

**A Plan for Maintaining
The National Ambient Air Quality
Standards
For Particulate Matter (PM₁₀)
In Klamath Falls Urban Growth Boundary**

**Appendix D6-8
DESIGN VALUE AND 2015
PROJECTIONS**

**Adopted by the
Environmental Quality Commission
October 2002**

State of Oregon
Department of Environmental Quality
811 SW Sixth Avenue
Portland, OR 97204-1390

Daily Design Value				Annual Design Value			
Design Value	Peterson School	Wocus Marsh	Miller Island	Design Value	Peterson School	Wocus Marsh	Miller Island
Lognormal Distribution - 1 exp exceed	119.87	93.96	91.44	Lognormal Distribution - 1 exp exceed	23.02	26.69	21.00
Formula - Top 10%	95.16 $\mu\text{g}/\text{m}^3$	75.3 $\mu\text{g}/\text{m}^3$	74.3 $\mu\text{g}/\text{m}^3$	Formula - Top 10%	22.07 $\mu\text{g}/\text{m}^3$	20.2 $\mu\text{g}/\text{m}^3$	18.7 $\mu\text{g}/\text{m}^3$
Table Lookup	107 $\mu\text{g}/\text{m}^3$	83 $\mu\text{g}/\text{m}^3$	80 $\mu\text{g}/\text{m}^3$	Table Lookup	21.7 $\mu\text{g}/\text{m}^3$	18.8 $\mu\text{g}/\text{m}^3$	18.1 $\mu\text{g}/\text{m}^3$

Appendix E, Table 2. Klamath Falls UGB 1996 PM10 Season: Summary of Annual and Seasonal Emissions Growth from 1996 to 2015 with 10% increase in VMT

Category	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Tons per Year																				
Actuals																				
POINT SOURCES (1)	409	389	368	348	327	639	679	688	666	675	684	692	701	710	719	728	737	746	755	764
Percent of Category	29%	28%	27%	26%	25%	39%	40%	40%	39%	39%	39%	39%	39%	39%	39%	39%	39%	39%	39%	39%
AREA SOURCES	419	389	368	348	327	377	379	380	382	383	385	386	388	390	391	393	394	396	398	399
Percent of Category	30%	28%	27%	26%	25%	23%	22%	22%	22%	22%	22%	22%	21%	21%	21%	21%	21%	21%	21%	20%
NON-ROAD SOURCES	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Percent of Category	6%	6%	6%	6%	7%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
MOBILE SOURCES	509	519	529	538	548	558	567	577	586	596	606	615	625	634	644	654	663	673	682	692
Percent of Category	36%	38%	39%	41%	43%	34%	33%	33%	34%	34%	34%	34%	35%	35%	35%	35%	35%	35%	35%	35%
TOTAL ALL SOURCES	1,418	1,378	1,348	1,318	1,287	1,659	1,711	1,733	1,723	1,744	1,785	1,786	1,807	1,829	1,850	1,871	1,892	1,913	1,934	1,956
Total Percent	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Lbs per Day																				
Actuals																				
POINT SOURCES (1)	2516	2300	2085	1870	1654	4431	4662	4724	4617	4679	4741	4803	4865	4927	4989	5051	5113	5175	5237	5299
Percent of Category	21%	20%	19%	18%	16%	34%	35%	35%	34%	34%	34%	34%	34%	34%	34%	34%	34%	34%	34%	34%
AREA SOURCES	5,338	4,998	4,660	4,322	4,336	4,350	4,364	4,378	4,393	4,407	4,421	4,435	4,449	4,463	4,477	4,492	4,506	4,520	4,534	4,548
Percent of Category	45%	44%	43%	41%	42%	33%	32%	32%	32%	32%	32%	32%	31%	31%	31%	31%	31%	30%	30%	30%
NON-ROAD SOURCES	1,307	1,324	1,341	1,357	1,374	1,391	1,408	1,424	1,441	1,458	1,475	1,491	1,508	1,525	1,542	1,558	1,575	1,592	1,609	1,625
Percent of Category	11%	12%	12%	13%	13%	11%	10%	10%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%
MOBILE SOURCES	2,742	2,794	2,845	2,897	2,949	3,001	3,052	3,104	3,156	3,208	3,259	3,311	3,363	3,415	3,466	3,518	3,570	3,622	3,673	3,725
Percent of Category	23%	24%	26%	26%	29%	23%	23%	23%	23%	23%	23%	23%	24%	24%	24%	24%	24%	24%	24%	25%
TOTAL ALL SOURCES	11,903	11,415	10,931	10,446	10,314	13,172	13,486	13,631	13,606	13,751	13,896	14,040	14,185	14,330	14,474	14,619	14,764	14,908	15,053	15,198
Total Percent	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Annual Mobile Source Growth as Generated from Season Day Emissions Above																				
Mobile Source Growth	1.0188729	1.037746	1.055619	1.075492	1.09436445	1.113237	1.1321102	1.150983	1.169856	1.188729	1.207602	1.226475	1.245348	1.26422	1.283093	1.30196624	1.320839	1.33971202	1.359	1.378

