

August 20, 2014 0111910030

Mr. Robert Hull Senior AQ Engineer Bay Area Air Quality Management District 939 Ellis Street San Francisco, CA 94109

SUBJECT: RESPONSE TO QUESTIONS ABOUT LEHIGH CUPERTINO HRA

Dear Ted:

The purpose of this letter is to respond to the two comment letters from Mr. Frank R. Freedman, as requested by the Bay Area AQMD. These include the first letter ("Letter A") dated June 2, 2014 and the second letter ("Letter B") dated July 16, 2014. Each of the items will be discussed in turn.

In Letter B, there is a request to provide a protocol for HRA changes made as a function of the comments received. AQMD has also made this request. Thus, in this letter response, the protocol (explanation of methods used) is incorporated in each response item below.

Item #1—Wind gust speed for wind erosion calculations (Item #1 in Letter B, per Item A3 in Letter A, dated June 2, 2014—Note that the first two items in Letter A are being addressed by BAAQMD.)

It has been confirmed that the wind gust speed calculations used in wind erosion emission estimates incorporated in the December 2013 HRA used an adjustment factor corresponding to a wind monitor elevation that was not consistent with the measurement height for the dataset used. That dataset was obtained from an offsite monitoring network whose data was posted on a website. In order to correct this wind monitor elevation adjustment factor, the meteorological monitoring data is required, and, this original data is no longer available. However, onsite wind data, a preferred source, is available. The use of this onsite data was proposed to BAAQMD and, hence, per instructions received from BAAQMD, the on-site wind gust data for July 1, 2010 through June 30, 2011 has now been used for wind gust speed calculations.



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Item #5—Operating hours for quarry roads and other roads (Item #5 in Letter B, dated July 16, 2014)

As of 2009, the quarry only operated five days per week, and this operating schedule was taken into account in wind erosion calculations. It is now assumed that all plant sections, including the quarry, operate 7 days/week, and thus the wind erosion calculations have been revised accordingly.

Both of these changes (wind gust correction and operating hours correction) have been incorporated in the wind erosion calculations, and the resulting change in emission factors is shown in the following table. These changes have been incorporated in the updated HRA emission rate calculations.

Parameter	Units	2013 HRA (Factor for Monitor Height Applied)	2010 On-Site Met Data Weekdays Only (No Factor)	2010 On-Site Met Data All Days (No Factor)
Wind erosion, unpaved roads	tons/acre*yr	0.73	0.73	1.2
Wind erosion, bauxite stockpile	tons/yr	0.074	0.078	0.14

Note,

1. Stockpile emissions a function of stockpile geometry. Example shown above is for the bauxite stockpile.

Item #2—Wind speed for material handling from stockpiles emission calculations (Item #2 in Letter B, dated July 16, 2014):

The same rationale for use of the onsite wind data set is applicable for this Item as for Item #1 above. This change has been incorporated in the updated HRA emission rate calculations.

Parameter	Units	2013 HRA (Factor for Monitor	2010 On-Site Met Data All Days
		Height Applied)	(No Factor)
Material handling EF	lb/ton	1.88E-04	5.52E-03



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Item #3—Benzene emission factor recalculation (Item #3 in Letter B):

The results from kiln benzene source tests in 2009, 2010, and 2012, which were used in the December 2013 HRA, were re-evaluated for use in developing a benzene emission factor with the units "pounds of benzene emitted per short ton of clinker produced". These source test results contained all of the data necessary to prepare such a factor. The results were checked for data abnormalities, and then used to calculate this factor. The results of this recalculation indicate a benzene emission rate which is higher than that used in the December 2013 HRA. The detailed results are contained in an attachment to this letter. This change has been incorporated in the updated HRA emission rate calculations.

Item #4—Hexavalent chromium emissions from feed materials and stockpiles (Item #4 in Letter B):

Under the AB2588 program, in cases where lab test results show non-detect values for a certain compound (in this case, hexavalent chromium) in a specified material, and engineering judgment and experience is that the compound will not be present in the material because of its production and handling, it is acceptable to use a zero value for the compound for that material. Because hexavalent chromium is generally only formed from trivalent chromium during combustion at high temperatures or under other severe oxidizing conditions, it is unlikely that hexavalent chromium will be present in the following raw materials because they have not previously been exposed to those conditions: Quarry overburden, limestone (all grades), iron ore, coal, coke, gypsum, and slag. Thus, no changes have been made to the updated HRA emission calculations for these materials.

Item #6—Diesel PM emission factor for emergency generator (Item #6 in Letter B):

It has been confirmed that the diesel emission factor used in the December 2013 HRA came from AP-42 Table 3.4-2 rather than 3.4-1. This is because the AP-42 section instructs the reader to use Table 3.4-2 for PM emission factor. Therefore, the emission factor selected was appropriate and acceptable to use. Thus, no changes have been made to the updated HRA emission calculations for these sources.

Item #7—Diesel emissions from mobile sources (Item #7 in Letter B)—To be addressed by BAAQMD



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Item #8—Request for protocol (Item #8 in Letter B)— The above explanations have incorporated detailed descriptions of the methods used to evaluate topics of interest, and where required, any changes made to values used in the updated HRA emission calculations.

If you have questions regarding this matter, please call Anne McQueen with AMEC Environment & Infrastructure at (949) 574-7082.

Very truly yours,

Caryn akelly

Caryn A. Kelly Senior Toxicologist

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Anne McQueen, Ph.D., P.E. Senior Associate Engineer

Enclosures:

- 1. 2010 Lehigh On-Site Met Data (July 1, 2010 through June 30, 2011)
- 2. Wind Erosion Emission Factor Calculation for Unpaved Road and Bauxite Stockpile Using 2010 Lehigh On-Site Met Data
- 3. Material Handling Emission Factor Calculations
- 4. Stationary Emergency Diesel Generator Emission Factor Support
- 5. Kiln Benzene emission factor calculation
- 6. Updated 2013 HRA emission rate tables for the kiln and fugitive sources

8/15/2014

Met Data

COMPARISON OF WIND DATA USED IN 2008 CEIR AND LEHIGH ON-SITE DATA SUNNYVALE, CA

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5 17.212.010 6 17.8054 7.22.2010 7.2.3555 7.2.3.2010 7.2.35516 7.2.4.2010 7.2.3555 7.2.2.2010 7.2.3555 7.2.2.2010 7.2.35510 7.2.4.2010 7.2.35510 7.2.4.2010 7.2.5010 7.2.5.2010 7.2.5010 7.2.5.2010 7.2.5010 7.2.5.2010 7.2.5010 7.2.5.2010 2.5.6355 7.2.5.0010 2.5.6355 8.2.2010 2.5.6355 8.2.2010 2.5.6355 8.2.2010 2.5.6355 8.2.2010 2.5.6355 8.7.2010 2.5.6355 8.7.2010 2.5.6355 8.7.2010 2.5.511 8.7.2010 2.5.511 8.7.2010 2.5.511 8.7.2010 2.5.511 8.7.2010 2.5.511 8.7.2010 2.5.511 8.7.2.2010 2.5.511 8.7.2.2010 2.5.511 8.7.2.2010 <t< td=""><td>1/21/2008</td><td>1100.24</td><td>7/20/2010</td><td>13.69</td><td>4.58</td></t<>	1/21/2008	1100.24	7/20/2010	13.69	4.58
8/3456 7/22/2010 8/3456 7/22/2010 8/3555 7/22/2010 3/3166 7/22/2010 3/3165 7/22/2010 3/3165 7/22/2010 3/3165 7/22/2010 3/3165 7/22/2010 3/3165 7/22/2010 3/32010 7/27/2010 256342 7/31/2010 26,013 7/31/2010 26,013 8/3/2010 53,655 8/1/2010 53,655 8/1/2010 20,1242 8/3/2010 53,655 8/1/2010 53,655 8/1/2010 20,1242 8/1/2010 21,1251 8/1/2010 21,1352 8/1/2010 21,1352 8/1/2010 24,6553 8/1/2010 11,18952 8/1/2010 24,6553 8/1/2010 11,2952 8/1/2010 11,8952 8/1/2010 11,8952 8/1/2010 11,8952 8/1/2010	8006/26/1	1610.62	7/21/2010	13.9	4.57
6 31.3166 7.23.2010 31.3166 7.23.2010 31.3166 7.23.2010 32.5011 7.25.2010 32.5011 7.25.2010 33.5535 7.25.2010 25.6121 7.25.2010 25.6328 7.25.0010 25.6328 7.25.0010 25.6328 7.25.0010 25.6328 7.25.0010 25.6326 8.7.2010 23.6566 8.7.2010 23.6567 8.7.2010 23.6567 8.7.2010 23.6356 8.7.2010 24.5601 8.7.2010 25.6328 8.7.2010 26.328 8.7.2010 26.328 8.7.2010 26.328 8.7.2010 26.328 8.7.2010 26.328 8.7.2010 26.328 8.7.2010 26.328 8.7.2010 26.328 8.7.2010 27.8852 8.7.2010 28.7.2010 8.7.22010 21.5653 8.7.1.2010 <td>1/23/2008</td> <td>17.8952</td> <td>7/22/2010</td> <td>15.75</td> <td>4.93</td>	1/23/2008	17.8952	7/22/2010	15.75	4.93
31.516 7/24/2010 33.5555 7/26/2010 42.5011 7/26/2010 33.5555 7/26/2010 42.5011 7/26/2010 26.8428 7/26/2010 26.8428 7/26/2010 26.8428 7/26/2010 26.8428 7/26/2010 26.8428 7/30/2010 26.8428 7/30/2010 20.3271 7/31/2010 20.3271 8/2/2010 20.3271 8/2/2010 20.3281 8/2/2010 20.3291 8/2/2010 20.3291 8/2/2010 20.3292 8/1/2/2010 20.3291 8/2/2010 20.3291 8/1/2/2010 20.3291 8/1/2/2010 21.321 8/1/2/2010 21.5653 8/1/2/2010 21.5653 8/1/2/2010 17.8552 8/1/2/2010 17.8552 8/1/2/2010 17.8552 8/1/2/2010 17.8552 8/1/2/2010 17.8552 8/1/2/20	1/2//2000	8.9476	7/23/2010	15.48	4 79
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26.8428 86.2010 26.8426 8.67.2010 20.1321 8.67.2010 20.1321 8.67.2010 20.1321 8.67.2010 17.8952 8.17.2010 17.8952 8.17.2010 17.8952 8.17.2010 42.5011 8.13.2010 17.8952 8.13.2010 17.8952 8.15.2010 17.8953 8.15.2010 15.6583 8.15.2010 15.6583 8.16.2010 15.6583 8.17.2010 20.1311 8.19.2010 15.6583 8.16.2010 17.8952 8.17.2010 20.1311 8.19.2010 17.8952 8.19.2010 17.8952 8.19.2010 20.1231 8.19.2010 17.8952 8.19.2010 21.8623 8.19.2010 20.3014 8.19.2010 21.87.2010 2.29.2010 40.978 8.22.2010	8002/6/2	20.1321	8/5/2010	15.93	4 30
24.6659 8/7/2010 20.1321 8/9/2010 26.428 8/9/2010 26.428 8/9/2010 11.8952 8/1/2010 11.8952 8/1/2010 11.8952 8/1/2010 11.8952 8/1/2010 11.8952 8/1/2010 24.6059 8/1/2010 12.5642 8/1/2010 12.5653 8/15/2010 15.6533 8/15/2010 15.6533 8/15/2010 15.6533 8/15/2010 17.8952 8/19/2010 17.8952 8/19/2010 17.8952 8/19/2010 17.8952 8/19/2010 17.8952 8/19/2010 20.13 8/19/2010 17.8952 8/19/2010 20.13 8/19/2010 20.5010 8/19/2010 20.5010 8/19/2010 20.5010 8/19/2010 20.5010 8/19/2010 20.5010 8/19/2010 20.5010 8/12/2010	8007/0/2	26.8428	8/6/2010	15.12	4 5.8
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1.655 8/1/12010 24.655 8/1/12010 42.5011 8/122010 42.5011 8/122010 10.2642 8/14/2010 11.15653 8/14/2010 15.6553 8/14/2010 15.6553 8/16/2010 15.6553 8/16/2010 15.6553 8/19/2010 17.8952 8/19/2010 17.8952 8/19/2010 17.8952 8/19/2010 17.8952 8/19/2010 20.1321 8/19/2010 17.8952 8/19/2010 20.12610 8/19/2010 20.12810 8/19/2010 45.749 8/13/2010 24.738 8/12/2010	2/11/2008	1.1.8952	8/10/2010	13.36	4.51
4.7.5003 8/12/2010 4.2.5003 8/12/2010 4.2.642 8/12/2010 17.8952 8/14/2010 15.6583 8/16/2010 15.6583 8/17/2010 15.6583 8/17/2010 17.8952 8/19/2010 17.8952 8/19/2010 17.8952 8/19/2010 17.8952 8/19/2010 17.8952 8/19/2010 17.8952 8/19/2010 17.8952 8/19/2010 17.8952 8/19/2010 17.8952 8/19/2010 41.738 8/22/2010 44.738 8/22/2010	2/12/2008	170687/1	8/11/2010	19.24	5.11
40.26471 8/13/2010 40.2647 8/14/2010 17.8952 8/14/2010 15.6563 8/17/2010 15.6563 8/17/2010 15.6563 8/17/2010 15.6563 8/17/2010 15.6563 8/17/2010 15.6563 8/17/2010 15.6563 8/17/2010 17.8952 8/19/2010 17.8952 8/19/2010 17.8952 8/19/2010 17.8952 8/19/2010 17.8952 8/19/2010 17.8952 8/19/2010 17.8952 8/19/2010 46.9749 8/22/2010 29.0797 8/22/2010 44.738 8/22/2010	2/13/2008	24,0039	8/12/2010	15.18	4.46
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15.6533 8/17/2010 15.6533 8/17/2010 20.1321 8/18/2010 17.8952 8/19/2010 17.8952 8/19/2010 17.8952 8/19/2010 46.9449 8/21/2010 29.0797 8/22/2010 44.738 8/22/2010	2/16/2008	15,6583	8/15/2010	14.97	4.26
20.1321 80.17.2010 17.8952 8.19.2010 17.8952 8.19.2010 17.8952 8.19.2010 45.349 8.202010 29.0797 8.222010 44.738 8.232010	2/17/2008	15.6583	01 07/01/0	13.75	4.35
17.8952 8/192010 17.8952 8/192010 46.9749 8/202010 29.0747 8/22/2010 44.738 8/22/2010	2/18/2008	20.1321	0/11/2010	14.08	4.61
17,8952 87202010 46.9749 82712010 29.0797 87272010 44.738 8/23/2010	2/19/2008	17.8952	8/10/2010	10.32	4.40
46.9749 82712010 29.0797 82212010 44.738 82212010	2/20/2008	17.8952	8/20/2010	AC-71	4.22
29.0797 8.2222010 44.738 8.222010 8.2372010	2/21/2008	46.9749	8/21/2010	10.10	4.42
44.738 8/23/2010	2/22/2008	29.0797	8/22/2010	20.4	4.20
	2/23/2008	44.738	8/23/2010	16.38	1 76
44.738 8/24/2010	512412008	44.738	8/24/2010	15 78	0.14

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COMPARISON OF WIND DATA USED IN 2008 CEIR AND LEHIGH ON-SITE DATA SUNNYVALE, CA

	Per 2008 CEID Inoto 11		The second se	the second se
Date		Date	Peringin Data (/14 (note 2)	2)
2/22/2008		8/25/2010	A Jono	HYM BVH
2/26/2008		8/26/2010	14.	4.36
2/27/2008	20 1321	0102/02/0		3.95
2/28/2008		01.07/170	14.91	3.75
2/29/2008	22 3401	8/28/2010		5.23
3/1/2008		8/29/2010		4.76
3/2/2008		8/30/2010	19.6	5.10
3/3/2008	00:000	8/31/2010	19.21	4.70
800C/V/2		9/1/2010	17.3	5 06
3/5/2000		9/2/2010	176	00.0
9007/c/c		9/3/2010	0.1.	0.03
3/6/2008	20.1321	01/02/010	13.42	3.53
3/7/2008	and a second	01/1/20110	10.8	3.22
3/8/2008		9/5/2010	15.6	3.87
3/0/2008	20.0420	9/6/2010	16.55	5.35
0000/01/0		9/7/2010	16.14	101
2010/01/01	24.6059	9/8/2010	1100	- 1. C
3/11/2008	24.6059	0/0/0/0	19.02	9.71
3/12/2008	29.0797	0107/6/6	57.07	5.19
3/13/2008	42 5011	0107/01/6	16.67	4.51
3/14/2008	1100.27	9/11/2010	16.79	5.76
3/15/2008	30.02/3	9/12/2010	14.29	3.79
0000/91/5	42.5011	9/13/2010	13.81	A 40
0101000	46.9749	9/14/2010	13.6	4 45
0007/11/0	24.6059	9/15/2010	14 68	of t
3/18/2008	24.6059	Q/16/2010	00'1	10.4
3/19/2008	31.3166	0/12/010	02.01	4.25
3/20/2008	31.3166	0/12/11/0	11.12	3.57
3/21/2008	313166	0102/01/0	56.01	4.63
3/22/2008	22 360	01.07/81/8	19.6	4.75
3/23/2008	20.460	9/20/2010	19.21	4.62
3/24/2008	00777	9/21/2010	24.96	6.27
3/25/2008	20.0420	9/22/2010	22.07	5.96
3/26/2008	1910.02	9/23/2010	16.14	4.65
3/27/2008	1100.24	9/24/2010	14.29	5.40
3/28/2008	0010/10	9/25/2010	14.41	4.67
3/29/2008	800.77	9/26/2010	14.5	4.59
3/30/08/8	6566.55	9/27/2010	15.12	5.85
3/31/000	51.4487	9/28/2010	13.84	02.0
0002/10/0	20.1321	9/29/2010	13.33	1 13
0002/174	33.5535	9/30/2010	12 71	Pri e
4/2/2008	22.369	10/1/2010	13.04	0.44
4/3/2008	29.0797	10/2/2010	11 201	0.00
4/4/2008	26.8428	10/3/2010	26.07	10.0
4/2/2/0/8	40.2642	10/4/2010	28.45	0.10
4/6/2008	46.9749	10/5/2010	100.10	0.03
4///2008	29.0797	10/6/2010	01.00	4
4/8/2008	38.0273	10/7/0040	20.13	4.50
4/9/2008	29.0797	10/02/1/01	14.68	4.39
4/10/2008	26.84281	1010/070101	15.33	4.61
4/11/2008	20.1321	10/9/2010	14.53	3.98
4/12/2008	22 360	01/02/01/01	12.95	3.25
4/13/2008	26.8428	0107/11/01	14.65	5.20
4/14/2008	40.2642	10/12/2010	19.83	7.81
4/15/2008	35 7004	0102/21/01	13.51	5.40
4/16/2008	24 6059	10/14/2010	12.74	3.84
4/17/2008	290792	0107/01/01	12.77	3.56
4/18/2008	24.6059	01/02/01/01	12.11	3.41
4/19/2008	53.6856	10/11/1/01	17.15	3.27
		01/02/01/01	14.5	4 06

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COMPARISON OF WIND DATA USED IN 2008 CEIR AND LEHIGH ON-SITE DATA SUNNYVALE, CA

	Per 2008 CEIR (note 1)			
Date	GustSneedMaxMpH	renign	Lenign Data 7/14 (note 2)	2)
4/20/2008	40.764.70	Date	Gust MPH	Avg MPH
4/21/2008	7407.042	10/19/2010	12.47	3.51
4/22/2008	001010	10/20/2010	13.54	3.49
4/23/2008	35./904	10/21/2010	19.89	5.39
4/24/2008	35.7904	10/22/2010	15.18	3.86
A/76/2008	26.8428	10/23/2010	27.65	8 22
0002/02/1	26.8428	10/24/2010	38.59	70.0
0007/07/14	29.0797	10/25/2010	11 22 44	0.4.0
4/2//2008	26.8428	10/26/2010	11.02	27.0
4/28/2008	26.8428	10/22/2010	24.22	7.96
4/29/2008	46.9749	10/08/0101	10.10	90.0
4/30/2008	35.7904	10/00/00101	07.00	(.93
5/1/2008	31.3166	10/2/2/10	34.68	5.28
5/2/2008	24 6050		21.98	5.70
5/3/2008	000011	10/31/2010	14.2	5.87
5/4/2008	35 7004	0102/1/11	16.05	5.10
5/5/2008	+001:00 400 CC	11/2/2010	17.06	5.39
5/6/2008	202.22	11/3/2010	12.2	4.19
5/7/2008	6000'47	11/4/2010	13.72	4.00
5/8/2008	16/0.67	11/5/2010	20.76	3.64
E/0/2000	22.369	11/6/2010	22.37	V OV
0007/6/0	29.0797	11/7/2010	23 60	+0.4
	24.6059	11/8/2010	10.00	17.1
8/11/2	26.8428	11/0/010	10.42	1.0.7
9/12/2008	35.7904	11/10/010	24.01	90.0
5/13/2008	24.6059	11/11/2010	14.02	6.86
5/14/2008	24.6059	11/12/10/01/01	22.34	7.61
5/15/2008	26.8428	14/10/01/01	/0.01	5.68
5/16/2008	26.8.728	0107/01/11	24.34	7.32
5/17/2008	1011201	0102/41/11	24.16	7.03
5/18/2008	1701-02	11/15/2010	24.96	7.39
5/19/2008	8000-157	11/16/2010	15.27	7.01
5/20/2008	20.1321	11/17/2010	13.96	5.37
5/21/2008	10.140	11/18/2010	11.9	3.64
5/22/2008	49.2118	11/19/2010	25.14	5.18
5/23/2008	G778'00	11/20/2010	31.17	7 09
1000310310	33.5535	11/21/2010	00 10	

