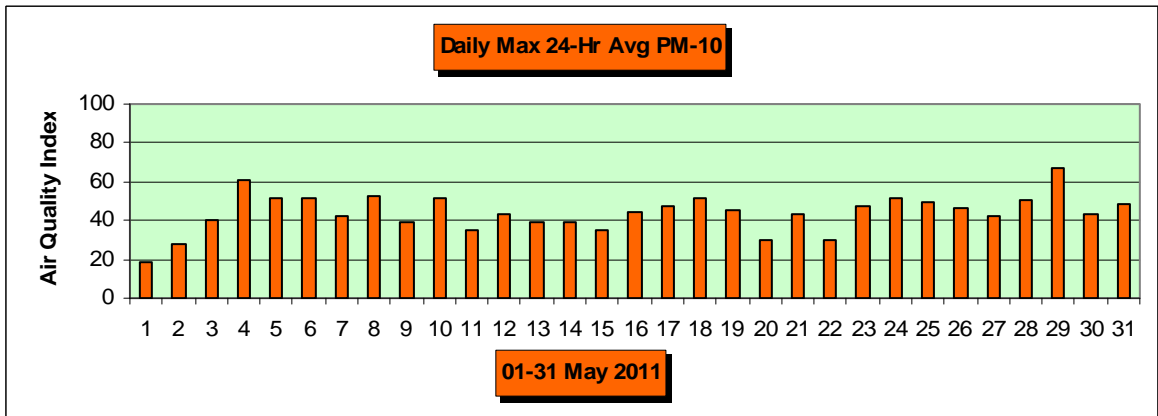
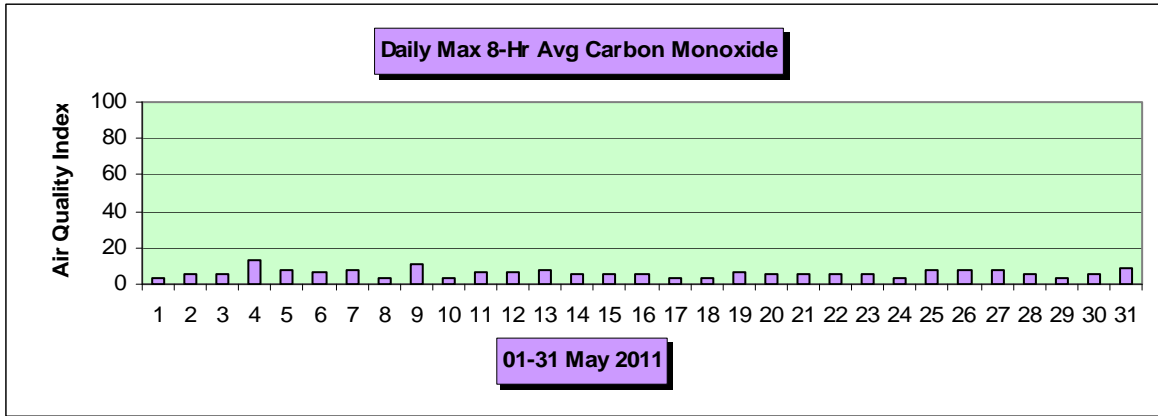
Total= 0 Date Max AQI Pollutant Site/s

