Appendix M Preferred Pollution Control Combination

Calculation of Hexavalent Chromium Emission Rates
Preferred Pollution Control Combination (as presented in the Action Plan)

Emission Rate Calculations for the Final Preferred Pollution Control Combination (E_R9)

							before RC	after RC	before RC	After RC-CFM only								
		Source	B01	B24	B25	B11current	B11	B38current	B38	B08	B10	B32	B33	B34	B35	C79	C80	Total
		Type	107 Furnace	105 Furnace	105 Furnace	conventional FH	conventional FH	CFM FH	CFM FH	RE1	RE2	RE2	RE1	RE2	RE2	RE1	RE1	
		Current Base Case Emission Rate (g/s)	3.55E-05			1.51E-04		3.32E-05		2.05E-06	2.39E-06	2.39E-06		2.39E-06	2.39E-06	2.04E-06	2.04E-06	2.35E-04
		2016 Reconfiguration Base Emission Rate (g/s)		1.78E-05	1.78E-05		7.53E-05		3.32E-05		1.19E-06	1.19E-06	2.05E-06	1.19E-06	1.19E-06	2.04E-06	2.04E-06	1.55E-04
		Uncertainty Applied		1.23	1.23		1.55		1.55		1.52	1.52	1.52	1.52	1.52	1.52	1.52	
		2016 Base RC Emission Rate (g/s) with Uncertainty Factors applied		2.18E-05	2.18E-05		1.17E-04		5.14E-05		1.82E-06	1.82E-06	3.12E-06	1.82E-06	1.82E-06	3.10E-06	3.10E-06	2.28E-04
Combination ID	Option Description		B01	B24	B25	B11	B11	B38current	B38 (combined FH Stack)	B08	B10	B32	B33	B34	B35	C79	C80	
E_R9	Reconfiguration + forehearth sections incorporating more accurate combustion control skids and construction of front end superstructures (14) + re-engineering exhaust stacks impacted by reconfiguration (15) Used of documented uncertainty stack configuration for B38 at 28mag	Description of Reduction Component					prototype		NA									
		Individual Reduction Identification #					14				Result of 14	Result of 14		Result of 14	Result of 14			
		Reduction Efficiency		0%	0%		50%			0%	50%	50%	0%	50%	50%	0%	0%	
		Additional Reduction Efficiency																
		Comments	Source ER (g/s)	Source ER (g/s)	Source ER (g/s)	Source ER (g/s)	Source ER (g/s)	Source ER (g/s)	Source ER (g/s)	Source ER (g/s)	Source ER (g/s)	Source ER (g/s)	Source ER (g/s)	Source ER (g/s)	Source ER (g/s)	Source ER (g/s)	Source ER (g/s)	TotalER (g/s)
		RC+14+partial 15		2.18E-05	2.18E-05		Exhausted out B38		1.10E-04		9.08E-07	9.08E-07	3.12E-06	9.08E-07	9.08E-07	3.10E-06	3.10E-06	1.66E-04

Explanation of Calculations

Furnace:
The reconfiguration plans include taking the existing furnace (T107) out of service and restarting the T105 furnace. The emission rate for T105 furnace is estimated (conservatively) to be the same as the existing furnace as they will employ similar technologies and the same glass formulation.
However, the emissions will be discharged from two existing (currently out of service) stacks B24 and B25.
The only change to the furnace emission rates is the incorporation of the uncertainty factor (23%) which is calculated using the Methodology outlined in the Alberta Air Monitoring Directive, Chapter 5: Quality System.

Forehearths:
The reconfiguration plans include removal of approximately half of the existing conventional forehearth which currently exhausts through stack B11 (B11current), therefore the current emission rate is divided by 2 to prior to the application of any reduction efficiencies related to the control option.
There are no planned changes to the CFM forehearth (exhausting through B38current).
An uncertainty factor (55%) is applied to the emission rates from both sections of forehearth. The uncertainty factor is calculated usinghe Methodology outlined in the Alberta Air Monitoring Directive, Chapter 5: Quality System.
The technology to be implemented as part of this pollution control option (E_R9) is the installation of more accurate combustion control skids and construction of front end superstructures in the remaining conventional forehearth.
Therefore, the reduction efficiency of 50% for the technology is applied only to the emission rate associated with the conventional forehearth (adjusted for downsizing).
After the reconfiguration and implementation of this pollution control combination, all forehearth emissions will be exhausted through a single location at the current B38 stack.

Example Calculation for the changes to the Conventional Forehearth emissions (B11current)

New B11 ER, g/s= (Current B11 forehearth rate, g/s) / 2(for reduction of forehearth area) x (Source Testing uncertainty factor of 1.55)

New B11 ER, g/s= [0.000151 , g/s / 2] x 1.55

New B11 ER, g/s= 1.17E-04

B11 ER after technologies applied = New B11 ER x (1 - reduction efficiency of technologies)

B11 ER after technologies applied = New B11 ER, g/s x (1 - 50%)

B11 ER after technologies applied = 5.84E-05

After Reconfiguration and implementation of the control technologies, all forehearth emissions will be exhausted through a new stack at the B38 location (here referred to above as the "B38 Combined FH" stack

B38 Combined FH stack ER, g/s= [B11 ER after technologies applied] + [B38 current ER x Source testing uncertainty factor of 1.55]

B38 Combined FH stack ER, g/s= 0.0000584 + 0.00005145

B38 Combined FH stack ER, g/s= 1.10E-04

General Ventilation Exhausts:
The reconfiguration plans include removal of approximately half of the existing conventional forehearth which is believed to be the greatest contributor to emissions leaving the facility through most of the general ventilation exhausts.
An uncertainty factor (52%) is applied to all of the general ventilation emission rates. The uncertainty factor is calculated usinghe Methodology outlined in the Alberta Air Monitoring Directive, Chapter 5: Quality System.
Therefore, the emission rates from 5 of the general ventilation exhaust fans are reduced by 50% based on the conventional forehearth downsizing.
The installation of the control technologies on the conventional forehearth is anticipated to reduce the furnace hall emissions by the same reduction efficiency.

Example Calculation for the changes to General Ventilation Source B32

New B32 ER, g/s= (current B32 ER, g/s) / 2 (for reduction of forehearth area) x 1.52 (Source Testing Uncertainty Factor) x (1-reduction efficiency for conventional forehearth technology)

New B32 ER, g/s= 0.00000239 / 2 x 1.52 x (1-0.5)

New B32 ER, g/s= 9.08E-07

RC	Reconfiguration in 2016
RE1	Roof exhausters unchanged by process changes
RE2	Roof exhausters affected by process changes

Calculation of Uncertainty for General Ventilation Sources

	Raw Cr+6	Blank Corrected Cr+6
Source	Concentration	Concentration
	µg/m3	µg/m3
Source B8	0.2781190	0.1751120
Source B10	0.3577441	0.2588797
Source C80	0.2373759	0.1424255

confidence interval =	0.05	95%	
number of samples (n) =	3		
test statistic (t-value) =	4.303	from t-tables.xls	
sample mean (x) =	0.291	(arithmetic mean)	
standard deviation (s) =	0.0612	(standard deviation of a sample using STDEV.S function)	

sample uncertainty is equal to the mean +/- [t-value x standard deviation (s) / Square root of # of samples (n)]

sample uncertainty =	0.291	+/-	0.15

Uncertainty as a percentage	52%

Calculation of Uncertainty for Source B38 (with prototype technology)

Using both Data Sets (August 2013 condition #1 and September 2014 Validated Testing)

Combined Data Sets (values)