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COMPARISON OF WIND DATA USED IN 2008 CEIR AND LEHIGH ON-SITE DATA SUNNY/ALE, CA

	GustSpeedMaxmPH 20.1321 26.328 35.7904 47.601	11/22/2010	e Gust MPH	Avg MPH
5/25/2008 5/26/2008 5/26/2008 5/28/2008 5/29/2008 5/29/2008 6/1/20	20.1321 26.8428 35.7904 40.2642 42.5011	11/22/2010	24.55	E 73
5/26/2008 5/26/2008 5/27/2008 5/21/2008 5/21/2008 5/31/2008 5/31/2008 6/3/2	26.8428 35.7904 40.2642 42.5011			
5/22/2008 5/22/2008 5/29/2008 5/29/2008 5/31/2008 6/1/200	35.7904 40.2642 42.5011	11/23/2010	24 84	2.02
5/22/2008 5/29/2008 5/39/2008 5/31/2008 6/1/2008	40.2642	11/24/2010	22.1	7 8.4
5/202008 5/202008 5/30/2008 6/1/2008 6/	42 5011	11/25/2010	14 35	28.3
5/3/2008 5/3/2008 5/3/2008 6/3/2008 6/3/2008 6/3/2008 6/3/2008 6/3/2008 6/3/2008 6/3/2008 6/3/2008 6/3/2008 6/3/2008 6/3/2008 6/12/2008 6/13/2008 6/12/2008 6/13/2008 6/12/2008 6/13/2008 6/13/2008 6/13/2008 6/12/2008		11/26/2010	12 0.8	000 V
6/12/2008 5/51/2008 6/12/2008 6/12/2008 6/12/2008 6/12/2008 6/12/2008 6/12/2008 6/12/2008 6/12/2008 6/11/2008 6/11/2008 6/11/2008 6/11/2008 6/11/2008 6/11/2008 6/11/2008 6/12/2	40.2642	11/27/2010	20 00	10.1
6/1/2008 6/1/2008 6/1/2008 6/1/2008 6/1/2008 6/1/2008 6/1/2/2008 6	26.8428	11/28/2010	28 90	12.0
6/1/2006 6/1/2008 6/3/2008 6/3/2008 6/3/2008 6/3/2008 6/1	29.0797	11/29/2010	46.03	0.0
6/2/2008 6/2/2008 6/4/2008 6/4/2008 6/4/2008 6/6/2008 6/6/2008 6/1/2/2008 6/11/2/2008 6/11/2/2008 6/11/2/2008 6/11/2/2008 6/11/2/2008 6/11/2/2008 6/11/2/2008 6/11/2/2008 6/11/2/2008 6/19/2/2008 6/19/2/2008 6/19/2/2008 6/19/2/2008 6/19/2/2008 6/19/2/2008 6/19/2/2008 6/19/2/2008 6/19/2/2008 6/19/2/2008 6/19/2/2008 6/19/2/2008 6/19/2/2008 6/19/2/2008 6/19/2/2008	40.2642	11/20/2010	10.02	1.31
6/3/2008 6/3/2008 6/5/2008 6/5/2008 6/5/2008 6/5/2008 6/5/2008 6/1/2/2008 6/1/3/2008 6/1/2008 6/1/2008 6/1/2008 6/1/2008 6/1/2008 6/1/2008 6/1/2008 6/1/20	31.3166	10102/02/11	11.19	3.65
6/4/2008 6/4/2008 6/5/2008 6/5/2008 6/5/2008 6/1/2008 6/11/2008	33.5535	12/11/2010	11.1	3.86
6/5/2008 6/6/2008 6/6/2008 6/6/2008 6/1/2008 6/1/2/2008 6/2/2/2008	38.0273	12/2/2/10	9.81	2.86
6/6/2008 6/7/2008 6/7/2008 6/9/2008 6/10/2008 6/11/2008 6/13/2008 6/12/2008	20.0202	01/02/2/2/100/10	12.8	3.00
6/1/2008 6/8/2008 6/8/2008 6/10/2008 6/11/2008 6/11/2008 6/11/2008 6/11/2008 6/11/2008 6/11/2008 6/11/2008 6/11/2008 6/13/2008 6/13/2008 6/13/2008 6/13/2008 6/13/2008 6/13/2008 6/13/2008 6/13/2008 6/13/2008 6/13/2008 6/13/2008 6/13/2008 6/13/2008 6/13/2008	23 6535	12/4/2010	31.11	9.32
6:8:2008 6:9:2008 6:10:2008 6:11:2008	00,000	12/5/2010	52.13	9.80
69/2008 6/10/2008 6/11/2008 6/11/2008 6/13/2008 6/13/2008 6/13/2008 6/13/2008 6/13/2008 6/15/2008 6/15/2008 6/13/2008 6/12/208	20.0428	12/6/2010	36.41	7.51
6/10/2008 6/11/2008 6/11/2008 6/13/2008 6/13/2008 6/13/2008 6/17/2008 6/17/2008 6/11/72008 6/11/2008 6/11/2008 6/11/2008 6/11/2008 6/12/2008 6/12/2008 6/12/2008	507.020	12/7/2010	12.23	4.18
6/11/2008 6/11/2008 6/13/2008 6/13/2008 6/13/2008 6/13/2008 6/17/2008 6/19/2008 6/19/2008 6/19/2008 6/19/2008 6/22/2008	26.8428	12/8/2010	20.1	5.71
6/12/2008 6/13/2008 6/13/2008 6/13/2008 6/13/2008 6/13/2008 6/17/2008 6/19/2008 6/19/2008 6/19/2008 6/12/2008 6/22/2008	29.0797	12/9/2010	13.15	3.14
6/13/2008 6/14/2008 6/14/2008 6/16/2008 6/17/2008 6/17/2008 6/17/2008 6/19/2008 6/19/2008 6/19/2008 6/19/2008 6/19/2008 6/12/2008	31.3166	12/10/2010	13.33	3 10
6/15/2008 6/15/2008 6/16/2008 6/17/2008 6/17/2008 6/19/2008 6/19/2008 6/2008 6/2/2008 6/2/2008	29.0797	12/11/2010	7 668	0000
6/15/2008 6/15/2008 6/16/2008 6/17/2008 6/19/2008 6/19/2008 6/19/2008 6/22/2008 6/22/2008	24.6059	12/12/2010	14.11	3.25
6/15/2008 6/15/2008 6/17/2008 6/19/2008 6/19/2008 6/21/2008 6/21/2008 6/22/2008	22.369	12/13/2010	13.93	2.4.0
6/17/2008 6/17/2008 6/19/2008 6/19/2008 6/20/2008 6/22/2008 6/22/2008	24.6059	12/14/2010	19.03	
6/17/2008 6/18/2008 6/19/2008 6/21/2008 6/22/2008 6/22/2008	26.8428	12/15/2010	13.01	6.03
6/19/2008 6/19/2008 6/20/2008 6/2/2008 6/2/2008 6/22/2008	22.369	12/16/2010	13.27	5.06
6/15/2008 6/21/2008 6/21/2008 6/22/2008	22.369	12/17/2010	43.06	4 84
6/21/2008 6/21/2008 6/22/2008	24.6059	12/18/2010	37.49	7.55
6/21/2008	20.1321	12/19/2010	35.88	7 51
0/22/2000	44.738	12/20/2010	27.2	6 95
6 (02 (020)	22.369	12/21/2010	26.87	0.60
0007/C7/0	22.369	12/22/2010	16.23	0.00
0/24/2008	29.0797	12/23/2010	15.24	4 66
9007/07/0	22.369	12/24/2010	20.31	7 63
0/20/2008	20.1321	12/25/2010	54.22	9.07
0/2/1/2/00	20.1321	12/26/2010	15.96	4 77
0120/2010	26.8428	12/27/2010	16.08	5.78
6/30/2008	26.8428	12/28/2010	41.16	6.68
7/1/2008	26.8428	12/29/2010	42.02	12.27
10/0/08	29.0797	12/30/2010	22.07	6.16
73/2008	24.6059	12/31/2010	12.56	3.53
7/4/2008	29.0797	1/1/2011	33.58	7.78
7/5/2008	1810.82	1/2/2011	15.87	4.64
7/6/2008	1810.87	1/3/2011	10.65	3.90
7/7/2008	17 8067	1/4/2011	10.68	4.57
7/8/2008	20 1321	1107/9/1	14.88	5.03
7/9/2008	20.1321	1107/9/1	15.6	3.57
7/10/2008	22 360	1107///1	10.17	2.89
7/11/2008	26.8428	110/0/1	12.89	3.67
7/12/2008	20,1321	1/10/2011	15.84	5.74
7/13/2008	26.8428	1/11/2011	16 11	07.0
7/14/2008	29.0797	1/12/2011	12 35	00.7
//15/2008	26.8428	1/13/2011	15.48	01.0
7/16/2008	22.369	1/14/2011	10:10	0.0

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COMPARISON OF WIND DATA USED IN 2008 CEIR AND LEHIGH ON-SITE DATA SUNNYVALE, CA

Data			The Part of the state	
	GustSpeedMaxMPH	Date	e Gust MPH	
7/17/2008	24.6059	1/15/2011	30.24	LY 2
7/18/2008	22.369	1/16/2011	11.30	0.47
7/19/2008	22.369	1/17/2011	14.08	000
7/20/2008	22.369	1/18/2011	19 47	5.03
7/21/2008	26.8428	1/19/2011	1 10	00.2
7/22/2008	22.369	1/20/2011	21.8	20.3
7/23/2008	22.369	112412044	10.1 4	0.90
7/24/2008	26.8428	1/02/12/1	00.11	4.00
7/25/2008	26.8428	1/23/2011	26.40	0.10
7/26/2008	33.5535	1/2/2011	44 55	0.03
7/27/2008	26.8428	1107/1-2/1	00.41	4.29
7/28/2008	22.22	1102/02/1	23.11	5.92
7/29/2008	20.727	1107/07/1	1/.33	5.76
7/30/2008	1610.02	1107/17/1	12.26	4.08
7/31/2008	22.009 AF 6602	1/28/2011	12.59	3.61
8/1/2008	10,0000	1/29/2011	17.06	4.38
0007/1 /0	22.369	1/30/2011	19.33	5.27
0007/2/0	22.369	1/31/2011	13.84	4.00
0/2/2/008	24.6059	2/1/2011	24.07	6.96
0/4/2/0/05	24.6059	2/2/2011	20.37	7.43
8/5/2008	22.369	2/3/2011	14.23	5.81
8/6/2008	26.8428	2/4/2011	14.47	4 64
8/7/2008	26.8428	2/5/2011	31.11	9 96
8/8/2008	26.8428	2/6/2011	32.84	0 33
8/9/2008	22.369	2/7/2011	23.03	6.76
8/10/2008	24.6059	2/8/2011	37.97	11 53
8/11/2008	20.1321	2/9/2011	22.1	8 52
8/12/2008	20.1321	2/10/2011	14.56	7 00
8/13/2008	20.1321	2/11/2011	13.07	5 18
8/14/2008	17.8952	2/12/2011	114	4 12
8/15/2008	17.8952	2/13/2011	10.5	3 34
8/16/2008	22.369	2/14/2011	36.59	10.15
8/17/2008	24.6059	2/15/2011	48.19	12 00
8/18/2008	29.0797	2/16/2011	37.82	9.35
8/19/2008	31.3166	2/17/2011	37.46	8.36
8007/07/8	35.7904	2/18/2011	25.68	7.18
8/1/2/08	31.3166	2/19/2011	23.03	5.79
0007/20/0	24.6059	2/20/2011	16.49	4.82
0002/62/0	24.6059	2/21/2011	19.72	5.37
0/24/2000	20.1321	2/22/2011	15.81	6.30
0002/02/0	29.0797	2/23/2011	26.66	7.02
00020200	20.1321	2/24/2011	23.83	6.05
0002(12)0	20.1321	2/25/2011	39.72	8.15
00000000	20.1321	2/26/2011	18.07	6.25
0002/82/0	20.1321	2/27/2011	21.53	5.45
8/31/2008	20.1321	2/28/2011	22.34	6.68
0/1/2/000	20.8428	3/1/2011	26.22	8.27
8000/07 0000/07	26.8428	3/2/2011	42.71	11.68
100041710	26.8428	3/3/2011	20.07	5.22

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COMPARISON OF WIND DATA USED IN 2008 CEIR AND LEHIGH ON-SITE DATA SUNNYVALE, CA

	Per 2008 CEIR (note 1)	I chich I	I shinh Data 7/14 (noto 2)	31
Date	GustSpeedMaxMPH	Date	Gust MPH	Ave MDU
9/3/2008	20.1321	3/4/2011	15.54	11 Jul RAV
9/4/2008	20.1321	3/5/2011	15.45	5 30 F 30
9/5/2008	20.1321	3/6/2011	30.84	00.0
9/6/2008	22.369	3/7/2011	10.00	67.0
9/7/2008	20.1321	3/8/2011	13 75	70.0
9/8/2008	20.1321	3/9/2011	14 17	404
9/9/2008	22.369	3/10/2011	26.48	5.55
9/10/2008	24.6059	3/11/2011	19.27	5 82
9/11/2008	20.1321	3/12/2011	13 12	4 88
9/12/2008	20.1321	3/13/2011	24.25	5 0 4
9/13/2008	20.1321	3/14/2011	15.37	10.0
9/14/2008	22.369	3/15/2011	30.03	10.4 F 60
9/15/2008	20.1321	3/16/2011	21 12	0.03
9/16/2008	24.6059	3/17/2011	25.2	0.00
9/17/2008	22.369	3/18/2011	49.74	04.1
9/18/2008	24.6059	3/19/2011	39.81	10 10
9/19/2008	31.3166	3/20/2011	47.09	7.61
9/20/2008	35.7904	3/21/2011	24.99	5.88
9/21/2008	24.6059	3/22/2011	28.01	9 10
9/22/2008	26.8428	3/23/2011	39.31	7 26
9/23/2008	20.1321	3/24/2011	50.76	10.36
9/24/2008	22.369	3/25/2011	19.8	5.56
8007/07/6	20.1321	3/26/2011	26.72	6 79
8/26/2008	20.1321	3/27/2011	22.85	6.66
8/2//2008	17.8952	3/28/2011	19.09	5.57
9/28/2008	22.369	3/29/2011	21.24	5.81
8/28/2008	22.369	3/30/2011	23.05	6.37
9/30/2008	17.8952	3/31/2011	20.4	7.36
10/1/2/000	20.1321	4/1/2011	18.07	5.75
10/2/2008	26.8428	4/2/2011	14.14	4.32
10/0/2/2000	29.0797	4/3/2011	16.85	5.69
10/4/2000	38.0273	4/4/2011	14.5	5.45
0002/6/01	20.1321	4/5/2011	21.12	4.82
0002/0/01	17.8952	4/6/2011	26.69	5.73
10/2/1/01	15.6583	4/7/2011	33.61	8.39
10/0/00	20.8428	4/8/2011	20.19	6.09
10/10/008	1/6/0.62	4/9/2011	25.32	5.02
10/04/10/00	1.4487	4/10/2011	20.79	5.46
10/11/2000	33.5535	4/11/2011	18.7	5.17
10/12/2000	31.3166	4/12/2011	24.04	5.96
10/13/2008	15.6583	4/13/2011	22.2	

COMPARISON OF WIND DATA USED IN 2008 CEIR AND LEHIGH ON-SITE DATA SUNNYVALE, CA

	Per 2008 CEIR (note 1)	Lehiah	Lehioh Data 7/14 (note 2)	21
Date	GustSpeedMaxMPH	Date	Guet MDH	Ave Hou
10/14/2008	20.1321	4/14/2011	17 03	U JM RAV
10/15/2008	17.8952	4/15/2011	09.71	01.0
10/16/2008	17 8952	1102/01/2	60.71	05.6
10/17/2008	15 6583	1102/01/24	23.08	5.13
10/18/2008	035.00	1107/1/14	00°C1	4.24
10/19/2008	800.32 1001 00	4/18/2011	15.24	4.14
10/00/00	20.1321	4/19/2011	15.81	3.93
10/20/2000	22.369	4/20/2011	27.86	6.51
8007/17/01	17.8952	4/21/2011	18.1	5.74
8007/27/01	20.1321	4/22/2011	21.98	4.63
10/23/2008	15.6583	4/23/2011	22.73	
10/24/2008	15.6583	4/24/2011	18.28	
10/25/2008	13.4214	4/25/2011	22.10	2,40
10/26/2008	15.6583	4/26/2011	24.2	0,10
10/27/2008	17.8952	4/27/2011	2017	0.00 1 2 2 2
10/28/2008	15.6583	4/28/2011	20.1	10.4
10/29/2008	15.6583	4/29/2011	20 20	0.0
10/30/2008	33.5535	1/20/041	100.13	3.13
10/31/2008	55.9225	E/1/2014	10.00	10.22
11/1/2008	44.738	E/00/011	100.01	0.02
11/2/2008	24 6059	5/2/2/2/	47.44	0.40
11/3/2008	42 5011	5/0/2011	19.33	5.34
11/4/2008	38.0273	11102/5/0	10.04	6.64
11/5/2008	17 8057	1107/6/6	10.1/	5.92
11/6/2008	11.0902	1102/9/9	14.97	4.33
11/2/008	BCD0-47	5/7/2011	24.4	6.04
11/8/2008	7060'11	5/8/2011	24.16	7.80
11/0/2000	33.5535	5/9/2011	20.01	5.03
1113/2000	42.5011	5/10/2011	16.64	5.23
2002/01/11	20.1321	5/11/2011	16.38	4.89
11/11/2000	15.6583	5/12/2011	19.98	6.04
8007/21/11	22.369	5/13/2011	16.61	4 48
11/13/2008	31.3166	5/14/2011	24.7	6.03
11/14/2008	24.6059	5/15/2011	26.22	6 92
11/15/2008	20.1321	5/16/2011	35.85	9 49
11/16/2008	11.1845	5/17/2011	30.81	7 84
11/17/2008	15.6583	5/18/2011	29.88	7.62
11/18/2008	11 1845	E140/00/44	0.01	

K:\11191.000.0\CEIR 2008\Emission calcs\Hanson Appendix B Tables rev onsite.xls[tab]

