Report No. 91130

Report:

Greif Bros Canada Inc.
Town of Oakville By-Law 2010-035 Section 6 Application,
Oakville Facility

Date: July 31, 2013



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Town of Oakville By-Law 2010-035 Section 6 Application, Oakville Facility

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Report No.: 91130
19 Pages, 6 Attachments

Revision History

Version	Date	Summary Changes/Purpose of Revision
1	October 4, 2012	None
2	July 31, 2013	General Update

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PUBLIC SUMMARY

Introduction

Greif Inc. retained ORTECH Environmental (ORTECH), to prepare a submission under section 6 of the Town of Oakville By-Law 2010-035 (the By-law), for the Greif Bros Canada Inc. (Greif) facility (the facility) located at 165 Wyecroft Road in Oakville, Ontario.

The facility employs 23 individuals to manufacture steel drums. The operations are described by NAICS Code 332439 – Other Metal Container Manufacturing. This facility emits the following air pollutants, as defined by the By-law: fine particulate matter (FPM), nitrogen dioxide, ammonia, sulphur dioxide and volatile organic compounds (VOCs). Sources of emissions include 5 stacks exhausting from paint spray booths, 12 stacks exhausting ovens and 25 comfort heating sources.

The Bylaw defines maximum total facility induced (MTFI) and maximum cumulative (MC) annual average and annual maximal emission scenarios for total FPM and provides a threshold MTFI that defines an affected airshed and triggers further analysis.

Assessment under Health Protection Air Quality By-law (HPAQB)

The air pollutants FPM and VOCs exceed their corresponding Oakville major emission thresholds of 300 kg per year and 10,000 kg per year respectively. To be conservative, all bylaw air pollutants were included in the modeling to address secondary particulate matter formation.

The results of calculating the maximum total facility induced (MTFI) and maximum cumulative (MC) annual average and annual maximal emission scenarios for total FPM are summarized on the table below and demonstrate that the facility does not create an affected airshed. Figure I and II provide the concentration contours for the MTFI annual maximal and the MC annual maximal total FPM concentrations. As indicated, the MTFI annual maximal concentrations are below the 0.2 $\mu g/m^3$ threshold for further consideration and constitute less than 2% of the cumulative FPM concentration. It is not anticipated that emissions will exceed 90% of the maximal emission scenario.

Summary Values Table

Annual Average Emissions Concentration ($\mu g/m^3$)			Annual Maximal Emissions Concentration ($\mu g/m^3$)		
MTFI		MC	MTFI		MC
Greif	Affected Airshed Threshold		Greif	Affected Airshed Threshold	
0.08	0.2	7.65	0.19	0.2	9.1

Figure I: MTFI Annual Maximal Emissions Concentration Contour Plot

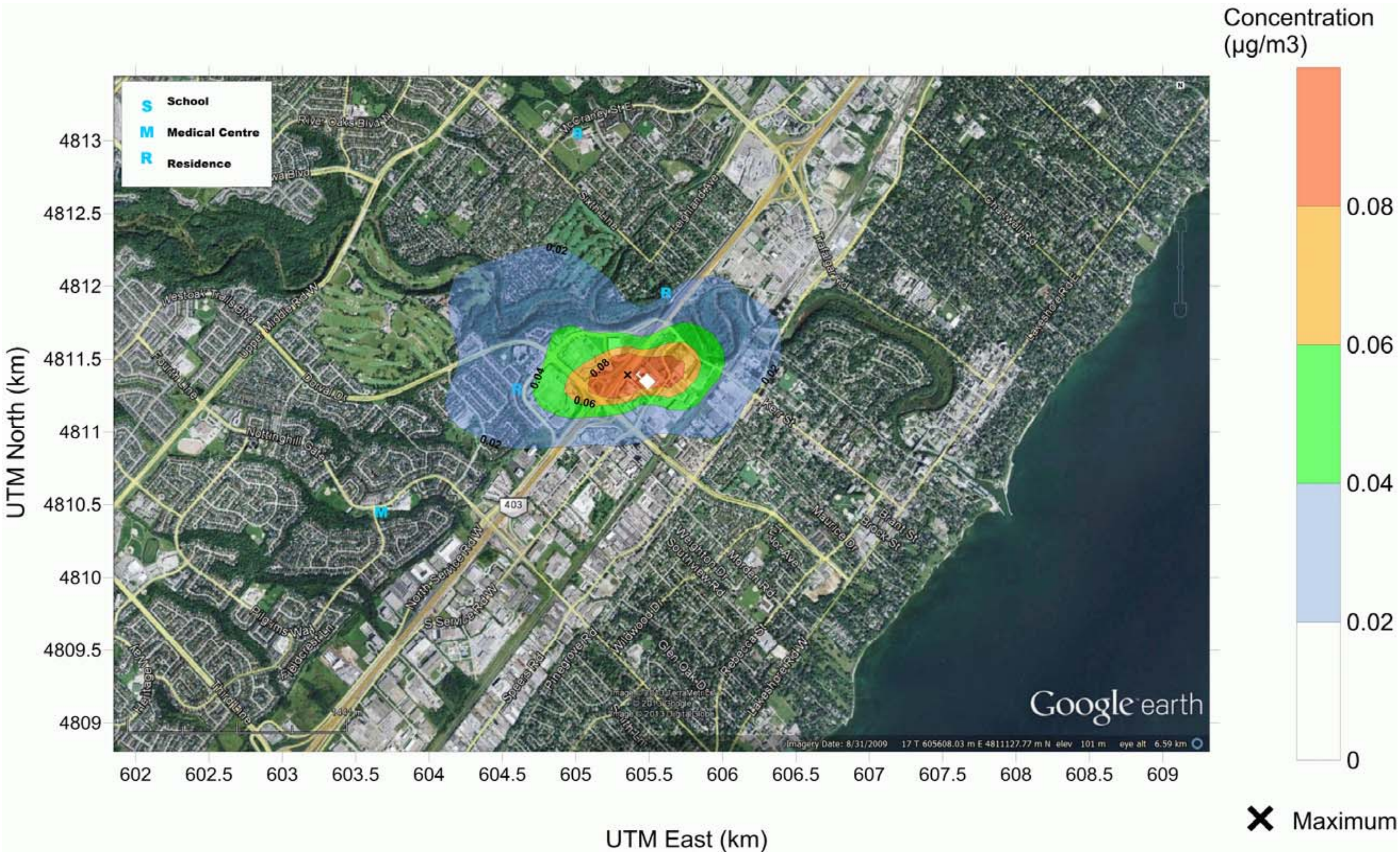
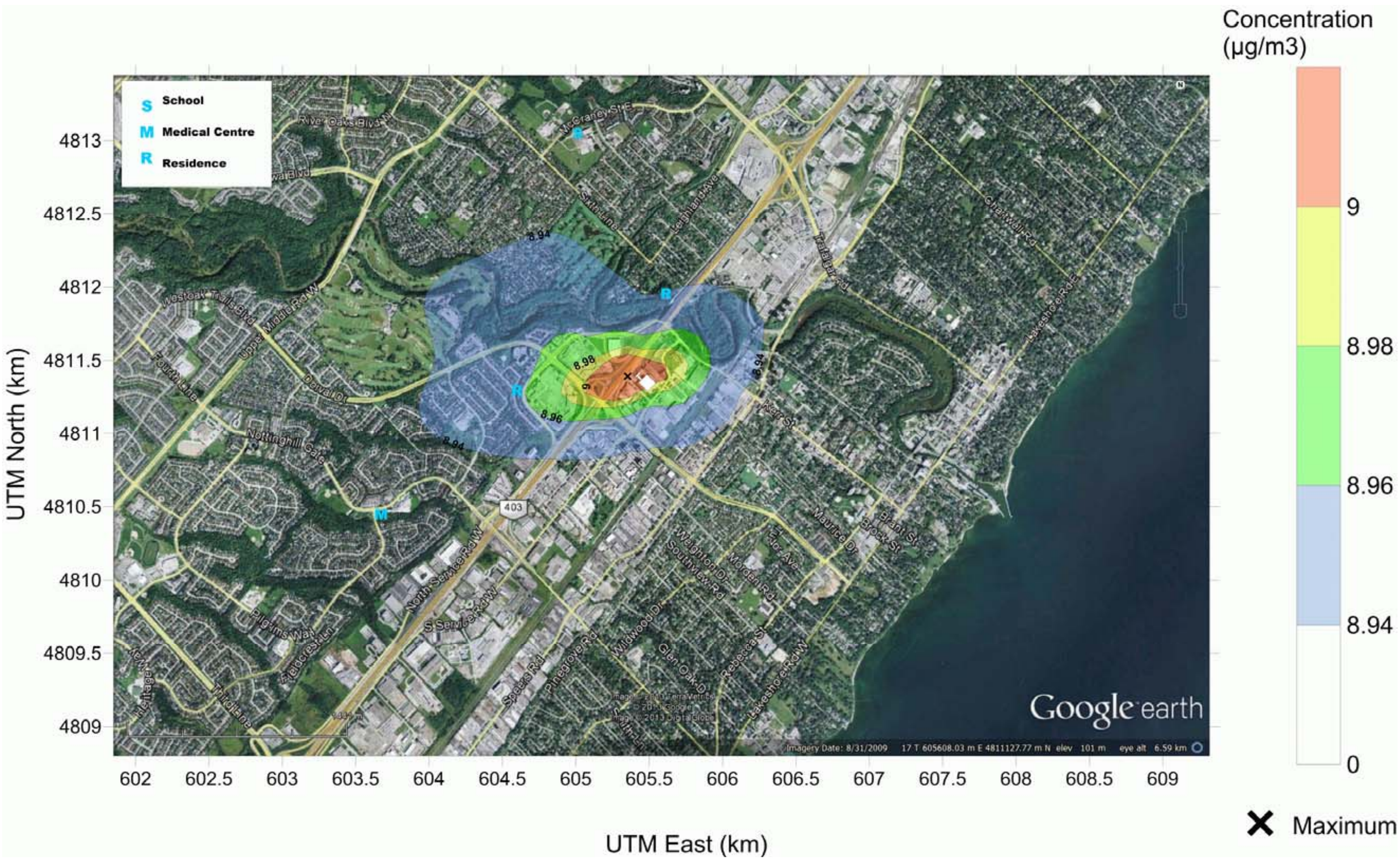


Figure II: MC Annual Maximal Emissions Concentration Contour Plot



EXECUTIVE SUMMARY

Greif Inc. retained ORTECH Environmental (ORTECH), to prepare a submission under section 6 of the Town of Oakville By-Law 2010-035, for the Greif Bros Canada Inc. facility located at 165 Wyecroft Road in Oakville, Ontario.

The Bylaw defines maximum total facility induced (MTFI) and maximum cumulative (MC) annual average and annual maximal emission scenarios for total FPM and provides a threshold MTFI that defines an affected airshed and triggers further analysis.

The Greif Oakville facility (the facility) manufactures steel drums. The facility operations are described by NAICS Code 332439 – Other Metal Container Manufacturing. The facility is a major emitter as defined in the Town of Oakville By-Law 2010-035 (the By-law) based on reporting to the National Pollutant Release Inventory (NPRI).

This application was prepared as outlined in the By-law and the Town of Oakville "*Guidance for Implementation of Oakville Health Protection Air Quality By-Law 2010-035: Section 5 and 6 and approval requirements for major emitters*" (Guidance Document). The original application was submitted in October 2012; this revision is based on feedback received from and through the Town of Oakville. It includes an evaluation of average and maximal total facility-induced concentrations (MTFI) of fine particulate matter (FPM); and average and maximal cumulative (MC) FPM concentrations.

The Summary Values Table below summarizes the concentrations for the MTFI and MC average and maximal emission scenarios for FPM. These results demonstrate that the facility does not create an affected airshed as defined by the By-law, as both the annual average and maximal MTFI emissions concentrations are below the 0.2 $\mu g/m^3$ threshold for further risk assessment. The results also indicate that the maximal MTFI constitute less than 2% of the cumulative FPM concentration

Summary Value Table

Annual Average Emissions Concentration ($\mu g/m^3$)			Annual Maximal Emissions Concentration ($\mu g/m^3$)		
MTFI		MC	MTFI		MC
Greif	Affected Airshed Threshold		Greif	Affected Airshed Threshold	
0.08	0.2	7.65	0.19	0.2	9.1

1. INTRODUCTION

Greif Inc. retained ORTECH Environmental (ORTECH), to prepare a submission under section 6 of the Town of Oakville (Town) By-law 2010-035, for the Greif Bros Canada Inc. (Greif) facility (the facility) located at 165 Wyecroft Road in Oakville, Ontario since the facility is designated as a major emitter under Section 6 of the By-law.

The Bylaw defines maximum total facility induced (MTFI) and maximum cumulative (MC) annual average and annual maximal emission scenarios for total FPM and provides a threshold MTFI that defines an affected airshed and triggers further analysis.

2. FACILITY DESCRIPTION

2.1 Overview

The facility employs 23 individuals to manufacture steel drums, which includes forming and painting. The facility operations are described by NAICS Code 332439 – Other Metal Container Manufacturing. The facility is currently covered by Ontario Ministry of the Environment Environmental Approval Certificate Number 3337-5YVHEB, issued July 2, 2004.