35.43	28.42	35.72	12.07	11.90	12.46

confidence interval =	0.05	95%	
number of samples (n) =	6		
test statistic (t-value) =	2.571	from t-tables.xls	
sample mean (x) =	22.7	(arithmetic mean)	
standard deviation (s) =	11.82193863	(standard deviation of a sample using STDEV.S function)	

sample uncertainty is equal to the mean +/- [t-value x standard deviation (s) / Square root of # of samples (n)]

sample uncertainty =	22.7	+/-	12.41

Uncertainty as a percentage 55%

Calculation of Uncertainty for Furnace Source B01

B01 Furnace Data	13-Oct-11	14-Oct-11	14-Oct-11	6-Aug-13	7-Aug-13	7-Aug-13	12-Jun-14	12-Jun-14	12-Jun-14
Hex Cr (ug/s)	37	33	42	46	24	25	38	50	19

only June 2014 data is validated
However, all testing done using same methodology and funace is considered to be very stead state with no technology/process changes

Using all 3 Data Sets

confidence interval =	0.05	95%
number of samples (n) =	9	
test statistic (t-value) =	2.306	from t-tables.xls
sample mean (x) =	34.8	(arithmetic mean)
standard deviation (s) =	10.3682	(standard deviation of a sample using STDEV.S function)

sample uncertainty is equal to the mean +/- [t-value x standard deviation (s) / Square root of # of samples (n)]

sample uncertainty =	34.8	+/-	7.97

Uncertainty as a percentage	23%

APPENDIX CALCULATING UNCERTAINTY OF MEASUREMENT

A number of samples, say n, are collected from a given condition for which measurement uncertainty is to be assessed. The purpose is to express measurement uncertainty in a confidence interval with a certain probability, say 95 per cent. In this instance, the wider the confidence interval, the greater is the measurement uncertainty for the method in question.

For practical reasons, $n = 6$ is considered applicable and the following parameters are to be computed:

$\bar{x} = \sum_{i=1}^{n} x_i \Big/ n$ the sample mean,

$\bar{x}_L = \bar{x} - t_{\alpha/2,n-1} \times s_{\bar{x}}$ the upper confidence limit of the sample mean,

$\bar{x}_U = \bar{x} + t_{\alpha/2,n-1} \times s_{\bar{x}}$ the lower confidence limit of the sample mean,

$s = \sqrt{\sum_{i=1}^{n} (x_i - \bar{x})^2 \Big/ (n-1)}$ the sample standard deviation,

$s_{\bar{x}} = s/\sqrt{n}$ the standard deviation of the sample mean.

For 95 % confidence interval ($\alpha = 0.05$) and a sample of n = 6, the test statistic (t-value) is $t_{\alpha/2,n-1} = 2.571$.

The measurement uncertainty is represented by $\bar{x} \pm t_{\alpha/2,n-1} \times s/\sqrt{n}$. This is $\bar{x} \pm 1.05s$ in this case.

As an example: for a sample of 6 observations: $x_1 = 0.61$, $x_2 = 0.95$, $x_3 = 0.91$, $x_4 = 1.16$, $x_5 = 0.72$, $x_6 = 0.59$. The mean is 0.82. The standard deviation s is 0.22. The resulting measurement uncertainty is 0.82 ± 0.23.

As a rough general rule, it is recommended that the minimum sample size be n=6 for an adequate estimation of uncertainty. The larger the sample size, the more precise the estimation in measurement uncertainty.

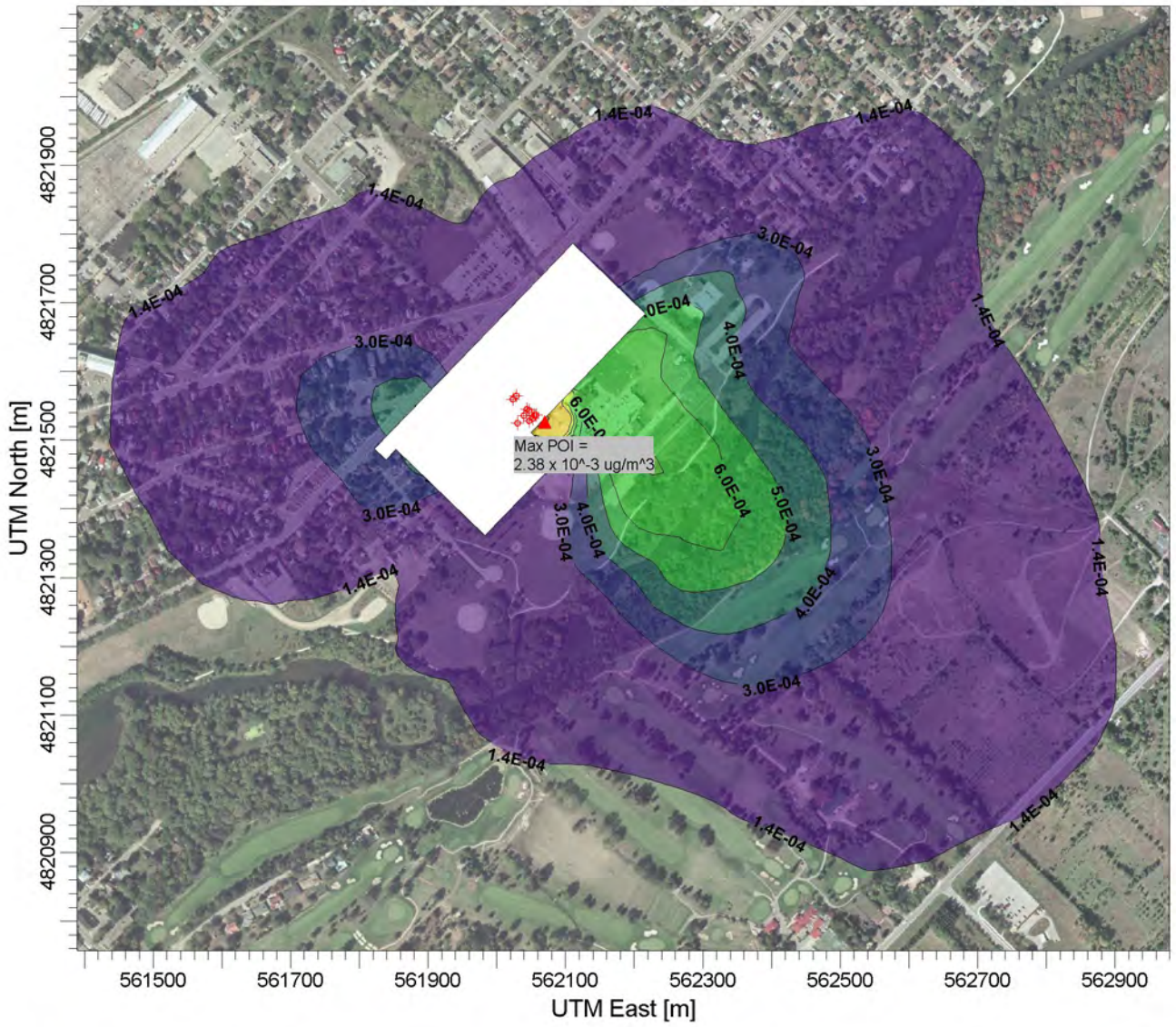
Note: As the sample size changes, the t-value needs to be changed accordingly. The above calculation is appropriate for a sample size of six. For a larger sample size, other values of the test statistic need to be used.