COMPARISON OF WIND DATA USED IN 2008 CEIR AND LEHICH ON-SITE DATA SUNNYVALE, CA

1/19/2008 CustSpeedMaxMPH Date Gust Min		Per 2008 CEIR (note 1)	Lehigh	Lehigh Data 7/14 (note 2)	5)
11/9/2008 26,33201 55,12011 25,166 55,12011 25,166 55,12011 25,166 55,12011 25,166 55,12011 25,166 55,12011 25,166 55,12011 25,166 55,12011 25,166 55,172011 25,166 55,172011 25,166 55,12011 25,166 55,12011 25,166 55,12011 25,166 55,172011 25,166 55,172011 25,166 55,172011 25,166 55,172011 25,166 55,172011 25,166 55,172011 24,366 11,12,120 55,12011 24,366 11,12,120 24,366 11,12,120 24,366 11,12,120 24,366 11,12,120 24,366 11,12,120 24,366 11,12,120 24,366 11,12,120 24,366 11,12,120 24,366 11,12,1	Uate	GustSpeedMaxMPH	Date	Gust MPH	Avg MPH
11/202008 15.51/201 20.19 11/272008 15.6563 5.52/2011 20.19 11/272008 15.6563 5.52/2011 20.19 11/272008 15.6563 5.52/2011 21.67 11/27209 11.25/2016 15.6563 5.52/2011 21.67 11/272008 13.4214 5.52/2011 23.66 11/27209 11.25/2016 13.4214 5.52/2011 23.67 11/272008 13.4214 5.52/2011 23.69 24.67 11/27209 11.25/2016 13.4214 5.52/2011 23.69 11/272008 13.4214 5.52/2011 24.66 24.66 11/27/2018 11.4845 5.61/2011 24.99 24.99 11/27/2018 11.4845 5.61/2011 24.99 24.20 11/27/2018 11.66231 14.7011 24.99 24.2011 11/27/2018 11.4845 5.61/2011 24.99 24.2011 11/27/2018 11.26/2018 11.4845 5.61/2011 24.99 <td>11/19/2008</td> <td>20.1321</td> <td>5/20/2011</td> <td>15.48</td> <td>468</td>	11/19/2008	20.1321	5/20/2011	15.48	468
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	11/20/2008	15.6583	5/21/2011	20.19	
11/2/2008 15.55.3 $5.25.2011$ $2.9.7$ 11/2/2008 13.4214 $5.25.2011$ $2.9.7$ 11/2/2008 13.4214 $5.25.0011$ $2.5.98$ 11/2/2008 $8.3.476$ $5.27.0011$ $2.5.98$ 11/2/2008 $8.3.476$ $5.27.0011$ $2.5.98$ 11/2/2008 $8.3.476$ $5.27.0011$ $2.9.7$ 11/2/2008 11.8450 $5.72.001$ $2.9.7$ 12/2/2008 11.8450 $5.72.011$ $2.9.7$ 12/2/2008 13.4214 $6.62.011$ $2.9.49$ 12/2/2008 13.4214 $6.62.011$ $2.9.49$ 12/2/2008 13.4214 $6.62.011$ 17.99 12/2/2008 13.4214 $6.62.011$ 17.99 12/2/2008 13.4214 $6.62.011$ 17.94 12/2/2008 13.4214 $6.62.011$ 17.94 12/2/2008 13.4214 $6.62.011$ 14.94 12/2/2008 13.4214 $6.62.011$ 17.94 1	11/21/2008	26.8428	5/22/2011	24 87	t u
11/12/2008 11/12/2008 11/12/2008 11/12/2008 12/12/2008 13/12/12 23/12/11 17/12 11/12/2008 13/42/14 5/26/20/11 29/86 5/26/20/11 29/86 11/12/12/008 13/42/14 5/26/20/11 29/86 5/26/20/11 29/86 11/12/12/008 13/42/14 5/26/20/11 23/17 29/86 11/12/12/008 11/12/12/008 13/42/14 5/26/20/11 23/19 11/12/12/008 13/42/14 5/26/20/11 23/19 20/15 11/12/12/008 13/42/14 5/22/20/11 20/15 20/15 12/6/2/008 13/42/14 6/12/20/11 20/15 20/15 12/6/2/008 13/42/14 6/12/20/11 20/15 20/15 12/6/2/008 13/42/14 6/12/20/11 13/16 20/15 12/6/2/008 13/42/14 6/12/20/11 13/16 20/15 12/6/2/008 13/42/14 6/12/20/11 13/16 20/15 12/6/2/008 13/42/14 6/12/20/11 13/16	11/22/2008	15.65.83	2/22/2014	10.42	0.0
11/12/2006 13.4214 5.265011 2.37 11/25/2008 8.3474 5.265011 2.216 11/25/2008 8.3474 5.265011 2.216 11/25/2008 8.3476 5.265011 2.216 11/25/2008 8.3476 5.276011 2.07 11/25/2008 8.3476 5.27011 2.05 11/25/2008 1.1845 5.3202011 2.05 11/25/2008 1.1845 5.3202011 2.05 12/2/2008 1.1845 5.3202011 2.05 12/2/2008 1.34214 6.52011 2.06 12/6/2008 1.34214 6.62011 17.90 12/6/2008 1.34214 6.612011 17.90 12/6/2008 1.34214 6.612011 17.91 12/6/2008 1.34214 6.612011 17.91 12/6/2008 1.34214 6.612011 17.91 12/6/2008 1.34214 6.612011 17.91 12/6/2008	11/23/2008	17 8057	1102/02/0	79.67	8.1
1125/2008 $1.325/2008$ $1.325/2001$ 2.9486 $11/27/2008$ 1.34716 5.262011 25.99 $11/27/2008$ 1.34716 5.272011 25.99 $11/27/2008$ 1.34716 5.272011 25.99 $11/27/2008$ 1.34716 5.272011 25.99 $11/27/2008$ 1.34214 6.52011 20.61 $11/27/2008$ 1.34214 6.52011 20.61 $11/27/2008$ 1.34214 6.52011 20.61 $11/27/2008$ 1.34214 6.52011 21.996 $11/27/2008$ 1.34214 $6.6/2011$ 12.64 $11/27/2008$ 1.34214 $6.6/2011$ 12.64 $11/27/2008$ 1.34214 $6.6/2011$ 12.64 $11/27/2008$ 1.327208 1.34214 $6.6/2011$ 12.69 $11/27/2008$ 1.327208 $6.6/2011$ 12.69 10.2011 $11/12/2008$ 1.32636 1.32636 $6.6/2011$ 12.69 12.730201	11/24/2008	12 1002	1102/42/6	11.42	5.58
11.267200 5.2761 $5.2.16$ 11.267200 5.476 5.2762011 22.16 11.27500 1.287200 5.2762011 22.16 11.27500 1.287200 5.2762011 22.16 11.27500 1.287200 5.2762011 22.16 11.2700 1.287200 1.287200 5.27611 24.99 11.2700 1.287200 1.3424 6.72011 24.99 11.2700 1.3424 6.72011 24.99 6.72011 24.99 12.72008 12.4214 6.72011 12.9201 12.9208 12.4214 12.72008 12.4214 6.72011 12.9201 12.9201 12.9201 12.72008 12.4214 6.72011 12.9201 12.9201 12.920 12.712008 11.287201 12.8200 12.8201 12.9201 12.9201 12.712008 12.72008 12.72008 12.72001 12.9201 12.9201 12.712008	11/25/2008	11210	1107/97/9	29.88	5.84
11/12/12008 15352 $5232/2011$ 25.96 $11/27/2008$ $11/28952$ 55302011 33.79 $11/27/2008$ $11/28952$ 55302011 33.79 $11/287008$ 11.4345 55302011 30.5 $11/287008$ 11.4345 55302011 30.5 $11/287008$ 11.4345 55302011 30.5 $11/287008$ 13.4214 $61/2011$ 24.391 $12/12008$ 13.4214 $61/2011$ 20.61 $12/12008$ 13.4214 $61/2011$ 12.910 $12/12008$ 13.4214 $61/2011$ 12.910 $12/12008$ 13.4214 $61/2011$ 12.910 $12/12008$ 13.4214 $61/2011$ 12.910 $12/11/2008$ 13.4214 $61/2011$ 12.910 $12/11/2008$ 13.2320 $61/2011$ 12.910 $12/11/2008$ 13.2320 $61/2011$ 12.910 $12/11/2008$ 13.2414 $61/2011$ 12.910 <	11/06/000	13.42.14	5/26/2011	22.16	6.08
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	0007/07/11	8.9476	5/27/2011	25.98	5.92
11.282.008 $11.282.008$ $11.282.008$ $5.30.2011$ 29.7 $11.292.008$ $11.1840.5$ $5.37.2011$ 30.6 $11.292.008$ $11.1840.5$ $5.37.2011$ 30.6 $12.12.008$ 11.1845 $6.37.12011$ 30.6 $12.42.008$ $12.42.008$ 13.4214 $6.37.2011$ 30.6 $12.42.008$ 13.4214 $6.57.2011$ 30.6 4.9011 $12.65.008$ 13.4214 $6.67.2011$ 30.6 $4.6.7.2011$ $12.67.008$ 13.4214 $6.67.2011$ 30.6 $4.6.7.2011$ $4.8.6$ $12.76.008$ 11.8952 $6.67.2011$ 14.34 $6.7.2011$ 14.34 $12.17.2008$ 13.4514 $6.17.2011$ 14.34 $1.7.9$ $1.7.9$ $12.17.2008$ $12.47.9008$ $12.47.9001$ $12.42.9001$ $1.7.9$ $12.17.2008$ $12.47.9001$ $12.47.9001$ $12.42.9001$ $12.42.9001$ $12.42.9001$ $12.17.2008$ $12.14.2008$ 22.3601 6.12	8002//2/11	17.8952	5/28/2011	33.79	8 04
11/39/2008 $11/39/2008$ 24.6059 $5.30/2011$ 30.75 $11/30/2008$ 13.4214 $6/12011$ 30.75 $12/3/2008$ 13.4214 $6/12011$ 30.75 $12/3/2008$ 13.4214 $6/12011$ 30.75 $12/3/2008$ 13.4214 $6/12011$ 30.75 $12/3/2008$ 15.6533 $6/2/2011$ 43.66 $12/3/2008$ 13.4214 $6/1/2011$ 13.426 $12/3/2008$ 13.4214 $6/1/2011$ 14.02 $12/1/0.2008$ 13.4214 $6/1/2011$ 14.02 $12/1/0.2008$ 13.4214 $6/1/2011$ 14.02 $12/1/0.2008$ 13.4214 $6/1/2011$ 11.02 $12/1/0.2008$ 13.4214 $6/1/2011$ 11.738 $12/1/0.2008$ 13.4214 $6/1/2011$ 11.738 $12/1/0.2008$ 13.4214 $6/1/2011$ 11.02 $12/1/0.2008$ 13.4214 $6/1/2011$ 11.02 $12/1/0.2008$ 12.14208 <	11/28/2008	15.6583	5/29/2011	7 90	N A
11.302.008 11.3445 5.312711 30.75 12.12.008 12.4214 6.12011 24.99 12.6503 22.369 6.12011 24.99 12.6503 12.4214 6.12011 24.96 12.6503 12.6533 6.62011 12.849 12.6503 12.6533 6.62011 12.849 12.67208 21.4214 6.62011 18.91 12.67208 21.4214 6.62011 14.94 12.67209 17.8952 6.62011 14.94 12.67209 17.8952 6.67011 14.94 12.67209 17.8952 17.8952 6.67011 14.94 12.102008 22.369 15.6533 6.172011 14.94 12.1142008 15.6533 15.6533 6.172011 17.94 12.1142008 15.6533 6.172011 17.94 12.133 12.1142008 22.369 6.172011 14.94 22.133 12.1142008 <	11/29/2008	24.6059	5/30/2011	30.6	r c
12/1/2008 13.4214 $6/1/2011$ $2.9/12$ 12/3/2008 13.4214 $6/1/2011$ 2.9/13 12/3/2008 13.4214 $6/1/2011$ 2.9/13 12/3/2008 13.4214 $6/1/2011$ 2.9/13 12/3/2008 13.4214 $6/1/2011$ 2.9/13 12/6/2008 13.4214 $6/1/2011$ 2.9/13 12/6/2008 13.4214 $6/1/2011$ 18.91 12/6/2008 13.4214 $6/1/2011$ 14.02 12/6/2018 13.4214 $6/1/2011$ 14.02 12/6/2018 13.4214 $6/1/2011$ 14.02 12/6/2018 13.4214 $6/1/2011$ 14.02 12/1/2008 17.4201 17.89 $6/1/2011$ 17.02 12/1/2008 17.4201 17.89 $6/1/2011$ 17.39 12/1/2008 17.4201 17.301 17.39 $6/1/2011$ 17.39 12/1/2008 20.3201 17.3201 17.32 $6/1/2011$ 17.39 12/1/1/2008	11/30/2008	11.1845	5/24/2014	20.00	
12/22008 $2/369$ $6/2/2011$ $2/391$ $12/3/2008$ $13/214$ $6/3/2011$ 17.06 $12/3/2008$ $13/214$ $6/3/2011$ 17.06 $12/6/2008$ $13/214$ $6/3/2011$ 17.06 $12/6/2008$ $13/214$ $6/3/2011$ 14.94 $12/6/2008$ $13/214$ $6/3/2011$ 14.94 $12/6/2008$ 20.1321 $6/6/2011$ 14.94 $12/6/2008$ $13/214$ $6/7/2011$ 14.94 $12/1/2/2008$ $13/214$ $6/1/2011$ 14.94 $12/1/2/2008$ $13/4214$ $6/1/2011$ 17.9 $12/1/2/2008$ $13/4214$ $6/1/2011$ 17.9 $12/1/2/2008$ $13/4214$ $6/1/2011$ 17.9 $12/1/2/2008$ $13/4214$ $6/1/2011$ 17.9 $12/1/2/2008$ $13/4214$ $6/1/2011$ 17.9 $12/1/2/2008$ 22.369 $6/1/2011$ 17.9 $12/1/2/2008$ 20.1321 $6/1/2011$ 17.9 <td>12/1/2008</td> <td>13 4214</td> <td>0.01/201</td> <td>101.00</td> <td>0.7</td>	12/1/2008	13 4214	0.01/201	101.00	0.7
12/3/2008 $1.3.2.04$ $6/3/2011$ 20.61 $12/4/2008$ $1.3.4214$ $6/3/2011$ 17.09 $12/4/2008$ $1.3.4214$ $6/3/2011$ 18.91 $12/6/2008$ $1.3.4214$ $6/3/2011$ 18.91 $12/6/2008$ $1.3.4214$ $6/3/2011$ 18.91 $12/6/2008$ $1.3.4214$ $6/3/2011$ 18.91 $12/6/2008$ $1.3.4214$ $6/3/2011$ 14.02 $12/1/2008$ $1.7.89.5683$ $6/1/2011$ 11.02 $12/1/2008$ $1.7.89.5683$ $6/1/2011$ 17.99 $12/1/2008$ $1.7.89.5683$ $6/1/2011$ 17.59 $12/1/2008$ 22.369 $6/1/2011$ 17.59 $12/1/2008$ 22.369 $6/1/2011$ 17.59 $12/1/2008$ 22.369 $6/1/2011$ 16.59 $12/1/2008$ 22.369 $6/1/2011$ 17.59 $12/1/2008$ 22.369 $6/1/2011$ 17.59 $12/1/2008$ $21.2/2008$ $6/1/2011$ 1	12/2/2008	1946 00	0/1/2011	54.9A	6.3
12.42008 15.4214 6.32011 17.09 12.42008 15.6503 6.62011 43.66 17.09 12.62008 15.6533 6.62011 43.66 14.306 12.762008 15.6533 6.62011 24.84 12.762008 17.8952 6.62011 18.46 12.7102008 17.8952 6.62011 14.02 12.1102008 13.4214 6.172011 14.02 12.1122008 13.4214 6.172011 14.02 12.1122008 13.4214 6.172011 17.9 12.1122008 22.369 6.172011 17.9 12.1122008 22.369 6.172011 17.9 12.1122008 22.369 6.172011 17.9 12.1122008 22.369 6.172011 17.9 12.1122008 22.369 6.172011 17.9 12.112008 22.369 6.172011 17.9 12.1182008 22.369 6.17201	12/2/2/20	1600.32	6/2/2011	20.61	5.45
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	0007/0/71	13.4214	6/3/2011	17.09	4.86
12/6/2008 20.1321 $6/5/2011$ 18.91 $12/6/2008$ 13.8952 $6/5/2011$ 18.91 $12/6/2008$ 13.8952 $6/6/2011$ 18.946 $12/6/2008$ 13.8952 $6/6/2011$ 18.946 $12/6/2008$ 13.8952 $6/6/2011$ 14.02 $12/9/2008$ 17.8920 $6/1/2011$ 14.02 $12/1/2/2008$ 17.8653 $6/1/2011$ 14.02 $12/1/2/2008$ 15.6533 $6/1/2011$ 17.9 $12/1/2/2008$ 24.603 $6/1/2011$ 17.9 $12/1/2/2008$ 22.5011 $6/1/2011$ 17.50 $12/1/2/2008$ 22.5011 $6/1/2011$ 17.50 $12/1/2/2008$ 22.369 $6/1/2011$ 15.54 $12/1/2/2008$ 22.369 $6/1/2011$ 15.54 $12/1/2/2008$ 22.3011 $6/1/2011$ 15.54 $12/1/2/2008$ 22.3269 $6/1/2011$ 15.54 $12/1/2/2008$ $21.3212/2008$ $6/1/2011$	0007/4/71	15.6583	6/4/2011	43.66	10.17
12/6/2008 17.6952 6.6/2011 24.84 12/10/2008 13.4214 6.6/2011 24.84 12/10/2008 20.1321 6.6/2011 14.02 12/10/2008 13.4214 6.6/2011 14.02 12/10/2008 13.4214 6.6/2011 14.02 12/10/2008 13.4214 6.1/2011 14.02 12/11/2008 13.7.895 6.1/2011 17.49 12/11/2008 13.4.591 6.1/2011 17.49 12/11/2008 13.4.591 6.1/2011 17.49 12/11/2008 24.5011 6.1/2011 15.54 12/11/2008 22.369 6.1/2011 15.54 12/11/2008 20.1321 6.1/2011 15.54 12/11/2008 20.1321 6.1/2011 15.54 12/11/2008 20.1321 6.1/2011 15.54 12/11/2008 20.1321 6.1/2011 15.54 12/11/2008 20.1321 6.1/2011 15.54 12/11/2008 20.1321 6.1/2011 17.45<	8002/6/21	20.1321	6/5/2011	18.91	5.37
12/1/2008 13.4214 6/7/2011 18.46 12/8/2008 20.1321 6.8/2011 14.34 12/8/2008 20.1321 6.8/2011 14.34 12/9/2008 17.8952 6.10/2011 14.34 12/9/2008 17.8952 6.10/2011 14.34 12/9/2008 13.2014 6.1/2011 17.48 12/12/2008 15.6533 6.1/2011 17.48 12/14/2008 22.501 6.1/2011 17.48 12/11/2008 22.503 6.1/2011 15.54 12/11/2008 22.369 6.1/2011 15.54 12/11/2008 22.369 6.1/2011 15.54 12/11/2008 20.1321 6.1/2011 15.54 12/11/2008 20.1321 6.1/2011 15.54 12/11/2008 20.1321 6.1/2011 17.48 12/11/2008 20.1321 6.1/2011 17.54 12/11/2008 20.1321 6.1/2011 15.54 12/12/2008 20.1321 6.1/2011 17.53	12/6/2008	17.8952	6/6/2011	24.84	99
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Notes, 1. Wind data used in original CEIR downloaded from www.wunderground.com, but specific location not specified. 2. On-site data used. Per BAAQMD, use 7/1/2010 to 6/30/2011.

K-\11191.000.0\CEIR 2008\Emission calcs\Hanson Appendix B Tables rev onsite.xis[tab]

Wind Erosian

8/12/2014

AMEC Geomatrix, Inc. Page 1 of 11

TABLE C-1

WIND EROSION FROM UNPAVED ROADS Lehigh Southwest Cement Company Cupertino Facility

0.5 k (PM10) = Ef (PM10)= threshold friction velocity $(u^*_t) =$

<=365 days <=AP-42 ² 0.62 0.73 ton/acre*yr 1.22 ton/acre*yr

<=weekdays only

| (a/m ²) | | | | |

 | | 0 | 0 | 0

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| (g/m ²) | 1 | | 0 | C |

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 | | 5 | 5
 | | 0 | 0 | 0 | 0 | 0
 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (m/s) | 0.359667397 | 0.404211185 | 0.427667754 | 0.43169565 | 0.378859135

 | 0.351137735 | 0 427667754 | 0 335026152 | 0 350476031

 | 0 341473308
 | 0.354691761 | 0.389995082 | 0.406343601

 | 0.335026152 | 0 427667754 | 0 300433636 | 0.282663508

 | 0.28105200 | 0 317756074 | 12000211000
 | C1040047000000 | 0.329339/11 | 0.3/31/2694 | 0.366775448 | 0.336447763 | 0.377437525
 | 0.357534981 | 0.40207877 | 0.416294872 | 0.347820645 | 0.291903974 | 0.366775448 | 0.307541687 | 0.308252492 | 0.292614779 | 0.354691761 |
| (m/s) | 6.8 | 7.6 | 8.1 | 8.1 | 7.1

 | 6.6 | 8.1 | 6.3 | 99

 | 6.4
 | 6.7 | 7.4 | 7.7

 | 6.3 | 8.1 | 5.7 | 5.3

 | 5.3 | 909 | 6.5
 | | 7.0 | | 0.0 | 0.3 | 1.7
 | 6.7 | 7.6 | 6.7 | 6.6 | 5.5 | 6.9 | 5.8 | 5.8 | 5.5 | 6.7 |
| , ., (s/m) | 6.8 | 7.6 | 8.1 | 8.1 | 7.1

 | 6.6 | 8.1 | 6.3 | 6.6

 | 6.4
 | 6.7 | 7.4 | 7.7

 | 6.3 | 8.1 | 5.7 | 5.3

 | 5.3 | 6.0 | 61
 | 6.9 | 7.0 | 0.9 | 0.9 | 0.0 |
 | 10 | 9.7 | B. 2 | 0.0 | 0.0 | 6.9 | 5.0 | 0.0 | 0.0 | 6.7 |
| 2 | | 2 | e. | 4 | 5

 | 9 | 7 | 8 | 6

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 | 11 | 12 | 13

 | 14 | 15 | 16 | 17

 | 18 | 19 | 20
 | 21 | 22 | 23 | 107 | 25 | 90
 | 207 | 17 | 07 | 200 | 34 | 10 | 20 | 200 | 40 | CC |
| Lay | | | <u>9</u> | |