Non-Ozone High Pollution Advisories issued during MAY 2011-

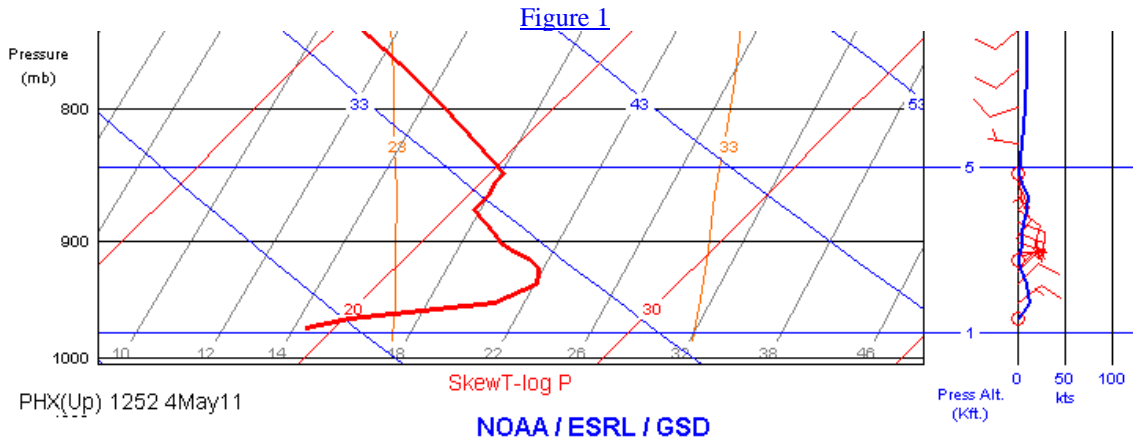
Total= 0 Date Max AQI Pollutant Site/s

Concentration Recap:

Days in the Good category:	4
Days in the Moderate category:	24
Days in the Unhealthy for Sensitive Groups category:	3
Days in the Unhealthy category:	<u>0</u>
Total Forecast Days:	31



Narrative: Although during the month of May there were no particle pollution exceedances and highest Air Quality Index values for both PM-10 (coarse) and PM-2.5 (fine) were only in the mid-moderate range, there were still several noteworthy episodes. During the first week of May a strong ridge aloft that was anchored to the west of Arizona gradually moved overhead. This led to a period of rather stagnant conditions with strong morning inversions (Figure 1 below shows the inversion that existed on the morning of the 4th). This situation in turn managed to trap elevated levels of PM-10 as well as PM-2.5 in the form of smoke from wildfires that were underway in various parts of Arizona. Figures 2-5 are images from the local VISNET array and show to good effect the impact that both pollutants had on visibilities in the Phoenix metro area.



[Figure 2](#)



[Figure 3](#)



[Figure 4](#)



[Figure 5](#)



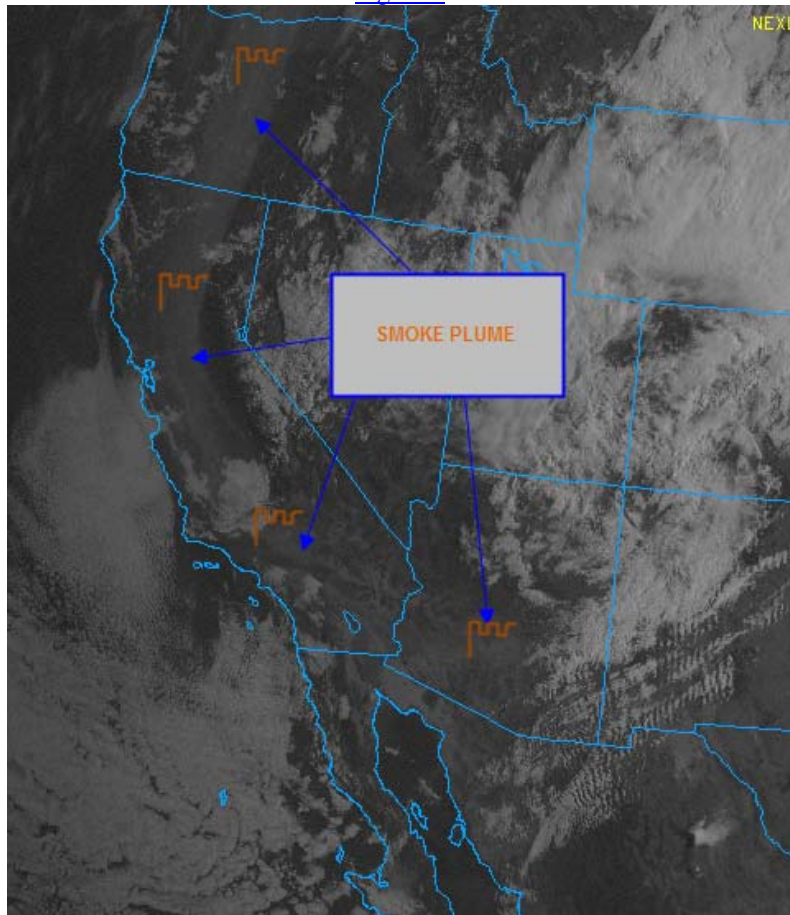
After a weak trough and surface frontal passage on the 9th and 10th, a much larger and stronger system in the mid-latitude storm track on the 18th brought the Valley its only rainfall of the month. The rain was preceded and then accompanied by strong gradient as well as thunderstorm outflow winds that gusted up to 46 mph and generated significant blowing dust that reduced visibilities to as low as 1/2 mile at times. [Figure 6](#) shows what the situation was like over the downtown area during the late afternoon hours.