t Table

cum. prob	$t_{.50}$	$t_{.75}$	$t_{.80}$	$t_{.85}$	$t_{.90}$	$t_{.95}$	$t_{.975}$	$t_{.99}$	$t_{.995}$	$t_{.999}$	$t_{.9995}$
one-tail	**0.50**	**0.25**	**0.20**	**0.15**	**0.10**	**0.05**	**0.025**	**0.01**	**0.005**	**0.001**	**0.0005**
two-tails	**1.00**	**0.50**	**0.40**	**0.30**	**0.20**	**0.10**	**0.05**	**0.02**	**0.01**	**0.002**	**0.001**
df											
1	0.000	1.000	1.376	1.963	3.078	6.314	12.71	31.82	63.66	318.31	636.62
2	0.000	0.816	1.061	1.386	1.886	2.920	4.303	6.965	9.925	22.327	31.599
3	0.000	0.765	0.978	1.250	1.638	2.353	3.182	4.541	5.841	10.215	12.924
4	0.000	0.741	0.941	1.190	1.533	2.132	2.776	3.747	4.604	7.173	8.610
5	0.000	0.727	0.920	1.156	1.476	2.015	2.571	3.365	4.032	5.893	6.869
6	0.000	0.718	0.906	1.134	1.440	1.943	2.447	3.143	3.707	5.208	5.959
7	0.000	0.711	0.896	1.119	1.415	1.895	2.365	2.998	3.499	4.785	5.408
8	0.000	0.706	0.889	1.108	1.397	1.860	2.306	2.896	3.355	4.501	5.041
9	0.000	0.703	0.883	1.100	1.383	1.833	2.262	2.821	3.250	4.297	4.781
10	0.000	0.700	0.879	1.093	1.372	1.812	2.228	2.764	3.169	4.144	4.587
11	0.000	0.697	0.876	1.088	1.363	1.796	2.201	2.718	3.106	4.025	4.437
12	0.000	0.695	0.873	1.083	1.356	1.782	2.179	2.681	3.055	3.930	4.318
13	0.000	0.694	0.870	1.079	1.350	1.771	2.160	2.650	3.012	3.852	4.221
14	0.000	0.692	0.868	1.076	1.345	1.761	2.145	2.624	2.977	3.787	4.140
15	0.000	0.691	0.866	1.074	1.341	1.753	2.131	2.602	2.947	3.733	4.073
16	0.000	0.690	0.865	1.071	1.337	1.746	2.120	2.583	2.921	3.686	4.015
17	0.000	0.689	0.863	1.069	1.333	1.740	2.110	2.567	2.898	3.646	3.965
18	0.000	0.688	0.862	1.067	1.330	1.734	2.101	2.552	2.878	3.610	3.922
19	0.000	0.688	0.861	1.066	1.328	1.729	2.093	2.539	2.861	3.579	3.883
20	0.000	0.687	0.860	1.064	1.325	1.725	2.086	2.528	2.845	3.552	3.850
21	0.000	0.686	0.859	1.063	1.323	1.721	2.080	2.518	2.831	3.527	3.819
22	0.000	0.686	0.858	1.061	1.321	1.717	2.074	2.508	2.819	3.505	3.792
23	0.000	0.685	0.858	1.060	1.319	1.714	2.069	2.500	2.807	3.485	3.768
24	0.000	0.685	0.857	1.059	1.318	1.711	2.064	2.492	2.797	3.467	3.745
25	0.000	0.684	0.856	1.058	1.316	1.708	2.060	2.485	2.787	3.450	3.725
26	0.000	0.684	0.856	1.058	1.315	1.706	2.056	2.479	2.779	3.435	3.707
27	0.000	0.684	0.855	1.057	1.314	1.703	2.052	2.473	2.771	3.421	3.690
28	0.000	0.683	0.855	1.056	1.313	1.701	2.048	2.467	2.763	3.408	3.674
29	0.000	0.683	0.854	1.055	1.311	1.699	2.045	2.462	2.756	3.396	3.659
30	0.000	0.683	0.854	1.055	1.310	1.697	2.042	2.457	2.750	3.385	3.646
40	0.000	0.681	0.851	1.050	1.303	1.684	2.021	2.423	2.704	3.307	3.551
60	0.000	0.679	0.848	1.045	1.296	1.671	2.000	2.390	2.660	3.232	3.460
80	0.000	0.678	0.846	1.043	1.292	1.664	1.990	2.374	2.639	3.195	3.416
100	0.000	0.677	0.845	1.042	1.290	1.660	1.984	2.364	2.626	3.174	3.390
1000	0.000	0.675	0.842	1.037	1.282	1.646	1.962	2.330	2.581	3.098	3.300
z	0.000	0.674	0.842	1.036	1.282	1.645	1.960	2.326	2.576	3.090	3.291
	0%	50%	60%	70%	80%	90%	95%	98%	99%	99.8%	99.9%
	Confidence Level										

PROJECT TITLE:

OC Guelph Glass Plant - Annual Average Hexavalent Chromium Concentration
Preferred Pollution Control Combination (ID E_R9) from Technical Benchmarking



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL — MICROGRAMS/M3

Max: 2.4E-03 [MICROGRAMS/M3] at (562063.97, 4821525.92)

1.4E-04 | 3.0E-04 | 4.0E-04 | 5.0E-04 | 6.0E-04 | 8.0E-04 | 9.0E-04 | 1.0E-03 | 2.0E-03 | 2.4E-03

COMMENTS: Reg 419 grid Met Year 2	SOURCES: **10**	COMPANY NAME: **Owens Corning Guelph Glass Plant**	
	RECEPTORS: **2062**	MODELER: **C.MacKay, LEHDER**	LEHDER Excellence in Industrial Air Quality Services
	OUTPUT TYPE: **Concentration**	SCALE: 1:10,000 0 — 0.3 km	
	MAX: **2.4E-03 MICROGRAMS/M3**	DATE: **3/19/2015**	PROJECT NO.: **144539**

Annual Hexavalent Chromium Results
Preferred Option - Summary of 5 year data set

Run (tab) Name:	Ann_Opt_E_R9_Metyr1	Ann_Opt_E_R9_Metyr2	Ann_Opt_E_R9_Metyr3	Ann_Opt_E_R9_Metyr4	Ann_Opt_E_R9_Metyr5	
Run Description:	Option E_R9, Reg 419 grid, Site Specific Met (2009)	Option E_R9, Reg 419 grid, Site Specific Met (2010)	Option E_R9, Reg 419 grid, Site Specific Met (2011)	Option E_R9, Reg 419 grid, Site Specific Met (2012)	Option E_R9, Reg 419 grid, Site Specific Met (2013)	**MAX**
Result Units:	**ng/m3**	**ng/m3**	**ng/m3**	**ng/m3**	**ng/m3**	**ng/m3**
ALL	2.11662	2.38471	2.12615	2.19456	2.25161	**2.38471**
B38	1.10762	1.21329	1.13902	1.21907	1.30165	**1.30165**
B10	0.05166	0.05303	0.05319	0.05381	0.05314	**0.05381**
B32	0.10545	0.11196	0.104	0.10709	0.10604	**0.11196**
B34	0.07842	0.08919	0.07613	0.08062	0.07885	**0.08919**
B35	0.0783	0.09035	0.07616	0.08169	0.07834	**0.09035**
C79	0.1094	0.14398	0.10188	0.11608	0.10601	**0.14398**
C80	0.10431	0.1442	0.0961	0.11224	0.09545	**0.1442**
B24	0.25232	0.2487	0.25864	0.24412	0.26899	**0.26899**
B25	0.17283	0.18459	0.17381	0.16453	0.18086	**0.18459**
B33	0.11544	0.14794	0.10557	0.115	0.10744	**0.14794**
FURNACE	0.42515	0.4333	0.43245	0.40865	0.44985	**0.44985**
FOREHEAR	1.10762	1.21329	1.13902	1.21907	1.30165	**1.30165**
GENEXHTS	0.62718	0.76247	0.59689	0.6495	0.61285	**0.76247**