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 | + | | | - | 1001 | 1001 | 2 | | | |
| 7/1/2010 Th | 7/0/040 | _ | 0107/01/2 | |

 | | | 7/8/2010 Th |

 | 7/10/2010
 | 7/11/2010 | //12/2010 M | //13/2010 T

 | //14/2010 W | //15/2010 Th | 7/16/2010 Fr | //1//2010

 | 7/18/2010 | 7/19/2010 M | 7/20/2010 T
 | 7/21/2010 W | 7/22/2010 Th | 7/23/2010 Fr | | 7/25/2010 | 7/26/2010 M
 | 7/27/2010 T | | | | - | 8/1/2010 | 8/2/2010 M | 8/3/2010 T | 8/4/2010/1/ | 1101071-10 |
| | $\frac{1}{1}$ $\frac{1}$ | 2010 Th day w (m/s) "0 (m/s) (g/m ²) (g/m ²) | 2010 Th day w (m/s) (m/s) (m/s) (m/s) (g/m²) Only:
2010 Fr 2 7.6 7.6 0.404211185 0 | Z010 Th (m/s) (m/s) (m/s) (m/s) 0nly: Z010 Fr 2 7.6 0.359667397 0 | Z010 Th (m/s) (m/s) (m/s) (g/m²) Only: Z010 Fr 2 7.6 6.8 0.359667397 0 <th>Z010 Th (m/s) (m/s) (m/s) (g/m²) Only: Z010 Fr 2 7.6 6.8 0.359667397 0 0 Z010 Fr 2 7.6 7.6 0.404211185 0 0 Z010 100 3 8.1 8.1 0.427667754 0 0 Z010 100 4 8.1 0.43169565 0 0</th> <th>Z010 Th (m/s) (m/</th> <th>Z010 Th Cary N (m/s) (m/s) (m/s) (m/s) (g/m²) Only: Z010 Fr 1 6.8 6.8 0.359657397 0</th> <th>Z010 Th Cary N (m/s) (m/s)<!--</th--><th>Th Casy N (m/s) (m/s) (m/s) Only: Fr 1 6.8 6.8 0.359667397 0 0 Fr 2 7.6 7.6 7.6 0.404211185 0 0 M 100 3 8.1 8.1 0.427667754 0 0 M 5 7.1 7.1 0.4316565 0 0 W 5 7.1 7.1 0.378859135 0 0 W 7 8.1 8.1 0.427667754 0 0 T 6.6 0.331859135 0 0 0 1 T 8.1 8.1 0.427667754 0 0 1 V 7 8.1 0.427667754 0 0 1 1 F 6.6 6.6 0.351137735 0 0 1 1 1 1 0.35026152 0 1 1 1</th><th>Th (m/s) (m/s) (m/s) (m/s) 0nly: Fr 1 6.8 6.8 0.359667397 0 0 Fr 2 7.6 7.6 7.6 0.40421185 0 0 100 3 8.1 8.1 0.427667754 0 0 M 5 7.1 7.1 0.378859135 0 0 M 5 7.1 7.1 0.378859135 0 0 W 7 8.1 8.1 0.427667754 0 0 T 6.6 6.6 0.351137735 0 0 1 Th 8 1 8.1 0.427667754 0 0 Th 8 6.3 6.6 0.355137755 0 0 Th 8 0.335026152 0 0 0 1 0 Th 8 6.5 6.6 0.35502693 0 0 1 <</th><th>$\begin{array}{ c c c c c c c c c c c c c c c c c c c$</th><th>Lag N (m/s) (m/s) (m/s) (m/s) (m/s) (g/m²) Only: r 100 2 7.6 7.6 0.404211185 0 0 n 100 3 8.1 8.1 0.404211185 0 0 n 100 3 8.1 8.1 0.404211185 0 0 n 100 4 8.1 8.1 0.404211185 0 0 n 100 4 8.1 0.435665 0 0 0 n 6 6.6 6.6 0.351137735 0 0 0 n 8 1 0.1 0.3506552 0 0 0 0 0 n 8 6.6 6.6 0.3506552 0 0 0 0 0 0 0 1 0 137735 0 0 1 0 1 0 137065152 0 0<!--</th--><th>h (m/s) (m/s) (m/s) (m/s) 0nly: 1 6.8 6.8 6.8 0.359667397 0 0 100 2 7.6 7.6 7.6 0.404211185 0 100 3 8.1 8.1 8.1 0.1427165754 0 100 5 7.1 7.1 0.378559135 0 0 6 6.6 6.6 0.6137735 0 0 0 7 8.1 8.1 0.1 0.37850135 0 0 6 6.6 6.6 0.3514561754 0 0 0 100 10 0.355026152 0 0 0 0 100 11 6.1 0.35026152 0 0 0 100 11 0.335026152 0 0 0 0 100 10.333905082082</th><th>Vary N (m/s) (m/s) (m/s) 0nly: 1 6.8 6.8 0.359667397 0 0 100 3 8.1 8.1 0.14271657754 0 0 100 3 8.1 8.1 0.427667754 0 0 100 5 7.1 7.1 0.378551135 0 0 6 6.6 6.6 0.51137735 0 0 0 7 8.1 8.1 0.427667754 0 0 0 7 7.1 7.1 0.351355 0 0 0 7 8.1 8.1 0.427667754 0 0 0 100 10 0.335026152 0 0 0 0 100 11 6.7 6.3 0.335026152 0 0 100 11 0.335026152 0</th><th>h (m/s) (m/s) (m/s) (m/s) 0nly: 100 2 7.6 7.6 7.6 0.359667397 0 0 100 3 8.1 8.1 8.1 0.40211185 0 0 100 3 8.1 8.1 0.412667754 0 0 6 6.6 6.6 6.6 0.3518595655 0 0 7 7.1 7.1 0.3718595655 0 0 0 6 6.6 6.6 0.3518595655 0 0 0 7 7.1 7.1 0.3718599135 0 0 0 9 6.6 6.3 0.35026152 0 0 0 100 11 6.7 6.3 0.35026152 0 0 100 11 6.7 6.7 0.359995082 0 0 100 11</th><th>Vary N (m/s) (m/s) (m/s) 0nly: 100 2 (3.9667397) 0 0 0 100 3 8.1 6.8 0.359667397 0 0 100 3 8.1 8.1 8.1 0.427667754 0 0 100 5 7.1 7.1 0.43169565 0 0 6 6.6 6.6 0.43163735 0 0 0 7 8.1 8.1 0.427667754 0 0 0 7 8.1 8.1 0.427667754 0 0 0 9 6.6 6.6 0.351859135 0 0 0 100 11 6.7 8.1 0.427667754 0 0 100 11 6.7 6.7 0.35026152 0 0 100 11 6.7 6.7
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WIND EROSION FROM UNPAVED ROADS Lehigh Southwest Cement Company Cupertino Facility

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ď	(g/m ²)		0	0	0	0	0	0			0	, c	C			C	C							510	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*n	(m/s)	0.377437525	0.358245787	0.366064643	0.534288524	0.354691761	0.316545219	0.455863025	0.359667397	0.349242255	0.345688229	0.354691761	0.325785686	0.333604542	0.386677992	0.29830122	0.325785686	0.405632795	0 48334740	0.388099602	0.373883499	0 333604542	0 355407566	0.202402000	1010/2000-0	0.528602083	0.454441414	0.464392686	0.45515222	0.409897626	0.417005678	0.317966829	0.255889848	0.369618669	0.392127498	0.382413161	0.554664938	0.479793464	0.394970718	0.397813939
n [‡]	(m/s)	7.1	6.8	6.9	10.1	6.7	6.0	8.6	6.8	6.6	6.5	6.7	6.1	6.3	7.3	5.6	6.1	7.7	9.1	7.3	7.1	6.3	67	6.7		0.01	0.0	<u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u>	8.6	1.7	7.9	6.0	4.8	7.0	7.4	7.2	10.5	9.1	7.5	7.5
+n	(m/s) ', '	7.1	6.8	6.9	10.1	6.7	6.0	8.6	6.9	6.6	6.5	6.7	6.1	6.3	7.3	5.6	6.1	7.7	9.1	7.3	7.1	6.3	6.7	67	10.01	0.01	0.0	0.0	0.0 1	1.1	N. /	6.0	4.8	7.0	7.4	7.2	10.5	9.1	7.5	7.5
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	B/F/2010 Th	8/6/2010 11	8/7/2010	8/8/2010	8/0/2010		0/ 10/2010 1	M 0102/11/9	8/12/2010 1h	8/13/2010 Fr	8/14/2010	8/15/2010	8/16/2010 M	8/1//2010 1	8/18/2010 W	_	8/20/2010 Fr	8/21/2010	8/22/2010	8/23/2010 M	8/24/2010 T	8/25/2010 W	-	8/27/2010 Fr	8/28/2010	8/29/2010	8/30/2010 M		9/1/2010 M	0/2/2010 Th	0/3/2010 111 0/3/2010 Er		0/6/0040		9/0/2010 M	8///2010	N010702010	9/9/2010 LU	9/ 10/2010 Fr	101.07/11/8

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WIND EROSION FROM UNPAVED ROADS Lehigh Southwest Cerment Company Cupertino Facility

Day N (m/s) $1,3$					n [†] 0	n*	ď	Weekday	Ρİ
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		Jay		-	(m/s)	(m/s)	(g/m ²)	Only:	(a/m ²)
IM 75 6.2 6.2 0.327207296 0 7 6 6 0.327201766 0 7 7 6 6 0.37780645 0 7 7 6 6 0.3778166 0 7 7 7 0.37781635 0 7 7 7 0.3773752 0 100 80 7 7 0.37743752 0 7 7 7 0.37743752 0 80 81 99 99 91433398 0 46 6.4 6.4 6.4 6.4 0 99 6.7 0.377355546 77 0 99 6.8 6.4 0.34135398 0 6.7 6.4 6.341441 77 0 99 6.7 0.3352456191 77 0 90 6.7 6.7	9/12/2010	100	74	6.4		0.338580178	0		
01 76 6.1 6.1 6.1 0.3223166 01 78 6.6 0.37820645 0.37820645 01 78 5.2 5.2 0.2776873725 01 100 80 7.1 7.1 0.37820645 01 100 80 7.1 7.1 0.37820546 01 100 81 8.8 0.46515222 01 82 8.6 8.6 0.4551522 01 83 0.12 7.1 0.37820586 01 85 0.4551522 0.3273161 01 85 6.4 6.4 0.3413553161 01 88 6.5 6.37305864 0.343555814 01 88 6.5 6.4 6.4 0.341441 01 88 6.5 6.343555814 6.6 0.3435555814 01 98 6.4 6.4 0.341435784 7.2 0.3039327 01 00 88	9/13/2010 M		75	6.2	6.2	0.327207296	0		
VW 77 6.6 6.6 0.347820645 7 7 7 7 0.37814833 1 7 7 7 0.37814833 1 100 80 7 0.377437525 M 80 7 0.3783769178 M 80 6.4 6.4 0.3743758142 M 88 6.6 6.4 6.4 0.3743758142 M 99 6.7 6.7 0.3376376814 M 99 6.8 6.8 0.3474391441 M 99 6.8 6.8 0.338560178 M 99 6.8 6.8 0.378245787 M 99 6.7			76	6.1	6.1	0.32223166	C		
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$			17	9.9	6.6	0.347820645			
Γ 7 5.2 5.2 0.277687872 100 80 7.1 7.1 0.377437525 100 81 0.464392686 0.464392686 110 82 8.6 0.464392686 112 0.377437525 0.377437525 112 0.377437525 0.464392686 112 0.377437525 0.464392686 112 0.377437523 0.4643926814 112 0.382417816 0.343560178 110 81 6.4 0.34123398 110 81 6.4 0.343563144 110 81 6.6 0.343563144 11 90 6.2 6.2 0.33753414 110 89 6.8 0.3355555456 0.33753414 110 90 6.1 6.1 0.347826619 110 90 6.1 0.3478274789 1100 90 0.0 0.33358			78	7.1	7.1	0.37814833	0		
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$			79	5.2	5.2	0.277687872			
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	9/18/2010	100	80	7.1	7.1	0.377437525			
Im 82 8.6 0.4551522 0 11.2 0.59138987 0.59138987 0 83 11.2 0.59138987 0 85 7.2 0.59138987 0 85 7.2 7.2 0.59138987 0 85 6.4 0.522915642 0 86 6.4 6.33558144 0 87 6.5 0.33558178 0 88 6.6 6.4 0.33558178 0 88 6.5 0.3144341 0 88 6.6 0.315834144 0 88 6.6 0.315834144 0 6.0 0.315834144 17 0 91 6.0 0.315834144 0 93 5.7 5.7 0.3114441 0 93 6.6 6.0 0.31583414 0 93 6.1 5.0 0.317832645 0 100 93 6.1 0.3	9/19/2010	100	81	8.8	8.8	0.464392686			
IT 83 11.2 11.2 0.59138987 WW 84 9.9 9.9 0.522915642 Fr 85 7.2 0.382413161 Fr 85 6.4 6.4 0.338580178 M 85 6.4 6.4 0.33824537 M 89 6.6 0.343555414 W 91 6.0 6.0 0.343555414 Th 90 6.5 0.343555456 W 91 6.0 6.0 0.3114441 Fr 93 6.5 0.34782645 M 94 6.6 0.3683078 M 96 11.7 11.7 $0.177565555555555555555555555555555555555$			82	8.6	8.6	0.45515222			
W 84 9.9 9.9 9.9 0.522915642 $1Th$ 85 7.2 0.332580178 0.522915642 100 87 6.4 6.4 0.31423398 100 87 6.4 6.4 0.31423398 100 87 6.4 0.33258114 100 88 6.5 0.343555814 100 89 6.6 0.331534414 100 89 6.5 0.3375458178 11.7 90 6.2 0.327918101 100 95 11.7 11.7 0.31534414 100 94 5.2 0.375555456 100 94 5.2 0.338580178 100 99 0.6 0.338580178 100 99 0.6 0.34720645 100 99 0.6 0.34720645 100 100 0.6 0.347206423	9/21/2010 T		83	11.2	11.2	0.59138987			
ITh 85 7.2 7.2 0.382413161 Fr 86 6.4 6.3 0.34355814 M 88 6.5 0.34355814 M 89 6.5 0.34123398 T 90 6.5 0.341537161 W 91 6.0 6.2 0.341423398 T 90 6.8 6.5 0.3355814 T 90 6.8 6.6 0.33555456 T 90 6.2 0.315834144 T 91 6.0 6.0 0.31553444 T 92 5.8 0.30896327 M 96 11.7 11.7 0.61768966 M 99 6.4 6.4 0.347820645 T 91 6.6 0.347820645 T 99 6.5 0.347820645 T 99 6.5 0.347820645 T 90 6.6 0.3478206456 T 99	9/22/2010 W		84	6.6	9.9	0.522915642			
Fr 86 6.4 6.4 0.336560178 M 87 6.4 6.5 0.33655614 M 88 6.5 6.341423398 T 90 6.8 0.365245787 T 90 6.8 0.365245787 T 90 6.8 0.35555414 T 90 6.2 6.2 0.315334414 T 91 6.0 0.31634414 T 93 5.8 0.318963237 M 91 6.0 93 0.31534414 T 93 5.8 5.3 0.318963748 M 96 12.6 12.6 0.34726645 M 99 6.6 0.34736644 M 99 6.6 0.34732645 M 99 6.6 0.347326645 M 99 6.6 0.347326645 M 100 101 6.5 0.347326645 M			85	7.2	7.2	0.382413161			
$ \begin{array}{l c c c c c c c c c c c c c c c c c c c$			86	6.4	6.4	0.338580178			
100 88 6.5 6.3 0.33555814 W 91 6.0 6.8 0.358245787 W 91 6.0 6.3 0.358245787 W 91 6.0 6.3 0.358245787 W 91 6.0 6.3 0.358245787 F 90 6.0 6.315834144 F 92 5.7 0.301144441 F 93 5.8 0.308963297 M 96 12.6 0.275555456 M 96 12.6 0.2478371554 W 96 6.6 0.347820645 W 99 9.0 9.0 0.478371654 W 99 6.6 6.5 0.347820645 M 100 101 6.5 0.347820645 M 99 6.6 6.5 0.347266619 M 100 101 6.5 0.347266619 M 100 101 6.5 <	9/25/2010	100	87	6.4	6.4	0.341423398			
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$		100	88	6.5	6.5	0.343555814			
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$			89	6.8	6.8	0.358245787	C		
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	9/28/2010 T		06	6.2	6.2	0.327918101			
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	9/29/2010 W		91	6.0	6.0	0.315834414			
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	9/30/2010 Th		92	5.7	5.7	0.301144441			
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $			93	5.8	5.8	0.308963297	0		
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	10/2/2010	100	94	5.2	5.2	0.275555456	0		
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$		100	95	11.7	11.7	0.61768966	0		
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$			96	12.6	12.6	0.666972149	1.302274		1 30227393
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	10/5/2010 T		97	6.4	6.4	0.338580178	0		0
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	10/6/2010 W		86	9.0	9.0	0.478371854			
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$			66	6.6	6.6	0.347820645	0		
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$			100	6.9	6.9	0.363221423	10		
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	10/9/2010	9	101	6.5	6.5	0.344266619	0		
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		<u>8</u>	102	5.8	5.8	0.306830882	0		
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$			103	6.5	6.5	0.34710984	0		
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$			104	8.9	8.9	0.469842192	0		
In 106 5.7 5.7 Fr 100 107 5.7 5.7 100 108 5.4 5.4 M 110 109 7.7 7.7 W 111 5.6 6.5 6.5 W 112 6.1 6.1 6.1 Th 113 8.9 8.9 8.9			105	6.0	6.0	0.320099244	0		
Fr 107 5.7 5.7 5.7 100 108 5.4 5.4 5.4 M 110 109 7.7 7.7 W 111 5.6 5.6 5.6 W 112 6.1 6.1 6.1 Th 113 8.9 8.9 8.9	10/14/2010 10		106	5.7	5.7	0.301855246	0		0
100 108 5.4 5.4 100 109 7.7 7.7 7.7 M 110 110 6.5 6.5 T 111 5.6 5.6 W 112 6.1 6.1 Th 113 8.9 8.9			107	5.7	5.7	0.302566051	0		
100 109 7.7 7.7 7.7 M 110 6.5 6.5 6.5 T 111 5.6 5.6 W 112 6.1 6.1 Th 113 8.9 8.9	10/10/01/01	100	108	5.4	5.4	0.286928338	0		
M 110 6.5 6.5 T 111 5.6 5.6 W 112 6.1 6.1 Th 112 6.1 6.1 Th 113 8.9 8.9		90	109	7.7	1.7	0.406343601	0		
I 111 5.6 5.6 W 112 6.1 6.1 Th 113 8.9 8.9			110	6.5	6.5	0.343555814	0		
W 112 6.1 6.1 Th 113 8.9 8.9 E-			111	5.6	5.6	0.295458	0		
Th 113 8.9 8.9 0			112	6.1	6.1	0.32081005	0		
	10/21/2010 1h		113		8.9	0.471263803	0		
FT 114 6.8 6.8	10/22/2010 Fr		114		6.8	0.359667397	C		

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WIND EROSION FROM UNPAVED ROADS Lehigh Southwest Cement Company Cupertino Facility

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WIND EROSION FROM UNPAVED ROADS Lehigh Southwest Cement Company Cupertino Facility

		t,	u ¹ 0	n*	٩.	Weekday	Ρi
Day	z	(m/s) ^{1, 3}	(m/s)	(m/s)	(g/m ²)	Only:	(a/m ²)
12/3/2010 Fr	156	5.7	5.7	0.303276856	0		2
12/4/2010 100	157	13.9	13.9	0.737104922	3.72301		-
12/5/2010 100	158	23.3	23.3	1.235142385	37.32577		-
12/6/2010 M	159	16.3	16.3	0.862680495	9.482854		9.4828541
12/7/2010 T	160	5.5	5.5	0.289771559	0		
12/8/2010 W	161	0.0	9.0	0.476239439	0		
12/9/2010 Th	162	5.9	5.9	0.311569583	0		
12/10/2010 Fr	163	6.0	6.0	0.315834414	0		
12/11/2010 100	164	3.4	3.4	0.181681792	0		
2/12/2010 100	165	6.3	6.3	0.334315347	0		
12/13/2010 M	166	6.2	6.2	0.330050516	0		0
12/14/2010 T	167	8.5	8.5	0.450887389	0		0
12/15/2010 W	168	5.8	5.8	0.308252492	0		0
12/16/2010 Th	169	5.9	5.9	0.314412803	0		
12/17/2010 Fr	170	19.2	19.2	1.0202423	19.2973		19.2973036
	171	16.8	16.8	0.88826948	10.88091		
12/19/2010 100	172	16.0	16.0	0.850122938	8.824554		•
12/20/2010 M	173	12.2	12.2	0.64446332	0.646293		0.64629333
12/21/2010 T	174	12.0	12.0	0.636644463	0.43218		0.4321798
12/22/2010 W	175	7.3	7.3	0.384545576	0		0
12/23/2010 Th	176	6.8	6.8	0.361089007	0		0
Fr	177	9.1	9.1	0.481215074	0		0
12/25/2010 100	178	24.2	24.2	1.284661809	42.23951		0
12/26/2010 100	179	7.1	7.1	0.37814833	0		
12/27/2010 M	180	7.2	7.2	0.380991551	0		0

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WIND EROSION FROM UNPAVED ROADS Lehigh Southwest Cement Company Cupertino Facility

id	(alm ²)	16 1003107	17 5704490	0												0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Weekdav	Only																																										
ď	(a/m ²)	16.19932	-	1		6.17971			, c															5	50	5	0	0 010000	0.013338	0		5	5	0	5		0			0	0	3.72301	5.402015
*n	(m/s)	0.975224641	0.995601055	0.522915642	0.297590415	0.795627878	0.376015915	0.252335822	0.253046627	0.352559346	0.369618669	0.24096294	0.305409272	0.37530511	0 496141982	0 381702356	0.202614770	0 366775448	0.305681524	0.42553501324	0.263708704	0 333604642	0.460107866	0.5710121000	0.51661013430	06001001010	0.4030038	0.400004209	0020202020.0	0.0449/1424	0.4106084940	10400001400	0.230402304	0.4044444	0.404211105	0 2070010101010101	0.52/910101	10070201010	0.9974507000	890201/0070	0.342845009	0./3/104922	0.778094685
u [†] 10	(m/s)	18.4	18.8	6.6	5.6	15.0	7.1	4.8	4.8	6.7	7.0	4.5	5.8	7.1	9.4	7.2	5.5	69	7.5	80	5.0	6.3	87	10.8	0.01	7.6	0.10	11 7	6.5	10.0	7 7	<u>т</u> л	2.9	7.6	2.0	0.0	10 8	0.0	1.0	0.4	10.0	13.8	14.7
+1	(m/s) ^{1, 3}	18.4	18.8	9.6	5.6	15.0	7.1	4.8	4.8	6.7	7.0	4.5	5.8	7.1	9.4	7.2	5.5	6.9	7.5	8.0	5.0	6.3	8.7	10.8	2.6	76	0 1	11.7	6.5	10.6	7.7	5.5	5.6	7.6	9.9	6.9	10.8	0.1	6.4	6.5	13.0		14./
	z	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	1177
	Uay					001	3						100	100						100	100						100	100						100	100						100	1001	1221
	12/28/2010 T	1010202121	11 0700/0101	12/20/2010 10	12/31/2010 FF	1/2/2011		113/2011 M	1/4/2011 1	_		1///2011 Fr	1/8/2011	-	1/10/2011 M				1/14/2011 Fr	1/15/2011	1/16/2011	1/17/2011 M		1/19/2011 W	1/20/2011 Th	1/21/2011 Fr	1/22/2011	1/23/2011	1/24/2011 M	1/25/2011 T		1/27/2011 Th	1/28/2011 Fr	1/29/2011	1/30/2011	1/31/2011 M	2/1/2011 T	2/2/2011 W	2/3/2011 Th	2/4/2011 Fr	2/5/2011	2/6/2011	T