2.2 Location

The Greif facility is located at 165 Wyecroft Road, Oakville, Ontario. The QEW highway is adjacent to the northwest property line. A railway line is located 400 m to the northwest of the facility. The closest sensitive receptors, as defined in the By-law, are a church and school located approximately 700 m to the northwest of the facility. Attachment A provides a map of the general location of the facility. See Figure 1 for the the environs within 3 km of the facility including sensitive receptors and nearby significant sources, primarily highways and major roads. There are no day care facilities or other sensitive receptors located within the facility property. The facility is in an area designated as an Employment Zone (see Attachment A for zoning map). Zoning to the north of the QEW includes Commercial, Residential and Open Space.

2.3 Buildings

The building layout, with process stacks, is illustrated by Figure B-1. Figure B-2 shows the orientation and location of the facility. A diagram outlining the process layout is included as Figure B-3. In addition, the location of comfort heating exhausts is detailed by Figure B-4.

2.4 Raw Materials, Products and Processes

Coiled steel is cut into lengths of steel required for the body of the drum. The steel lengths are then rolled to form the body of the drum. This cylinder is then welded and lacquered internally. The heads or bottoms of the drums are made when the coiled steel is stamped into blanks. These blanks are then lined, after which they are attached to the body of the drum. Prior to the final processing the drums are painted on the outside and lined on the inside. Natural gas fired ovens are used to dry and cure the paint and the lining of the drums. A separate line is used to paint, line and dry the tops. Emission control devices for the paint spray booths consist of spray booth filters and water wash systems. To be conservative, the water wash system control was not taken into consideration when calculating emissions from the paint spray booths.

Raw materials relevant to air emissions include paint and lining liquids, glue and seam sealer and natural gas combustion. Resistance welding does not melt the steel but acts to bond the steel together, thereby not releasing any emissions. The painting and lining operations are a source of both volatile organic compounds (VOCs) and particulate emissions. The combustion sources, including process heating equipment and comfort heating units, are the source of nitrogen oxide, sulphur dioxide and ammonia emissions. See Attachment B, Figure B-5 for a Process Flow Diagram.

The normal operating hours for the plant are 8.5 hrs per day (06:00 – 14:30), 5 days a week for 51 weeks per year.

The production rates from 2005 to 2012 as well as the annual average and maximum production rates are included in Table 1. The average production rate was calculated using the 2005 to 2012 data and used as the basis for the annual average emission scenario. The maximum annual production rate is based on equipment maximums. It is not anticipated that emissions will exceed 90% of the maximal emission scenario, as the production rate over the period of 2005 to 2012 never reached 90% of the maximum production rate. Realistically, the current maximum production rate is considered to be 350,000 drums per year, which is 88% of the theoretical maximum production rate (400,000 drums per year) which was used as the basis for the maximal emission scenario.

Table 2 illustrates the average and maximum natural gas usage for the facility over the period of 2008 to 2012. The average natural gas usage was calculated and used as the basis for the annual average emission scenario. The theoretical maximum natural gas usage was calculated based on a 65% increase over the actual annual maximum usage.

The aforementioned tables illustrate the variability of the annual process rates, the variability of production rates around the average and the relationship between the average and maximum process rates.

Table 1: Annual Process Production Rates

Year	Drums Produced	Drums/Day
2005	294,148	1,177
2006	334,791	1,339
2007	355,256	1,421
2008	259,302	1,310
2009	187,438	1,258
2010	202,337	1,176
2011	262,591	1,050
2012	276,082	1,104
Average	271,493	1,229
Maximum	400,000	1,600

Table 2: Annual Natural Gas Usage

Year	Usage (MMBTU)
2008	9,094
2009	14,452
2010	12,151
2011	14,239
2012	13,398
Average	12,667
Maximum	20,851

Planned Maintenance Periods

The plant is generally shutdown the last week of the year. Maintenance occurs during this time.

2.5 Emission Sources and Processes

All of the process emission sources at the facility are listed in the following table (see Table 3). The site plan in Attachment B (Figure B-1) shows the location of all process sources.

The annual average and annual maximum emissions of relevant air pollutants for each source are listed in Table 4.

Table 3: Source Parameters

Source ID	Description	Exhaust Conditions: Flow Rate (m^3/s)	Exhaust Conditions: Temp. (°C)	Stack Parameters: Exit Dia. (m)	Height Above Roof (m)	Height Above Grade (m)	Stack Orientation	Is Stack Capped?	Location: x	Location: y
External Coating Line										
S1-14	Paint Spray Booth	3.63	ambient	0.79	15.24	24.44	Vertical	No	605474	4811375
S1-15	Paint Spray Booth	1.09	ambient	0.51	15.24	24.44	Vertical	No	605476	4811375
S2-23	Curing Oven - Preheat	0.46	118	0.41	15.24	24.44	Vertical	No	605472	4811368
S2-24	Curing Oven - Entrance	2.73	38	0.61	15.24	24.44	Vertical	No	605476	4811369
S2-25	Curing Oven - Middle	3.91	31	0.61	15.24	24.44	Vertical	No	605492	4811355
S2-27	Curing Oven - FireBox	0.24	133	0.33	15.24	24.44	Vertical	No	605484	4811365
Internal Coating Line										
S3-19	Paint Spray Booth	2.56	ambient	0.86	15.24	22.06	Vertical	No	605461	4811354
S4-5	Curing Oven - Front 1	0.45	79	0.41	15.24	24.44	Vertical	No	605475	4811390
S8-12	Curing Oven - Front 2	0.49	190	0.36	15.24	24.44	Vertical	No	605448	4811365
S9-13	Curing Oven - Rear	1.8	163	0.51	15.24	24.44	Vertical	No	605447	4811364
Parts Coating										
S5-20	Paint Spray Booth	4.68	ambient	0.86	15.24	24.44	Vertical	No	605453	4811363
S6-7	Wicket Oven	1.63	53	0.46	15.24	24.44	Vertical	No	605468	4811380
S6-8	Wicket Oven	0.51	40	0.46	15.24	24.44	Vertical	No	605468	4811378
S6-10	Wicket Oven	1.03	131	0.45x0.35	15.24	24.44	Vertical	No	605460	4811372
S6-11	Wicket Oven	1.24	32	0.46	15.24	24.44	Vertical	No	605456	4811368
S7-18	Batch Oven	2.8	100	0.61	15.24	24.44	Vertical	No	605491	4811350
Touch Up Line										
S8-1	Paint Spray Booth	3.04	ambient	0.61	15.24	24.44	Vertical	No	605504	4811333
Comfort Heating Exhausts										
S11-1		0.000	50	0.1	-	5.7	Horizontal	No	605495	4811294
S11-2		0.000	50	0.1	-	5.7	Horizontal	No	605462	4811316
S11-3		0.000	50	0.1	-	5.7	Horizontal	No	605460	4811318
S11-4		0.000	50	0.1	-	5	Horizontal	No	605429	4811350
S11-5		0.000	50	0.1	-	5	Horizontal	No	605440	4811361
S11-6		0.000	50	0.1	-	5.7	Horizontal	No	605445	4811333
S11-7		0.000	50	0.1	-	5.7	Horizontal	No	605515	4811314
S11-8		0.000	50	0.1	-	5.7	Horizontal	No	605516	4811314
S11-9		0.018	50	0.1	0.9	10.1	Vertical	Yes	605492	4811342
S11-10	Plant	0.018	50	0.1	0.9	7.72	Vertical	Yes	605479	4811333
S11-11		0.018	50	0.1	0.9	10.1	Vertical	Yes	605472	4811377
S11-12		0.000	50	0.1	-	5.7	Horizontal	No	605525	4811323
S11-13		0.000	50	0.1	-	6.2	Horizontal	No	605540	4811349
S11-14		0.000	50	0.1	-	5.7	Horizontal	No	605534	4811355
S11-15		0.000	50	0.1	-	6.2	Horizontal	No	605519	4811370
S11-16		0.018	50	0.1	0.9	10.1	Vertical	Yes	605510	4811361
S11-17		0.000	50	0.1	-	4.7	Horizontal	No	605495	4811394
S11-18		0.000	50	0.1	-	6.2	Horizontal	No	605468	4811389
S11-19		0.000	50	0.1	-	5.6	Horizontal	No	605495	4811293
S11-20		0.000	120	0.1	0.6	5.6	Horizontal	No	605440	4811377
S11-21		0.000	120	0.1	0.6	5.6	Horizontal	No	605430	4811386
S11-22	Office	0.000	120	0.1	0.6	5.6	Horizontal	No	605436	4811411
S11-23		0.000	120	0.1	0.6	5.6	Horizontal	No	605429	4811404
S11-24		0.000	120	0.1	0.6	5.6	Horizontal	No	605420	4811396
S11-25	Paint Room	0.000	120	0.1	0.6	9.8	Horizontal	Yes	605479	4811389