Run Description:	Option E_R9, Reg 419 grid, Site Specific Met (2009)	Option E_R9, Reg 419 grid, Site Specific Met (2010)	Option E_R9, Reg 419 grid, Site Specific Met (2011)	Option E_R9, Reg 419 grid, Site Specific Met (2012)	Option E_R9, Reg 419 grid, Site Specific Met (2013)	**MAX**
Result Units:	**ug/m3**	**ug/m3**	**ug/m3**	**ug/m3**	**ug/m3**	**ug/m3**
ALL	0.00211662	0.00238471	0.00212615	0.00219456	0.00225161	**0.002385**
B38	0.00110762	0.00121329	0.00113902	0.00121907	0.00130165	**0.001302**
B10	0.00005166	0.00005303	0.00005319	0.00005381	0.00005314	**5.38E-05**
B32	0.00010545	0.00011196	0.000104	0.00010709	0.00010604	**0.000112**
B34	0.00007842	0.00008919	0.00007613	0.00008062	0.00007885	**8.92E-05**
B35	0.0000783	0.00009035	0.00007616	0.00008169	0.00007834	**9.04E-05**
C79	0.0001094	0.00014398	0.00010188	0.00011608	0.00010601	**0.000144**
C80	0.00010431	0.0001442	0.0000961	0.00011224	0.00009545	**0.000144**
B24	0.00025232	0.0002487	0.00025864	0.00024412	0.00026899	**0.000269**
B25	0.00017283	0.00018459	0.00017381	0.00016453	0.00018086	**0.000185**
B33	0.00011544	0.00014794	0.00010557	0.000115	0.00010744	**0.000148**
FURNACE	0.00042515	0.0004333	0.00043245	0.00040865	0.00044985	**0.00045**
FOREHEAR	0.00110762	0.00121329	0.00113902	0.00121907	0.00130165	**0.001302**
GENEXHTS	0.00062718	0.00076247	0.00059689	0.0006495	0.00061285	**0.000762**

Source Pathway - Source Inputs

Point Sources

Source Type	Source ID	X Coordinate [m]	Y Coordinate [m]	Base Elevation (Optional)	Release Height [m]	Emission Rate [g/s]	Gas Exit Temp. [K]	Gas Exit Velocity [m/s]	Stack Inside Diameter [m]
POINT	B10	562030.25	4821525.28	312.00	14.45	9.08E-7	321.90	12.10	1.24
		General Exhaust Above T107B F/H							
POINT	B32	562047.16	4821528.02	312.00	14.48	9.08E-7	321.90	19.19	1.24
		General Exhaust Above T106							
POINT	B34	562039.70	4821535.65	312.00	14.48	9.08E-7	321.90	19.19	1.24
		General Exhaust Above T107A F/H							
POINT	B35	562047.03	4821543.82	312.00	14.48	9.08E-7	321.90	19.19	1.24
		General Exhaust Above CFM Main Channel							
POINT	C79	562023.15	4821559.58	312.00	11.64	3.10E-6	310.80	9.59	1.41
		General Exhaust West CFM F/H							
POINT	C80	562028.25	4821564.97	312.00	11.64	3.10E-6	310.80	9.59	1.41
		General Exhaust East CFM F/H							
POINT	B38	562043.48	4821544.79	312.00	28.00	0.00011	379.15	5.43	0.75
		final parameters provided to OC							
POINT	B24	562052.59	4821531.65	312.00	31.43	0.00002	597.00	15.00	0.33
		final parameters provided to OC							
POINT	B25	562057.67	4821536.90	312.00	31.43	0.00002	597.00	15.00	0.33
		final parameters provided to OC							
POINT	B33	562055.21	4821536.35	312.00	20.00	3.12E-6	321.90	30.00	0.79
		B33J uncapped, existing loc, ht=25, V=30m/s							

Volume Sources

No Volume Sources Specified

Area Sources

No Area Sources Specified

**MODELOPTs: NonDFAULT CONC   ELEV   FLGPOL   BETA

***   MODEL SETUP OPTIONS SUMMARY   ***

- -

**Model Is Setup For Calculation of Average CONCentration Values.

  -- DEPOSITION LOGIC --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION. DRYDPLT = F
**Model Uses NO WET DEPLETION. WETDPLT = F

**Model Uses RURAL Dispersion Only.

**Model Allows User-Specified Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay.
        6. BETA Option for Capped & Horiz Stacks Selected With:

                4 Capped Stack(s); and   0 Horiz Stack(s)

**Other Options Specified:
        CCVR_Sub - Meteorological data includes CCVR substitutions
        TEMP_Sub - Meteorological data includes TEMP substitutions

**Model Accepts FLAGPOLE Receptor Heights.

**The User Specified a Pollutant Type of: HCR

**Model Calculates ANNUAL Averages Only

**This Run Includes: 10 Source(s);   14 Source Group(s); and   2062 Receptor(s)

**Model Set To Continue RUNning After the Setup Testing.

**The AERMET Input Meteorological Data Version Date: 14134

**Output Options Selected:
         Model Outputs Tables of ANNUAL Averages by Receptor
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) =   325.00 ; Decay Coef. =   0.000   ; Rot. Angle =   0.0
                 Emission Units = GRAMS/S   ; Emission Rate Unit Factor =   0.10000E+10
                 Output Units   = NANOGRAMS/M3

**Approximate Storage Requirements of Model =   4.5 MB of RAM.

**File for Saving Result Arrays: Ann_Opt_E_R9_Metyr2.sv1
**File for Summary of Results: Ann_Opt_E_R9_Metyr2.sum

♀ *** AERMOD - VERSION 14134 ***   *** OC Guelph Project 144539 - Site Specific Standard   ***   02/23/15
*** AERMET - VERSION 14134 ***   *** Ann_Opt_E_R9_Metyr2   ***   07:06:26
                                                                                                                    PAGE   2

**MODELOPTs: NonDFAULT CONC   ELEV   FLGPOL   BETA

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
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METEOROLOGICAL DATA PROCESSED BETWEEN START DATE: 2010   1 1 1
AND END DATE: 2010 12 31 24

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54,   3.09,   5.14,   8.23, 10.80,

*** AERMOD - VERSION 14134 ***   *** OC Guelph Project 144539 - Site Specific Standard   ***   02/23/15
*** AERMET - VERSION 14134 ***   *** Ann_Opt_E_R9_Metyr2   ***   07:06:26
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**MODELOPTs: NonDFAULT CONC   ELEV   FLGPOL   BETA

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: E:_Site Specific Met\OCGuelph_ONLY\V14134\OwensCorning-Guelph-v14134.SFC   Met Version: 14134
Profile file: E:_Site Specific Met\OCGuelph_ONLY\V14134\OwensCorning-Guelph-v14134.PFL
Surface format: FREE
Profile format: FREE
Surface station no.:   61430   Upper air station no.:   14733
Name: UNKNOWN   Name: BUFFALO/GREATER_BUFFALO_INT'L
Year: 2009   Year: 2009