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WIND EROSION FROM UNPAVED ROADS Lehigh Southwest Cement Company Cupertino Facility

1			+5	u [†] 10	* n	P,	Weekday	Ρi
Date	Day	z	(m/s) ^{1, 3}	(m/s)	(m/s)	(g/m ²)	Only:	(g/m ²)
-1	Σ	222	10.3	10.3	0.545661406	0		0
	L-	223	17.0	17.0	0.899642362	11.52665		11.5266504
	N	224	6.6	9.9	0.523626447			0
_	Th	225	6.5	6.5	0.344977424	0		0
	Fr	226	5.8	5.8	0.309674103	0		
2/12/2011	100	227	5.1	5.1	0.27010595	0		0
2/13/2011	100	228	4.7	4.7	0.248781796	0		0
=1	Σ	229	16.4	16.4	0.866945326	9.710589		9.71058881
	_	230	21.5	21.5	1.141789977	28.83611		28.8361067
2/16/2011 V	N	231	16.9	16.9	0.896088337	11.32325		11.323245
2/17/2011 Th	<u>د</u>	232	16.7	16.7	0.887558675	10.84105		10.8410503
_	Fr	233	11.5	11.5	0.608449193	0		C
2/19/2011	100	234	10.3	10.3	0.545661406	0		
	100	235	7.4	7.4	0.390705888	0		0
	Σ	236	8.8	8.8	0.467235907	0		0
2/22/2011 1		237	7.1	7.1	0.374594305	0		0
	2	238	11.9	11.9	0.631668827	0.299618		0.29961805
	Th	239	10.7	10.7	0.56461621	0		0
	Fr	240	17.8	17.8	0.941105995	14.00798		14.0079754
2/26/2011	100	241	8.1	8.1	0.428141625	0		0
2/27/2011	100	242	9.6	9.6	0.51012115	0		0
2/28/2011 M	V	243	10.0	10.0	0.529312888	0		0
3/1/2011 T		244	11.7	11.7	0.621243685	0.031182		0.03118185
	>	245	19.1	19.1	1.011949573	18.70896		18.7089585
	Th	246	9.0	0.6	0.475528633	0		0
	Fr	247	6.9	6.9	0.368197058	0		0
3/5/2011	100	248	6.9	6.9	0.366064643	0		0
-+	100	249	13.8	13.8	0.730707676	3.478551		0
3/7/2011 M	V	250	21.2	21.2	1.124256784	27.35436		27.354364
		251	6.1	6.1	0.325785686	0		0
3/9/2011 W	>	252	6.3	6.3	0.335736957	0		0
3/10/2011 T	Th	253	11.8	11.8	0.627403997	0.188279		0.18827943
3/11/2011 Fr		254	8.6	8.6	0.45657383	0		0
3/12/2011	100	255	5.9	5.9	0.310858778	0		0
3/13/2011	100	256	10.8	10.8	0.574567482	0		0
3/14/2011 M		257	6.9	6.8	0.361799812	0		0
3/15/2011 T		258	13.4	13.4	0.711515937	2.773658		2.7736581
3/16/2011 W	>	259	9.4	9.4	0.500406813	0		0

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WIND EROSION FROM UNPAVED ROADS Lehigh Southwest Cement Company Cupertino Facility

Date 3/17/2011 Th 3/18/2011 Fr 3/19/2011 3/20/2011 3/20/2011 Th 3/22/2011 Th 3/22/2011 Th 3/22/2011 Th	Day	z				A REAL PROPERTY AND A REAL PROPERTY A REAL PROPERTY A REAL PROPERTY AND A REAL PROPERT		
		THE OWNER AND ADDRESS OF TAXABLE PARTY OF TAXABLE PARTY.	(m/s) ^{1, 3}	(m/s)	(m/s)	(g/m ²)	Only:	(g/m ²)
		260	11.3		0.597076311	0		0
		261	22.2	22.2	1.178514909	32.05533		32.0553291
	100	262	17.8	17.8	0.94323841	14.14098		0
+	100	263	21.1	21.1	1.115727122	26.64641		0
+		264	11.2	11.2	0.592100675	0		0
		265	12.5	12.5	0.663655058	1.201911		1.20191078
		266	17.6	17.6	0.931391658	13.40875		13.4087478
-		267	22.7	22.7	1.202682284	34.25914		34.2591384
11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		268	8.9	8.9	0.469131387	0		0
3/26/2011	100	269	11.9	11.9	0.633090438	0.3372		0
3/27/2011	100	270	10.2	-	0.541396576	0		0
3/28/2011 M		271	8.5		0.452308999	0		0
3/29/2011 T		272	9.5		0.503250034	0		0
3/30/2011 W		273	10.3		0.546135276	0		0
		274	9.1		0.48334749	0		0
4/1/2011 Fr		275	8.1	8.1	0.428141625	0		0
4/2/2011	100	276	6.3		0.335026152	0		0
4/3/2011	100	277	7.5		0.399235549	0		0
4/4/2011 M		278	6.5		0.343555814	0		0
4/5/2011 T		279	9.4		0.500406813	0		0
4/6/2011 W		280	11.9	11.9	0.632379633	0.31838		0.31837962
4/7/2011 Th		281	15.0	15.0	0.796338683	6.211996		6.21199628
4/8/2011 Fr		282	9.0	9.0	0.478371854	0		0
4/9/2011	100	283	11.3	-	0.599919531	0		0
4/10/2011	100	284	9.3		0.492587957	0		0
4/11/2011 M		285	8.4	8.4	0.443068532	0		0
4/12/2011 T		286	10.7		0.569591846	0		0
		287	10.4		0.549689302	0		0
		288	8.0	8.0	0.424824534	0		0
4/15/2011 Fr		289	2.9		0.419138093	0		0
4/16/2011	100	290	10.3	-	0.546846082	0		0
	100	291	7.0		0.371040279	0		0
4/18/2011 M		292	6.8	6.8	0.361089007	0		0
		293	7.1		0.374594305	0		0
		294	12.5	-	0.660101033	1.095795		1.0957952
	-	295	8.1		0.42885243	0		0
4/22/2011 Fr		296	9.8		0.520783227	0		0
4/23/2011	100	297	10.2	10.	0.538553355	0		0
4/24/2011	100	298	8.2	8.2	0.43311726	0		0
4/25/2011 M		299	6.6	6.6	0.525758863	0		0
4/26/2011 T		300	9.5	9.5	0.504671644	0		0

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WIND EROSION FROM UNPAVED ROADS Lehigh Southwest Cement Company Cupertino Facility

Day	4	5	u ₁₀	"n	<u>a</u> .	Weekday	Ы
	z	(m/s) ^{1, 3}	(m/s)	(m/s)	(a/m ²)	Only:	(a/m ²)
	301	6.4	6.4	0.339290983			(
	302	10.3	10.3	0.544950601	0		
	303	12.5	12.5	0.660101033	1.095795		1 0957952
100	304	15.2	15.2	0.804868345	6.603934		
100	305	7.3	7.3	0.388099602	0		
	306	6.6	6.6	0.349242255	0		
	307	8.6	8.6	0.45799544	0		
	308	7.4	7.4	0.394259913	0		
5/5/2011 Th	309	7.2	7.2	0.383123966	0		, c
5/6/2011 Fr	310	6.7	6.7	0.354691761	0		
100	311	10.9	10.9	0.578121507	0		
100	312	10.8	10.8	0.572435066	0		
5/9/2011 M	313	8.9	8.9	0.474107023	0		
	314	7.4	7.4	0.394259913	0		
5/11/2011 W	315	7.3	7.3	0.388099602	0		
5/12/2011 Th	316	8.9	8.9	0.473396218	0		
5/13/2011 Fr	317	7.4	7.4	0.393549108	C		
100	318	11.0	11.0	0.585229559	C		
100	319	11.7	11.7	0.621243685 0.031182	0.031182		
5/16/2011 M	320	16.0	16.0	0.849412133	8,787839		8 78783907
	321	13.8	13.8	0.729996871	3.451682		3 45168184

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WIND EROSION FROM UNPAVED ROADS Lehigh Southwest Cement Company Cupertino Facility

av pi		6	0				2.43314712		2 64781107					3 26523053	3 39811957								0			0	0	0	0	0		0				0		0			
Weekdav	-vinO	5																																							
ď	(a/m ²)	2.647811	0		0	0	2.433147	0	2.647811	C		6 40691	2.498729	3.26524	3.39812	0	0	0	20.32445	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
۳* ۲	(m/s)	0.707961912	0.429563235	0.366775448	0.478371854	0.589257455	0.7018016	0.412740847	0.707961912	0.525048058	0.615557244	0.800603514	0.703697081	0.725021235	0.72857526	0.592100675	0.488323126	0.40492199	1.034458402	0.448044168	0.588546649	0.437382091	0.353980956	0.332182932	0.474107023	0.505382449	0.414162457	0.424113729	0.385967187	0.364643033	0.345688229	0.368197058	0.394259913	0.48619071	0.417005678	0.366064643	0.32365327	0.394259913	0.389995082	0.37814833	
u ⁺ 10	(m/s)	13.4	8.1	6.9	9.0	11.1	13.2	7.8	13.4	9.9	11.6	15.1	13.3	13.7	13.7	11.2	9.2	7.6	19.5	8.5	11.1	8.3	6.7	6.3	8.9	9.5	7.8	8.0	7.3	6.9	6.5	6.9	7.4	9.2	7.9	6.9	6.1	7.4	7.4	7.1	C r
+	(m/s) ^{1, 3}	13.4	8.1	6.9	0.6	11.1	13.2	7.8	13.4	6.9	11.6	15.1	13.3	13.7	13.7	11.2	9.2	7.6	19.5	8.5	11.1	8.3	6.7	6.3	8.9	9.5	7.8	8.0	7.3	6.9	6.5	6.9	7.4	9.2	7.9	6.9	6.1	7.4	7.4	7.1	7 6
	z	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	34/	348	349	350	351	352	353	354	355	356	357	358	359	360	361
	Day				100	100						100	100						100	100						1001	001						100	100						100	1001
				5/20/2011 Fr	1.1.07/1.7/2		M 1102/22/C				5/27/2011 Fr	5/28/2011		5/30/2011 M				6/3/2011 Fr	0/4/2011		W 11.07/9/9		0/0/2011 VV		6/10/2011 FF	6/1/2/11/0	-1-	0/13/2011 IN	C/14/20111	_		6/1//2011 FF	0/10/2011		0/20/2011 M		-	-	0/24/2011 Fr	6/25/2011	0/26/2011

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WIND EROSION FROM UNPAVED ROADS Lehigh Southwest Cement Company Cupertino Facility

			5	n [‡]	* 3	م	Weekdav	ig
Date	Day	z	(m/s) ^{1, 3}	(m/c)	(m/e)	(mlm2)	fan voor i	1.1.2
C10010014		000			16411	1 / III/A	:Simo	l (m/b)
20111		363	00	8	0 4295632351	C		
1	() V (0010000110	>		5
012812011	~	364	7.7	177	0 410608431	C		
E P P P P P P P P P P P P P P P P P P P	1.1	100			101000011.0	2		5
		365	7.7	77	0 406343601	c		
					-]	>		D
						547.8653	547.8653 g/m2*yr	330.043243
						2.44	ton/acre*yr	1.47
					Ef (PM10)=	1.22	.22 ton/acre*yr	0.73
					CRAWNING MARKING MARKING AND ADDRESS OF	CONTRACTOR OF A DESCRIPTION OF A DESCRIP		

Notes:

1. For u^{\star} used gust speed. Data was taken at a height of 10 m with on-site meteorlogical data. 2. u^{\star}_{\star} obtained from Table 13.2.5-2 AP-42

3. Maximum wind gust speed was used in place of fastest mile.

weathout only U'SEC'

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			(g/m ²) (g/m ²) (g/m ²)								0	0	0	0	0	<u> </u>			0	0	0	0	0		0	0			0	0	0	0	0	0		0	0	0		0
0.55	UISTEGAL		(g/m ²)	1		0		0	1	1								0		0 0	1							1	1	1 0			0					- 0		
	0.9		(g/m ²)																																D C					
Pile Subarea	2b 0.6a	5	(g/m ²																																					
	0.2a 0.		(<u>g/m</u>) (<u>g/m</u>	50			20				00		0	0	0	0	0	0	0	00					C	0	0	0	0	00	50			0	0	0	0	0	0	5
	0.9	*"	711 0 610756	38 0 6862	52 0	0	0	0				0	0	0	0		<u>[]</u>			132 U.4/8/88		2	0		ł	0	0	0	plo	9 0.090039		jc		0		8 0.640932	1 0.608342	3 0.621619	5 0 907282	
Pile Subarea	.2b 0.6a	э (35724 0 4071	2533 0.4575	384 0.4841	0.4887	42966 0.42889	32505 0.397514	0	26425 0.37927		0	0	47168 0.441504	0	o			06307 0.313339	0 3501	0.3675	0.372	0.42	38406 0.41521	26961 0.380884	0.4272	919 0	0.455	082 0 252 0	153	$ ^{\circ}$) o	10421 0.331262	0	42429 0.427288	o	38138 0.414413	1618 0.60485 ⁴	
	0.2a 0	(m/e)	24 0 1	0	6	0	0	0	6	0.126425 0.12	6	0.128839 0.12	<u>.</u>	0	5	6	5	0 106665 0 10			0	0	0	0.1	0.12	0.1	6	0.151/28 0.151			0.1	0.1	0.1	0.1	0.1	0.7		0.7	0.201618 0.20	
	us/ur:	u' ₁₀ (m/s)	- 11	7.6			7.1	6.6	8.1	6.3		6.4	- 1		7.7	6.3	0.1	5.7	5.3	6.0	6.1	6.2	7.0			7.1			1		1	ł	5.8 (-+		
	+	u _z U (m/s)			8.1																														6.7		6.8			
		z											11	7.								21	22	23	24	G7.	27				31	32	33	34	35	00	3/	200	BC .	101
		Date	7/1/2010	7/2/2010	7/3/2010	//4/2010	//5/2010	//6/2010	7/7/2010	//8/2010	7/9/2010	//10/2010	0102/11//	112/2010	0102/01/1	7/15/2010	7/16/2010	7/17/2010	7/18/2010	7/19/2010	7/20/2010	7/21/2010	//22/2010	//23/2010	7/02/12/12	1/25/2010	7/27/2010	7/28/2010	7/29/2010	7/30/2010	7/31/2010	8/1/2010	8/2/2010	8/3/2010	8/4/2010	0107/0/0/0	8/7/2010	8/0/01/0	0107000	

WIND EROSION FROM BAUXITE STOCKPILE Lehigh Southwest Cement Company Cupertino Facility

k (PM10) = threshold friction velocity $(u^*_i) =$

0.5 1.12 m/s

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Onsite 2010 Met data

WIND EROSION FROM BAUXITE STOCKPILE Lehigh Southwest Cement Company Cupertino Facility

k (PM10) = threshold friction velocity $(u^*_i) =$

0.5 1.12 m/s

	-				n i	200000	-			Subarea			Diarozz			
			us/ur:	0.2a	0.2b	0.6a	00	0.02	40 0	0.62	00			UISIEGAIGING WEEKEND		
	L	, , ,	, , , ,		*	***				0.0a	6.0		0.2a	0.2b	0.6a	0.9
Date	z	(m/s)	(s/m)	/m/e)	, (°/w)	n	n (Γ. 2	<u>م</u> تر	نة م	: م		P	ď	٩	ď
8/12/2010	43	68	6.01	0 135734	-			(m/g)	(g/m	(g/m²)	(g/m [^])		(g/m ²)	(g/m ²)	(g/m ²)	(g/m ²)
8/13/2010	44	6.6	9.0		1001.0	0.40/1/1	S	5		0		0	0			
8/14/2010	45	8.5	0.0	C	4	2	o	0		0		0	0			
8/15/2010	46	6.7	1 2 2	_	5 d	2	olo	0		0						
8/16/2010	47	6.1	1.0	0.122040	5 C	20	0	0		0		0				
8/17/2010	48	0 A 3		0.125000		olo		0		0						
8/18/2010	49	2.0	0.0	0.120889	2	0.3776		0		0		1	0			
8/19/2010	202	2.4	0.1	0.140911	S	o l	0.656623	0		0		1	0			
8/20/2010	51	0.0	0.0	00000111.0	50	0	0.506549	0		0		1	0			
8/21/2010	52	1 2 2	0.1	0.122938	5		0.553221	0		0		1				
8/22/2010	52	+-		0.153069		0.4592	0.68881	0		0						
8/23/2010	272	3.1	- 6	0.182395	5 o		0.820779	0		0		0				
8/24/2010	55	1. L	k 7	0.140403	j	3]:	0.659037	0		0						
8/25/2010	56	6.9	6.3	0 175000	0 10 10 1000	0.423204	0.634897	0		0		1	0			
8/26/2010	57	67	6.7	0.124114		216	0.566498	0		0	0	1	0			
8/27/2010	58	67	6.7	0 133300	5 c		0.500500			0	C	1	0			
8/28/2010	59	10.01	10.01	0 100472	0.100309	1	0.5999893			0	0	1	0			
8/29/2010	60	86	8.6	0 171 407		0.74440	0.89/626	0		0	0	0 0				
8/30/2010	61	8.8		0 1752/2		0.57570	0.7/1693			0	0					
8/31/2010	62	8.6		0 171756		02/02/20	1.6088/.0			0	0	1 1	0			
9/1/2010	63	7.7		0.154678		19701010	0.1729			0	0	1	0			
9/2/2010	64	7.9		0.157361		0.404030	0.700103			0	0	1	0			
9/3/2010	65	6.0		0 110087	slè	0.05000	0./08123			0	0	1	0			
9/4/2010	99	4.8	48	0.006562	0.006667	7088607	0.539944	0		0	0	1	0			
9/5/2010	67	7.0	0.7	0.130/70			0.43453			0	0	0				
9/6/2010	68	7.4	7 4	0 147073	sic	0.4104.30	0.027034	0		0	0					
9/7/2010	69	7.2	7.2	0.144307	0 144307	1420010	1 1000001			0	0	-	0			
9/8/2010	70	10.5	10.5	0.209308		0.627923	0.049301				0	-	0	0	0	0
9/9/2010	71	9.1	9.1	0.181054	0		0.041004					-	0			
9/10/2010	72	7.5	7.5	0.149046	-	0.447137	0.670705						0			
9/11/2010	73	7.5		0.150118	0	450	0.675533						0			
9/12/2010	74	6.4	1	0.127766	0	0.383298	0.574947						0			
9/13/2010	75	6.2		0.123474	0		0 555635					0	0			
9/14/2010	76	6.1	6.1	0.121597	0	0.364791							0			
9/15/2010	11	6.6	6.6	0.131253	131	0.393759	0.590639						0			
9/16/2010	78	7.1	7.1	0.142697	15	4280	0.642139						0			
9/17/2010	62	5.2	5.2	0.104788		0.314364	0.471545						0			
9/18/2010	80	7.1	7.1	0.142429	0.142429	0.427288	0 640932						5			
9/19/2010	81	8.8	8.8	0.175243	0.175243		0.788591					D (0			0
9/20/2010	82	8.6	1	0.171756	17		0.7720						0			0
9/21/2010	83	11.2	11.2	0.223166	0		1 004247						0			0
9/22/2010	84	9.9		0.197327			0.00707			0	0	-	0			C
					5						ĉ					

WIND EROSION FROM BAUXITE STOCKPILE Lehigh Southwest Cerment Company Cupertino Facility