Mobile Source VMT 1996 through 2015 plus 10%VMT

Category	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Associated VMT	187,317,689	191,190,105	195,062,521	198,934,937	202,807,353	206,679,769	210,552,185	214,424,601	218,297,017	222,169,432	226,041,848	229,914,264	233,786,680	237,659,096	241,531,512	245,403,928	249,276,344	253,148,760	257,021,176	260,893,592
MOBILE SOURCES	509	519	529	538	548	558	567	577	586	596	606	615	625	634	644	654	663	673	683	692
Year per Year																				
Category	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Associated VMT	513,199	523,809	534,418	545,027	555,637	566,246	576,855	587,465	598,074	608,683	619,293	629,902	640,511	651,121	661,730	672,340	682,949	693,558	704,168	714,777
MOBILE SOURCE	2,742	2,794	2,845	2,897	2,949	3,001	3,053	3,104	3,156	3,208	3,260	3,311	3,363	3,415	3,467	3,518	3,570	3,622	3,674	3,725
Lbs per Day																				

Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Mobile Source Growth	1.01882939	1.037738781	1.056638171	1.075517562	1.094396952	1.113276343	1.132155733	1.151035123	1.169914514	1.188793904	1.207673295	1.226552685	1.245432076	1.264311466	1.283190856	1.302070247	1.320949637	1.339829028	1.358708418	

cic updated 11/28/01 for Klamath Falls PM10

Mobile Source VMT 1996 through 2015

Category	1996	1997	1998	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Associated VMT	170,244,808	173,809,186	177,329,564	180,849,943	184,370,321	187,890,699	191,411,077	194,931,455	198,451,833	201,972,211	205,492,589	209,012,968	212,533,346	216,053,724	219,574,102	223,094,480	226,614,858	230,135,236	233,655,614	237,175,993	
MOBILE SOURCES	463	472	481	489	498	507	516	524	533	542	551	559	577	585	594	603	612	620	628	636	639
Tons per Year																					
Category	1996	1997	1898	1898	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Associated VMT	466,345	476,190	483,834	493,479	505,124	514,769	524,414	534,059	543,704	553,349	562,993	572,638	582,283	591,928	601,573	611,218	620,863	630,507	640,152	649,797	
MOBILE SOURCE	2,493	2,540	2,587	2,634	2,681	2,728	2,775	2,822	2,869	2,916	2,963	3,010	3,057	3,104	3,151	3,198	3,245	3,292	3,339	3,386	
Lbs per Day																					

Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Mobile Source Growth	1.01847289	1.03774578	1.05661867	1.07549156	1.09436445	1.11323734	1.13211023	1.15098312	1.16985601	1.1887289	1.20760179	1.22647468	1.24534757	1.26422046	1.28309335	1.30196624	1.32083913	1.33971202	1.35858491	

cdc updated 11/28/01 for Klamath Falls PM10

Klamath Falls UGB 1996 PM10 Season: Summary of Annual and Seasonal Emissions Growth and Design Values from 1996 to 2015 Including 10% more VMT