Table 4: Source Emissions

Source ID	Description	SCC Code	Annual Average Emissions (kg/year)	Annual Worst-Case Emission s (kg/year)	Daily Average Emission s (kg/day)	Daily Worst-Case Emission s (kg/day)	Annual Average Emissions (kg/year)	Annual Worst-Case Emission s (kg/year)	Daily Average Emission s (kg/day)	Daily Worst-Case Emission s (kg/day)	Annual Average Emissions (kg/year)	Annual Worst-Case Emissions (kg/year)	Daily Average Emission s (kg/day)	Daily Worst-Case Emission s (kg/day)	Annual Average Emission s (kg/year)	Annual Worst-Case Emissions (kg/year)	Daily Average Emission s (kg/day)	Daily Worst-Case Emissions (kg/day)	Annual Average Emission s (kg/year)	Annual Worst-Case Emissions (kg/year)	Daily Average Emissions (kg/day)	Daily Worst-Case Emission s (kg/day)	Annual Average Emission s (kg/year)	Annual Worst-Case Emission s (kg/year)	Daily Average Emissions (kg/day)	Daily Worst-Case Emission s (kg/day)
POINT SOURCES			VOC				Toluene				PM				Nitrogen Oxide				Sulphur Dioxide				Ammonia			
External Coating Line																										
S1-14	Paint Spray Booth	40200201	2637.81	3886.38	11.93	15.55	0.00	0.00	0.00	0.00	106.82	157.39	0.48	0.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S1-15	Paint Spray Booth	40200201	638.46	940.66	2.89	3.76	0.00	0.00	0.00	0.00	25.85	38.09	0.12	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S2-23	Curing Oven - Preheat	10200603	11.34	16.85	0.05	0.07	0.00	0.00	0.00	0.00	1.55	2.47	0.01	0.01	14.83	24.42	0.07	0.10	0.09	0.15	0.00	0.00	0.07	0.12	0.00	0.00
S2-24	Curing Oven - Entrance	10200603	1211.01	1784.68	5.48	7.14	0.00	0.00	0.00	0.00	52.54	78.03	0.24	0.31	47.59	78.34	0.22	0.31	0.29	0.47	0.00	0.00	0.23	0.38	0.00	0.00
S2-25	Curing Oven - Middle	10200603	72.04	106.59	0.33	0.43	0.00	0.00	0.00	0.00	6.37	10.01	0.03	0.04	47.59	78.34	0.22	0.31	0.29	0.47	0.00	0.00	0.23	0.38	0.00	0.00
S2-27	Curing Oven - FireBox	10200603	45.90	68.08	0.21	0.27	0.00	0.00	0.00	0.00	5.37	8.53	0.02	0.03	47.59	78.34	0.22	0.31	0.29	0.47	0.00	0.00	0.23	0.38	0.00	0.00
Internal Coating Line																										
S3-19	Paint Spray Booth	40200201	154.30	227.34	0.70	0.91	11.13	16.39	0.05	0.07	2.86	4.21	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S4-5	Curing Oven - Front 1	10200603	884.47	1303.59	4.00	5.21	80.86	119.14	0.37	0.48	15.09	22.88	0.07	0.09	49.44	81.39	0.22	0.33	0.30	0.49	0.00	0.00	0.24	0.40	0.00	0.00
S8-12	Curing Oven - Front 2	10200603	2162.55	3186.63	9.78	12.75	198.82	292.92	0.90	1.17	31.30	46.76	0.14	0.19	49.44	81.39	0.22	0.33	0.30	0.49	0.00	0.00	0.24	0.40	0.00	0.00
S9-13	Curing Oven - Rear	10200603	4911.73	7237.08	22.21	28.95	451.05	664.54	2.04	2.66	66.59	98.76	0.30	0.40	49.44	81.39	0.22	0.33	0.30	0.49	0.00	0.00	0.24	0.40	0.00	0.00
Parts Coating																										
S5-20	Paint Spray Booth	40200201	3140.28	4626.69	14.20	18.51	180.14	265.41	0.81	1.06	72.83	107.31	0.33	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S6-7	Wicket Oven	10200603	239.70	353.33	1.08	1.41	12.71	18.72	0.06	0.07	7.22	10.88	0.03	0.04	18.54	30.52	0.08	0.12	0.11	0.18	0.00	0.00	0.09	0.15	0.00	0.00
S6-8	Wicket Oven	10200603	257.81	380.02	1.17	1.52	14.63	21.56	0.07	0.09	7.39	11.14	0.03	0.04	18.54	30.52	0.08	0.12	0.11	0.18	0.00	0.00	0.09	0.15	0.00	0.00
S6-10	Wicket Oven	10200603	136.86	201.82	0.62	0.81	7.15	10.54	0.03	0.04	4.74	7.23	0.02	0.03	18.54	30.52	0.08	0.12	0.11	0.18	0.00	0.00	0.09	0.15	0.00	0.00
S6-11	Wicket Oven	10200603	1906.74	2809.43	8.62	11.24	110.56	162.89	0.50	0.65	45.26	66.93	0.20	0.27	18.54	30.52	0.08	0.12	0.11	0.18	0.00	0.00	0.09	0.15	0.00	0.00
S7-18	Batch Oven	10200603	2516.35	3707.60	11.38	14.83	145.02	213.67	0.66	0.85	59.54	87.97	0.27	0.35	18.54	30.52	0.08	0.12	0.11	0.18	0.00	0.00	0.09	0.15	0.00	0.00
Touch Up Line																										
S8-1	Paint Spray Booth	40200201	476.07	701.41	2.15	2.81	0.00	0.00	0.00	0.00	19.24	28.35	0.09	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Comfort Heating																										
S11-1	plant	10200603	0.41	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.93	0.00	0.00	7.42	12.21	0.03	0.05	0.04	0.07	0.00	0.00	0.04	0.06	0.00	0.00
S11-2		10200603	0.41	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.93	0.00	0.00	7.42	12.21	0.03	0.05	0.04	0.07	0.00	0.00	0.04	0.06	0.00	0.00
S11-3		10200603	0.41	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.93	0.00	0.00	7.42	12.21	0.03	0.05	0.04	0.07	0.00	0.00	0.04	0.06	0.00	0.00
S11-4		10200603	0.41	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.93	0.00	0.00	7.42	12.21	0.03	0.05	0.04	0.07	0.00	0.00	0.04	0.06	0.00	0.00
S11-5		10200603	0.41	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.93	0.00	0.00	7.42	12.21	0.03	0.05	0.04	0.07	0.00	0.00	0.04	0.06	0.00	0.00
S11-6		10200603	0.36	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.49	0.81	0.00	0.00	6.49	10.68	0.03	0.04	0.04	0.06	0.00	0.00	0.03	0.05	0.00	0.00
S11-7		10200603	0.36	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.49	0.81	0.00	0.00	6.49	10.68	0.03	0.04	0.04	0.06	0.00	0.00	0.03	0.05	0.00	0.00
S11-8		10200603	0.36	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.49	0.81	0.00	0.00	6.49	10.68	0.03	0.04	0.04	0.06	0.00	0.00	0.03	0.05	0.00	0.00
S11-9		10200603	0.41	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.93	0.00	0.00	7.42	12.21	0.03	0.05	0.04	0.07	0.00	0.00	0.04	0.06	0.00	0.00
S11-10		10200603	0.41	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.93	0.00	0.00	7.42	12.21	0.03	0.05	0.04	0.07	0.00	0.00	0.04	0.06	0.00	0.00
S11-11		10200603	0.41	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.93	0.00	0.00	7.42	12.21	0.03	0.05	0.04	0.07	0.00	0.00	0.04	0.06	0.00	0.00
S11-12		10200603	0.36	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.49	0.81	0.00	0.00	6.49	10.68	0.03	0.04	0.04	0.06	0.00	0.00	0.03	0.05	0.00	0.00
S11-13		10200603	0.36	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.49	0.81	0.00	0.00	6.49	10.68	0.03	0.04	0.04	0.06	0.00	0.00	0.03	0.05	0.00	0.00
S11-14		10200603	0.41	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.93	0.00	0.00	7.42	12.21	0.03	0.05	0.04	0.07	0.00	0.00	0.04	0.06	0.00	0.00
S11-15		10200603	0.41	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.93	0.00	0.00	7.42	12.21	0.03	0.05	0.04	0.07	0.00	0.00	0.04	0.06	0.00	0.00
S11-16		10200603	0.41	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.93	0.00	0.00	7.42	12.21	0.03	0.05	0.04	0.07	0.00	0.00	0.04	0.06	0.00	0.00
S11-17		10200603	0.41	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.93	0.00	0.00	7.42	12.21	0.03	0.05	0.04	0.07	0.00	0.00	0.04	0.06	0.00	0.00
S11-18		10200603	0.16	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.37	0.00	0.00	2.97	4.88	0.01	0.02	0.02	0.03	0.00	0.00	0.01	0.02	0.00	0.00
S11-19		10200603	0.41	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.93	0.00	0.00	7.42	12.21	0.03	0.05	0.04	0.07	0.00	0.00	0.04	0.06	0.00	0.00
S11-20	Office	10200603	0.31	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.42	0.70	0.00	0.00	5.56	9.16	0.03	0.04	0.03	0.05	0.00	0.00	0.03	0.04	0.00	0.00
S11-21		10200603	0.31	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.42	0.70	0.00	0.00	5.56	9.16	0.03	0.04	0.03	0.05	0.00	0.00	0.03	0.04	0.00	0.00
S11-22		10200603	0.28	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.38	0.63	0.00	0.00	5.01	8.24	0.02	0.03	0.03	0.05	0.00	0.00	0.02	0.04	0.00	0.00
S11-23		10200603	0.31	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.42	0.70	0.00	0.00	5.56	9.16	0.03	0.04	0.03	0.05	0.00	0.00	0.03	0.04	0.00	0.00
S11-24		10200603	0.31	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.42	0.70	0.00	0.00	5.56	9.16	0.03	0.04	0.03	0.05	0.00	0.00	0.03	0.04	0.00	0.00
S11-25	Paint Room	10200603	0.31	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.42	0.70	0.00	0.00	5.56	9.16	0.03	0.04	0.03	0.05	0.00	0.00	0.03	0.04	0.00	0.00

2.6 Emission Control Equipment and Procedures and Emissions Monitoring

Emission control devices and their efficiencies are summarized in Table 5. The effectiveness of the emission control devices is maintained by routine observations and preventive maintenance, including scheduled filter changes. The spray booth filters are replaced every 2-3 days depending on usage.

There are no dedicated continuous emissions monitoring systems in place at the facility. Pollution prevention practices include minimizing the amounts of surface coatings used; and minimizing and prompt cleaning of any spillage. See Attachment C for Filter Reports, which indicate control efficiencies. For conservatism, calculations use a capture efficiency of 95%.

Table 5: Emission Control Devices

Emission Control Device	Capture Efficiency	Source ID	Description
External Coating Line			
Dry Filter	97.7%	S1-14	Paint Spray Booth
		S1-15	Paint Spray Booth
		S2-23	Curing Oven - Preheat
		S2-24	Curing Oven - Entrance
		S2-25	Curing Oven - Middle
		S2-27	Curing Oven - FireBox
Internal Coating Line			
Dry Filter	95.3%	S3-19	Paint Spray Booth
		S4-5	Curing Oven - Front 1
		S8-12	Curing Oven - Front 2
		S9-13	Curing Oven - Rear
Parts Coating			
Dry Filter	95.3%	S5-20	Paint Spray Booth
		S6-7	Wicket Oven
		S6-8	Wicket Oven
		S6-10	Wicket Oven
		S6-11	Wicket Oven
		S7-18	Batch Oven
Touch Up Line			
Dry Filter	97.7%	S8-1	Paint Spray Booth

2.7 Identification and Quantification of Substances Released to Air

Table 6 summarizes the relevant air pollutant emissions that are released from the facility along with the By-law annual major emission level threshold for each pollutant.

Table 6: Health Protection Air Quality By-Law Emission Thresholds

Health-Risk Air Pollutant	Annual Average Emissions (kg/year)	Annual Worst-Case Emissions (kg/year)	Daily Average Emissions (kg/day)	Daily Worst-Case Emissions (kg/day)	Oakville Bylaw Threshold (kg/year)	Exceeds Threshold?
VOC	21,412.48	31,553.09	96.83	126.21	10000	Yes
PM	543.07	807.52	2.46	3.23	300	Yes
Toluene	1,212.07	1,785.78	5.48	7.14	-	-
Nitrogen Oxide (as NO_2)	563.30	927.24	2.55	3.71	20000	No
Sulphur Dioxide	3.38	5.56	0.02	0.02	20000	No
Ammonia	2.76	4.54	0.01	0.02	10000	No

The emission rate calculations were based on engineering calculations for the operating conditions described in Section 2.4 and are provided in Attachment D.

3. EVALUATION

3.1 Model Selection and Inputs

The Town approved model, CALPUFF (http://www.src.com/calpuff/calpuff1.htm), was used to evaluate the total FPM concentrations. The Town default model inputs were used as described in the guidance document (See Model Input Checklist in Attachment E).

The model was run for both the annual average emissions and annual maximal emissions. BPIP was run for the facility to account for downwash. There were no off-site buildings adjunct to the facility building and as such only the facility building was used to calculate building downwash. The total FPM, including both primary and secondary FPM emissions, was calculated to determine the total facility induced concentration of FPM.

Attachment E contains an electronic copy of model inputs and outputs.

4. MAPPING

Numerical outputs of the modelling are summarized in Table 7.

Table 7: Summary Values

	"Average Emissions" Concentration ($\mu g/m^3$)		"Maximal Emissions" Concentration ($\mu g/m^3$)	
	MTFI	MC	MTFI	MC
Annual Value	0.08	7.65	0.19	9.1

An Affected Airshed is defined, by the By-law, as an "airshed receiving any increase in concentrations of FPM of more than 0.2 $\mu g/m^3$, expressed as an annual average, due to a major emission as determined on a maximal annual emission basis". Based on the above results the Greif facility does not create an affected airshed.

Total Facility Induced Concentrations

See Figures 1 and 2 for contour maps illustrating the TFI FPM concentrations. The locations of the maximum concentrations are indicated on the contour plots with an 'x'. Sensitive receptors, such as schools and medical centres, have also been indicated on the map. As indicated by the legend, the increments for the concentration contours are 0.02 $\mu g/m^3$.

Cumulative Concentrations

Contour maps illustrating the Cumulative FPM concentrations were created using the sum of the TFI FPM concentration and the background concentration of FPM, as provided by the Town. The locations of the maximum concentrations are indicated on the contour plots with an 'x'. Sensitive receptors, such as schools and medical centres, have also been indicated on the map. As indicated by the legend, the increments for the concentration contours are 0.02 $\mu g/m^3$ against a background concentration of more than 7.5 $\mu g/m^3$. See Figures 3 and 4 for the contour maps.

5. HEALTH RISK ASSESSMENT

The Greif facility did not create an affected airshed, therefore, a health risk assessment was not required and has not been done.

6. APPRAISAL

As an affected airshed was not created by the facility an appraisal is not required and has not been done.

As demonstrated by the modelling results (Table 7), the annual average and maximal FTI FPM concentrations are below the 0.2 $\mu g/m^3$ threshold for an affected airshed.