> k (PM10) = threshold friction velocity $(u^*_t) =$

0.5 1.12 m/s

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$ \begin{array}{c c c c c c c c c c c c c c c c c c c $
$ \begin{array}{c} 0.14337 & 0.17368 \\ 0.127766 & 0.127766 & 0.132321 & 0.643381 & 0.0 & 0 & 0 \\ 0.128839 & 0.128839 & 0.336517 & 0.579776 & 0 & 0 & 0 & 0 \\ 0.128639 & 0.123618 & 0.332388 & 0.579376 & 0 & 0 & 0 & 0 \\ 0.125743 & 0.135183 & 0.337128 & 0.563327 & 0 & 0 & 0 & 0 & 0 \\ 0.135743 & 0.135183 & 0.337128 & 0.563322 & 0 & 0 & 0 & 0 & 0 \\ 0.136539 & 0.11659 & 0.339718 & 0.556322 & 0 & 0 & 0 & 0 & 0 \\ 0.119639 & 0.119183 & 0.377128 & 0.5563522 & 0 & 0 & 0 & 0 & 0 \\ 0.119639 & 0.119183 & 0.377128 & 0.556322 & 0 & 0 & 0 & 0 & 0 \\ 0.119639 & 0.119183 & 0.377128 & 0.556322 & 0 & 0 & 0 & 0 & 0 \\ 0.119509 & 0.119183 & 0.377128 & 0.556322 & 0 & 0 & 0 & 0 & 0 \\ 0.113659 & 0.119183 & 0.337594 & 0.524655 & 0 & 0 & 0 & 0 & 0 \\ 0.127766 & 0.127766 & 0.332389 & 0.574947 & 0 & 0 & 0 & 0 & 0 \\ 0.137056 & 0.127766 & 0.332356 & 0.573934 & 0 & 0 & 0 & 0 & 0 \\ 0.137055 & 0.130985 & 0.392756 & 0.593332 & 0 & 0 & 0 & 0 & 0 \\ 0.137056 & 0.137056 & 0.411194 & 0.616791 & 0 & 0 & 0 & 0 & 0 \\ 0.137056 & 0.137056 & 0.411194 & 0.616791 & 0 & 0 & 0 & 0 & 0 \\ 0.137056 & 0.137056 & 0.332386 & 0.574345 & 0 & 0 & 0 & 0 & 0 \\ 0.137056 & 0.137056 & 0.332356 & 0.539337 & 0.583397 & 0 & 0 & 0 & 0 \\ 0.137056 & 0.137056 & 0.411194 & 0.547721 & 0.543565 & 0 & 0 & 0 & 0 \\ 0.137056 & 0.137056 & 0.332381 & 0.5633977 & 0 & 0 & 0 & 0 & 0 \\ 0.137056 & 0.137056 & 0.332381 & 0.573397 & 0 & 0 & 0 & 0 & 0 \\ 0.137055 & 0.130986 & 0.332381 & 0.573397 & 0 & 0 & 0 & 0 & 0 \\ 0.137055 & 0.130986 & 0.334815 & 0.517594 & 0 & 0 & 0 & 0 & 0 \\ 0.130572 & 0.130383 & 0.336391 & 0.5633397 & 0 & 0 & 0 & 0 & 0 \\ 0.130572 & 0.130355 & 0.53696 & 0.690259 & 0.690279 & 0 & 0 & 0 & 0 & 0 \\ 0.130572 & 0.130585 & 0.53696 & 0.690259 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0.13164 & 0.117846 & 0.334815 & 0.571284 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0.130572 & 0.130575 & 0.336931 & 0.5633977 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0.130572 & 0.345051 & 0.336831 & 0.5633977 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0.130572 & 0.345051 & 0.348656 & 0.690259 & 0.94772 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & $
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $
0.128639 0.128639 0.386517 0.57976 0 0 0.123644 0.123644 0.380531 0.583397 0.603342 0 0 0 0.123644 0.123644 0.380531 0.583397 0.603342 0 0 0 0.1123743 0.317281 0.371228 0.5666442 0.380571 0.503327 0
0.123644 0.123644 0.373397 0.583337 0 0 0.133187 0.135187 0.371228 0.586342 0 0 0 0 0.135187 0.135187 0.371228 0.586342 0
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WIND EROSION FROM BAUXITE STOCKPILE Lehigh Southwest Cement Company Cupertino Facility

k (PM10) = threshold friction velocity (u_t^*) =

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	i	ns/u:	ur: 0.2a	0.2b	0.6a	0.9	0.2a	0.2b	0.6a	0.9		0 2a			0
		n ⁺ 10	*⊃	*n	*⊐	*¬	E E	4	P	A		р 2.5	D D	D.00	8.0 0
	N (m/s)	(m/s)	(m/s)	(m/s)	(m/s)	(s/m)	(g/m ²)	(g/m ²)	(a/m ²)	(a/m ²)		(a/m ²)	(a/m ²)	1/2/10/	12
11/4/2010			6.1 0.12267	57 0.12267	0.368009	0.552014	0	C			•	-	-11	-1	(11)/6)
11/5/2010		9.3	9.3 0.185614	14 0.185614	0.556842	0.835263	C						5		
11/6/2010		10.0	10.0 0.200009	0	0							5		0	
11/7/2010	130		10.5 0.210917	0	0	0 949126						5	5	0	
11/8/2010	131 1		1	0	0.652063						0		0	0	
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11/30/2010				siè		0.0/0/0/4			0	0	-	0	0	0	
12/1/2010	154	5.0	1		1	177004-0			5	0	1	0	0	0	0
12/2/2010					0.263130	0.304600	5		5	0	-	0	0	0	
12/3/2010			5.7 0 114444		0 3/3227				5	0	-	0	0	0	
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12/8/2010	161 5	9.0			0.530130	0.492000				0	-	0	0	0	
12/9/2010	162 5				0.25070	0,5000				0	-	0	0	0	
12/10/2010					0.357540	0.525300			0	0	-	0	0	0	
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Lehigh Southwest Cement Compa Cupertino Facility

k (PM10) = threshold friction velocity (u_i^*) =

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					E	subarea			Pile S	Subarea			Disrea	Disregarding Weekends	skende	
	1	+	us/ur:		0.2b	0.6a	0.9	0.2a	0.2b	0.6a	0.9		0.2a	0.2b	0.6a	60
	;	n z	n 10	*⊃	*n	*n	*⊐	۳.	۳_	٩	<u>م</u>		ď	La T	d	
10116	Z	(m/s)	(m/s)		(m/s)	(m/s)	(m/s)	(g/m ²)	(g/m ²)	(g/m ²)	(g/m ²)		(g/m ²)	(g/m ²)	(g/m ²)	(a/m ²)
12/17/2010	ROI	0.0	5.9			0.355939	0.533909	0	0	0	10	11	0			
12/18/2010	171	16.0	19.2			1.154991	1.732487	0		0.9457967	37.070307	1	0	0	0.9457967	37.07031
12/19/2010	172	16.01	16.0	081000190	0.335196	1.005020	1.508382	0		0		0	0		0	
12/20/2010	173	12.0	12.0			0.962403	1.443605	0		0	14.163896	0	0			
12/21/2010	174	12.0	12.1		5 c	1.129567	1.0943/2			0	0	-	0	0		
12/22/2010	175	7.3	7.3			U.12U13	1.081094	0		0	0	-	0		0	0
12/23/2010	176	6.8	6.8		4.	0.00000000	0.61947			0	0		0			0
12/24/2010	1771	9.1	9.1	1	ſ	0.544770	0.817158				0	-	0	0		0
12/25/2010	178	24.2	24.2		+-	1 454334				14 0 4 4 7 7 0	10100	-t ^c	0	0		
12/26/2010	179	7.1	7.1			0.428092	0.642130			14.841003	91.891046		0	0		
12/27/2010	180	7.2	7.2	1	+	0.431311	0.646967					5	0	0		
12/28/2010	181	18.4	18.4	2	Ľ	1.104028	1 656042				20 066046			0		
12/29/2010	182	18.8	18.8		0	1.127096	1 690643			0 1902095	30.000810	-		0		30.06682
12/30/2010	183	6.6	9.9	1	0	0.59198	0.88797			0.1000000	+07C1	=†;		0	0.180308	33.15284
12/31/2010	184	5.6	5.6	1	0	0.336895	0.505342					-		0		
1/1/2011	185	15.0	15.0	0.300237	0	0.900711	1.351066				0 0700675	- 0				
1/2/2011	186	7.1	7.1	1	0	0.425678	0.638518				0.0000000			0		
1/3/2011	187	4.8	4.8	0.095221	0.095221	0.285663	0.428495	C	þc							
1/4/2011	188	4.8	4.8	0.095489	0.095489	0.286468	0.429702	0								
1/5/2011	189	6.7	6.7	L	0.133041	0.399124	0.598686	0	C			- -				
1/6/2011	190	7.0	7.0	1	0.139479	0.418436	0.627654	0	0	0	p c					
1102/1/1	191	4.5	4.5		o	0.272788	0.409182	0	0	0	0					
1/8/2011	192	5.8	5.8		0	0.345746	0.51862	0	0	0	0	. 0				
1102/8/1	193	7.1	7.1		o	0.424874	0.637311	0	0	0	0	0	0			
110/2011	194	9.4	9.4			0.56167	0.842505	0	0	0	0	, -	0	0	D C	
1/12/11/1	106	7.7	2.7			0.432116	0.648174	0	0	0	0	1	0	0		
1/13/2011	102	0.0	0.0			0.331262	0.496893	0	0	0	0	-	0	0		
1/14/2011	108	7 5	0.9	0.130400	0.138406	0.415217	0.622826	0	0	0	0	-	0	0		
1/15/2011	1991	8.0	0.4	0.160570		0.44/941	0.01912	50		0	0	-	0	0	0	0
1/16/2011	200	5.0	5.0	0.099513		0.208538	0.472001		50		0	0	0	0		0
1/17/2011	201	6.3	6.3	0.125889		0.377666	0.566.408				0	0		0		0
1/18/2011	202	8.7	8.7	0.173633		0.520800	0.781340						0	0		0
1/19/2011	203	10.8	10.8	0.215477	0	0.64643	0 969645				50			0	0	
1/20/2011	204	9.7	9.7	0.194913	0.194913	0.584738	0.02000					_	0	0		
1/21/2011	205	7.6	7.6	0.152264	0.152264	35	0.685180				0		0	0		0
1/22/2011	206	9.1	9.1	0.181322	0.181322	212	0 815051		50				0	0		0
1/23/2011	207	11.7	11.7	0.234163	0	1 70249	1 053735					50	0	0		0
1/24/2011	208	6.5	6.5	0.13018		_	0.585811			50		5		0	0	0
1/25/2011	209	10.6	10.6	0.212526	0.212526	37579	0.956368						50	50	0	0
1/26/2011	210	7.7	7.7	0.154947	0.154947	34	0.69726				50				0	0
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k (PM10) = threshold friction velocity $(u^*_i) =$

	m/s
0.5	1.12

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	1		u _s /u _r :	0.2a	0.2b	0.6a	0.9	0.2a	0.2h	0.69	00			UISregarding Weekends	kends	
		u [†]	- د+ ت	*=	*"	*		0.128	07.0	0.03	B.0		0.2a	0.2b	0.6a	0.9
Date	z	(m/s)	(m/s)	(m/s)	(m/e)	(m/e)	n (2))	r; (a/m ²)	1	- H	n .		- H	Ъ,	۳. ۳	ď
1/27/2011	211	55			6	_	0 1000-01		(m/g)	(()	(g/m ⁻)		(g/m ^{<})	(g/m ²)	(g/m ²)	(g/m ²)
1/28/2011	212	56	5.0	<u> </u>	0 11266	4			0	0		1	0	0	0	
1/29/2011	213	76	7.6	1	sle		0.506565					1	0	0	0	
1/30/2011	214	98	9.9		slo	4	0.080396					0	0	0	0	_
1/31/2011	215	6.0	0.0				0.////28	0		0	0	0	0	0	C	
2/1/2011	216	10 8	10.0	1			0.556842	0				1	0	0		
2/2/2011	212	0.0	- C			_	0.968438	0				F	0	0		
2/3/2011	218	0.1		-1	5	0.546381	0.819572	0		0		1	C	C		
2/1/2011	210	4. L	0.4			0.381689	0.572533	0	0		0	-	c			
214/2011	219	10.0	6.5		o	0.388126	0.58219	0								
1102/0/2	. 22	13.9	13.9		0	0.834458	1.251688	0			4 298004					
11.07/9/7	221	14.7	14.7	0.293621	1 0.293621	0.880862	1.321293	C			۴ľ۲	5 0	5		0	
2/7/2011	222	10.3	10.3	0.20591		0.61773	0.926595				-		0	0	0	0
2/8/2011	223	17.0	17.0	0.339488	C	1	1 577605					-	0	0	0	J
2/9/2011	224	6.6	6.6	0.197595	° °	- -	- -				6	-	0	0	0	19.83283
2/10/2011	225	6.5	6.5	0 13018		2	이					1	0	0	0	
2/11/2011	226	58	200	0 116858		1	0.202011					1	0	0	0	0
2/12/2011	227	5-1	2.0 4	0.101000		2	0.525862		0		0	1	0	0	0	
2/13/2011	228	4 7		0.00000	1	8/002.0	0.45867	0		0		0	0	0	C	
2/14/2011	229	16.1	40.4	0.0224.40	1	0.28164	0.42246	0				0	0	0	C	
2/15/2011	230	21 8	10.4	0.32/149	-	0.981448	1.472171	0			15.997711	1	0	C		15 00771
2/16/2011	120	0.12	0.12	0.430864	-j	1.292592	1.938889	0	0	6.0425231	56		C		6 0425231	50 26575
2/17/2011	220	10.9	6.01	0.33814/	2		1.521659	0	0		19.39864	-	C			10 3086/
2/18/2011	202	19.1	10.1	0.334928	2	-1	1.507175	0			1 ²⁰		C			10.00004
1102/01/2	200	0.11	11.5	0.229603	3 0.229603		1.033216	0	0	0						10.1.00
1107/61/7	234	10.3	10.3	0.20591		0.61773	0.926595	0			C					
1102/02/2	230	1.4	7.4	0.147436	o	0.442309	0.663463	0								
1107/17/2	236	8.8	8.8	0.176315		0.528946	0.793419	0	C			5+				
11.02/22/2	237	7.1	7.1	0.141356	0.141356	0.424069	0.636104	C				- +		5		
2/23/2011	238	11.9	11.9	0.238366	0.238366	0.715097	1.072645	C							0	
2/24/2011	239	10.7	10.7	0.213063		0.639188	0.958782) C				-		5	0	
2/25/2011	240	17.8	17.8	0.355134	0.355134	1.065403	1.598105	C			75 21040		5		0	
2/26/2011	241	8.1	8.1	0.161563	0.161563	0.484689	0.727033				20.21040	- 0	5	0	0	25.21048
2/27/2011	242	9.6	9.6	0.192499	0	0.577496	0 866243						0	o	0	0
2/28/2011	243	10.0	10.0	0.199741	ò	0.599222	0.898833				0	0	0	0	0	0
3/1/2011	244	11.7	11.7	0.234432	0	0 703295	1 054042						5	0	0	0
3/2/2011	245	19.1	19.1	0.381868	0	1.145603	1 718405			0 6701070			0	0		0
3/3/2011	246	9.0	0.6	0.179445	0	0.538334	0 807501			01010	50.129294		0	0	0.6781029	35.72925
3/4/2011	247	6.9		0.138942	0	0.416827	0.62524						0	0	0	0
3/5/2011	248	6.9	1	0.138138	Ċ	0 414413	0.621610				5		0	0	0	0
3/6/2011	249	13.8		0.275739	C	0 827216	1 2000 A				Ð	0	0	0	0	0
3/7/2011	250	21.2		0.424248		1 272744	1 000115			01111	3.8673233	0	0	0	0	0
3/8/2011	251	6.1		0.122938			0 553771			9.1/1/622	55.844653	-	0		5.1717622	55.84465
3/9/2011	252	6.3	+	0 126693	5	0.38004	0.670440		D I		0	-	0	0	0	0
	and a second sec															

VIND EROSION FROM BAUXITE STOCKPIL Lehigh Southwest Cernent Company Cupertino Facility
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k (PM10) = threshold friction velocity $(u^*_i) =$

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Date N 310/2011 253 311/2011 253 311/2011 255 313/2011 256 313/2011 256 314/2011 256 316/2011 258	r_z^+n	n°/u ⁺	0.2a	0.2b	0.6a	0.9	0.29						UISTEGATOING WEEKENDS	ekends	
0/2011 1/2011 2/2011 4/2011 6/2011	n ⁺	+							220						
0/2011 2/2011 2/2011 1/2011 1/2011 1/2011 1/2011 1/2011		u.'v	*=	*	*		27.0	0.2.U	0.03	6.0		0.2a	0.2b	0.6a	0.9
0/2011 1/2011 3/2011 4/2011 6/2011	(m/s)	(m/e)	(m/e)	(a))	, , , , , , , , , , , , , , , , , , ,	n (й Т.	Σ.			P,	۳.	٣.	ď
		- 11 -	0 000750		(m/s)	(m/s)	(m/g)	((g/m ⁻)	(g/m ²)		(g/m ²)	(g/m ²)	(g/m ²)	(g/m ²)
	0.1 9 8	0.11	0010220	05/36/90	0./10269	1.065403	0		0	0	1	0			
		0.0	0 117205	0.447205	9/89/6.0	0.775314	ō	0	0	0	+	0	0	0	
		10 a		0.011/000	0.301910	0.52/8/3			0	0	0	0			
	7 6.8	0.01	1	0.10010	0.050454	0.975681		0	0	0	0	0			
		13 4	0700200	0.760407	0.409585	0.614377	0		0	0	-	0	0		
		4.0	0.1000491	0.400000	0.80549	1.208235	0		0	2.6574154	-	0	0		2657415
3/17/201111 26/		4, 0, t	0.100033	0.188833	0.566498	0.849747	0		0	0	1	C			
		5.11	U.2253372	0.225312	0.675935	1.013903	0	0	0	c	-				
	7.7.7	22.2	0.444723	0.444723	1.334168	2.001252	0		8.0145312	67 074361				0.044504	ľ
		17.8	0.355939	0.355939	1.067817	1.601726	C			25 502504				8.014031	b/.U/436
		21.1	0.421029	0.421029	1.263087	1 894631			V 76 A670A	F4 100015			P		
3/21/2011 26/		11.2	0.223434	-	0.670303	1 005464				24.108855	,	0	0	0	
	5 12.5		0 250436	0.250426	0.751000	1.0004.04			0	0	-	0	0		
			0.351/60	기억	1 05 1 100	1.120901		5	0	0.1768463	1	0	0		0.176846
			0 450040	-	1.004400	8091.801	0	0		23.89899	1	0	0		23 89890
		1.77	0.432042		1.30152/	2.042291	0	0	9.4216279	72.393231	1	0	C	9 421627	77 30373
		0.0	0.17/031	1//031	0.531092	0.796638	0	0	0	0	1	0		10.1.0	10000-1
		B.11	0.238902	238902	0.716706	1.075059	0	0	0	0					
		10.2	0.204301		0.612902	0.919353	0	0	C	C					
		8.5	0.170683		0	0.768072	0	c	C						
		9.5	0.189906	0.189906	1	0.854576	C					5			
			0.206089	0.206089	100	0 9274					=	0	0	0	0
_		9.1	0.182395	0.182395	+	0 820770					-	0	0		0
_			0.161563	0.161563	_	0 727033						0	0		-
-			0.126425	0 126425	_	0 568012			50	5		0	0		0
4/3/2011 277		7.5	0.150655	1-	-	21200000				0	0	0	0		0
4/4/2011 278		6.5	0 129644	_	200004	0.01/34/			0	0	0	0	0		0
4/5/2011 279		0.4	0 188833	_	-	0.0003397		0	0	0	-	0	0	0	0
4/6/2011 280			0 238634	4	715001	0.048/4/		5	0	0	-	0	0	0	
4/7/2011 281		1	0.300505	4	+	1.0700201			0	0	-	0	0	0	
1	9.0		0.180518		541553	0177001			5	8.9359805	-	0	0	0	8.93598
		1	0.226385	+	670154	1 018721			0	0	+	0	0	0	
4/10/2011 284			0.185882		ERTRAT	243000	50			0	0	0	0	0	0
			0.167196	+	501587	0 752301		5		0	0	0	0	0	0
		1	0 21494	-	644074	1002010				0		0	0	0	0
4/13/2011 287		10.4	0.20743	20743	-10	200		50		0	-	0	0	0	
4/14/2011 288		1	0 160311	60311				5	5	0	1	0	0	0	
-			0 158165	+.	200	0.71774	0		0	0	-	0	0	0	0
4/16/20111 290			0 00000	4	-	0.711/44		0	0	0	-	0	0	0	C
	2.07		1100020	_		0.928607	0	0	0	0	0	0	0	0	
			0.140010	_	20046	0.630068	0	0	0	0	0	0	C		
4/19/2011 293		7.1	0.13020		_	0.61317	0	0	0	0	-	0	0	0	
		_	0.141300		_	0.636104	0	0	0	0	-	0	C		
			0.249095	0.249095 0	0./4/284	1.120926	0	0	0	0.0232068	-	C			

WIND EROSION FROM BAUXITE STOCKPILE Lehigh Southwest Cement Company Cupertino Facility

k (PM10) = threshold friction velocity $(u^*_i) =$

0.5 _____1.12 m/s

		LIE SUDA	s suba	ioarea	ŀ			Pile Si	Pile Subarea			Disrege	Disregarding Weekends	cends	
	+	n ^s /n ^r :	0.2a	0.2b	0.6a	0.9	0.2a	0.2b	0.6a	0.9		0.2a	0.2h	0.6a	00
	u z	u ¹⁰	*n	*n	*n	*n	٩	ď	ď	d		٥	2	200	3
z	(m/s)	(m/s)	(m/s)	(m/s)	(m/c)	(m/e)	(c/m ²)	(2,m/2)	/~/~/~/			ا ا	1-1-1	2	-
262	R 11	4		0 164024	1001 100	1 (6/11)	/	1 11/61	1 (11/6)	1 (11/6)		(()	(g/m ⁻)	(g/m ²)	(g/m [^])
			0.101031	0.101031	U.483493	0./2824	0	0	0	0	~	C	C	C	
		9.8	0.196522	0.196522	0.589566	0.884349	0	0	C	C	. +				
	10.2	10.2	10.2 0.203228	0.203228	0.609683	0.914525	C	C							
4/24/2011 298	8.2	8.2	0.16344	0.16344	0.16344 0.490321	0 735482							0	D	0
4/25/2011 299	9.6	6.6	0.1984	0.1984	_	0 807708			50		5		0	0	0
4/26/2011 300	9.5	9.5	0		0.571326	0.85600						0	0	0	0
4/27/2011 301	6.4	6.4	0.128034	0 128034	0 384103	0 576154				5		0	0	0	0
4/28/2011 302	10.3	10.3		0.205642	0.616925	0.075388				0		0	0	0	0
4/29/2011 303		12.5	12.5 0.249095	0.249095	0.747284	1 120026				0 000000		0	0	0	0
4/30/2011 304	15.2	15.2	15.2 0.303724	0.303724	0.911172	1 366758				0.0232068	- 0	0	0	0	0.023207
	7.3	7.3	0.146453	0.146453	0.439358	0.659037				491 COO 1.8		5		0	0
5/2/2011 306	6.6	6.6	0.13179	0.13179	0.395369 0.593053	0.593053	, c						5	0	0
5/3/2011 307	8.6	8.6	0.172828	0.172828	0.518485	0 777708						5	0	0	0
5/4/2011 308	7.4	7.4		0.148777	0 446332	0.660408						0	0	0	0
5/5/2011 309	7.2	7.2		0.144575		0.650588					-	0	0	0	0
310	6.7	6.7	6.7 0.133846	0.133846	1	0.602307							0	0	0