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
09	01	01	1	01	-8.4	0.105	-9.000	-9.000	-999.	81.	11.8	0.57	0.55	1.00	1.50	291.	10.0	258.1	2.0
09	01	01	1	02	-16.5	0.147	-9.000	-9.000	-999.	135.	16.6	0.57	0.55	1.00	2.10	308.	10.0	258.1	2.0
09	01	01	1	03	-8.4	0.105	-9.000	-9.000	-999.	82.	11.8	0.57	0.55	1.00	1.50	294.	10.0	257.5	2.0
09	01	01	1	04	-7.9	0.100	-9.000	-9.000	-999.	76.	11.0	0.50	0.55	1.00	1.50	233.	10.0	255.9	2.0
09	01	01	1	05	-3.5	0.067	-9.000	-9.000	-999.	41.	7.3	0.50	0.55	1.00	1.00	223.	10.0	255.3	2.0
09	01	01	1	06	-3.2	0.067	-9.000	-9.000	-999.	41.	8.1	0.50	0.55	1.00	1.00	222.	10.0	254.8	2.0
09	01	01	1	07	-9.5	0.113	-9.000	-9.000	-999.	91.	13.2	0.70	0.55	1.00	1.50	145.	10.0	255.9	2.0
09	01	01	1	08	-8.5	0.109	-9.000	-9.000	-999.	86.	13.0	0.63	0.50	1.00	1.50	243.	10.0	257.5	2.0
09	01	01	1	09	-6.0	0.107	-9.000	-9.000	-999.	84.	17.8	0.61	0.95	0.76	1.50	127.	10.0	258.1	2.0
09	01	01	1	10	-1.6	0.057	-9.000	-9.000	-999.	33.	9.9	0.30	0.95	0.66	1.00	121.	10.0	263.8	2.0
09	01	01	1	11	13.2	0.424	0.253	0.009	42.	662.	-499.8	0.50	0.55	0.54	3.10	224.	10.0	264.2	2.0
09	01	01	1	12	19.8	0.428	0.402	0.008	114.	671.	-342.9	0.50	0.55	0.51	3.10	196.	10.0	265.4	2.0
09	01	01	1	13	22.9	0.367	0.559	0.011	265.	536.	-187.8	0.50	0.55	0.51	2.60	203.	10.0	265.4	2.0
09	01	01	1	14	2.1	0.468	0.256	0.007	275.	768.	-4237.3	0.70	0.55	0.48	3.10	179.	10.0	265.9	2.0
09	01	01	1	15	-4.6	0.538	-9.000	-9.000	-999.	946.	2954.8	0.70	0.55	0.51	3.60	162.	10.0	265.4	2.0
09	01	01	1	16	-20.2	0.526	-9.000	-9.000	-999.	915.	625.4	0.70	0.55	0.59	3.60	164.	10.0	265.9	2.0
09	01	01	1	17	-33.2	0.401	-9.000	-9.000	-999.	622.	168.7	0.61	0.95	0.82	3.10	141.	10.0	265.9	2.0
09	01	01	1	18	-28.3	0.491	-9.000	-9.000	-999.	824.	362.7	0.61	0.95	1.00	3.60	137.	10.0	265.9	2.0
09	01	01	1	19	-53.3	0.464	-9.000	-9.000	-999.	760.	163.0	0.61	0.95	1.00	3.60	134.	10.0	265.9	2.0
09	01	01	1	20	-60.2	0.545	-9.000	-9.000	-999.	964.	233.5	0.61	0.95	1.00	4.10	127.	10.0	265.4	2.0
09	01	01	1	21	-44.8	0.474	-9.000	-9.000	-999.	788.	206.2	0.61	0.95	1.00	3.60	130.	10.0	265.9	2.0
09	01	01	1	22	-61.4	0.544	-9.000	-9.000	-999.	961.	227.6	0.61	0.95	1.00	4.10	132.	10.0	266.4	2.0
09	01	01	1	23	-53.4	0.464	-9.000	-9.000	-999.	764.	162.3	0.61	0.95	1.00	3.60	140.	10.0	266.4	2.0
09	01	01	1	24	-21.2	0.225	-9.000	-9.000	-999.	318.	46.9	0.70	0.55	1.00	2.10	160.	10.0	267.0	2.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
09	01	01	01	10.0	1	291.	1.50	258.2	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: NonDFAULT CONC ELEV FLGPOL BETA

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF HCR IN NANOGRAMS/M3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)				OF TYPE	NETWORK GRID-ID
B10	1ST HIGHEST VALUE IS	0.05303	562050.10,	4821511.55,	311.00,	311.00, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.05303	562050.10,	4821511.55,	311.00,	311.00, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.03800	562076.93,	4821485.66,	310.19,	310.19, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.03800	562076.93,	4821485.66,	310.19,	310.19, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.03586	562070.22,	4821492.13,	310.40,	310.40, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.03586	562070.22,	4821492.13,	310.40,	310.40, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.03541	562057.04,	4821518.74,	311.00,	311.00, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.03541	562057.04,	4821518.74,	311.00,	311.00, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.03486	562063.97,	4821525.92,	311.00,	311.00, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.03486	562063.97,	4821525.92,	311.00,	311.00, 0.00)	DC	
B24	1ST HIGHEST VALUE IS	0.24870	562063.97,	4821525.92,	311.00,	311.00, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.24870	562063.97,	4821525.92,	311.00,	311.00, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.23024	562057.04,	4821518.74,	311.00,	311.00, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.23024	562057.04,	4821518.74,	311.00,	311.00, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.21928	562070.91,	4821533.11,	311.00,	311.00, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.21928	562070.91,	4821533.11,	311.00,	311.00, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.18708	562050.10,	4821511.55,	311.00,	311.00, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.18708	562050.10,	4821511.55,	311.00,	311.00, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.17240	562085.76,	4821532.01,	311.00,	311.00, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.16245	562077.84,	4821540.29,	311.01,	311.01, 0.00)	DC	
B25	1ST HIGHEST VALUE IS	0.18459	562063.97,	4821525.92,	311.00,	311.00, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.18459	562063.97,	4821525.92,	311.00,	311.00, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.15927	562057.04,	4821518.74,	311.00,	311.00, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.15927	562057.04,	4821518.74,	311.00,	311.00, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.15868	562070.91,	4821533.11,	311.00,	311.00, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.15868	562070.91,	4821533.11,	311.00,	311.00, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.13006	562085.76,	4821532.01,	311.00,	311.00, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.12033	562050.10,	4821511.55,	311.00,	311.00, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.12033	562050.10,	4821511.55,	311.00,	311.00, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.11479	562065.76,	4821512.01,	311.00,	311.00, 0.00)	DC	
B32	1ST HIGHEST VALUE IS	0.11196	562063.97,	4821525.92,	311.00,	311.00, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.11196	562063.97,	4821525.92,	311.00,	311.00, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.10100	562057.04,	4821518.74,	311.00,	311.00, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.10100	562057.04,	4821518.74,	311.00,	311.00, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.09109	562070.91,	4821533.11,	311.00,	311.00, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.09109	562070.91,	4821533.11,	311.00,	311.00, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.08363	562050.10,	4821511.55,	311.00,	311.00, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.08363	562050.10,	4821511.55,	311.00,	311.00, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.05866	562085.76,	4821512.01,	311.00,	311.00, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.05805	562065.76,	4821512.01,	311.00,	311.00, 0.00)	DC	