Figure 1: MTFI Annual Average Emissions Concentration Contour Plot

Figure 2: MTFI Annual Maximal Emissions Concentration Contour Plot

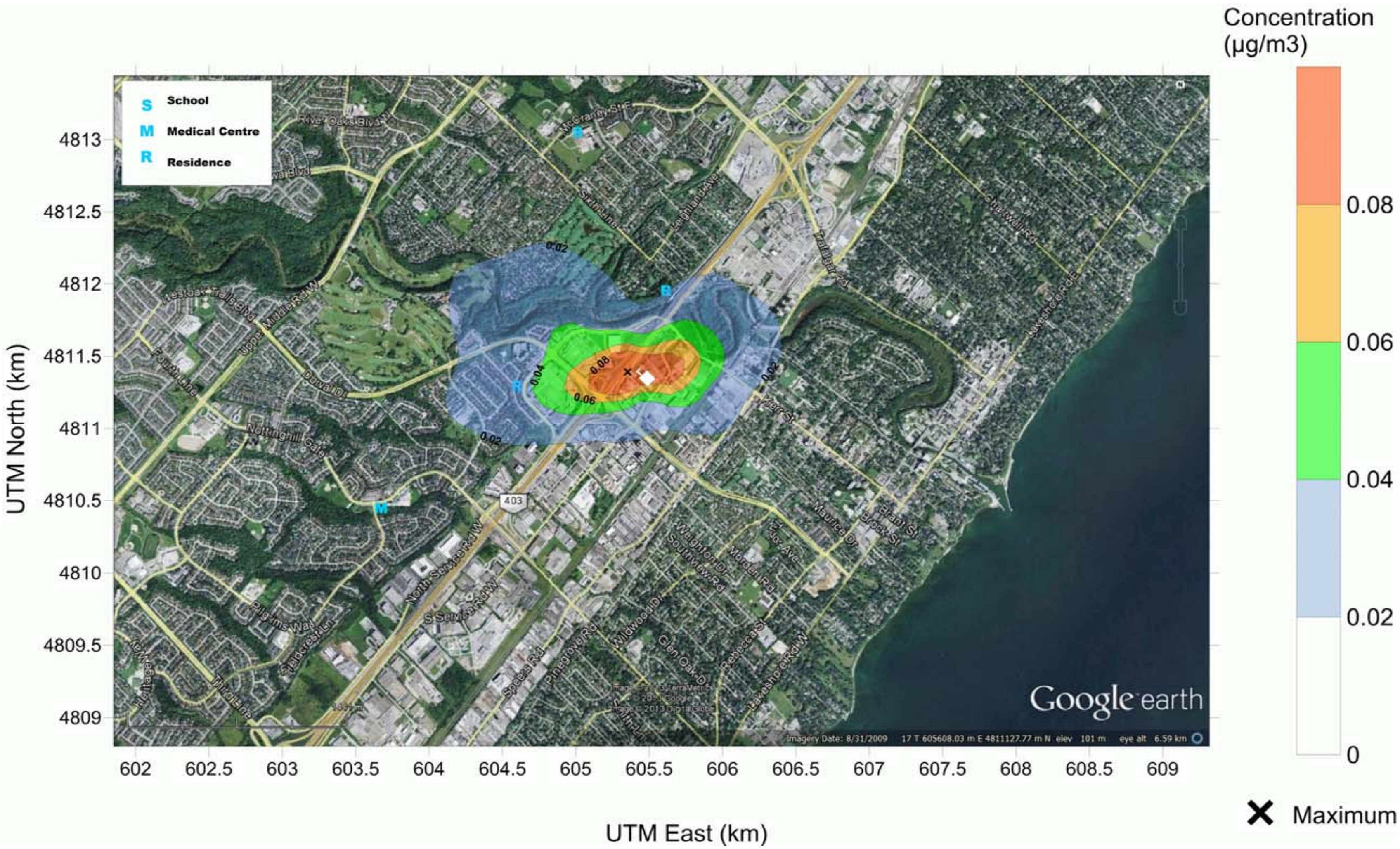
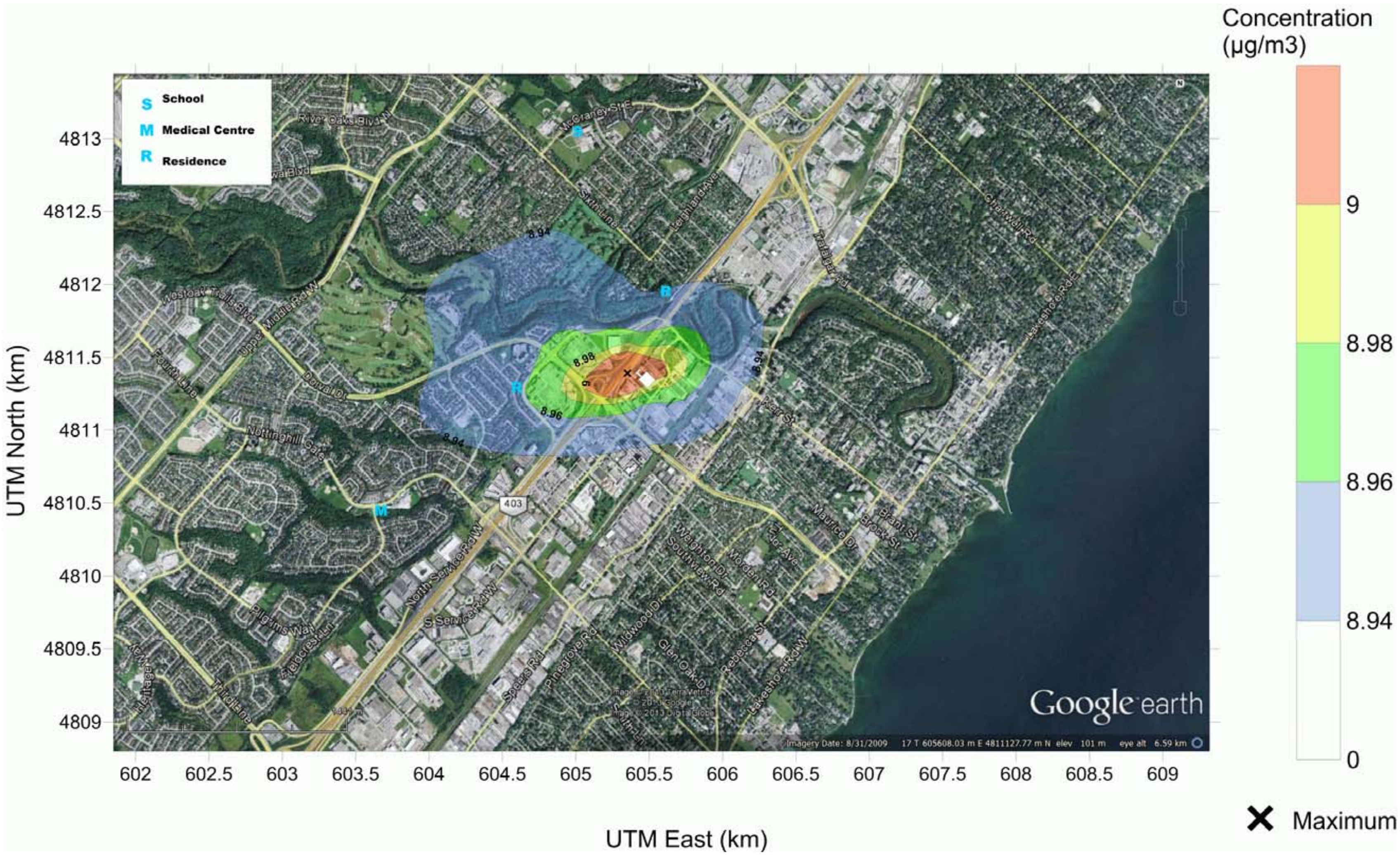


Figure 3: MC Annual Average Emissions Concentration Contour Plot

Figure 4: MC Annual Maximal Emissions Concentration Contour Plot



ATTACHMENT A

Site Location
(6 pages)

Figure A-1: City Boundary

16. DIVISION INTO ZONES

For the purposes of this by-law, the Town of Oakville is divided into the following zones, the boundaries of which are shown on the maps comprising Part VII and identified by the following symbols:

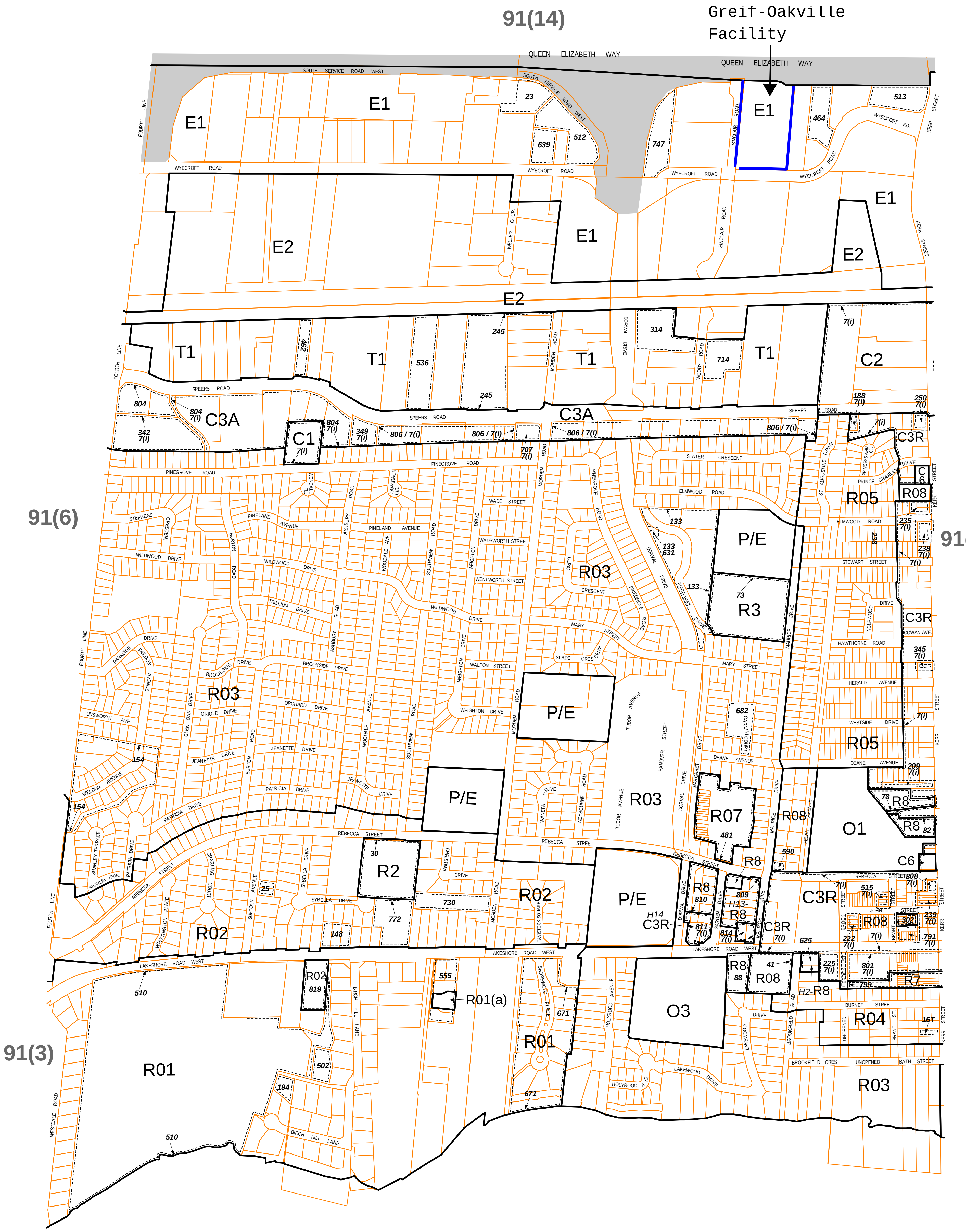
Class	Zone Designation	Symbol *
Residential	Detached Dwellings	R1 or R01, R2 or R02 R3 or R03, R4 or R04 R5 or R05, R10, R13
	Mixed Dwellings	R6 or R06, R7 or R07 R8 or R08, R11, R12
	Apartment Zone	R9
Commercial	Local Shopping Centre	C1
	Community Shopping Centre	C2
	Central Business District	C3
	Central Business District - Residential	C3R
	Arterial Commercial	C3A
	Rural Commercial	C4
	Highway Commercial	C5
	Service Station Zone	C6 or C3A
	Travellers' Service Zone	C7
Employment	Light Employment	E1
	General Employment	E2
	Transition Employment	T1
Industrial	Light Industrial	M1
	Medium Industrial	M2
	Heavy Industrial	M3

Class	Zone Designation	Symbol *
Open Space	Public Open Space	01
	Private Open Space	02
	Semi-Public	03
	Conservation	04
	Parkway Belt Public Use	05
	Marine Commercial	06
Public Use	Public Use	G
	Public Use/Education	P/E
Agricultural	Agricultural	A
Mixed Use	Mixed Use One	MU1
	Mixed Use Three	MU3
	Mixed Use Four	MU4
Parkway Belt	Parkway Belt Agricultural	PBA
	Parkway Belt Rural	PBR
	Parkway Belt	PB

* Where the symbol for a zone is used in conjunction with another notation, that symbol shall be deemed to be a reference to the relevant zone subject to such modifications as are contained in the relevant special provision of this by-law.

16A PLANNING COMMUNITIES

The Planning Communities of the Town of Oakville are depicted on the following Figure 1 and may be referred to by the names identified in Figure 1.



HIGHWAY CORRIDOR

ZONING BOUNDARY

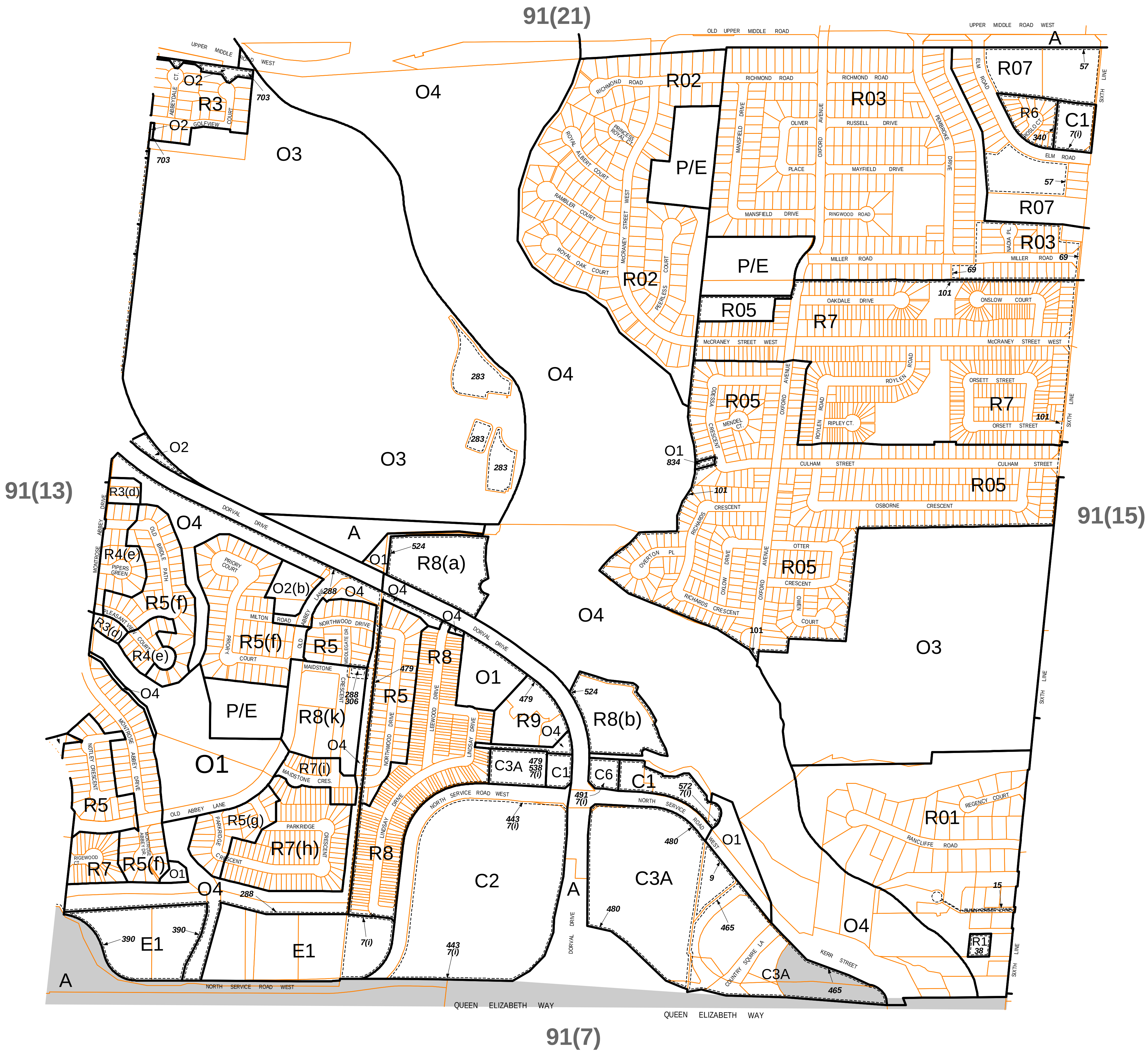
SPECIAL PROVISION BOUNDARY

TOWN OF OAKVILLE

Planning Services Department
Corporate Drafting and Design Office

0 200 400 600 800 1,000 Meters

S:\DEPARTME\PLANNING\GIS DATA DEVELOPMENT\ZONING\GIS_ZONING_MAPS\...91_7.MXD



NOTE:

This By-law is presently under appeal and is not yet in force with respect to the following locations only

Blocks 3, 4, and 5, Plan 20M-266

940887 Ontario Limited

(grey box)	HIGHWAY CORRIDOR
(solid line)	ZONING BOUNDARY
(dashed line)	SPECIAL PROVISION BOUNDARY

TOWN OF OAKVILLE

Planning Services Department

Corporate Drafting and Design Office

0 250 500 750 1,000 Meters

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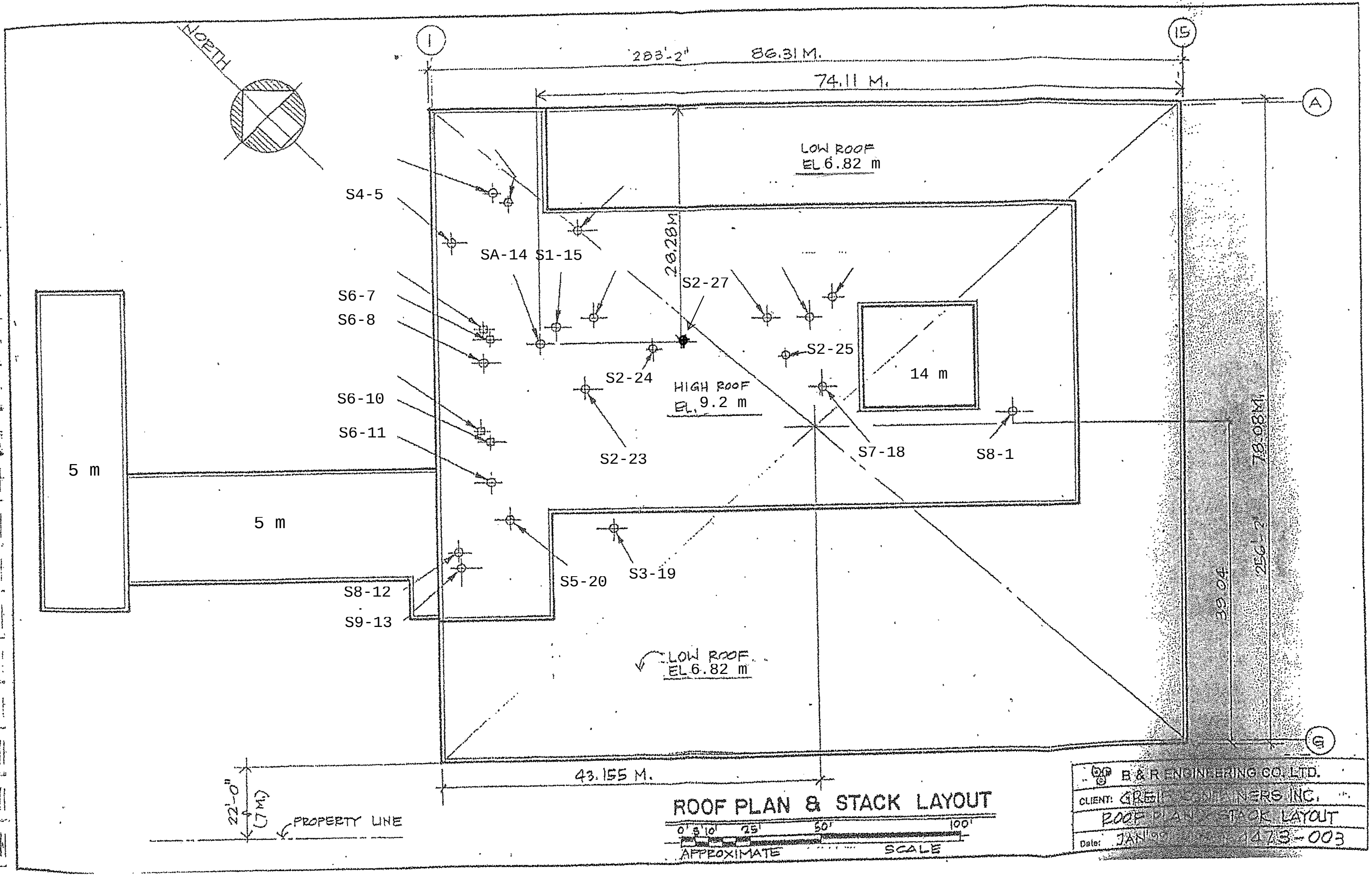
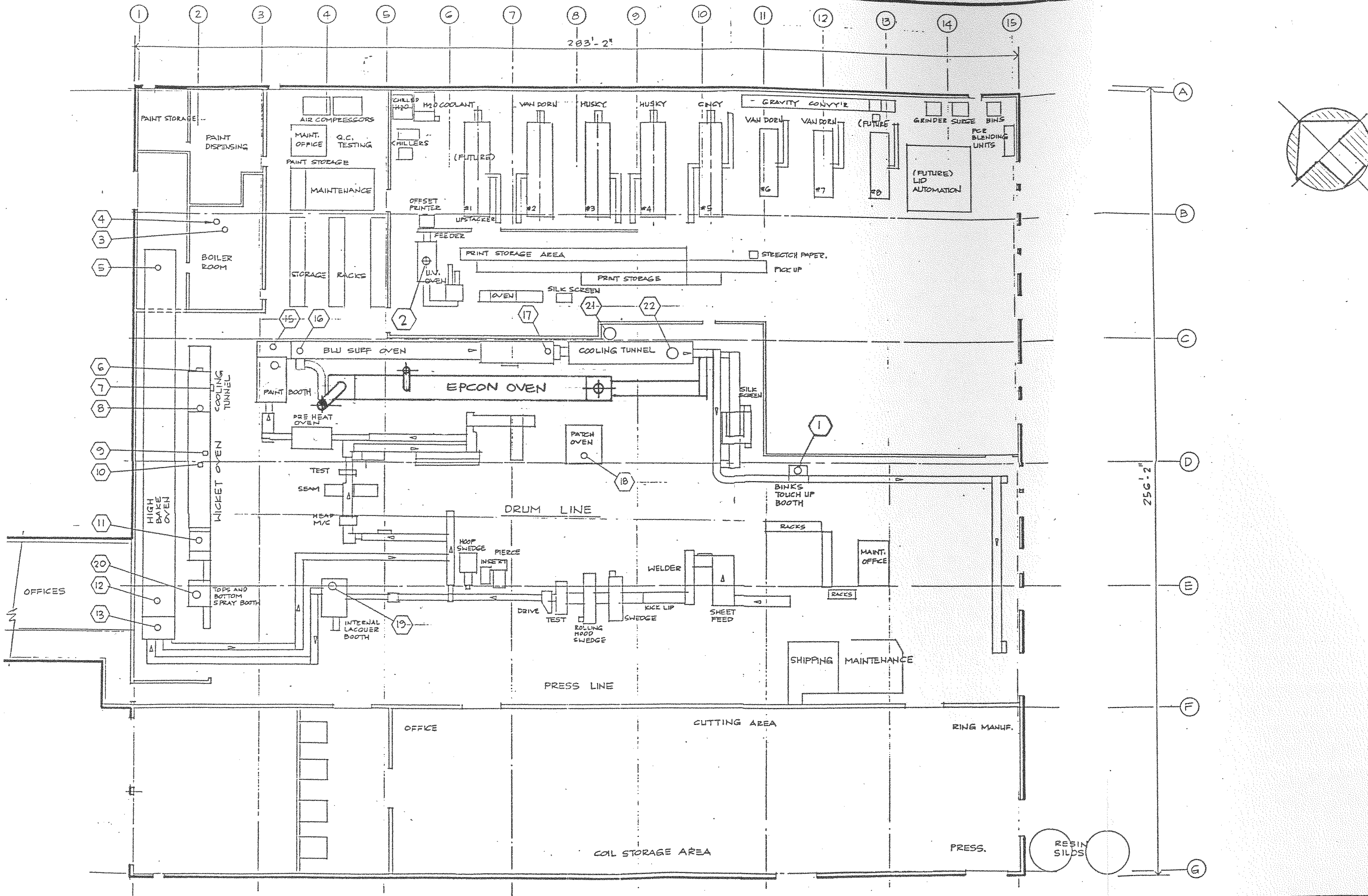
ATTACHMENT B

Site Layout and Process Flow Diagram
(6 pages)



NORTH
1
15
A
G
283'-2"
86.31 M.
74.11 M.
LOW ROOF
EL 6.82 m
28.28M
78.08M.
256'-2"
39.04
S4-5
SA-14
S1-15
S2-27
S6-7
S6-8
S2-25
S2-24
HIGH ROOF
EL. 9.2 m
14 m
S6-10
S6-11
S2-23
S7-18
S8-1
5 m
5 m
S5-20
S3-19
S8-12
S9-13
LOW ROOF
EL 6.82 m
43.155 M.
22'-0"
(7 M.)
PROPERTY LINE
ROOF PLAN & STACK LAYOUT
0' 5' 10' 25' 50' 100'
APPROXIMATE
SCALE
B & R ENGINEERING CO. LTD.
CLIENT:
LAYOUT
Date: JAN
1473-003


605400
605600
4811500
4811400
4811300
4811200
QUEEN ELIZABETH WAY
QUEEN ELIZABETH WAY
165 Wyecroft Rd, Oakville ON
WYECROFT RD
Entrance, 605591.412387, 4811310.29556
SINCLAIR RD
SW Corner of Property, 605530.560691, 4811241.675563
bing
© 2010 DigitalGlobe © 2013 Microsoft Corporation
Entrance
SW Corner of Property
Expressway
Principal Highway
Major Road
Local road
Meters
0 15 30 60
N
ORTECH Environmental
UTM NAD 83
Zone 17
Prepared by:
N Collard
2013 Jul 26