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WIND EROSION FROM BAUXITE STOCKPILE Lehigh Southwest Cement Company Cupertino Facility

k (PM10) = threshold friction velocity $(u^*_i) =$

L

	m/s
0.5	1.12

					ast	Subarea			Pile Su	Subarea			Disrega	Disregarding Weekends	kends	
		+	us/ur:	0.2a	0.2b	0.6a	0.9	0.2a	0.2b	0.6a	0.9		0.2a	0.2b	0.6a	0.9
1	 :	n z	0 ¹⁰	*⊃	*⊃	*⊃	*⊃	۳.	۵.	۵.	ď		۵.	đ	Ā	Ъ.
Dale F13/0011	z	(m/s)	(m/s)	(m/s)	s/m)	(m/s)	(m/s)	(g/m²)	(g/m ²)	(g/m ²)	(g/m ²)		(g/m ²)	(g/m ²)	(g/m ²)	(g/m ²)
1107///9	5115	10.9	10.9	0.218159	0.21	0.654477	0.981716	0	0	0	0	0	0	11		0
1102/012011	312	10.0	10.8	0.216013	0	0.64804	0.97206	ō		0	0	0	0	0		0
5/10/2011	010	0.0 1	<u>π</u> .α	0.1/8908	o lo	0.536725	0.805087	0		0	0	1	0	0	0	0
5/11/2011	014	7.4	7.0	0.148///	S	0.446332	0.669498	0		0	0	1	0	0		0
5/17/2011	010	0.7	1.3	0.146453	-il	0.439358	0.659037	0		0	0	-	0	0	0	0
1102/21/2	010	α. <u>9</u>	8.9	0.1/864	_	0.53592	0.80388	0		0	0	1	0	0		0
1102/01/0	110	1.4	1.4	0.148509	<u> </u>	0.445527	0.668291	0		0	0	-	0	0		0
5/14/2011	318	11.0	11.0	0.220841	o	0.662524	0.993786	0		0	0	0	0	0		
5/15/2011	319	11.7	11.7	0.234432	0	0.703295	1.054942	0		0	C					
5/16/2011	320	16.0	16.0	0.320533	0.320533	0.961599	1.442398	C	C	p c	14 088405	-				1 1 000 10
5/17/2011	321	13.8	13.8	0.275471	0	0.826412	1.239617	0) C	3 8203149					14.00049
5/18/2011	322	13.4	13.4	0.267155	0.267155	0.801466	1 202199				2 1460705	- -				3.820315
5/19/2011	323	8.1	8.1	0.162099	0	0.486298	0 729447				010011					2.4408/9
5/20/2011	324	6.9	6.9	0.138406	0	0.415217	0.622826					- +				
5/21/2011	325	9.0	0.6	0.180518	0	0.541553	0.81233					- c		50		0
5/22/2011	326	11.1	11.1	0.222361	0	0.667084	1 000626									
5/23/2011	327	13.2	13.2	0.264831		0.794492	1.191739				2 0010566					0 00000
5/24/2011	328	7.8	7.8	0.155751	0.155751	0.467254	0,700881				0000100.7	+				CALANZ
5/25/2011	329	13.4	13.4	0.267155		0.801466	1.202199	C			2 4468785	-+-				
5/26/2011	330	6.6		0.198131	0.1981	0.594394	0.891591	0			00000	-				2.4400/9
5/27/2011	331	11.6		0.232286	0	0.696857	1.045286	0								
5/28/2011	332	15.1		0.302115		0.906344	1.359515	0		0	9.3152074	·c				
5/29/2011	333	13.3	13.3	0.265546	0	0.796638	1.194957	0	0	0	2.1998114	p c				
5/30/2011	334	13.7	13.7	0.273593		0.820779	1.231168	0		0	3.4959879			P O		3 405088
5/31/2011	335	13.7	13.7	0.274934	0.274934	0.824802	1.237203	0		0	3.726805					3 726805
6/1/2011	336	11.2	11.2	0.223434	0.5	0.670303	1.005454	0		0	0					20071
6/2/2011	337	9.2	9.2	0.184273	-	0.552819	0.829228	0		0	0		C	0	C	
6/3/2011	338	7.6		0.152801	o	0.458402	0.687603	0		0	0	1	0	0	C	
6/4/2011	339	19.5		0.390362	o	1.171085	1.756627	0	0	1.4284858	39.42277	0	0	0	0	
1107/0/0	340	C.8		0.169073	o	0.50722	0.76083	0		0	0	0	0	0	0	0
6/7/2011	341	1.1.	1.1	0.222093	0	0.666279	0.999419	0	0	0	0	+	0	0	0	0
6/8/2011	313	0.0	0.0	0.10203	1	0.493.05	0./42/24			0	0	-	0	0	0	0
6/9/2011	344	6.3	0.7	0.1333/0		0.400/33	0.6011	0		0	0	-	0	0	0	0
6/10/2011	345	0.0	0.0	0.178000	5 c	000000	0.564084			0	0	-	0	0	0	0
6/11/2011	346	0.0	0.0	0.10074	5	0.7050/20	1000000				0	-	0	0	0	0
6/12/2011	347	7.8	0.2 g L	0 156200	0.13071	1012/0.0	18100020	0		0	0	0	0	0	0	0
6/13/2011	348	8.0		0.1600.13	0.130200	0.400000	0.700100				0	0	0	0	0	0
6/14/2011	349	7.3	73	0 145648		0 436044							0	0	0	0
6/15/2011	350	6.9	6.9	0.137601		0.412803	0.610205				0				0	0
6/16/2011	351	6.5	6.5	0.130448	. E `		0.587018					-	5	5	0	0
6/17/2011	352	6.9	6.9	0.138942	Ċ		0.62524					-		5	D	
					5	T	1	1,	12	2	12	-	Tn In	Ъ	17	h

STOCKPILE	
FROM BAUXITE	I ehinh Southwest Compatibution
WIND EROSION FROM BAUXITE STOCKPILE	I ahidh Sou

Lehigh Southwest Cement Company Cupertino Facility

k (PM10) = threshold friction velocity $(u^*_i) =$

0.5 1.12 m/s

Dila Subaras	u _s /u _r : 0.2a 0.2b 0.6a 0.9 0.2a	U ¹⁰ U* U* U* D		(301) (601) (601) (601) (601) (601)	0.148////	9.2 0.183468 0.183468 0.550405 0.825607	7.9 0.157361 0.157361 0.472082 0.708122	0 138130 0 41443			7.4 0.148777 0.148777 0.4463321 0.660408	1000110	41000 1 1 1 00 0. 1 1 1 1 00 0. 1 1 1 00 0 1 1 1 0 0 0 1 1 0 0 0 0	<u>7.1</u> 0.142697 0.142697 0.428092 0.642139	7.6 0.151191 0.151191 0.453574 0.680361	120000 420000	107201 0, 102201	8.1 0.162099 0.162099 0.486298 0.729447	7.7 0.154947 0.154947 0.46484 0.60796	0.460012
Dila	_	*ɔ		10/11/	1		61 0.1573(38 0 1381		33 0.1221:	77 0.1487	28 0 1 A 7 10		9/1 0.1426						
		*⊃	(m/s)	11			0.1573	0 1381				0 17710					+	_		0.15333
	n²/n²	u [†] 10	(m/s)	11		9.2	7.9	9	1	0.	7.4	7 7			7.6	99		α.1	7.7	7.7
	-	n z	(m/s)		1.4	9.2	7.9	6.9	A 1		7.4	7.4	7 4		7.6	9.9	40	0.1	7.7	7.7
			z	363	100	400	355	356	357		358	359	360	100	361	362	362	200	364	365
			Date	6/18/20111	R/10/0011	1107/01/0	1102/02/9	6/21/2011	6/22/2011	6/00/0014	1102/02/0	6/24/2011	6/25/2011	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0/20/2011	6/27/2011	6/28/2011	1,100,00,0	11102/62/9	6/30/2011

(g/m²

(g/m²) ٩

olc

 \sim 0

00 00 0

0.9 ٦

0.6a

0.2b P_i (g/m²)

0.2a (g/m²) ۵.

0.9 P₁ (g/m²)

Pile Subarea

(g/m²) 0.6a ٦

(g/m²) 0.2b

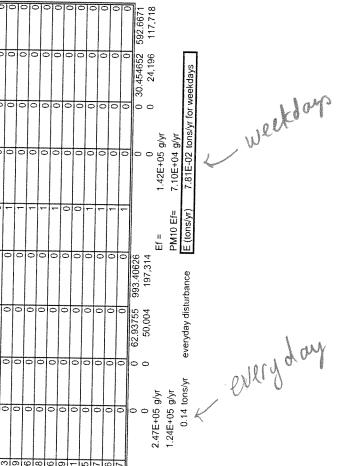
00

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Disregarding Weekends

Area Section	us/ur	% total A	A (m ²)
4	0.9	12	199
2	0.6	48	794
3	0.2	40	662
		Total Area:	1,655

Pi x A	Ef =	PM10 Ef:	E (ton/yr)	





Material Handling

COMPARISON OF MATERIAL HANDLING EMISSION FACTORS USING ON-SITE WIND DATA Lehigh Southwest Cement Company Cupertino Facility

5.52E-03	1.88E-04	lb/ton	мањиа палало
No Factor Applied	Applied	Units	Motorial Handler
Monitor Height 2011 MET Data),	Monitor Height		
Rev), Factor for EF (Lehigh 2010-	Rev), Factor for		
	EF (2013 CEIR		

K:\11191.000.0\CEIR 2008\Emission calcs\Hanson Appendix B Tables rev onsite.xls

AMEC Geomatrix, Inc.

TABLE B-5

MATERIAL HANDLING OF STOCKPILES Lehigh Southwest Cement Company

Cupertino Facility

Equations for TSP Emission Factor as per EPA AP-42¹ **Example for Quarry Overburden**



	A REAL PROPERTY AND A REAL PROPERTY A REAL PRO		
Equation element	Symbol	Value used	Notes
Particle size multiplier for PM10	k	0.35	pg. 13.2.4-4, AP-42 Aggregate Handling and Storage Piles
Mean wind cneed (muh) @ 10 m			Average wind data from 2008 using NOAA monitoring station (see
	n	0.41	attached)
Moisture content (%) ²	W	0.70	Assume no watering
PM10 emission factor (lb/ton)	Ef	1.88E-04	0

Notes:

Wind speed data for 2008 assumed to be representative of typical year 1. Equation is from US EPA AP-42 discussion on aggregate handling and storage piles (13.2.4) equation 1

2. Values for moisture content taken from Table 13.2.4-1, AP-42. Assumed that all materials have moisture content of crushed limestone

TABLE B-5

AMEC Geomatrix, Inc.

MATERIAL HANDLING OF STOCKPILES Lehigh Southwest Cement Company **Cupertino Facility**

Equations for TSP Emission Factor as per EPA AP-42¹ Example for Quarry Overburden

$\times \left(\frac{U}{5}\right)^{1.3}$	$\left(\frac{M}{2}\right)^{1.4}$
$E_f = k \times 0.0032$	

Equation element	Svmhol	Symbol Value used	
		nnen nnte	Notes
rarticle size multiplier for PM10	k	0.35	Dg. 13.2.4-4. AP-47 Appreciate Handling and Strugge Dilag
			soli I og i on g i i i n n n n n n n n n n n n n n n
INTERIM WIND Speed (mph) (@ 10 m	[]	5 51	Average wind dote from 2010 Lata Arts of .
			TAVE AND UNDER A DUNCTION AND A DUNCTION AND A DUNCTION
Moisture content (%) ²	y v		
	M	0./0	Assume no waterino
PM10 emission factor (16/100)	ſ		0
	, L	5 57E-03	
	ī	0.0445.00	

Notes:

Wind speed data for 2008 assumed to be representative of typical year

Equation is from US EPA AP-42 discussion on aggregate handling and storage piles (13.2.4) equation 1
 Values for moisture content taken from Table 13.2.4-1, AP-42. Assumed that all materials have moisture content of crushed limestone

I fem 6 Desel I fem Ef

3.4 Large Stationary Diesel And All Stationary Dual-fuel Engines

3.4.1 General

The primary domestic use of large stationary diesel engines (greater than 600 horsepower [hp]) is in oil and gas exploration and production. These engines, in groups of 3 to 5, supply mechanical power to operate drilling (rotary table), mud pumping, and hoisting equipment, and may also operate pumps or auxiliary power generators. Another frequent application of large stationary diesels is electricity generation for both base and standby service. Smaller uses include irrigation, hoisting, and nuclear power plant emergency cooling water pump operation.

Dual-fuel engines were developed to obtain compression ignition performance and the economy of natural gas, using a minimum of 5 to 6 percent diesel fuel to ignite the natural gas. Large dual-fuel engines have been used almost exclusively for prime electric power generation. This section includes all dual-fuel engines.

3.4.2 Process Description

All reciprocating internal combustion (IC) engines operate by the same basic process. A combustible mixture is first compressed in a small volume between the head of a piston and its surrounding cylinder. The mixture is then ignited, and the resulting high-pressure products of combustion push the piston through the cylinder. This movement is converted from linear to rotary motion by a crankshaft. The piston returns, pushing out exhaust gases, and the cycle is repeated.

There are 2 ignition methods used in stationary reciprocating IC engines, compression ignition (CI) and spark ignition (SI). In CI engines, combustion air is first compression heated in the cylinder, and diesel fuel oil is then injected into the hot air. Ignition is spontaneous because the air temperature is above the autoignition temperature of the fuel. SI engines initiate combustion by the spark of an electrical discharge. Usually the fuel is mixed with the air in a carburetor (for gasoline) or at the intake valve (for natural gas), but occasionally the fuel is injected into the compressed air in the cylinder. Although all diesel- fueled engines are compression ignited and all gasoline- and gas-fueled engines are spark ignited, gas can be used in a CI engine if a small amount of diesel fuel is injected into the compressed gas/air mixture to burn any mixture ratio of gas and diesel oil (hence the name dual fuel), from 6 to 100 percent diesel oil.

CI engines usually operate at a higher compression ratio (ratio of cylinder volume when the piston is at the bottom of its stroke to the volume when it is at the top) than SI engines because fuel is not present during compression; hence there is no danger of premature autoignition. Since engine thermal efficiency rises with increasing pressure ratio (and pressure ratio varies directly with compression ratio), CI engines are more efficient than SI engines. This increased efficiency is gained at the expense of poorer response to load changes and a heavier structure to withstand the higher pressures.¹

3.4.3 Emissions And Controls

Most of the pollutants from IC engines are emitted through the exhaust. However, some total organic compounds (TOC) escape from the crankcase as a result of blowby (gases that are vented from the oil pan after they have escaped from the cylinder past the piston rings) and from the fuel tank

and carburetor because of evaporation. Nearly all of the TOCs from diesel CI engines enter the atmosphere from the exhaust. Crankcase blowby is minor because TOCs are not present during compression of the charge. Evaporative losses are insignificant in diesel engines due to the low volatility of diesel fuels. In general, evaporative losses are also negligible in engines using gaseous fuels because these engines receive their fuel continuously from a pipe rather than via a fuel storage tank and fuel pump.

The primary pollutants from internal combustion engines are oxides of nitrogen (NO_x) , hydrocarbons and other organic compounds, carbon monoxide (CO), and particulates, which include both visible (smoke) and nonvisible emissions. Nitrogen oxide formation is directly related to high pressures and temperatures during the combustion process and to the nitrogen content, if any, of the fuel. The other pollutants, HC, CO, and smoke, are primarily the result of incomplete combustion. Ash and metallic additives in the fuel also contribute to the particulate content of the exhaust. Sulfur oxides also appear in the exhaust from IC engines. The sulfur compounds, mainly sulfur dioxide (SO₂), are directly related to the sulfur content of the fuel.²

3.4.3.1 Nitrogen Oxides -

Nitrogen oxide formation occurs by two fundamentally different mechanisms. The predominant mechanism with internal combustion engines is thermal NO_x which arises from the thermal dissociation and subsequent reaction of nitrogen (N_2) and oxygen (O_2) molecules in the combustion air. Most thermal NO_x is formed in the high-temperature region of the flame from dissociated molecular nitrogen in the combustion air. Some NO_x called prompt NO_x , is formed in the early part of the flame from reaction of nitrogen intermediary species, and HC radicals in the flame. The second mechanism, fuel NO_x , stems from the evolution and reaction of fuel-bound nitrogen compounds with oxygen. Gasoline, and most distillate oils, have no chemically-bound fuel N_2 and essentially all NO_x formed is thermal NO_x .

3.4.3.2 Total Organic Compounds -

The pollutants commonly classified as hydrocarbons are composed of a wide variety of organic compounds and are discharged into the atmosphere when some of the fuel remains unburned or is only partially burned during the combustion process. Most unburned hydrocarbon emissions result from fuel droplets that were transported or injected into the quench layer during combustion. This is the region immediately adjacent to the combustion chamber surfaces, where heat transfer outward through the cylinder walls causes the mixture temperatures to be too low to support combustion.

Partially burned hydrocarbons can occur because of poor air and fuel homogeneity due to incomplete mixing, before or during combustion; incorrect air/fuel ratios in the cylinder during combustion due to maladjustment of the engine fuel system; excessively large fuel droplets (diesel engines); and low cylinder temperature due to excessive cooling (quenching) through the walls or early cooling of the gases by expansion of the combustion volume caused by piston motion before combustion is completed.²

3.4.3.3 Carbon Monoxide -

Carbon monoxide is a colorless, odorless, relatively inert gas formed as an intermediate combustion product that appears in the exhaust when the reaction of CO to CO_2 cannot proceed to completion. This situation occurs if there is a lack of available oxygen near the hydrocarbon (fuel) molecule during combustion, if the gas temperature is too low, or if the residence time in the cylinder is too short. The oxidation rate of CO is limited by reaction kinetics and, as a consequence, can be accelerated only to a certain extent by improvements in air and fuel mixing during the combustion process.²⁻³

3.4.3.4 Smoke, Particulate Matter, and PM-10 -

White, blue, and black smoke may be emitted from IC engines. Liquid particulates appear as white smoke in the exhaust during an engine cold start, idling, or low load operation. These are formed in the quench layer adjacent to the cylinder walls, where the temperature is not high enough to ignite the fuel. Blue smoke is emitted when lubricating oil leaks, often past worn piston rings, into the combustion chamber and is partially burned. Proper maintenance is the most effective method of preventing blue smoke emissions from all types of IC engines. The primary constituent of black smoke is agglomerated carbon particles (soot).²

3.4.3.5 Sulfur Oxides -

Sulfur oxide emissions are a function of only the sulfur content in the fuel rather than any combustion variables. In fact, during the combustion process, essentially all the sulfur in the fuel is oxidized to SO₂. The oxidation of SO₂ gives sulfur trioxide (SO₃), which reacts with water to give sulfuric acid (H_2SO_4), a contributor to acid precipitation. Sulfuric acid reacts with basic substances to give sulfates, which are fine particulates that contribute to PM-10 and visibility reduction. Sulfur oxide emissions also contribute to corrosion of the engine parts.^{2,3}

Table 3.4-1 contains gaseous emission factors for the pollutants discussed above, expressed in units of pounds per horsepower-hour (lb/hp-hr), and pounds per million British thermal unit (lb/MMBtu). Table 3.4-2 shows the particulate and particle-sizing emission factors. Table 3.4-3 shows the speciated organic compound emission factors and Table 3.4-4 shows the emission factors for polycyclic aromatic hydrocarbons (PAH). These tables do not provide a complete speciated organic compound and PAH listing because they are based only on a single engine test; they are to be used only for rough order of magnitude comparisons.

Table 3.4-5 shows the NO_x reduction and fuel consumption penalties for diesel and dual-fueled engines based on some of the available control techniques. The emission reductions shown are those that have been demonstrated. The effectiveness of controls on a particular engine will depend on the specific design of each engine, and the effectiveness of each technique could vary considerably. Other NO_x control techniques exist but are not included in Table 3.4-5. These techniques include internal/external exhaust gas recirculation, combustion chamber modification, manifold air cooling, and turbocharging.