**MODELOPTs: NonDFAULT CONC ELEV FLGPOL BETA

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF HCR IN NANOGRAMS/M3 **

GROUP ID	AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID

B33	1ST HIGHEST VALUE IS	0.14794 AT (	562063.97,	4821525.92,	311.00,	311.00,	0.00)	DC
	2ND HIGHEST VALUE IS	0.14794 AT (	562063.97,	4821525.92,	311.00,	311.00,	0.00)	DC
	3RD HIGHEST VALUE IS	0.12244 AT (	562057.04,	4821518.74,	311.00,	311.00,	0.00)	DC
	4TH HIGHEST VALUE IS	0.12244 AT (	562057.04,	4821518.74,	311.00,	311.00,	0.00)	DC
	5TH HIGHEST VALUE IS	0.11999 AT (	562065.76,	4821512.01,	311.00,	311.00,	0.00)	DC
	6TH HIGHEST VALUE IS	0.11040 AT (	562070.91,	4821533.11,	311.00,	311.00,	0.00)	DC
	7TH HIGHEST VALUE IS	0.11040 AT (	562070.91,	4821533.11,	311.00,	311.00,	0.00)	DC
	8TH HIGHEST VALUE IS	0.11031 AT (	562085.76,	4821512.01,	311.00,	311.00,	0.00)	DC
	9TH HIGHEST VALUE IS	0.06974 AT (	562085.76,	4821492.01,	310.52,	310.52,	0.00)	DC
	10TH HIGHEST VALUE IS	0.06889 AT (	562085.76,	4821532.01,	311.00,	311.00,	0.00)	DC
B34	1ST HIGHEST VALUE IS	0.08919 AT (	562063.97,	4821525.92,	311.00,	311.00,	0.00)	DC
	2ND HIGHEST VALUE IS	0.08919 AT (	562063.97,	4821525.92,	311.00,	311.00,	0.00)	DC
	3RD HIGHEST VALUE IS	0.07666 AT (	562057.04,	4821518.74,	311.00,	311.00,	0.00)	DC
	4TH HIGHEST VALUE IS	0.07666 AT (	562057.04,	4821518.74,	311.00,	311.00,	0.00)	DC
	5TH HIGHEST VALUE IS	0.07406 AT (	562070.91,	4821533.11,	311.00,	311.00,	0.00)	DC
	6TH HIGHEST VALUE IS	0.07406 AT (	562070.91,	4821533.11,	311.00,	311.00,	0.00)	DC
	7TH HIGHEST VALUE IS	0.06139 AT (	562050.10,	4821511.55,	311.00,	311.00,	0.00)	DC
	8TH HIGHEST VALUE IS	0.06139 AT (	562050.10,	4821511.55,	311.00,	311.00,	0.00)	DC
	9TH HIGHEST VALUE IS	0.05589 AT (	562085.76,	4821512.01,	311.00,	311.00,	0.00)	DC
	10TH HIGHEST VALUE IS	0.05486 AT (	562065.76,	4821512.01,	311.00,	311.00,	0.00)	DC
B35	1ST HIGHEST VALUE IS	0.09035 AT (	562063.97,	4821525.92,	311.00,	311.00,	0.00)	DC
	2ND HIGHEST VALUE IS	0.09035 AT (	562063.97,	4821525.92,	311.00,	311.00,	0.00)	DC
	3RD HIGHEST VALUE IS	0.07545 AT (	562070.91,	4821533.11,	311.00,	311.00,	0.00)	DC
	4TH HIGHEST VALUE IS	0.07545 AT (	562070.91,	4821533.11,	311.00,	311.00,	0.00)	DC
	5TH HIGHEST VALUE IS	0.07161 AT (	562057.04,	4821518.74,	311.00,	311.00,	0.00)	DC
	6TH HIGHEST VALUE IS	0.07161 AT (	562057.04,	4821518.74,	311.00,	311.00,	0.00)	DC
	7TH HIGHEST VALUE IS	0.06046 AT (	562065.76,	4821512.01,	311.00,	311.00,	0.00)	DC
	8TH HIGHEST VALUE IS	0.05898 AT (	562085.76,	4821512.01,	311.00,	311.00,	0.00)	DC
	9TH HIGHEST VALUE IS	0.05420 AT (	562085.76,	4821532.01,	311.00,	311.00,	0.00)	DC
	10TH HIGHEST VALUE IS	0.04152 AT (	562077.84,	4821540.29,	311.01,	311.01,	0.00)	DC
B38	1ST HIGHEST VALUE IS	1.21329 AT (	562070.91,	4821533.11,	311.00,	311.00,	0.00)	DC
	2ND HIGHEST VALUE IS	1.21329 AT (	562070.91,	4821533.11,	311.00,	311.00,	0.00)	DC
	3RD HIGHEST VALUE IS	1.18894 AT (	562063.97,	4821525.92,	311.00,	311.00,	0.00)	DC
	4TH HIGHEST VALUE IS	1.18894 AT (	562063.97,	4821525.92,	311.00,	311.00,	0.00)	DC
	5TH HIGHEST VALUE IS	0.97601 AT (	562085.76,	4821532.01,	311.00,	311.00,	0.00)	DC
	6TH HIGHEST VALUE IS	0.94370 AT (	562077.84,	4821540.29,	311.01,	311.01,	0.00)	DC
	7TH HIGHEST VALUE IS	0.94370 AT (	562077.84,	4821540.29,	311.01,	311.01,	0.00)	DC
	8TH HIGHEST VALUE IS	0.87345 AT (	562057.04,	4821518.74,	311.00,	311.00,	0.00)	DC
	9TH HIGHEST VALUE IS	0.87345 AT (	562057.04,	4821518.74,	311.00,	311.00,	0.00)	DC
	10TH HIGHEST VALUE IS	0.77779 AT (	562084.78,	4821547.47,	311.25,	311.25,	0.00)	DC

**MODELOPTs: NonDFAULT CONC ELEV FLGPOL BETA

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF HCR IN NANOGRAMS/M3 **

GROUP ID	AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
C79	1ST HIGHEST VALUE IS 0.14398 AT (562063.97, 4821525.92, 311.00, 311.00, 0.00)		DC	
	2ND HIGHEST VALUE IS 0.14398 AT (562063.97, 4821525.92, 311.00, 311.00, 0.00)		DC	
	3RD HIGHEST VALUE IS 0.12547 AT (562085.76, 4821512.01, 311.00, 311.00, 0.00)		DC	
	4TH HIGHEST VALUE IS 0.12092 AT (562070.91, 4821533.11, 311.00, 311.00, 0.00)		DC	
	5TH HIGHEST VALUE IS 0.12092 AT (562070.91, 4821533.11, 311.00, 311.00, 0.00)		DC	
	6TH HIGHEST VALUE IS 0.11452 AT (562065.76, 4821512.01, 311.00, 311.00, 0.00)		DC	
	7TH HIGHEST VALUE IS 0.10708 AT (562057.04, 4821518.74, 311.00, 311.00, 0.00)		DC	
	8TH HIGHEST VALUE IS 0.10708 AT (562057.04, 4821518.74, 311.00, 311.00, 0.00)		DC	
	9TH HIGHEST VALUE IS 0.08593 AT (562085.76, 4821532.01, 311.00, 311.00, 0.00)		DC	
	10TH HIGHEST VALUE IS 0.08321 AT (562105.76, 4821512.01, 311.00, 311.00, 0.00)		DC	