Category	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Tons per Year																				
E.I. TOTAL ALL SOURCES	1,372	1,378	1,348	1,318	1,287	1,659	1,711	1,733	1,744	1,765	1,786	1,807	1,829	1,850	1,871	1,892	1,913	1,934	1,956	
Annual NAAQS	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Annual Predicted Ambient Concentration	21.0	21.1	20.8	20.6	20.3	23.4	23.8	24.0	23.9	24.1	24.2	24.4	24.6	24.7	24.9	25.1	25.3	25.4	25.6	25.8
Background DV Annual	10																			
Difference	11																			
DV-bkgd*cur EI/1998 EI	11.15	11.20	10.96	10.71	10.46	13.49	13.91	14.09	14.00	14.17	14.35	14.52	14.69	14.86	15.03	15.21	15.38	15.55	15.72	15.90
Bkgd added back	21.03	21.09	20.84	20.59	20.35	23.37	23.79	23.97	23.88	24.06	24.23	24.40	24.57	24.75	24.92	25.09	25.26	25.43	25.61	25.78
DV w/o background	21	21.13	20.67	20.20	19.74	25.44	26.24	26.57	26.41	26.74	27.06	27.39	27.71	28.04	28.36	28.69	29.01	29.33	29.66	29.99
Lbs per Day																				
E.I. TOTAL ALL SOURCES	11,654	11,415	10,931	10,446	10,314	13,172	13,486	13,631	13,606	13,751	13,896	14,040	14,185	14,330	14,474	14,619	14,764	14,908	15,053	15,198
Daily NAAQS	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150
Daily Predicted Ambient Concentration	95.2	93.9	91.3	88.7	88.0	103.4	105.0	105.8	105.7	106.5	107.2	108.0	108.8	109.6	110.4	111.1	111.9	112.7	113.5	114.3
Background DV Annual	32																			
Difference	63																			
DV-bkgd*cur EI/1998 EI	62.76	61.48	58.87	56.26	55.55	70.94	72.63	73.41	73.28	74.06	74.84	75.62	76.40	77.18	77.95	78.73	79.51	80.29	81.07	81.85
Bkgd added back	95.17	93.89	91.28	88.67	87.96	103.35	105.04	105.82	105.69	106.47	107.25	108.03	108.81	109.59	110.37	111.14	111.92	112.70	113.48	114.26
DV w/o Background	95.2	93.23	89.27	85.31	84.23	107.58	110.14	111.32	111.12	112.30	113.48	114.67	115.85	117.03	118.21	119.39	120.57	121.76	122.94	124.12

Appendix E, Table 2. Klamath Falls UGB 1996 PM10 Season: Summary of Annual and Seasonal Emissions Growth from 1996 to 2015

Category	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Tons per Year																				
Actuals																				
POINT SOURCES (1)	409	389	368	348	327	639	679	688	666	675	684	692	701	710	719	728	737	746	755	764
Percent of Category	30%	29%	28%	27%	25%	40%	41%	41%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%
AREA SOURCES	419	395	385	374	375	377	379	380	382	383	385	386	388	390	391	393	394	396	398	399
Percent of Category	31%	30%	29%	29%	29%	23%	23%	23%	23%	23%	23%	22%	22%	22%	22%	22%	22%	21%	21%	21%
NON-ROAD SOURCES	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Percent of Category	6%	6%	6%	6%	7%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
MOBILE SOURCES	463	472	481	489	498	507	516	524	533	542	551	559	568	577	585	594	603	612	620	629
Percent of Category	34%	35%	37%	36%	39%	32%	31%	31%	32%	32%	32%	32%	32%	33%	33%	33%	33%	33%	33%	33%
TOTAL ALL SOURCES	1,372	1,338	1,316	1,295	1,286	1,608	1,660	1,680	1,669	1,690	1,710	1,730	1,751	1,771	1,791	1,812	1,832	1,852	1,872	1,893
Total Percent	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Lbs per Day																				
Actuals																				
POINT SOURCES (1)	2516	2390	2085	1870	1654	4431	4662	4724	4617	4679	4741	4803	4865	4927	4989	5051	5113	5175	5237	5299
Percent of Category	22%	21%	20%	18%	16%	34%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	36%
AREA SOURCES	5,338	4,998	4,660	4,322	4,336	4,350	4,364	4,378	4,393	4,407	4,421	4,435	4,449	4,463	4,477	4,492	4,506	4,520	4,534	4,548
Percent of Category	46%	45%	44%	42%	43%	34%	33%	33%	33%	33%	33%	32%	32%	32%	31%	31%	31%	31%	31%	31%
NON-ROAD SOURCES	1,307	1,324	1,341	1,357	1,374	1,391	1,408	1,424	1,441	1,458	1,475	1,491	1,508	1,525	1,542	1,558	1,575	1,592	1,609	1,625
Percent of Category	11%	12%	13%	13%	14%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%
MOBILE SOURCES	2,493	2,540	2,587	2,634	2,681	2,728	2,775	2,822	2,869	2,916	2,963	3,010	3,057	3,104	3,151	3,198	3,245	3,292	3,339	3,386
Percent of Category	21%	23%	24%	26%	27%	21%	21%	21%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	23%	23%
TOTAL ALL SOURCES	11,454	11,162	10,672	10,183	10,045	12,899	13,208	13,348	13,319	13,459	13,599	13,739	13,879	14,019	14,159	14,299	14,439	14,579	14,719	14,859
Total Percent	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Annual Mobile Source Growth as Generated from Season Day Emissions Above																				
Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Mobile Source Growth	1.0188729	1.037746	1.056619	1.075492	1.09436445	1.113237	1.1321102	1.150983	1.169856	1.188729	1.207602	1.226475	1.245348	1.264221	1.283093	1.30196624	1.320839	1.339712	1.358585	1.377458