[Figure 6](#)



A very unusual situation then occurred the very next day. In the wake of the upper level trough passage a long fetch of northerly winds aloft behind the system transported a significant amount of smoke over much of Arizona including the Phoenix metro area (see [Figure 7](#) on the following page). This smoke plume – that had been generated by large wildfires located in western Canada – had a major impact on Valley visibilities but a lesser impact on air quality than would be expected. The smoke was dense enough to lower visibilities to as low as five miles thru the a.m. period ([Figures 8-11](#) show the visual impacts of the smoke and [Figures 12-13](#) are PM-2.5 time-series graphs from a pair of monitoring sites in the downtown area. Subsequent winds that gusted up to 30 mph during the afternoon hours helped to disperse the smoke. The final significant wind and blowing dust event of the month occurred on the 29th with the passage of another strong but in this case dry upper level trough and surface cold front. Winds gusted up to 40 mph and visibilities dropped to as low as seven miles; this date had the highest PM-10 AQI level of the month. -Reith

[Figure 7](#)



[Figure 8](#)



[Figure 9](#)



[Figure 10](#)



Figure 11



Figure 12

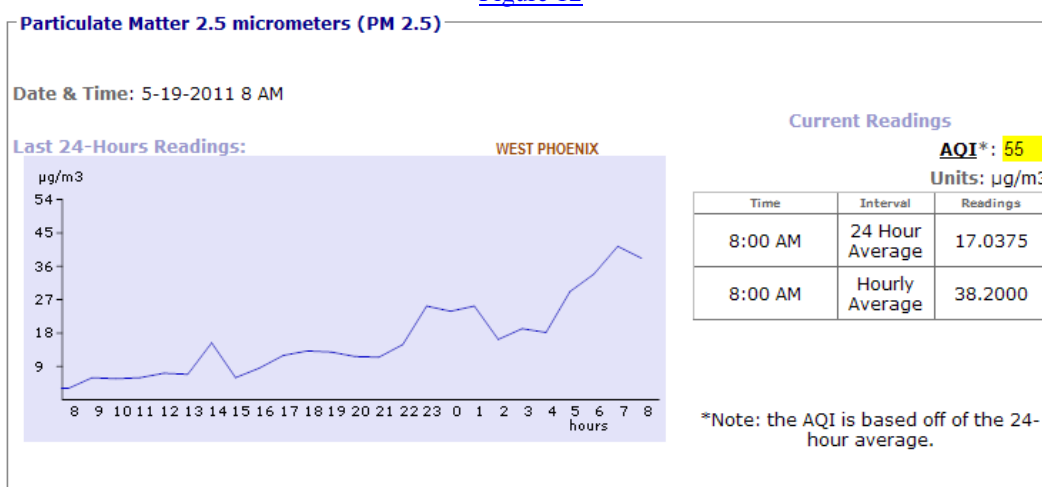
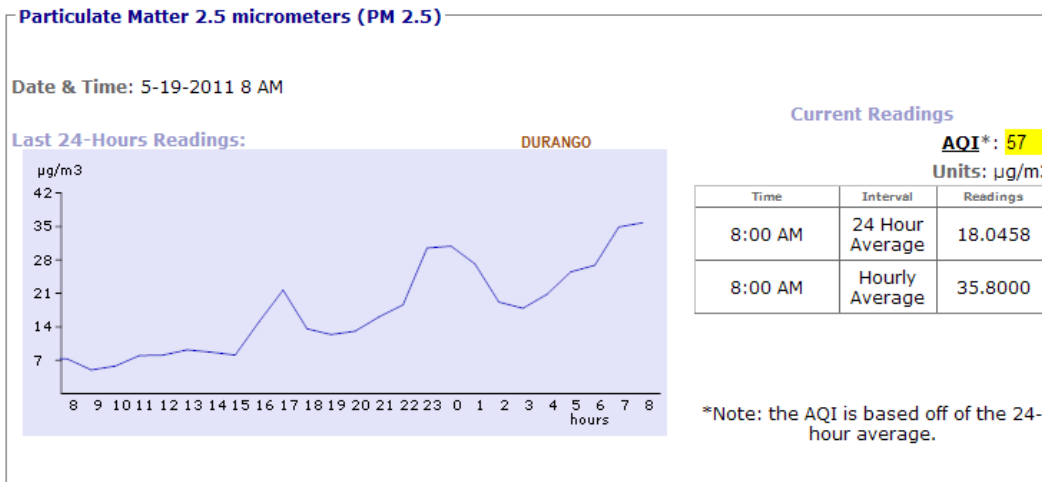


