

# 2007 Air Quality and the Fires

The 2007 Firestorm adversely affected air quality in a number of ways:

- Burning coastal sage scrub, trees, houses, and outbuildings released toxic compounds and vaporized organic materials into the atmosphere. Higher than normal levels of benzene, toluene, isoprene, chloromethane, 1,3-butadiene, and formaldehyde were observed, as were a variety of rarely encountered terpenes and aldehydes.
- Most of these preceding hydrocarbon compounds function as ozone precursors to varying degrees and caused increased ozone levels when exposed to sunlight. Incomplete combustion during the fires also released carbon monoxide and oxides of nitrogen. The oxides of nitrogen reacted with the hydrocarbons to form higher concentrations of ozone than would have been expected without the fires.
- High levels of particulate matter suspended in the smoke were measured on several days. During the fires, the highest PM<sub>10</sub> concentration of 500 µg/m<sup>3</sup> was recorded on October 22 at the Escondido monitoring station. At the District's Otay Mesa monitoring station, the PM<sub>10</sub> concentration was 395 µg/m<sup>3</sup> on October 21. Additional samples collected throughout the week showed PM<sub>10</sub> levels above the federal 24-hour standard of 150 µg/m<sup>3</sup> through October 25 for the Otay Mesa area. PM<sub>10</sub> concentrations had dropped below 100 µg/m<sup>3</sup> at all District monitoring locations after October 27.
- Fine PM<sub>2.5</sub> particulates remain airborne much longer than the heavier PM<sub>10</sub> particulates. The federal PM<sub>2.5</sub> 24-hour standard (35 µg/m<sup>3</sup>) was exceeded 22 times among five different sites during the fires. Maximum 24-hour PM<sub>2.5</sub> concentrations of slightly over 125 µg/m<sup>3</sup> were recorded at the Escondido site on October 22 and October 23. Accumulated ash and strong winds contributed to elevated particulate levels for many weeks following the fires.

Although these data exceeded federal standards, they were caused by a specific, unusual, unpreventable natural event. The U. S. Environmental Protection Agency (EPA) allows such data to be designated with an "exceptional event" flag.

These flagged data remain in the national database. However, these data are not used for purposes of attainment/non-attainment designation. Data collected during and after the fires were analyzed by District staff, and the following data-flagging recommendations were submitted to the public for a 30-day review and comment period before being forwarded to EPA for approval:

- Flag all ozone data for October 21-28, 2007. No other gaseous pollutant data was flagged.
- Flag all PM<sub>10</sub> data for October 21-27, 2007.
- Flag all PM<sub>2.5</sub> data for October 21-November 8, 2007.

# Particulate Matter (PM<sub>10</sub> and PM<sub>2.5</sub>)

Exceptional Event Data due to Wildfires

San Diego County, October 21-27, 2007

Station	PM <sub>10</sub> Maximum 24-Hour Sample Federal Standard 150 micrograms/m <sup>3</sup> State Standard 50 micrograms/m <sup>3</sup>	No Data Available For These Dates*	PM <sub>2.5</sub> Maximum 24-Hour Sample Federal Standard 35 micrograms/m <sup>3</sup>	No Data Available For These Dates*
Chula Vista	122	10/21-23, 10/27	85	10/25, 10/26
El Cajon	136	10/21, 10/27	60	10/23, 10/25
Kearny Mesa	116	10/24-25	44	10/22, 10/24-26
Escondido	505	10/23	126	
Downtown San Diego	110	10/23	70	
Otay Mesa	395	10/23	-	

\* Particulates are monitored differently than gaseous pollutants. Due to the highly resource intensive nature of this monitoring, samples are collected at various intervals at the different sites. During the days that samples were not collected, concentrations may have reached higher levels than measured.

(Ozone data for October 21-28, 2007, was designated as “exceptional event” data due to wildfires and is not included in this table.)