Appendix E, Table 2. Klamath Falls UGB 1996 PM10 Season: Summary of Seasonal Emissions Growth from 1996 to 2015

Seasonal	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Lbs per Day																				
Actuals																				
Category																				
POINT SOURCES (1)	2,516	2,300	2,085	1,870	1,654	4,431	4,662	4,724	4,617	4,679	4,741	4,803	4,865	4,927	4,989	5,051	5,113	5,175	5,237	5,299
Percent of Category	22%	21%	20%	18%	16%	34%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%	36%
AREA SOURCES	5,338	4,998	4,660	4,322	4,336	4,350	4,364	4,378	4,393	4,407	4,421	4,435	4,449	4,463	4,477	4,492	4,506	4,520	4,534	4,548
Percent of Category	46%	45%	44%	42%	43%	34%	33%	33%	33%	33%	33%	32%	32%	32%	32%	31%	31%	31%	31%	31%
NON-ROAD SOURCES	1,307	1,324	1,341	1,357	1,374	1,391	1,408	1,424	1,441	1,458	1,475	1,491	1,508	1,525	1,542	1,558	1,575	1,592	1,609	1,625
Percent of Category	11%	12%	13%	13%	14%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%
MOBILE SOURCES	2,493	2,540	2,587	2,634	2,681	2,728	2,775	2,822	2,869	2,916	2,963	3,010	3,057	3,104	3,151	3,198	3,245	3,292	3,339	3,386
Percent of Category	21%	23%	24%	26%	27%	21%	21%	21%	22%	22%	22%	22%	22%	22%	22%	22%	22%	23%	23%	23%
TOTAL ALL SOURCES	11,654	11,162	10,672	10,183	10,045	12,899	13,208	13,348	13,319	13,459	13,599	13,739	13,879	14,019	14,159	14,299	14,439	14,579	14,719	14,859
Total Percent	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

1) Point source emissions are based on estimated actuals until 2001 when the PSELs were used because the annual reports have not arrived for future years.

Appendix E, Table 1. Klamath Falls UGB 1996 PM10 Season: Summary of Annual Emissions Growth from 1996 to 2015

Annual	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Tons per Year																				
Category	Actuals																			
POINT SOURCES (1)	409	389	368	348	327	639	679	688	666	675	684	692	701	710	719	728	737	746	755	764
Percent of Category	30%	29%	28%	27%	25%	40%	41%	41%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%
AREA SOURCES	419	395	385	374	375	377	379	380	382	383	385	386	388	390	391	393	394	396	398	399
Percent of Category	31%	30%	29%	29%	29%	23%	23%	23%	23%	23%	23%	22%	22%	22%	22%	22%	22%	21%	21%	21%
NON-ROAD SOURCES	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Percent of Category	6%	6%	6%	6%	7%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
MOBILE SOURCES	463	472	481	489	498	507	516	524	533	542	551	559	568	577	585	594	603	612	620	629
Percent of Category	34%	35%	37%	38%	39%	32%	31%	31%	32%	32%	32%	32%	32%	33%	33%	33%	33%	33%	33%	33%
TOTAL ALL SOURCES	1,372	1,338	1,316	1,295	1,286	1,608	1,660	1,680	1,669	1,690	1,710	1,730	1,751	1,771	1,791	1,812	1,832	1,852	1,872	1,893
Total Percent	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

1) Point source emissions are based on estimated actuals until 2001 when the PSELS were used because the annual reports have not arrived for future years.