Figure 13



DETAILED OZONE SECTION

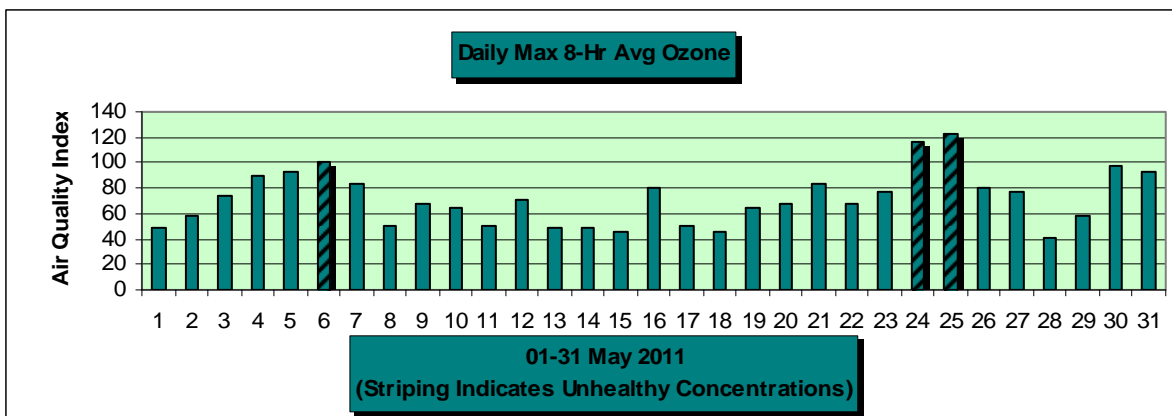
(Based on the 2008 EPA Revised 8-Hour Ozone Standard)

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

SUMMARY OF MAXIMUM 8-HR OZONE AQI VALUES FOR MAY 2011*

*Preliminary data

SUN		MON		TUES		WED		THU		FRI		SAT	
1	49	2	58	3	74	4	90	5	93	6	101	7	84
8	51	9	67	10	64	11	51	12	71	13	49	14	49
15	46	16	80	17	51	18	45	19	64	20	67	21	84
22	67	23	77	24	116	25	122	26	80	27	77	28	41
29	58	30	97	31	93								