FLOOR PLAN

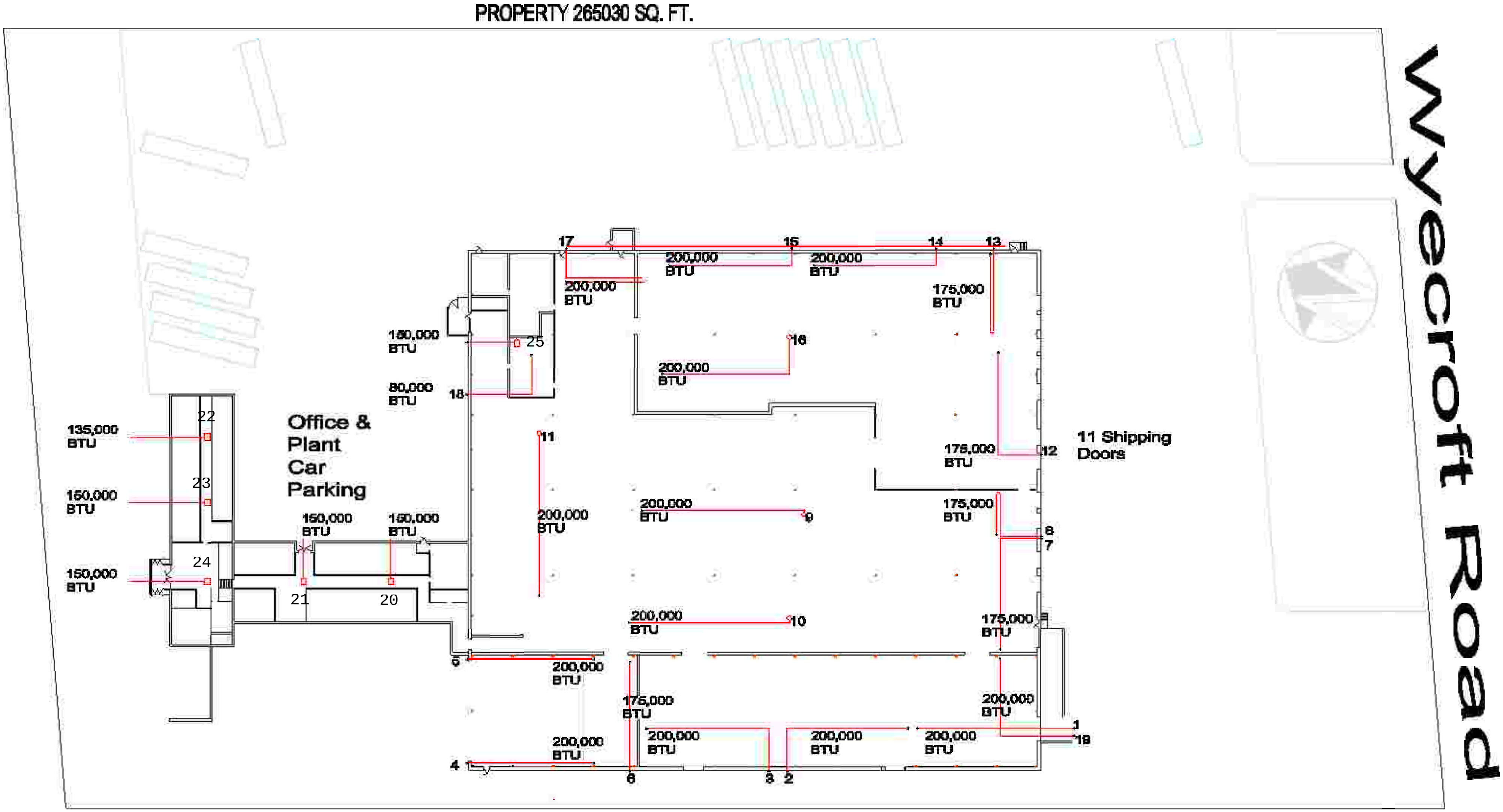
APPROXIMATE SCALE 0 5' 10' 15' 20' 30' 40' 50'

ISSUE	REVISION	BY	DATE	ISSUE	REVISION	BY	DATE

BARENCO — B & R ENGINEERING CO. LTD.

TITLE: PLANT EQUIPMENT ARRG'T
GREIF CONTAINERS INC.

DRAWN	ML	SCALE: NTS	SHEET 1 OF	ISSUE
CHECKED		DRAWING NO. 4473M 002		1
APP'D				

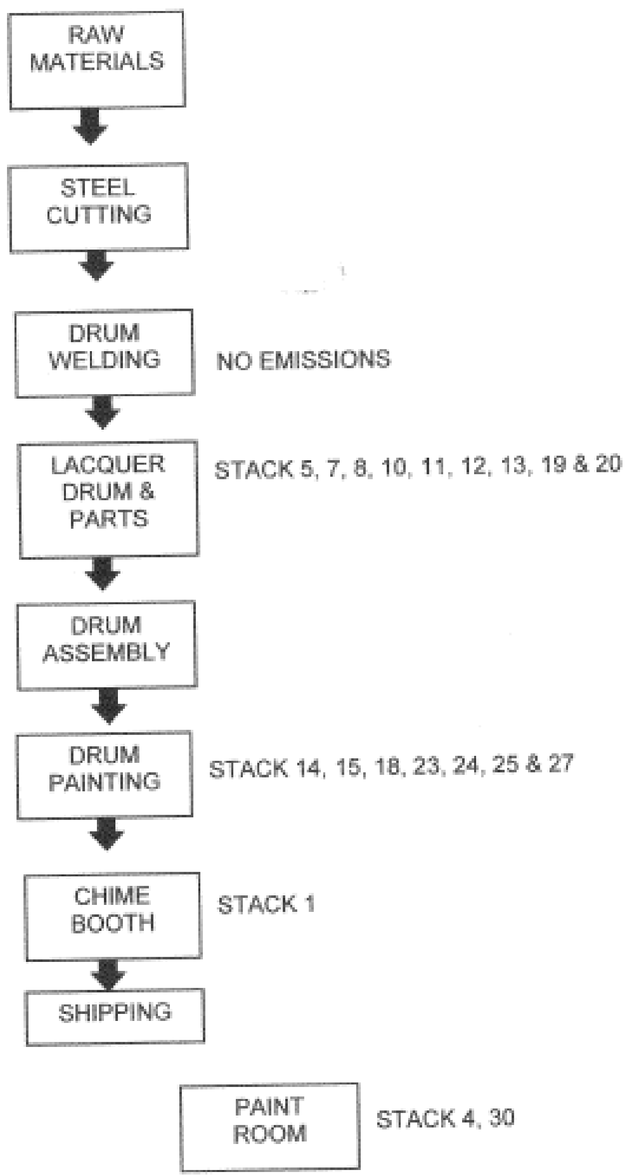


Oakville Plant

PLANT AND OFFICE 82,384 SQ. FT.

NOTE: Prefix to all numbers is S11 (ie. S11-17)

Figure B-5: Process Flow Diagram



ATTACHMENT C

Paint Arrestance Filter Reports
(4 pages)

11/11/2002 11:20 FAX 905 842 0116
SERVAIR INC.
GREIF
Fax : 905-840-5150
NOV 05 '02 09:54
002

RESEARCH PRODUCTS PAINT ARRESTOR TEST SUMMARY

Test Number: 3067
Date: 3-14-97
Purpose of Test: For Research Products Corp., Standard Product Evaluation

Paint Arrestor Identification

PA Model: 3000 Series RP Standard Paint Arrestor
Manufacturer: Research Products Corporation
Number of Pads in Series: 2
Pad Type (Production, Experimental): Production

Paint Identification

Paint Type: High Solids
Manufacturer ID: 63-3864
Color: Gray
Density (lb/gal): 12.7

Manufacturer: Lilly Industries
User ID: RP
Thinner Used: Xylol
Viscosity (Ford #4 - sec): 59

Test Conditions

Duct Velocity (fpm): 150
Gun Manufacturer & Model: DeVilbiss JGA-502
Tank Pressure (psi): 10
Gun Distance from PA (ft): 6

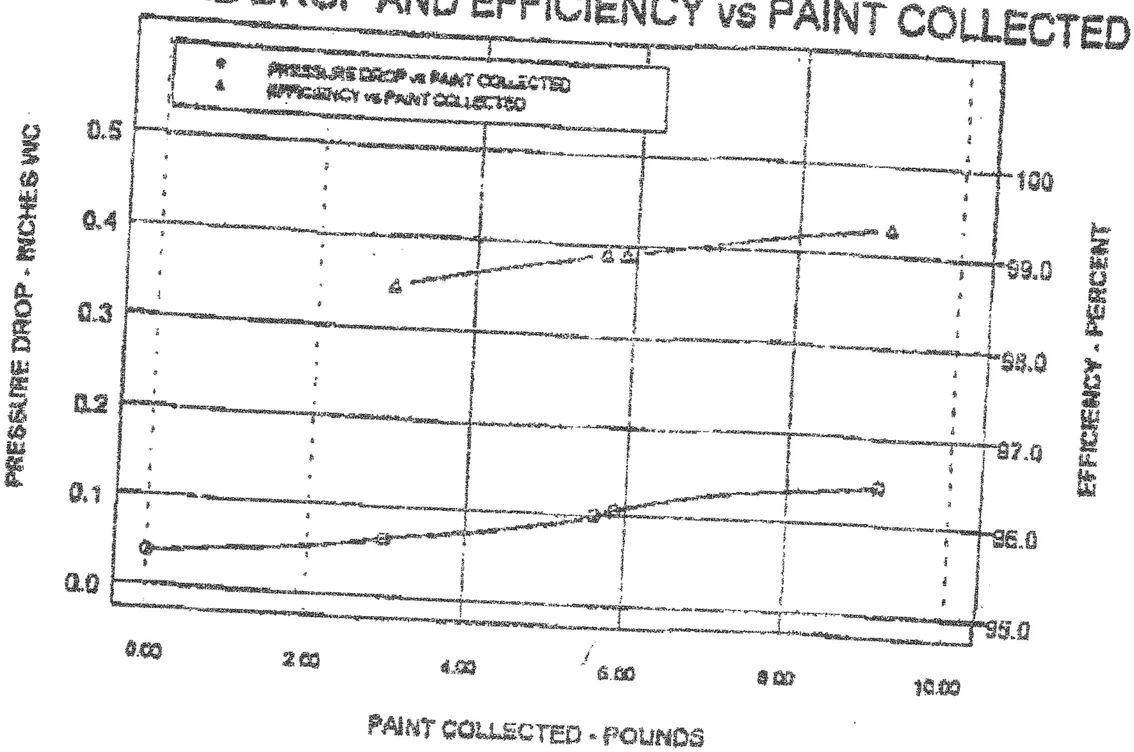
Paint Feedrate (gal/hr): 1
Nozzle and Air Cap: 54FX
Atomization Pressure (psi): 20

Test Summary

Pressure Drop (" w.c.) Initial	Final	Efficiency (%) Initial	Average	Paint Collection (lbm) Total	Run Off
0.037	0.100	98.47	98.68	8.6	0.0

Face Velocity (fpm)	50	100	150	200
Initial Pressure Drop (" w.c.)	0.005	0.019	0.037	0.066

GRAPH
PRESSURE DROP AND EFFICIENCY vs PAINT COLLECTED



Air Filter Testing Laboratories, Inc.

4632 Old LaGrange Road • Crestwood, Kentucky 40014 • Phone (502) 222-5720

REPORT NO. 5020
TEST NO. 6

PAINT ARRESTOR PAD PERFORMANCE TEST

TEST REQUESTED BY: ANDREAE FILTERS

MANUFACTURER: ANDREAE FILTERS

PRODUCT NAME: ANDREA

HOW LABORATORY PROCURED TEST SAMPLE: FURNISHED BY MANUFACTURER

MODEL NO.: ________ DIMENSIONS: 20 IN. H 20 IN. W 2 IN. L

PRODUCT DESCRIPTION: CORRUGATED PAPER BAFFLE TYPE AIR FILTER

TEST CONDITIONS:

TEST AIR FLOW RATE 150 FPM

PAINT APPLICATION RATE 1 QT. /40 MIN.

DESCRIPTION OF PAINT USED BAKE ENAMEL F 73 W 100 ALKYD 40% NON-VOLATILES BY VOLUME

RESULTS:

WEIGHT GAIN PAINT ARRESTOR PAD 1229.2 GM.

FINAL ARRESTANCE FILTERS WEIGHT GAIN 28.30 GM.

TOTAL WEIGHT PAINT FED (DRY BASES) 1257.5 GM.

FINAL RESISTANCE PAINT LOADED FILTER 1.08 IN. W.G.

PERFORMANCE TO CHANGE OUT RESISTANCE 1.00 IN. W.G.

AVERAGE PAINT REMOVAL EFFICIENCY 97.7 %

PAINT HOLDING CAPACITY 1198 GM. OR 2.64 LBS.

DATE 9-21-1988

ENGINEERING APPROVAL [signature]

PAINT ARRESTANCE FILTER TEST REPORT

Spray Removal Efficiency & Paint Holding Capacity

BASED ON 40 CFR PART 63 NATIONAL EMMISSION STANDARD

Tested for:	**Paint Pockets® Company**
Filter Mfr.:	**Paint Pockets® Company**
Filter Name/Model:	**PP Series (PP****)**
Report#./Test#	**R 042 T 079**
Report Date:	**Jan. 8, 1997**

Test Information

FILTER DESCRIPTION:

Two layers, stiff poly w/large voids on soft poly pa

PAINT DESCRIPTION:

High Solids Baking Enamel (S.W. Permaclad 2400, red

PAINT SPRAY METHOD:

Conventional Air Gun at 40 PSI

SPRAY FEED RATE:

140 gr./min. **130** cc./min.

AIR VELOCITY:

150 FPM

Test Results

INITIAL PRESSURE DROP of Clean Test Filter

0.08 in. water

FINAL PRESSURE DROP of Loaded Test Filte

0.30 in. water

WEIGHT GAIN on TEST FILTER & Test Frame Trough

4340 grams

PAINT HOLDING CAPACITY of TEST FILTER

3125 grams = **6.9** lbs.