C80	1ST HIGHEST VALUE IS	0.14420	AT (	562063.97,	4821525.92,	311.00,	311.00,	0.00)	DC
	2ND HIGHEST VALUE IS	0.14420	AT (	562063.97,	4821525.92,	311.00,	311.00,	0.00)	DC
	3RD HIGHEST VALUE IS	0.14226	AT (	562065.76,	4821512.01,	311.00,	311.00,	0.00)	DC
	4TH HIGHEST VALUE IS	0.13260	AT (	562057.04,	4821518.74,	311.00,	311.00,	0.00)	DC
	5TH HIGHEST VALUE IS	0.13260	AT (	562057.04,	4821518.74,	311.00,	311.00,	0.00)	DC
	6TH HIGHEST VALUE IS	0.11474	AT (	562085.76,	4821512.01,	311.00,	311.00,	0.00)	DC
	7TH HIGHEST VALUE IS	0.09768	AT (	562070.91,	4821533.11,	311.00,	311.00,	0.00)	DC
	8TH HIGHEST VALUE IS	0.09768	AT (	562070.91,	4821533.11,	311.00,	311.00,	0.00)	DC
	9TH HIGHEST VALUE IS	0.09222	AT (	562085.76,	4821492.01,	310.52,	310.52,	0.00)	DC
	10TH HIGHEST VALUE IS	0.08340	AT (	562056.81,	4821505.08,	310.84,	310.84,	0.00)	DC
FURNACE	1ST HIGHEST VALUE IS	0.43330	AT (	562063.97,	4821525.92,	311.00,	311.00,	0.00)	DC
	2ND HIGHEST VALUE IS	0.43330	AT (	562063.97,	4821525.92,	311.00,	311.00,	0.00)	DC
	3RD HIGHEST VALUE IS	0.38951	AT (	562057.04,	4821518.74,	311.00,	311.00,	0.00)	DC
	4TH HIGHEST VALUE IS	0.38951	AT (	562057.04,	4821518.74,	311.00,	311.00,	0.00)	DC
	5TH HIGHEST VALUE IS	0.37796	AT (	562070.91,	4821533.11,	311.00,	311.00,	0.00)	DC
	6TH HIGHEST VALUE IS	0.37796	AT (	562070.91,	4821533.11,	311.00,	311.00,	0.00)	DC
	7TH HIGHEST VALUE IS	0.30741	AT (	562050.10,	4821511.55,	311.00,	311.00,	0.00)	DC
	8TH HIGHEST VALUE IS	0.30741	AT (	562050.10,	4821511.55,	311.00,	311.00,	0.00)	DC
	9TH HIGHEST VALUE IS	0.30246	AT (	562085.76,	4821532.01,	311.00,	311.00,	0.00)	DC
	10TH HIGHEST VALUE IS	0.26144	AT (	562065.76,	4821512.01,	311.00,	311.00,	0.00)	DC
FOREHEAR	1ST HIGHEST VALUE IS	1.21329	AT (	562070.91,	4821533.11,	311.00,	311.00,	0.00)	DC
	2ND HIGHEST VALUE IS	1.21329	AT (	562070.91,	4821533.11,	311.00,	311.00,	0.00)	DC
	3RD HIGHEST VALUE IS	1.18894	AT (	562063.97,	4821525.92,	311.00,	311.00,	0.00)	DC
	4TH HIGHEST VALUE IS	1.18894	AT (	562063.97,	4821525.92,	311.00,	311.00,	0.00)	DC
	5TH HIGHEST VALUE IS	0.97601	AT (	562085.76,	4821532.01,	311.00,	311.00,	0.00)	DC
	6TH HIGHEST VALUE IS	0.94370	AT (	562077.84,	4821540.29,	311.01,	311.01,	0.00)	DC
	7TH HIGHEST VALUE IS	0.94370	AT (	562077.84,	4821540.29,	311.01,	311.01,	0.00)	DC
	8TH HIGHEST VALUE IS	0.87345	AT (	562057.04,	4821518.74,	311.00,	311.00,	0.00)	DC
	9TH HIGHEST VALUE IS	0.87345	AT (	562057.04,	4821518.74,	311.00,	311.00,	0.00)	DC
	10TH HIGHEST VALUE IS	0.77779	AT (	562084.78,	4821547.47,	311.25,	311.25,	0.00)	DC

**MODELOPTs: NonDFAULT CONC ELEV FLGPOL BETA

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF HCR IN NANOGRAMS/M3 **

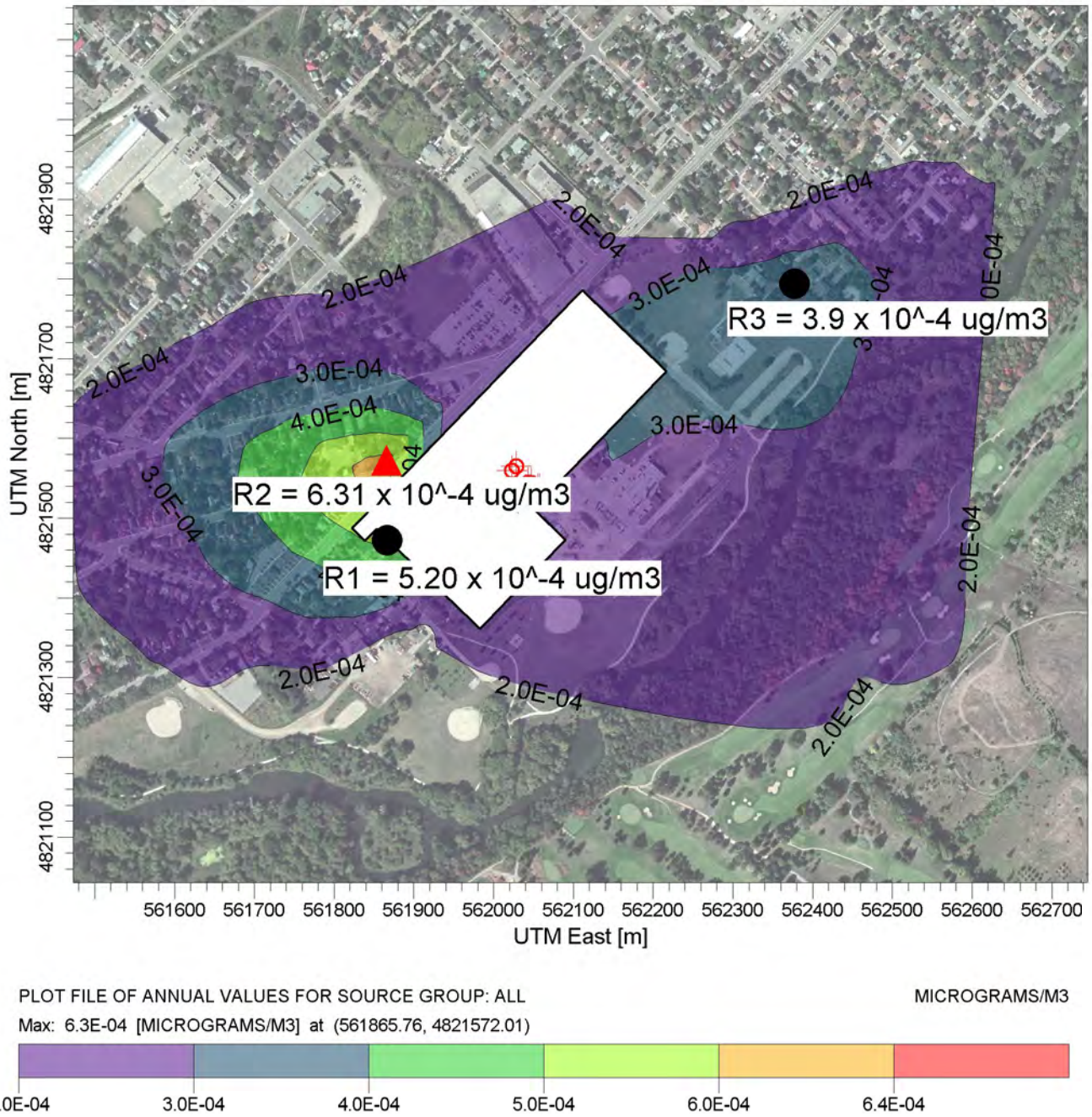
GROUP ID	AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
GENEXHTS	1ST HIGHEST VALUE IS 0.76247 AT (562063.97, 4821525.92, 311.00, 311.00, 0.00)		DC	
	2ND HIGHEST VALUE IS 0.76247 AT (562063.97, 4821525.92, 311.00, 311.00, 0.00)		DC	
	3RD HIGHEST VALUE IS 0.64680 AT (562057.04, 4821518.74, 311.00, 311.00, 0.00)		DC	
	4TH HIGHEST VALUE IS 0.64680 AT (562057.04, 4821518.74, 311.00, 311.00, 0.00)		DC	
	5TH HIGHEST VALUE IS 0.60412 AT (562070.91, 4821533.11, 311.00, 311.00, 0.00)		DC	
	6TH HIGHEST VALUE IS 0.60412 AT (562070.91, 4821533.11, 311.00, 311.00, 0.00)		DC	
	7TH HIGHEST VALUE IS 0.56747 AT (562065.76, 4821512.01, 311.00, 311.00, 0.00)		DC	
	8TH HIGHEST VALUE IS 0.53483 AT (562085.76, 4821512.01, 311.00, 311.00, 0.00)		DC	
	9TH HIGHEST VALUE IS 0.43243 AT (562050.10, 4821511.55, 311.00, 311.00, 0.00)		DC	
	10TH HIGHEST VALUE IS 0.43243 AT (562050.10, 4821511.55, 311.00, 311.00, 0.00)		DC	
ALL	1ST HIGHEST VALUE IS 2.38471 AT (562063.97, 4821525.92, 311.00, 311.00, 0.00)		DC	
	2ND HIGHEST VALUE IS 2.38471 AT (562063.97, 4821525.92, 311.00, 311.00, 0.00)		DC	
	3RD HIGHEST VALUE IS 2.19537 AT (562070.91, 4821533.11, 311.00, 311.00, 0.00)		DC	
	4TH HIGHEST VALUE IS 2.19537 AT (562070.91, 4821533.11, 311.00, 311.00, 0.00)		DC	
	5TH HIGHEST VALUE IS 1.90976 AT (562057.04, 4821518.74, 311.00, 311.00, 0.00)		DC	
	6TH HIGHEST VALUE IS 1.90976 AT (562057.04, 4821518.74, 311.00, 311.00, 0.00)		DC	
	7TH HIGHEST VALUE IS 1.67730 AT (562085.76, 4821532.01, 311.00, 311.00, 0.00)		DC	
	8TH HIGHEST VALUE IS 1.52625 AT (562077.84, 4821540.29, 311.01, 311.01, 0.00)		DC	
	9TH HIGHEST VALUE IS 1.52625 AT (562077.84, 4821540.29, 311.01, 311.01, 0.00)		DC	
	10TH HIGHEST VALUE IS 1.51423 AT (562065.76, 4821512.01, 311.00, 311.00, 0.00)		DC	