<u>8-hr Ozone exceedance days in MAY:</u>	Total=	3	<u>Date</u>	<u>Max ppb/AQI</u>	<u>Site/s</u>
			5/06	76/101	Tonto Nat'l Mon
			5/24	82/116	Blue Point
				80/111	Rio Verde
				77/104	Humboldt Mtn.
				76/101	Cave Creek
				76/101	Fountain Hills
				76/101	Tonto Nat'l Mon
		5/25	84/122	Blue Point	
			83/119	Cave Creek	
			83/119	Fountain Hills	
			82/116	North Phoenix	
			82/116	Pinnacle Peak	
			81/114	Humboldt Mtn.	
			81/114	Rio Verde	
			80/111	Glendale	
			78/106	Phx Supersite	
			78/106	South Phoenix	
			78/106	West Phoenix	
			77/104	South Scottsdale	
			77/104	Tonto Nat'l Mon	

Total number of exceedance days since APR 01: 3
Total number of exceedance sites since APR 01: 20

<u>Ozone Health Watches in MAY:</u> (Forecast max value 72-75 ppb)	Total=	7	<u>Date</u>	<u>Max ppb/AQI</u>	<u>Site/s</u>
			5/06	76/101	Tonto Nat'l Mon
			5/11	60/51	Humboldt Mtn.
			5/12	66/71	Queen Valley
			5/13	58/49	Queen Valley
				58/49	South Scottsdale
			5/24	82/116	Blue Point
			5/25	84/122	Blue Point
			5/31	73/93	Glendale

Ozone Health Watches since APR 01: Total= 9

<u>High Pollution Advisories in MAY:</u> (Forecast max value 76+ppb)	Total=	3	<u>Date</u>	<u>Max ppb/AQI</u>	<u>Site/s</u>
			5/05	73/93	Blue Point
			5/26	69/80	Rio Verde
			5/27	68/77	Rio Verde

High Pollution Advisories since APR 01: Total= 3

Concentration Recap:

Days in the Good category:	6
Days in the Moderate category:	22
Days in the Unhealthy for Sensitive Groups category:	3
Days in the Unhealthy category:	0
Total Forecast Days:	31

Maximum 8-Hr value:	<u>Date</u>	<u>Hour</u>	<u>Site</u>	<u>ppb/AQI</u>	<u>DOW</u>
	5/25	1100	Blue Point	84/122	Wed

Maximum 1-Hr value:	<u>Date</u>	<u>Hour</u>	<u>Site</u>	<u>ppb/AQI</u>	<u>DOW</u>
	5/25	1500	North Phoenix	94/78	Wed

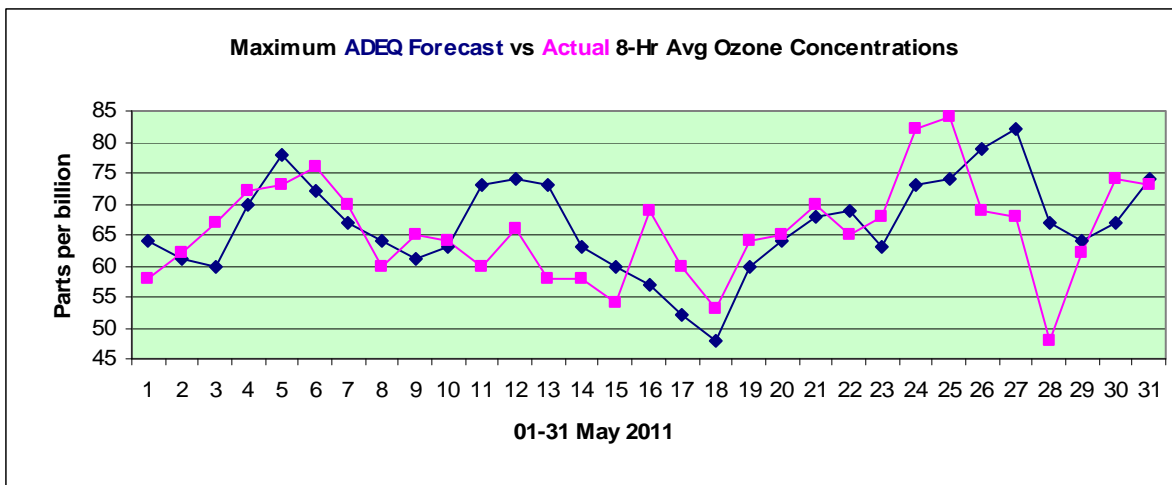
Average daily max 8-Hr concentration (ppb):	65.7
Deviation from the 1996-2010 average (ppb):	-5.2