PAINT RUN-OFF

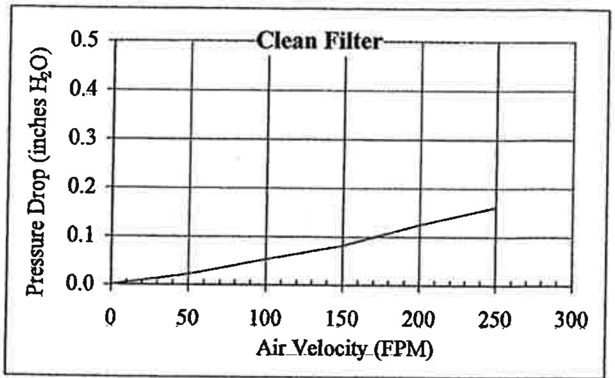
1215 grams

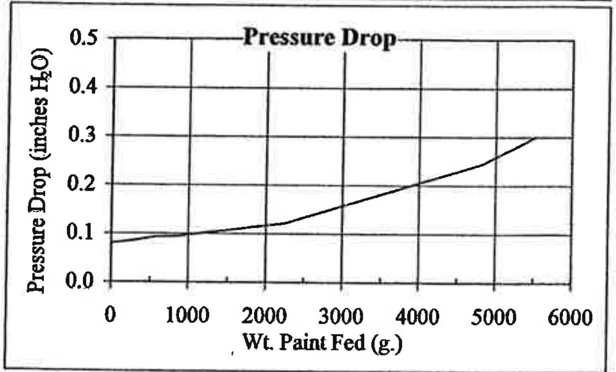
WEIGHT GAIN - FINAL FILTER

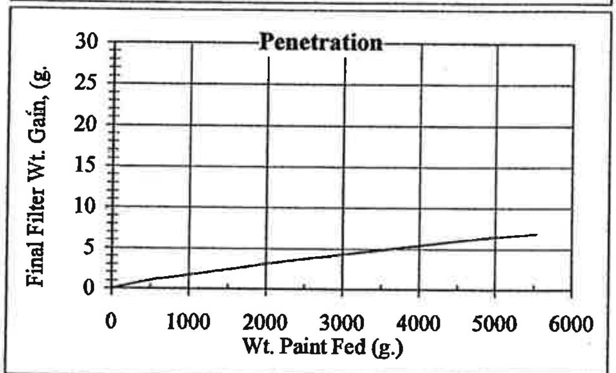
6.9 grams = **PENETRATION**

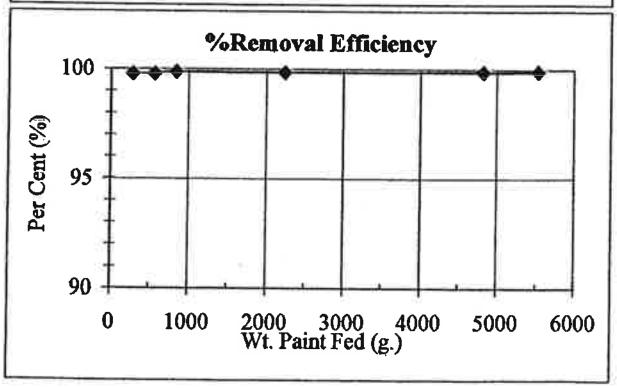
AVERAGE REMOVAL EFFICIENCY of TEST FILTEF

99.84 %









Test Engineer: P. Tuzinski

Supervising Engineer: K. C. Kwok, Ph.D.

Tel.: (612) 832-5353

LMS Technologies, Inc.

P.O. Box 24185; Edina, MN 55424

Fax: (612) 832-5354

ATTACHMENT D

Emission Calculations
(15 Pages)

D. CONTAINMANT EMISSION RATES

D.1 Natural Gas Combustion Emissions

Example NO_2 Calculation for Source S2-23

Natural Gas Consumption: Average ....12,667 MMBtu
Maximum ....20,851 MMBtu

NO_2 Emission Factor: 100 lb/10^6 scf (EPA AP-42 Section 1.4)

Facility Average NO_2 Emissions

= Consumption (MMBtu) x Emission Factor (lb/MMBtu)
= 12,667 MMBtu/yr x 100 lb/10^6 scf / 1020 Btu/scf x 1,000,000 Btu/MMBTU x 0.454 kg/lb
= 563 kg/yr

For modelling purposes, the facility combustion emissions were split between the individual sources. Since the emission factor for each contaminant applies to each individual piece of combustion equipment at the facility, the only variable in the above equation that changes for each unit is the consumption. This demonstrates that the unit consumption and emission rate are linearly related.

Therefore, combustion emissions were distributed amongst sources based upon the ratio of heat input from the individual source to total facility heat input as shown below and in Table D.10.

Annual Average NO_2 from Source S2-23

= Facility Average NO_2 Emissions (kg/year) x (External Coating Line Heat Input (Btu/hr) / Facility Heat Input (Btu/hr))
= 563 kg NO_2 / yr x (400,000 Btu/hr / 15,310,000 Btu/hr)
= 14.8 kg NO_2 /yr

Table D.0: Emission Factors

Contaminant	Emission Factor (lb/million scf.)	Emission Factor (lb/MMBTU)	Reference
Total VOC	5.5	0.0054	US EPA AP-42, Natural Gas Combustion
$PM_{2.5}$	7.6	0.0075	US EPA AP-42, Natural Gas Combustion
Nitrogen Oxide (as NO_2)	100	0.0980	US EPA AP-42, Uncontrolled Small Boilers
Sulphur Dioxide	0.6	0.0006	US EPA AP-42, Natural Gas Combustion
Ammonia	0.49	0.0005	Webfire, Commercial Boilers

Table D.1: Combustion Emissions

	Annual Average Emissions (kg/year)	Annual Worst-Case Emissions (kg/year)	Daily Average Emissions (kg/day)	Daily Worst-Case Emissions (kg/day)
VOC	31	51	0.14	0.20
PM	43	70	0.19	0.28
Toluene	0	0	0.00	0.00
Nitrogen Oxide (as NO_2)	563	927	2.55	3.71
Sulphur Dioxide	3.4	5.6	0.02	0.02
Ammonia	2.8	4.5	0.01	0.02

D.2 Painting

Historically the facility used oil-based paints, but has recently transitioned to water-based paints. The 2012 usage was used as a best estimate to represent the breakdown of water-based paints used at the facility moving forward. The average and worst-case emissions were calculated using a ratio of the 2012 production versus the average and maximum production numbers, respectively.

The painting uses an air-assisted airless system. The Illinois department of Natural Resources provides a fact sheet on spray painting options which provides a transfer efficiency of 65% - 70% for airless spraying and states that air-assisted airless spraying will have a higher transfer efficiency. Based on this document and standard practices, a transfer efficiency of 65% has been conservatively used in the emission estimates.

To be conservative, the capture by the water wash system control was not taken into consideration when calculating emissions from the paint spray booths.

D.2.1 Example Calculation for Paint #5 Emissions

2012 Purchased: 124 Gallons
Paint Density: 1.06 kg/L
VOC Content: 1.71 lbs/Gallon
Volatile by Weight: 61.3%
Solids Content = Paint Density (kg/L) x (100% - Volatile by Weight %)
= 1.06 kg/L x (100% – 61.3%)
= 0.41 kg/L
Spray Transfer Efficiency: 65%
Filter Control Efficiency: 95%

2012 VOC Emissions

= VOC Content of Paint (lbs/gal) x Conversion lb to kg x Conversion L to gal x 2012 purchased (L/yr)

= 1.71 lbs/gal x 0.454 kg/lb / 3.7854 L/gal x 470 L/yr

= 96 kg / yr

2012 Particulate Emissions

= Solids Content of Paint (kg/L) x 2012 Purchased (L/yr) x (100% - Transfer Efficiency) x (100% - Control Efficiency)

= 0.41 kg/L x 470 L/yr x (1-0.65) x (1-0.95)

= 3.4 kg / yr

Table D.2: Painting Calculations

ITEM Number	GREIF ID	DESCRIPTION	Density (kg/litre)	2012 Purchased (Gallons)	Material VOC Content (lbs/gallon)	Volatile by Weight (%)	Material Solids Content (kg/L)	Purchased (litres)	Material VOC Content (kg/L)	VOCs Per Year (kg)	Particulate Per Year (kg)
Paint #1	F-PA1081	BLACK LF701 HF WR L4887	1.03	4444	1.50	64.7	0.36	16823	0.18	3.02E+03	1.07E+02
Paint #2	F-PA1086	YELLOW GOLD HF WR L5035	1.17	37	1.53	53.0	0.55	140	0.18	2.57E+01	1.34E+00
Paint #3	F-PA1087	GREEN STRONG LF501 L5044	1.07	105	1.75	61.0	0.42	396	0.21	8.31E+01	2.89E+00
Paint #4	F-PA1089	GRAY WR HF L5108	1.13	866	1.69	57.8	0.48	3278	0.20	6.63E+02	2.73E+01
Paint #5	F-PA1090	PA BLUE ALCHEM HF WR L5099	1.06	124	1.71	61.3	0.41	470	0.20	9.64E+01	3.36E+00
Paint #6	F-PA1091	GREEN L5103 HF WR	1.09	22	1.75	59.1	0.45	82	0.21	1.71E+01	6.38E-01
Paint #7	F-PA1092	PA BLUE HF WR L5105	1.12	115	1.77	57.7	0.47	434	0.21	9.19E+01	3.59E+00
Paint #8	F-PA1094	YELLOW ULTRA HF WR L5110	1.15	133	1.49	54.1	0.53	504	0.18	8.99E+01	4.64E+00
Paint #9	F-PA1095	BLUE HF WR L5109	1.05	539	1.74	62.3	0.40	2039	0.21	4.24E+02	1.41E+01
Paint #10	F-PA1096	RED MOBIL HF WR L5093	1.07	85	1.72	61.6	0.41	320	0.21	6.62E+01	2.30E+00
Paint #11	F-PA1097	PA BLUE CHEVRON HF WR L5033	1.07	10	1.76	60.7	0.42	36	0.21	7.67E+00	2.68E-01
Paint #12	F-PA1100	BLUE HF WR L5119	1.06	13	1.66	62.4	0.40	49	0.20	9.76E+00	3.43E-01
Paint #13	F-PA1102	BLUE HF WR L5100	1.08	4	1.74	60.5	0.43	15	0.21	3.09E+00	1.10E-01
Paint #14	F-PA1103	BLUE HF WR L5122	1.07	43	1.74	60.8	0.42	163	0.21	3.39E+01	1.19E+00
Paint #15	F-PA1104	PA BLUE STRONG HF WR L5120	1.07	1	1.65	61.0	0.42	6	0.20	1.11E+00	4.12E-02
Paint #16	F-PA1105	ORANGE WR HF L5117	1.10	105	1.52	56.8	0.47	399	0.18	7.28E+01	3.32E+00
Paint #17	F-PA1106	RED WR HF L5124	1.09	73	1.71	57.7	0.46	278	0.20	5.69E+01	2.24E+00
Paint #18	F-PA1121	PA RED WR HF LEC LF L5164	1.04	41	1.92	60.0	0.42	155	0.23	3.57E+01	1.13E+00
Paint #19	F-PA1122	PA GREEN HF LEC LF WR L5166	1.08	0	1.77	59.2	0.44	2	0.21	3.30E-01	1.20E-02
Paint #20	F-PA1161	RED TOMATO HF LEC WR L5062	1.06	15	1.84	59.2	0.43	55	0.22	1.22E+01	4.19E-01
Paint #21	F-PA1181	RED LF5004 HF LEC WR L5191	1.06	89	1.39	62.8	0.40	336	0.17	5.58E+01	2.32E+00
Paint #22	F-PA1182	GRAY HT RES WR L5179	1.15	181	2.95	44.5	0.64	687	0.35	2.43E+02	7.67E+00
Paint #23	F-PA1183	GREEN STRG HTRES WR L5194	1.07	30	2.96	47.8	0.56	113	0.35	4.03E+01	1.11E+00
Paint #24	F-PA1184	BLUE DOW LF8004 WR HF LEC	1.07	22	1.72	62.4	0.40	83	0.21	1.72E+01	5.88E-01
Paint #25	F-PA1187	RED EXXON LF130W HFWR L5045	1.07	18	1.89	57.9	0.45	68	0.23	1.54E+01	5.37E-01
Paint #26	F-PA1241	WHITE HF WR L4940A	1.26	2814	1.82	49.5	0.64	10654	0.22	2.32E+03	1.19E+02
Paint #27	F-PA1244	PA BLUE GENTIAN HF LECWR L5314	1.06	28	1.69	61.5	0.41	106	0.20	2.15E+01	7.56E-01
Paint #28	F-PA1255	BLUE ODELL LF8009 L5376	1.06	3	1.69	60.6	0.42	11	0.20	2.31E+00	8.33E-02
Paint #29	F-PA1319	YELLOW 109 WR HF LF L5598	1.19	13	2.38	50.7	0.59	48	0.28	1.38E+01	5.00E-01
Paint #30	F-PA1361	GREEN 6027 HF LF WR L5615	1.06	443	1.81	61.4	0.41	1676	0.22	3.63E+02	1.19E+01
Paint #31	F-PA1681	PA BLUE SKY HF LEC WR L5162F	1.08	13	1.72	60.6	0.42	48	0.21	9.89E+00	3.56E-01
Paint #32	F-PA2013	PA ORANGE LEC WR 3WB5443	1.16	28	1.75	50.0	0.58	105	0.21	2.21E+01	1.07E+00
Paint #33	F-PA2149	PA BLUE 8WB5700	1.05	24	1.68	63.1	0.39	91	0.20	1.83E+01	6.14E-01
Paint #34	F-PA2189	PA WHITE WR BE BW208SF	1.28	12	1.53	49.7	0.64	46	0.18	8.50E+00	5.23E-01
							0.00	0	0.00	0.00E+00	0.00E+00
									Total	**7.96E+03**	**3.23E+02**

D.2.2 Example Calculation for Average Emissions

Sum of 2012 Emissions (from Table D.2)

Particulate:	323 kg/yr
VOC:	7960 kg/yr
2012 Production:	276,082 drums/yr
Average Production:	271,493 drums/yr

<u>Average Particulate Emissions</u>

= Sum of 2012 Particulate Emissions (kg/yr) x Average Production (drums/yr) / 2012 Production (drums/yr)

= 323 kg/yr x 271,493 drums/yr / 276,082 drums/yr

= 318 kg / yr

<u>Average VOC Emissions</u>

= Sum of 2012 VOC Emissions (kg/yr) x Average Production (drums/yr) / 2012 Production (drums/yr)

= 7960 kg/yr x 271,493 drums/yr / 276,082 drums/yr

= 7828 kg / yr

Worst-case emissions were calculated by the same method described above, using a maximum production of 400,000 drums/yr.