Station	Number of Days Exceeding Previous Federal 1-Hour Standard Concentration > 12 pphm (see note below)					Number of Days Exceeding State 1-Hour Standard Concentration > 9 pphm					Maximum 1-Hour Concentration (pphm)					Date of Maximum 1-Hour Concentration				
	07	06	05	04	03	07	06	05	04	03	07	06	05	04	03	07	06	05	04	03
Chula Vista	0	0	0	0	0	1	0	0	1	0	11	8	9	10	8	5/8	6/3	10/10	5/3	10/28
El Cajon	0	0	0	0	0	2	2	0	1	1	11	11	9	10	10	9/1	6/3	4/15	10/9	9/21
Kearny Mesa	0	0	0	0	0	0	1	0	6	2	9	11	8	11	11	3/16	6/3	4/15	5/2	10/19
Del Mar	0	0	0	1	0	0	0	0	3	0	9	9	8	13	9	5/8	9/18	8/25	10/8	10/17
Escondido	0	0	0	0	0	0	3	1	2	3	9	11	10	10	11	8/31	7/22	9/3	4/27	9/21
Alpine	1	0	0	0	1	17	21	13	5	17	13	12	11	11	13	9/1	7/1	7/13	5/31	9/21
Downtown SD (12th)*	-	-	0	0	0	-	-	0	0	0	-	-	7	9	8	-	-	5/12	9/5	4/9
Downtown SD (Beardsley)*	0	0	0	-	-	0	0	0	-	-	9	8	7	-	-	10/19	2/26	8/25		
Camp Pendleton	0	0	0	0	0	0	0	0	4	4	8	9	9	11	10	3/16	9/18	8/25	5/3	10/16
Otay Mesa	0	0	0	0	0	0	0	2	1	1	9	9	11	10	10	9/2	7/22	10/6	4/27	10/13
Basinwide	1	0	0	1	1	18	23	16	12	23	13	12	11	13	13	9/1	7/1	7/13	10/8	9/21

\* Downtown San Diego monitoring station moved July 14, 2005, from 12th Avenue to Beardsley Street.

**Note:** The federal 1-hour standard of 12 pphm was in effect from 1979 through June 15, 2005. Because this benchmark has been employed for such a long period, and because it is addressed in State Implementation Plans, we will continue to reference the revoked standard for historical perspective.

(Ozone data for October 21-28, 2007, was designated as "exceptional event" data due to wildfires and is not included in this table.)

Station	Number of Days Exceeding Federal 8-Hour Standard Concentration > 8.5 pphm					Number of Days Exceeding State 8-Hour Standard Concentration > 7.0 pphm					Maximum 8-Hour Concentration (pphm)					Date of Maximum 8-Hour Concentration				
	07	06	05	04	03	07	06	05	04	03	07	06	05	04	03	07	06	05	04	03
Chula Vista	1	0	0	1	0	2	0	State 8-Hour Standard adopted in 2006			9	7	8	9	6	5/8	5/11	4/6	5/3	7/10
El Cajon	0	1	0	0	0	3	9				8	9	7	8	7	9/1	6/3	5/13	4/25	9/21
Kearny Mesa	0	1	0	2	0	4	2				8	9	7	9	8	5/8	6/3	5/12	5/2	10/19
Del Mar	0	0	0	3	0	3	1				8	7	7	10	8	5/8	9/18	4/17	10/8	10/17
Escondido	0	2	0	2	0	5	10				8	10	8	9	8	9/1	7/22	4/16	4/27	9/21
Alpine	6	14	5	2	6	42	63				9	10	9	9	10	9/2	7/1	5/14	10/9	5/21
Downtown SD (12th)*	-	-	0	0	0	-	-				-	-	6	7	6	-	-	4/17	9/5	4/9
Downtown SD (Beardsley)*	0	0	0			0	0				7	7	6			3/16	2/26	9/17		
Camp Pendleton	0	0	0	2	0	4	5				7	7	7	10	8	5/18	2/26	4/17	10/8	10/8
Otay Mesa	0	0	0	0	0	1	0				7	7	7	8	8	9/2	4/20	10/6	4/27	5/21
Basinwide	7	14	5	8	6	43	68			9	10	9	10	10	9/2	7/1	5/14	10/8	5/21	

\* Downtown San Diego monitoring station moved July 14, 2005, from 12th Avenue to Beardsley Street.