MAY Climatology:
(Period 1996-2007
using 1997 85ppb
standard & 2008-
2010 using 76ppb
standard)

Average number of 8-Hr exceedance days:	2.9
Maximum number of 8-Hr exceedance days:	10 in 1996
Minimum number of 8-Hr exceedance days:	0 in 1997, 2001/04/07
Average daily max 8-Hr concentration (ppb):	70.9
Record high max 8-Hr concentration (ppb):	105 on the 21st, 1996
Record low max 8-Hr concentration (ppb):	46 on the 20th, 1997

Forecast Verification:

# of days maximum concentrations were over-forecast:	14
# of days maximum concentrations were under-forecast:	17
# of days maximum concentrations were correctly forecast:	0
May average forecast accuracy (ppb):	+/-6.4
May average forecast bias (ppb):	+0.9



Narrative:

May 2011 was a fairly active month for ground-level ozone pollution in the Phoenix metro area and the 84 parts per billion reading within the local monitoring network on the 25th was the highest reading during the month of May since 2006. Although there were only six days with high temperatures at or above the 100 degree F mark at Sky Harbor Airport – which was somewhat below average – on the majority of days winds in the 5-10K' layer were conducive to the transport from California of additional ozone and/or its precursors. In the past many if not most Valley 8-hour average ozone exceedance days during the month of May have been attributed to a shift in winds to west or northwesterly – frequently but not always in the wake of trough and frontal passages. All three exceedance days this month occurred during the wind regime described above and on other days large upward jumps in ozone concentrations were observed. One such shift in the winds and apparent influx of additional ozone was seen to begin on the 16th. Figure 1 below shows how hourly ozone levels at nearly every monitoring site peaked during the late night hours when ozone levels normally are dropping off. Figure 2 is a time-series graph from the Humboldt Mountain site and clearly illustrates this upward trend. During this episode highest ozone AQI levels rose from 46 (in the good range) on the 15th to 80 (in the upper-moderate range) on the 16th. Figure 3 illustrates the large geographical area that is often impacted by high ozone levels during a transport episode. On this date – May 24 – the high temperature in Phoenix was only 90 deg F. –Reith