3.4.4 Control Technologies

Control measures to date are primarily directed at limiting NO_x and CO emissions since they are the primary pollutants from these engines. From a NO_x control viewpoint, the most important distinction between different engine models and types of reciprocating engines is whether they are rich-burn or lean-burn. Rich-burn engines have an air-to-fuel ratio operating range that is near stoichiometric or fuel-rich of stoichiometric and as a result the exhaust gas has little or no excess oxygen. A lean-burn engine has an air-to-fuel operating range that is fuel-lean of stoichiometric; therefore, the exhaust from these engines is characterized by medium to high levels of O_2 . The most common NO_x control technique for diesel and dual fuel engines focuses on modifying the combustion process. However, selective catalytic reduction (SCR) and nonselective catalytic reduction (NSCR) which are post-combustion techniques are becoming available. Control for CO have been partly adapted from mobile sources.⁵

Combustion modifications include injection timing retard (ITR), preignition chamber combustion (PCC), air-to-fuel ratio, and derating. Injection of fuel into the cylinder of a CI engine initiates the combustion process. Retarding the timing of the diesel fuel injection causes the combustion process to occur later in the power stroke when the piston is in the downward motion and combustion chamber volume is increasing. By increasing the volume, the combustion temperature and pressure are lowered, thereby lowering NO_x formation. ITR reduces NO_x from all diesel engines; however, the effectiveness is specific to each engine model. The amount of NO_x reduction with ITR diminishes with increasing levels of retard.⁵

Improved swirl patterns promote thorough air and fuel mixing and may include a precombustion chamber (PCC). A PCC is an antechamber that ignites a fuel-rich mixture that propagates to the main combustion chamber. The high exit velocity from the PCC results in improved mixing and complete combustion of the lean air/fuel mixture which lowers combustion temperature, thereby reducing NO_x emissions.⁵

The air-to-fuel ratio for each cylinder can be adjusted by controlling the amount of fuel that enters each cylinder. At air-to-fuel ratios less than stoichiometric (fuel-rich), combustion occurs under conditions of insufficient oxygen which causes NO_x to decrease because of lower oxygen and lower temperatures. Derating involves restricting engine operation to lower than normal levels of power production for the given application. Derating reduces cylinder pressures and temperatures thereby lowering NO_x formation rates.⁵

SCR is an add-on NO_x control placed in the exhaust stream following the engine and involves injecting ammonia (NH₃) into the flue gas. The NH₃ reacts with the NO_x in the presence of a catalyst to form water and nitrogen. The effectiveness of SCR depends on fuel quality and engine duty cycle (load fluctuations). Contaminants in the fuel may poison or mask the catalyst surface causing a reduction or termination in catalyst activity. Load fluctuations can cause variations in exhaust temperature and NO_x concentration which can create problems with the effectiveness of the SCR system.⁵

NSCR is often referred to as a three-way conversion catalyst system because the catalyst reactor simultaneously reduces NO_x , CO, and HC and involves placing a catalyst in the exhaust stream of the engine. The reaction requires that the O_2 levels be kept low and that the engine be operated at fuel-rich air-to-fuel ratios.⁵

3.4.5 Updates Since the Fifth Edition

The Fifth Edition was released in January 1995. Revisions to this section since that date are summarized below. For further detail, consult the memoranda describing each supplement or the background report for this section.

Supplement A, February 1996

No changes.

Supplement B, October 1996

- The general text was updated.
- Controlled NO_x factors and PM factors were added for diesel units.
- Math errors were corrected in factors for CO from diesel units and for uncontrolled NO_x from dual fueled units.

Table 3.4-1. GASEOUS EMISSION FACTORS FOR LARGE STATIONARY DIESEL AND ALL STATIONARY DUAL-FUEL ENGINES^a

	S)	(SCC 2-02-004-01)			Dual Fuel ^o	
<u> </u>	Emission Factor	Emiraton P.		- 1	(70-4-00-20-20-20)	
Pollutant ((power output)	Linission Factor (Jb/MMBtu) (fuel input)	EMISSION FACTOR RATING	Emission Factor (lb/hp-hr) (power output)	Emission Factor (lb/MMBtu) (fuel input)	EMISSION FACTOR PATING
Uncontrolled Controlled CO SO _x ^d SO _x ^d SO _x ^d TOC (as CH ₄) Methane Noumethane	0.024 0.013° 5.5 E-03 8.09 E-03S ₁ 1.16 0.0007° 7.05 E-04 f	3.2 1.9° 0.85 1.01S ₁ 1.01S ₁ 0.1° 0.09 f	മമാമ മമംഗലല	We controlled 0.024 3.2 B 0.018 2.7 D Controlled 0.013 ^c 1.9^{c} B ND ND ND NA CO 5.5 E-03 1.9^{c} B $4.06 E \cdot 04S_1 + 9.57$ $0.05S_1 + 0.895S_2$ B CO $5.5 E \cdot 03$ 0.85 C $7.5 E \cdot 03$ 1.16 NA SO _a $8.09 E \cdot 03S_1$ $1.01S_1$ B $4.06 E \cdot 04S_1 + 9.57$ $0.05S_1 + 0.895S_2$ B CO 1.16 165 B 0.772 1110 B CO 0.0007^{c} 0.1^{c} B 0.772 110 B Methane f f f f f B 0.772 110 ND Nonmethane f f f f f 0.8 D Nounnethane f f f f f f ND ND	$\begin{array}{c} 2.7 \\ 2.7 \\ ND \\ 1.16 \\ 0.05S_1 + 0.895S_2 \\ 110 \\ ND \\ 0.8 \\ 0.6 \\ 0.6 \end{array}$	D NA B D NA E

point and of the use of data possibly sufficient to averages across all manufacturers and duty cycles. The actual emissions from a particular engine or manufacturer could vary considerably from these levels. To convert from lb/hp-hr to kg/kw-hr, multiply by 0.608. To convert from lb/MMBtu to ng/J, multiply by 430. SCC = calculate only 1 of the 2 emission factors (e.g., enough information to calculate lb/MMBtu, but not lb/hp-hr). Factors are based on

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- ^b Dual fuel assumes 95% natural gas and 5% diesel fuel.

- References 8-26. Controlled NO_x is by ignition timing retard. Assumes that all sulfur in the fuel is converted to SO₂. $S_1 = \%$ sulfur in fuel oil; $S_2 = \%$ sulfur in natural gas. For example, if sulfer 0

Assumes 100% conversion of carbon in fuel to CO₂ with 87 weight % carbon in diesel, 70 weight % carbon in natural gas, dual-fuel mixture of 5% diesel with 95% natural gas, average BSFC of 7,000 Btu/hp-hr, diesel heating value of 19,300 Btu/lb, and natural gas Based on data from 1 engine, TOC is by weight 9% methane and 91% nonmethane.

- OÚ)
- Assumes that nonmethane organic compounds are 25% of TOC emissions from dual-fuel engines. Molecular weight of nonmethane gas

3.4-5

Table 3.4-2. PARTICULATE AND PARTICLE-SIZING EMISSION FACTORS FOR LARGE UNCONTROLLED STATIONARY DIESEL ENGINES^a

EMISSION	FACTOR	RATING:	E

Pollutant	Emission Factor (lb/MMBtu) (fuel input)
Filterable particulate ^b	
< 1 µm	0.0478
< 3 µm	0.0479
< 10 µm	0.0496
Total filterable particulate	0.0620
Condensable particulate	0.0077
Total PM-10 ^c	0.0573
Total particulate ^d	0.0697

^a Based on 1 uncontrolled diesel engine from Reference 6. Source Classification Code 2-02-004-01. The data for the particulate emissions were collected using Method 5, and the particle size distributions were collected using a Source Assessment Sampling System. To convert from lb/MMBtu to ng/J, multiply by 430. PM-10 = particulate matter ≤ 10 micrometers (µm) aerometric diameter.

^b Particle size is expressed as aerodynamic diameter.

^c Total PM-10 is the sum of filterable particulate less than 10 µm aerodynamic diameter and condensable particulate.

^d Total particulate is the sum of the total filterable particulate and condensable particulate.

Table 3.4-3. SPECIATED ORGANIC COMPOUND EMISSION FACTORS FOR LARGE UNCONTROLLED STATIONARY DIESEL ENGINES^a

EMISSION FACTOR RATING: E

Pollutant	Emission Factor (lb/MMBtu) (fuel input)
Benzene ^b	7.76 E-04
Toluene ^b	2.81 E-04
Xylenes ^b	1.93 E-04
Propylene	2.79 E-03
Formaldehyde ^b	7.89 E-05
Acetaldehyde ^b	2.52 E-05
Acrolein ^b	7.88 E-06

^aBased on 1 uncontrolled diesel engine from Reference 7. Source Classification Code 2-02-004-01. Not enough information to calculate the output-specific emission factors of lb/hp-hr. To convert from lb/MMBtu to ng/J, multiply by 430. ^bHazardous air pollutant listed in the *Clean Air Act*.

Table 3.4-4.PAH EMISSION FACTORS FOR LARGEUNCONTROLLED STATIONARY DIESEL ENGINES^a

EMISSION FACTOR RATING: E

РАН	Emission Factor (lb/MMBtu) (fuel input)
Naphthalene ^b	1.30 E-04
Acenaphthylene	9.23 E-06
Acenaphthene	4.68 E-06
Fluorene	1.28 E-05
Phenanthrene	4.08 E-05
Anthracene	1.23 E-06
Fluoranthene	4.03 E-06
Pyrene	3.71 E-06
Benz(a)anthracene	6.22 E-07
Chrysene	1.53 E-06
Benzo(b)fluoranthene	1.11 E-06
Benzo(k)fluoranthene	<2.18 E-07
Benzo(a)pyrene	<2.57 E-07
Indeno(1,2,3-cd)pyrene	<4.14 E-07
Dibenz(a,h)anthracene	<3.46 E-07
Benzo(g,h,l)perylene	<5.56 E-07
TOTAL PAH	<2.12 E-04

^a Based on 1 uncontrolled diesel engine from Reference 7. Source Classification Code 2-02-004-01. Not enough information to calculate the output-specific emission factors of lb/hp-hr. To , convert from lb/MMBtu to ng/J, multiply by 430.

^b Hazardous air pollutant listed in the Clean Air Act.

		Dies (SCC 2-02		Dual (SCC 2-02	
Control Approach		NO _x Reduction (%)	ΔBSFC ^b (%)	NO _x Reduction (%)	$\Delta BSFC$ (%)
Derate	10%	ND	ND	<20	4
	20%	<20	4	ND	ND
	25%	5 - 23	1 - 5	1 - 33	1 - 7
Retard	<u>2</u> °	<20	4	<20	3
	4°	<40	4	<40	T
	8°	28 - 45	2 - 8	50 - 73	3 - 5
Air-to-fuel	3%	ND	ND	<20	0
	±10%	7 - 8	3	25 - 40	1 - 3
Water injection (H ₂ O/fuel ratio)	50%	25 - 35	2 - 4	ND	ND
SCR		80 - 95	0	80 - 95	0

Table 3.4-5. NO_x REDUCTION AND FUEL CONSUMPTION PENALTIES FOR LARGE STATIONARY DIESEL AND DUAL-FUEL ENGINES^a

References 1.27-28. The reductions shown are typical and will vary depending on the engine and duty cycle. SCC = Source Classification Code. Δ BSFC = change in brake-specific fuel consumption. ND = no data.

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Lehigh Cupertino kiln benzene data summary addendum to letter, August 20, 2014:

Below is a summary table showing recommended values for maximum hourly and annual average benzene emissions (lb/ton feed and lb/ton clinker), based on the 2009, 2011, and 2012 source test data summarized in Tables 1 and 2:

Kiln benzene emissions item	Recommended value based on Table 2 summary of 2009/2011/2012 data
Maximum hourly emissions, based on maximum of averages at either RM-on or RM-off, considering all three years	2.33
Average annual emissions, based on average of 70/30 ratio RM-on/RM-off for three years (lb/ton feed), using 1.55 ton feed per ton clinker	0.0065
Average annual emissions, based on average of 70/30 ratio RM-on/RM-off for three years, (lb/ton clinker)	0.0101

Note that the following changes were made to the 2012 data, based on observed outliers in data set:

- 1) 2012 RM-on high test-removed from 2012 RM-on average
- 2) 2012 RM-off high test—removed from 2012 RM-off average
- 3) 2012 RM-off production rate (feed and clinker rates)—values in average were replaced by using the same value as average for 2012 RM-on:

The RM-off production rates in the original test report are low, and do not seem realistic, given that the flow rates (corrected to 7%O2) are not also lower than for other tests.

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		5002	Fable 1: raw da	2009 Table 1: raw data from report, results calculated	results calculate	ed			
		RM On	ь О			RN	RM Off		70% On/30% Off
	Run 1	Run 2	Run3	Average	Run 1	Run 2	Run3	Average	Weighted Average
Clinker Rate (tph)	199	199	199	199	199	199	199	199	199
Feed Rate (tph)	309	308	309	309	309	309	309	309	309
02 (%)	12.56	10.81	10.86	11.41	10.96	12.82	11.11	11.63	11.476
Concentration (ug/m3)	1,200	1,200	066	1,130	1,300	1,400	980	1,227	1,159
Concentration (ug/m3 @ 7% 02)	2,000	1,653	1,371	1,675	1,818	2,408	1,391	1,873	1,734
Stack Flow (dscfm)	12,661	11,043	10,239	11,314	8,681	9,704	9,981	9,455	10,757
Total Flow (dscfm)	379,839	331,297	307,177	339,438	260,436	291,127	299,437	283,666	322,706
Stack Flow (dscfm @ 7% O2)	7,597	8,016	7,396	7,669	6,208	5,641	7,030	6,293	7,256
Total Flow (dscfm @ 7% O2)	227,903	240,489	221,875	230,089	186,240	169,230	210,898	188,789	217,699
Stack Emissions (Ib/hr)	0.0569	0.0496	0.0380	0.0482	0.0423	6050.0	0.0366	0.0433	0.0467
Total Emissions (Ib/hr)	1.707	1.489	1.139	1.445	1.268	1.527	1.099	1.298	1.401
Total Emissions (Ib/ton feed)	0.0055	0.0048	0.0037	0.0047	0.0041	0.0049	0.0036	0.0042	0.0045
Total Emissions (Ib/ton clinker)	0.0086	0.0075	0.0057	0.0073	0.0064	0.0077	0.0055	0.0065	0.0070
All calculated results within 10% of corresponding value in test report	econdine value in t	ect report							

All calculated results within 10% of corresponding value in test report Total flow is stack flow x 30.0, the flow factor derived from the 2012 source test.

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		RM On	On				RM Off		70% On/30% Off
	Run 1	Run 2	Run3	Average	Run 1	Run 2	Run3	Average	Weighted Average
Clinker Rate (tph)	179	186	185	183	179	186	185	183	183
Feed Rate (tph)	278	3 289	287	284	278	289	287	284	284
02 (%)	12.22	12.16	12.23	12.20	10.64	10.60	10.72	10.65	11.74
Concentration (ug/m3)	2,300	2,300	2,200	2,267	1,500	1,500	1,300	1,433	2,017
Concentration (ug/m3 @ 7% 02)	3,683	3,658	3,527	3,623	2,032	2,024	1,775	1,944	3,119
Stack Flow (dscfm)	8,563	9,066	9,167	8,932	8,563	990'6	9,167	8,932	8,932
Total Flow (dscfm)	256,893	272,000	275,017	267,970	256,893	272,000	275,017	267,970	267,970
Stack Flow (dscfm @ 7% O2)	5,347	5,701	5,718	5,589	6,321	6,718	6,714	6,584	5,887
Total Flow (dscfm @ 7% O2)	160,420	171,027	171,539	167,662	189,620	201,554	201,415	197,530	176,622
Stack Emissions (Ib/hr)	0.0738	0.0781	0.0755	0.0758	0.0481	0.0509	0.0446	0.0479	0.0674
Total Emissions (Ib/hr)	2.213	2.343	2.266	2.274	1.443	1.528	1.339	1.437	2.023
Total Emissions (Ib/ton feed)	0.0080	0.0081	0.0079	0.0080	0.0052	0.0053	0.0047	0.0051	0.0071
Total Emissions (Ib/ton clinker)	0.0124	0.0126	0.0123	0.0124	0.0081	0.0082	0.0072	0.0078	0.0110
RM On calculations are within 10% of corresponding value in test report. RM Off values more than 10% different from test report values due to report errors Anomalies in 2011 report are in K:\11191.000.0\Stack Oct 12\Permit Apr 14\HRA comments\HRW to ATM deliv 8 4 14\Benzene\Anomalies in 2011 report.pdf Due to errors in the report, concentrations from the 2011 report are from lab reports rather than summary tables. Total flow is stack flow x 30.0, the flow factor derived from the 2012 source test. Feed rate is clinker rate x 1.55, the feed/clinker factor derived from the 2012 source test.	orresponding value 91.000.0\Stack Oct lons from the 2011 factor derived from s/clinker factor deri	in test report. 12\Permit Apr report are from the 2012 sour ved from the 2	port. RM Off values n t Apr 14\HRA comme e from lab reports rat ? source test. the 2012 source test.	port. RM Off values more than 10% different from test report values due to report errors It Apr 14\HRA comments\HRW to ATM deliv 8 4 14\Benzene\Anomalies in 2011 report.pd e from lab reports rather than summary tables. 2 source test. the 2012 source test.	lifferent from tı M deliv 8 4 14\f ıry tables.	est report value Benzene\Anom	es due to repor alles in 2011 re	t errors :port.pdf	

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		2012 1	lable 1: raw da	2012 Table 1: raw data from report, results calculated	esults calculat	Pa			
		RM On	On				RM Off		70% On/30% Off
	Run 1	Run 2	Run3	Average	Run 1	Run 2	Run3	Average	Weighted Average
Clinker Rate (tph)	-	188	174	181	181		181	181	181
Feed Rate (tph)	ł	292	270	281	281		281	281	281
02 (%)	_	13.40	12.57	12.99	14.28		11.05	12.67	12.89
Concentration (ug/m3)	-	1,609	2,085	1,847	1,224		1,648	1,436	1,724
Concentration (ug/m3 @ 7% 02)		2,982	3,479	3,231	2,570		2,326	2,448	2,996
Stack Flow (dscfm)		13,409	9,546	11,478	14,310		10,019	12,165	11,684
Total Flow (dscfm)		402,272	286,381	344,327	429,314		300,585	364,950	350,513
Stack Flow (dscfm @ 7% O2)	•	7,235	5,721	6,478	6,815		7,100	6,958	6,622
Total Flow (dscfm @ 7% O2)	•	217,053	171,623	194,338	204,465		213,004	208,735	198,657
Stack Emissions (Ib/hr)	-	0.0808	0.0746	0.0777	0.0656		0.0618	0.0637	0.0735
Total Emissions (Ib/hr)		2.424	2.237	2.330	1.968		1.855	1.912	2.205
Total Emissions (Ib/ton feed)	•	0.0083	0.0083	0.0083	0.0070		0.0066	0.0068	0.0078
Total Emissions (Ib/ton clinker)	-	0.0129	0.0128	0.0129	0.0109		0.0102	0.0105	0.0122
All calculated results within 10% of corresponding value in test report Clinker chosen to correspond from summary in appendix (PDF page 2:	responding value in mary in appendix () test report PDF page 236) v	with feed rate	rt 236) with feed rate listed on summary table.	v table.				
RM On Run 1 and RM Off Run 2 are excluded because of anomaloui	hinded herailise of a		henzene emissions (4 lh/hr)	(h/hr)					

RM On Run 1 and RM Off Run 2 are excluded because of anomalous benzene emissions (4 lb/hr) RM Off feed and clinker rate are the average of RM On rates because measured rates are abnormally low for the flow rate (150 tph clinker)

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Table 1 Calculation Parameters

		RM	tM On			RI	RM Off	
	Run 1	Run 2	Run3	Average	Run 1	Run 2	Run3	Average
Flow Ratio from 2012 Test	-	30.00	30.00	30.00	30.00	•	30.00	30.00
Average Flow Ratio:	30.00							

		RM	RM On			R	RM Off	
	Run 1	Run 2	Run3	Average	Run 1	Run 2	Run3	Average
Feed/Clinker Ratio from 2012 Test	-	1.55	1.55	1.55	1.55 -		1.55	1.55
Average Feed/Clinker Ratio:	1.55							

35.315 ft3	453,592,370 ug	60 mins	
1 m3 =	1 lb =	1 hr =	

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		RA	RM On			RM	RM Off		70% On/30% Off
	2009	2011	2012	2012 Average	2009	2011	2012	2012 Average	Weighted Average
Clinker Rate (tph)	199	183	181	188	199	183	181	188	188
Feed Rate (tph)	309	284	281	291	309	284	281	291	291
02 (%)	11.41	12.20	12.99	12.20	11.63	10.65	12.67	11.65	12.03
Concentration (ug/m3)	1,130	2,267	1,847	1,748	1,227	1,433	1,436	1,365	1,633
Concentration (ug/m3 @ 7% 02)	1,675	3,623	3,231	2,843	1,873	1,944	2,448	2,088	2,616
Stack Flow (dscfm)	11,314	8,932	11,478	10,575	9,455	8,932	12,165	10,184	10,457
Total Flow (dscfm)	339,438	267,970	344,327	317,245	283,666	267,970	364,950	305,529	313,730
Stack Flow (dscfm @ 7% O2)	7,669	5,589	6,478	6,579	6,293	6,584	6,958	6,612	6,589
Total Flow (dscfm @ 7% O2)	230,089	167,662	194,338	197,363	188,789	197,530	208,735	198,351	197,659
Stack Emissions (Ib/hr)	0.0482	0.0758	0.0777	0.0672	0.0433	0.0479	0.0637	0.0516	0.0625
Total Emissions (Ib/hr)	1.445	2.274	2.330	2.017	1.298	1.437	1.912	1.549	1.876
Total Emissions (Ib/ton feed)	0.0047	0.0080	0.0083	0.0070	0.0042	0.0051	0.0068	0.0054	0.0065
Total Emissions (Ib/ton clinker)	0.0073	0.0124	0.0129	0.0108	0.0065	0.0078	0.0105	0.0083	0.0101

2012 RM On Run 1 and 2012 RM Off Run 2 are excluded because of anomalous benzene emissions (4 Ib/hr) 2012 RM Off feed and clinker rate are the average of RM On rates because measured rates are abnormally low for the flow rate (150 tph clinker)