# Carbon Monoxide

Maximum 1-Hour and 8-Hour Average Concentrations  
San Diego County 2003-2007

Station	Maximum 1-Hour Concentration in ppm Federal Standard 35 ppm State Standard 20 ppm					Date of Maximum 1-Hour Concentration					Maximum 8-Hour Concentration in ppm Federal Standard 9 ppm State Standard 9.0 ppm					Date of Maximum 8-Hour Concentration				
	07	06	05	04	03	07	06	05	04	03	07	06	05	04	03	07	06	05	04	03
Chula Vista	3.1	2.7	2.8	3.9	6.9	1/26	11/15	11/23	2/12	10/27	2.2	2.2	2.1	2.5	5.4	1/24	11/15	11/23	1/10	10/28
Escondido	5.2	5.7	5.9	5.3	12.7	1/9	12/5	1/20	12/11	10/28	3.2	3.6	3.1	3.6	10.6	12/24	12/25	1/20	12/11	10/28
⇒ Escondido (without fire data)					8.9					2/7				3.9						1/17
SD <i>curbside</i> (Union)	8.7	10.8	5.3	6.3	8.0	11/6	12/9	1/19	1/14	1/25	5.2	3.5	3.9	3.8	5.1	12/27	1/6	1/14	1/1	1/26
Downtown SD (12th)*	-	-	6.4	4.9	5.0	-	-	4/18	8/10	1/15	-	-	4.7	4.0	3.9	-	-	4/16	1/11	12/19
Downtown SD (Beardsley)*	4.4	5.3	4.5			1/24	2/8	12/21			3.0	3.3	3.1			1/9	12/7	12/20		
Otay Mesa	5.7	5.1	7.9	6.9	7.0	11/13	12/14	12/6	12/14	10/18	3.4	3.4	3.7	4.1	4.9	10/26	12/15	12/6	12/14	10/27

\* Downtown San Diego monitoring station moved July 14, 2005, from 12th Avenue to Beardsley Street.

⇒ In October 2003, wildfires caused unusually high levels of carbon monoxide.

# Nitrogen Dioxide

Annual Average and Maximum 1-Hour Concentration  
San Diego County 2003-2007

Station	Annual Average Federal Standard .053 ppm (see note below)					Maximum 1-Hour Concentration (ppm) State Standard > .25 ppm (see note below)					Date of Maximum 1-Hour Concentration				
	07	06	05	04	03	07	06	05	04	03	07	06	05	04	03
Chula Vista	.015	.017	.016	.016	.018	.082	.074	.071	.072	.102	10/24	10/27	11/15	5/2	10/20
El Cajon	.015	.018	.019	.019	.020	.065	.069	.079	.075	.130	10/24	10/27	11/23	1/13	10/28
Kearny Mesa	.015	.017	.017	.017	.018	.087	.091	.076	.085	.084	10/22	11/15	10/14	1/10	10/28
Escondido	.016	.017	.016	.018	.020	.072	.071	.076	.080	.135	11/28	11/22	10/13	10/8	10/28
Alpine	.010	.010	.011	.011	.014	.057	.057	.061	.063	.071	11/20	2/3	11/23	3/18	12/5
Downtown SD (12th)*	-	-	.020	.020	.021	-	-	.091	.094	.111	-	-	1/13	5/3	10/21
Downtown SD (Beardsley)*	.018	.021	.023			.098	.094	.100			10/24	12/7	11/15		
Camp Pendleton	.011	.011	.012	.012	.012	.068	.081	.077	.099	.095	1/25	5/12	1/14	1/13	1/15
Otay Mesa	.022	.024	.024	.023	.020	.101	.097	.109	.125	.148	6/20	12/7	9/6	9/1	10/18

\* Downtown San Diego monitoring station moved July 14, 2005, from 12th Avenue to Beardsley Street.

**Note:** The state standard was amended on February 22, 2007, to lower the 1-hour standard to 0.18 ppm and establish a new annual standard of 0.030 ppm. The new standards become effective March 20, 2008.

# Particulate Matter (PM<sub>10</sub>)

Annual Arithmetic Mean and Maximum 24-Hour Sample  
San Diego County 2003-2007

(PM<sub>10</sub> data for October 21-27, 2007, and October 2003 was designated as "exceptional event" data due to wildfires and is not included in this table.)