Figure 1

Arizona Department of Environmental Quality

AIR QUALITY DIVISION

MAXIMUM OBSERVED OZONE

FOR 05/16/2011

Preliminary Data QA LEVEL - 2

Ordered by PLACE ASC

AAADAILY

05/18/2011 11:36:39



Place ID	Name	Network	POC	* Hour	1-Hour (ppm)	1-Hour Exc	** 8-Hour	8-Hour Value	8-Hour Exc	Category	8-Hour AQI
34961	ALAMO LAKE	ADEQ	1	1400	.073		1100	.068		Moderate	77
16589	APACHE JUNCTION MAINTENANCE YARD	PINAL	1	1500	.053		1200	.051		Good	43
16417	BLUE POINT	MARICOPA	1	2300	.063		1600	.057		Good	48
21525	BUCKEYE	MARICOPA	1	1800	.07		1400	.058		Good	49
16367	CASA GRANDE MUNICIPAL AIRPORT	PINAL	1	2100	.064		1600	.057		Good	48
16368	CAVE CREEK	MARICOPA	1	2000	.074		1500	.062		Moderate	58
16329	CENTRAL PHOENIX	MARICOPA	1	2100	.072		1600	.061		Moderate	54
16657	COMBS SCHOOL	PINAL	1	2300	.062		2000	.049		Good	42
19550	DYSART	MARICOPA	1	1900	.077		1600	.061		Moderate	54
16381	FALCON FIELD	MARICOPA	1								
16707	FLAGSTAFF MIDDLE SCHOOL	ADEQ	1	1400	.062		2000	.062		Moderate	58
16376	FOUNTAIN HILLS	MARICOPA	1	2100	.069		1700	.060		Moderate	51
16378	GLENDALE	MARICOPA	1	2000	.069		1500	.058		Good	49
16416	HUMBOLDT MOUNTAIN	MARICOPA	1	2200	.079		1800	.067		Moderate	74
16328	JLG SUPERSITE	ADEQ	1	2000	.065		1600	.057		Good	48
16656	MARICOPA COUNTY COMPLEX	PINAL	1	2100	.067		1600	.057		Good	48
16390	NORTH PHOENIX	MARICOPA	1	2000	.075		1700	.064		Moderate	64
16552	PINAL AIR PARK	PINAL	1	1400	.055		1300	.052		Good	44
16406	PINNACLE PEAK	MARICOPA	1	2100	.072		1500	.062		Moderate	58
133011	PRESCOTT COLLEGE AQD	ADEQ	1	2200	.067		1800	.062		Moderate	58
16394	QUEEN VALLEY	ADEQ	1	2300	.062		2100	.057		Good	48
16396	RIO VERDE	MARICOPA	1	2300	.064		1500	.057		Good	48
16377	SOUTH PHOENIX	MARICOPA	1	2100	.074		1600	.063		Moderate	61
16398	SOUTH SCOTTSDALE	MARICOPA	1	2100	.072		1700	.061		Moderate	54
16405	TEMPE	MARICOPA	1	2100	.06		1700	.054		Good	46
16447	TONTON NM	ADEQ	1	2300	.064		2000	.061		Moderate	54

Green (0 - 50) = Good
 Yellow (51 - 100) = Moderate
 Orange (101 - 150) = Unhealthy for sensitive groups
 Red (151 - 200) = Unhealthy
 Purple (201 - 300) = Very unhealthy
 Maroon (301 - 500) = Hazardous
 Blank = observed value outside AQI breakpoints

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* Hour is Hour beginning, for example, 0800 is 0800 - 0859 hour.

** For 8-hour CO, Hour is last hour of the 8-hour period.
 For 8-hour Ozone, Hour is first hour of the 8-hour period.

Figure 2

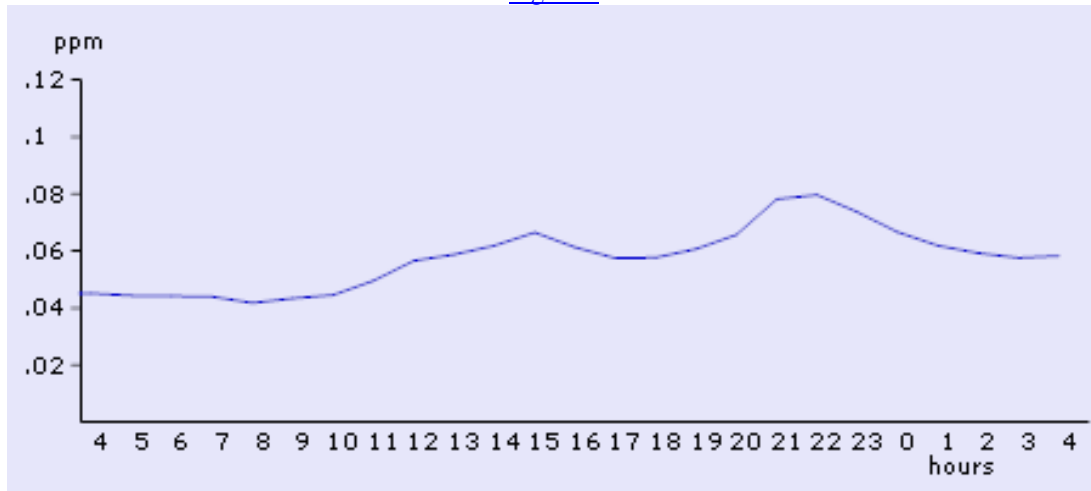


Figure 3