2.3847 ng/m3 = 0.0023847 ug/m3

```
 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
♀*** AERMOD - VERSION  14134 ***   *** OC Guelph Project 144539 - Site Specific Standard                 ***        02/23/15
 *** AERMET - VERSION  14134 ***   *** Ann_Opt_E_R9_Metyr2                                              ***        07:06:26
                                                                                                                 PAGE   8
 **MODELOPTs:   NonDFAULT CONC      ELEV      FLGPOL    BETA

 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of            0 Fatal Error Message(s)
 A Total of            0 Warning Message(s)
 A Total of            3 Informational Message(s)

 A Total of         8760 Hours Were Processed

 A Total of            3 Calm Hours Identified

 A Total of            0 Missing Hours Identified (  0.00 Percent)


    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***


    ********   WARNING MESSAGES   ********
               ***  NONE  ***
```

PROJECT TITLE:

OC Guelph Glass Plant -Sensitive Receptor Assessment
Preferred Pollution Control Combination (ID E_R9) from Technological Benchmarking



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ALL — MICROGRAMS/M3

Max: 6.3E-04 [MICROGRAMS/M3] at (561865.76, 4821572.01)

2.0E-04 3.0E-04 4.0E-04 5.0E-04 6.0E-04 6.4E-04

COMMENTS: Sensitive Receptor Grid Met Year 1 Red Triangle = Max POI Concentration Black Circle = Concentration at the location	SOURCES: **10**	COMPANY NAME: **Owens Corning Guelph Glass Plant**	
	RECEPTORS: **801**	MODELER: **C. Mackay, LEHDER**	LEHDER Excellence in Industrial Air Quality Services
	OUTPUT TYPE: **Concentration**	SCALE: 1:8,000 0 0.3 km	
	MAX: **6.3E-04 MICROGRAMS/M3**	DATE: **3/23/2015**	PROJECT NO.: **144539**

Annual Hexavalent Chromium concentrations

Technical Benchmarking - Preferred Option E_R9 - Sensitive Receptor Modeling - 5 year data set

Run (tab) Name:	Ann_Opt_E_R9_AllSR_R1_yr1	Ann_Opt_E_R9_AllSR_R1_yr2	Ann_Opt_E_R9_AllSR_R1_yr3	Ann_Opt_E_R9_AllSR_R1_yr4	Ann_Opt_E_R9_SRAll_R1_yr5	
Run Description:	Option E_R9_AllSR_R1, Reg 419 grid, Site Specific Met (2009)	Option E_R9_AllSR_R1, Reg 419 grid, Site Specific Met (2010)	Option E_R9_AllSR_R1, Reg 419 grid, Site Specific Met (2011)	Option E_R9_AllSR_R1, Reg 419 grid, Site Specific Met (2012)	Option E_R9_AllSR_R1, Reg 419 grid, Site Specific Met (2013)	**MAX**
Result Units:	**ng/m3**	**ng/m3**	**ng/m3**	**ng/m3**	**ng/m3**	**ng/m3**
ALL	0.63103	0.4272	0.58772	0.49976	0.58243	**0.63103**
B38	0.42566	0.28611	0.39354	0.33433	0.38774	**0.42566**
B10	0.00459	0.00355	0.00471	0.004	0.00468	**0.00471**
B32	0.00356	0.00248	0.00321	0.00284	0.00317	**0.00356**
B34	0.00356	0.00246	0.00322	0.00264	0.00296	**0.00356**
B35	0.00351	0.00284	0.0036	0.00285	0.00312	**0.0036**
C79	0.01508	0.01326	0.01519	0.01207	0.0122	**0.01519**
C80	0.01266	0.01128	0.01267	0.01153	0.01259	**0.01267**
B24	0.08456	0.05764	0.07746	0.0675	0.07923	**0.08456**
B25	0.07617	0.05175	0.07043	0.05924	0.07064	**0.07617**
B33	0.01128	0.00812	0.01061	0.00924	0.00961	**0.01128**
FURNACE	0.16073	0.10939	0.14789	0.12652	0.14987	**0.16073**
FOREHEAR	0.42566	0.28611	0.39354	0.33433	0.38774	**0.42566**
GENEXHTS	0.05004	0.04062	0.04918	0.04254	0.04482	**0.05004**

Run Description:	Option E_R9_AllSR_R1, Reg 419 grid, Site Specific Met (2009)	Option E_R9_AllSR_R1, Reg 419 grid, Site Specific Met (2010)	Option E_R9_AllSR_R1, Reg 419 grid, Site Specific Met (2011)	Option E_R9_AllSR_R1, Reg 419 grid, Site Specific Met (2012)	Option E_R9_AllSR_R1, Reg 419 grid, Site Specific Met (2013)	**MAX**
Result Units:	**ug/m3**	**ug/m3**	**ug/m3**	**ug/m3**	**ug/m3**	**ug/m3**
ALL	0.00063103	0.0004272	0.00058772	0.00049976	0.00058243	**0.000631**
B38	0.00042566	0.00028611	0.00039354	0.00033433	0.00038774	**0.000426**
B10	0.00000459	0.00000355	0.00000471	0.000004	0.00000468	**4.71E-06**
B32	0.00000356	0.00000248	0.00000321	0.00000284	0.00000317	**3.56E-06**
B34	0.00000356	0.00000246	0.00000322	0.00000264	0.00000296	**3.56E-06**
B35	0.00000351	0.00000284	0.0000036	0.00000285	0.00000312	**3.6E-06**
C79	0.00001508	0.00001326	0.00001519	0.00001207	0.0000122	**1.52E-05**
C80	0.00001266	0.00001128	0.00001267	0.00001153	0.00001259	**1.27E-05**
B24	0.00008456	0.00005764	0.00007746	0.0000675	0.00007923	**8.46E-05**
B25	0.00007617	0.00005175	0.00007043	0.00005924	0.00007064	**7.62E-05**
B33	0.00001128	0.00000812	0.00001061	0.00000924	0.00000961	**1.13E-05**
FURNACE	0.00016073	0.00010939	0.00014789	0.00012652	0.00014987	**0.000161**
FOREHEAR	0.00042566	0.00028611	0.00039354	0.00033433	0.00038774	**0.000426**
GENEXHTS	0.00005004	0.00004062	0.00004918	0.00004254	0.00004482	**5E-05**