Station	Annual Arithmetic Mean Federal Standard 50 micrograms/m <sup>3</sup> ** State Standard 20 micrograms/m <sup>3</sup>					Maximum 24-Hour Sample*** Federal Standard 150 micrograms/m <sup>3</sup> State Standard 50 micrograms/m <sup>3</sup>					Date of Maximum 24-Hour Sample				
	07	06	05	04	03	07	06	05	04	03	07	06	05	04	03
Chula Vista	25	26	27	26	27	51	51	52	44	65	11/20	10/26	10/7	1/16	12/5
El Cajon	26	27	28	30	34	48	47	48	55	66	1/10	12/7	12/12	3/22	12/5
Kearny Mesa	22	22	22	25	29	44	42	44	44	49	11/20	6/16	10/13	4/29	11/29
Escondido	24	24	24	27	33	57	51	42	57	58	11/2	12/25	10/13	1/10	12/31
Downtown SD (12th)*	-	-	28	33	37	-	-	76	68	60	-	-	1/10	12/17	12/5
Downtown SD (Beardsley)*	30	34	37			55	71	77			4/12	12/7	9/1		
Otay Mesa	47	54	58	51	53	143	133	155	137	130	11/26	12/7	10/13	12/15	12/5

\* Downtown San Diego monitoring station moved July 14, 2005, from 12th Avenue to Beardsley Street.

\*\* Federal annual standard revoked December 17, 2006.

\*\*\* Concentrations are averaged over a 24-hour period.

# Particulate Matter (PM<sub>2.5</sub>)

Annual Average and Maximum 24-Hour Sample  
San Diego County 2003-2007

(PM<sub>2.5</sub> data for October 21-November 8, 2007, was designated as "exceptional event" data due to wildfires and is not included in this table.)

Station	Annual Average Federal Standard 15 micrograms/m <sup>3</sup> State Standard 12 micrograms/m <sup>3</sup>					Maximum 24-Hour Sample** Federal Standard 35 micrograms/m <sup>3</sup>					Date of Maximum 24-Hour Sample				
	07	06	05	04	03	07	06	05	04	03	07	06	05	04	03
Chula Vista	11	11	12	12	14	46	30	34	33	41	11/20	2/4	11/6	3/16	12/5
El Cajon	12	11	11	13	12	43	38	41	44	33	11/20	2/5	10/21	1/1	1/1
Kearny Mesa	10	11	10	11	12	31	26	29	29	30	11/20	2/4	3/11	3/19	1/12
Escondido	12	11	12	14	14	36	41	43	67	38	12/25	12/25	1/1	1/1	12/31
Downtown SD (12th)*	-	-	11	14	15	-	-	32	43	51	-	-	1/22	1/9	1/23
Downtown SD (Beardsley)*	12	13	16			52	63	44			12/11	12/5	11/15		

\* Downtown San Diego monitoring station moved July 14, 2005, from 12th Avenue to Beardsley Street.

\*\* Concentrations are averaged over a 24-hour period; as of December 17, 2006, standard changed from 65 to 35 micrograms per cubic meter.



Station	Annual Average in pphm Federal Standard 3 pphm					Maximum 24-Hour Concentration in pphm Federal Standard 14 pphm State Standard 4 pphm					Maximum 3-Hour Concentration in pphm Federal Standard 50 pphm **					Maximum 1-Hour Concentration in pphm State Standard 25 pphm				
	07	06	05	04	03	07	06	05	04	03	07	06	05	04	03	07	06	05	04	03
Chula Vista	0.3	0.3	0.3	0.3	0.4	0.4	0.6	0.5	1.5	0.9	0.7	1.3	0.9	2.1	2.1	1.2	1.7	1.6	4.2	3.0
Downtown SD (12th) *	-	-	0.2	0.4	0.4	-	-	0.6	0.9	0.8	-	-	1.9	2.0	1.9	-	-	4.0	4.2	4.0
Downtown SD (Beardsley) *	0.3	0.4	0.3			0.6	0.9	0.9			1.0	3.0	2.6			1.8	3.4	3.6		
Otay Mesa	0.3	0.3	0.5	0.6	0.3	0.9	1.1	1.3	1.4	1.1	1.7	2.1	3.1	2.8	1.8	2.7	4.5	4.0	4.5	2.5

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\*\* The 3-hour maximum is a secondary standard.

**Note:** Secondary standards set limits to protect public welfare, which includes visibility and vegetation. For most other pollutants, the secondary standards are the same as the primary standards that protect public health.