Table D.3: Painting Emissions

Contaminant	Annual Average Emissions (kg/year)	Annual Worst-Case Emissions (kg/year)	Daily Average Emissions (kg/day)	Daily Worst-Case Emissions (kg/day)
VOC	7828	11533	35	46
PM	317	467	1.4	1.9

Painting emissions are distributed amongst the various sources based on measured levels of THC (See Attachment F for extract from the Greif Oakville Facility ESDM Report in support of their current ECA). See Table D.10 for the individual breakdown.

D.3 Drum Lining

The 2012 usage was used as a best estimate to represent the breakdown of linings used at the facility moving forward. The average and maximum emissions were calculated using a ratio of the 2012 production versus the average and maximum production numbers, respectively.

D.3.1 Example Calculation for Lining #1 Emissions

2012 Purchased:	299 gal/yr x 3.7854 L/gal
	= 1132 L/yr
Paint Density:	9.26 lb/gal / 3.7854 L/gal x 0.454 kg/lb
	= 1.11 kg/L
VOC Content:	4.44 lb/gal
Solids Content:	52%
Toluene Content:	7%
Spray Transfer Efficiency:	65%
Filter Control Efficiency:	95%

<u>2012 VOC Emissions</u>
= 2012 Purchased (gal/yr) x VOC Content x Conversion lb to kg
= 299 gal/yr x 4.44 lb/gal x 0.454 lb/kg
= 603 kg/yr

<u>2012 Toluene Emissions</u>
= 2012 Purchased (L/yr) x Paint Density (kg/L) x Toluene Content (%)
= 1132 L/yr x 1.11 kg/L x 6.6%
= 82 kg/yr

<u>2012 Particulate Emissions</u>
= Solids Content of Paint (%) x 2012 Purchased (L/yr) x Paint Density (kg/L) x (100% - Transfer Efficiency) x (100% - Control Efficiency)
= 52% x 1132 L/yr x 1.11 kg/L x (1-0.65) x (1-0.95)
= 11 kg / yr

Table D.4: Lining Calculations

ITEM Number	GREIF ID	DESCRIPTION	Density (lb/gallon)	2012 Purchased (Gallons)	VOC Content		Solids Content (%)	Toluene Content (%)	Purchased (L)	Density (kg/L)	VOCs Per Year (kg)	Particulate Per Year (kg)	Toluene Per Year (kg)
					(lbs/gal)	(%)							
Lining #1	F-LG043	LG DK BUFF EP PHEN 4093HJ14	9.26	299	4.44	48%	52%	7%	1132	1.11	6.03E+02	1.13E+01	8.24E+01
Lining #2	F-LG071	LG CLEAR PHEN 1141X	9.10	93	3.53	39%	61%	0%	352	1.09	1.49E+02	4.12E+00	0.00E+00
Lining #3	F-LG152	LG CLEAR LF W/R HF SPRAY LEC	8.51	209	1.52		36%	0%	791	1.02	1.44E+02	5.05E+00	0.00E+00
Lining #4	F-LG154	LG BROWN MOD PHEN 407LS0F05	10.18	55	2.92	29%	54%	1%	208	1.22	7.29E+01	2.41E+00	2.03E+00
Lining #5	F-LG155	LG TAN PHEN 4045BJ04	10.18	55	2.71	27%	61%	1%	208	1.22	6.75E+01	2.73E+00	3.18E+00
Lining #6	F-LG157	LG OLIVE DRAB PHEN 4045BN04OD	10.24	91	2.46	24%	57%	2%	344	1.23	1.01E+02	4.25E+00	6.34E+00
Lining #7	F-LG173	LG BUFF EP PHEN 41209B08	9.18	165	3.50	38%	39%	1%	625	1.10	2.62E+02	4.67E+00	6.87E+00
Lining #8	F-LG186	LG CLEAR PHEN 11410C05	8.85	264	4.07	46%	47%	0%	1001	1.06	4.88E+02	8.73E+00	0.00E+00
Lining #9	F-LG188	LG OLIVE DRAB PHEN 40410D04	10.18	68	3.60	35%	51%	0%	256	1.22	1.11E+02	2.77E+00	0.00E+00
Lining #10	F-LG189	LG BROWN MOD PHEN 40710R03	10.10	421	4.32	43%	45%	0%	1593	1.21	8.25E+02	1.52E+01	0.00E+00
Lining #11	F-LG190	LG BUFF EP PHEN 41210B09	9.43	3952	4.29	46%	36%	0%	14959	1.13	7.70E+03	1.08E+02	0.00E+00
Reducer	RH4	Vanblend RH-4	6.77	921	6.77	100%	0%	40%	3488	0.81	2.83E+03	0.00E+00	1.13E+03
Total											**13349.72**	**1.69E+02**	**1232.55**

D.3.2 Example Calculation for Average Emissions

Sum of 2012 Emissions (from Table D.4)
Particulate: 169 kg/yr
VOC: 13,350 kg/yr
Toluene: 1,233 kg/yr
2012 Production: 276,082 drums/yr
Average Production: 271,493 drums/yr

<u>Average VOC Emissions</u>
= Sum of 2012 VOC Emissions (kg/yr) x Average Production (drums/yr) / 2012 Production (drums/yr)
= 13,350 kg/yr x 271,493 drums/yr / 276,082 drums/yr
= 13,128 kg / yr

<u>Average Toluene Emissions</u>
= Sum of 2012 Toluene Emissions (kg/yr) x Average Production (drums/yr) / 2012 Production (drums/yr)
= 1,233 kg/yr x 271,493 drums/yr / 276,082 drums/yr
= 1,212 kg / yr

<u>Average Particulate Emissions</u>
= Sum of 2012 Particulate Emissions (kg/yr) x Average Production (drums/yr) / 2012 Production (drums/yr)
= 169 kg/yr x 271,493 drums/yr / 276,082 drums/yr
= 166 kg / yr

Table D.5: Lining Emissions

Contaminant	Annual Average Emissions (kg/year)	Annual Worst-Case Emissions (kg/year)	Daily Average Emissions (kg/day)	Daily Worst-Case Emissions (kg/day)
VOC	13128	19342	59	77
PM	166	245	0.75	0.98
Toluene	1212	1786	5.5	7.1

Lining emissions are distributed amongst the various sources based measured levels of THC (See Attachment F for extract from the Greif Oakville Facility ESDM Report in support of their current ECA). See Table D.11 for the individual breakdown.

D.4 Fugitive Emissions

Fugitive emissions have no designated source exhaust and are released within the plant.

D.4.1 Seam Sealer and Glue Emissions

Example Calculation for Seam Sealer #007 Emissions

2012 Purchased: 6329 kg/yr
Glue Density: 1.26 kg/L
VOC Content: 0.417 lb/gallon

VOC Content = 0.417 lb/gallon x gallon/3.79 L x 0.454 kg / lb
= 0.05 kg/L

There are no significant FPM emissions from the Seam Sealer or Glue.

D.4.2 Silk Screening Emissions

See Section D.2.1 for example calculation.

Table D.6: Seam Sealer and Glue Calculations

ITEM Number	GREIF ID	Description	Density (kg/litre)	2012 Purchased (kg)	Material VOC Content (lbs/gallon)	Total Purchased (litres)	Material VOC Content (kg/L)	VOCs Per Year (kg)
Seam Sealer #007		Seam Sealer	1.26	6329	0.417	5023	0.05	2.51E+02
ADH Gasket Glue	19-87	Glue	0.795	453.6	2.52	571	0.30	1.72E+02
							Total	4.23E+02

Table D.7: Silk Screening Calculations

ITEM Number	GREIF ID	Description	Density (kg/litre)	2012 Purchased (Gallons)	VOC Content (%bw)	Solids Content (%bw)	Material VOC Content (lbs/gallon)	Material Solids Content (kg/L)	Purchased (litres)	Material VOC Content (kg/L)	VOCs Per Year (kg)	Particulate Per Year (kg)
Silk Screen #1	F-IW079	INK BLACK GE111G	1.17	1	31	69	3.02	0.81	4	0.3619	1.37E+00	3.06E+00
Silk Screen #2	F-IW087	INK WHITE GE1126G	1.36	3	37	63	4.21	0.86	10	0.5045	5.09E+00	8.64E+00
Silk Screen #3	F-IW142	INK BLUE ULTRA 59156	1.07	0	35	65	3.1	0.70	2	0.3715	5.63E-01	1.06E+00
Silk Screen #4	F-IW159	INK BLUE PMS300 J1174659	1.49	1	50	50	4.25	0.75	3	0.5093	1.45E+00	2.12E+00
Silk Screen #5	F-IW430	INK BLUE B00151125904	1.49	0	50	50	4.25	0.75	0	0.5093	4.65E-02	6.80E-02
Silk Screen #6	F-IW434	INK BLUE PMS280C J1156559	1.49	1	50	50	4.25	0.75	3	0.5093	1.45E+00	2.12E+00
									Total		9.96E+00	1.71E+01

D.4.3 Total Fugitive Emissions

Seam sealer, glue and silk screening emissions were summed for total fugitive emissions.

Example Calculation for VOC Average Emissions

Sum of 2012 Emissions (from Table D.5 and Table D.6)

VOC:	423 kg/yr + 10 kg/yr
	= 433 kg/yr
Particulate:	17 kg/yr
2012 Production:	276,082 drums
Average Production:	271,493 drums

Average VOC Emissions

= Sum of 2012 VOC Emissions (kg/yr) x Average Production (drums/yr) / 2012 Production (drums/yr)

= 433 kg/yr x 271,493 drums/yr / 276,082 drums/yr

= 426 kg / yr

Average Particulate Emissions

= Sum of 2012 Particulate Emissions (kg/yr) x Average Production (drums/yr) / 2012 Production (drums/yr)

= 17 kg/yr x 271,493 drums/yr / 276,082 drums/yr

= 17 kg / yr

Since fugitive emissions are released within the facility, it was assumed that the emissions would exhaust to the atmosphere via the process exhausts stacks. The emissions are distributed amongst the various exhaust stacks based on a ratio of flow rates. See Table D.12 for distribution. The rationale behind this method of distribution is the assumption that the fugitive emissions are distributed evenly around the plant and therefore any air exhausted will have an equal concentration of contaminants. Therefore, exhausts with a higher flow of air leaving the facility will also have a higher emission rate.

Table D.9: Fugitive Emissions

Contaminant	Annual Average Emissions (kg/year)	Annual Worst-Case Emissions (kg/year)	Daily Average Emissions (kg/day)	Daily Worst-Case Emissions (kg/day)
VOC	426	628	1.9	2.5
PM	17	25	0.076	0.10

D.5 Emissions Distribution

As the individual sources of natural gas combustion emissions are not metered, the total facility emissions are distributed amongst the various exhausts based on a standard approach of using a ratio of input capacity (See Table D.10 and additional discussion in section D.1).

Table D.10: Distribution of Natural Gas Combustion Emissions

Stack ID	Process	Source Description	BTU Rating	Combustion Emissions Breakdown (%)
14	External Coating Line	Paint Spray Booth	-	0%
15		Paint Spray Booth Rear Exhaust	-	0%
23		Curing (Epcon) Oven - Preheat	400,000	3%
24		Curing (Epcon) Oven - Entrance	3,850,000	8%
25		Curing (Epcon) Oven - Middle		8%
27		Curing (Epcon) Oven - Fire Box		8%
19	Internal Coating Line	Paint Spray Booth	-	0%
5		Curing (High Bake) Oven - Rear	4,000,000	9%
12		Curing (High Bake) Oven - Front 2		9%
13		Curing (High Bake) Oven - Front 1		9%
20	Drum tops/bottoms (wicket oven)	paint booth (parts)	-	0%
7		wicket oven	2,000,000	3%
8		wicket oven		3%
10		wicket oven		3%
11		wicket oven		3%
18	Batch Oven	Batch Oven	500,000	3%
1	Paint touch-up booth	Paint booth	-	0%
S11-1	Plant and Office Comfort Heating	Plant	200,000	1%
S11-2			200,000	1%
S11-3			200,000	1%
S11-4			200,000	1%
S11-5			200,000	1%
S11-6			175,000	1%
S11-7			175,000	1%
S11-8			175,000	1%
S11-9			200,000	1%
S11-10			200,000	1%
S11-11			200,000	1%
S11-12			175,000	1%
S11-13			175,000	1%
S11-14			200,000	1%
S11-15			200,000	1%
S11-16			200,000	1%
S11-17			200,000	1%
S11-18			200,000	1%
S11-19			200,000	1%
S11-20		Office	150,000	1%
S11-21			150,000	1%
S11-22			135,000	1%
S11-23			150,000	1%
S11-24			150,000	1%
S11-25		Paint Room	150,000	1%

Emissions from the painting and lining processes were distributed amongst the various process stacks based on measured levels of total hydrocarbon in each exhaust stream, a method which was used for the ESDM Report in support of the current ECA (See Attachment F) and hourly usage. See Table D.11.

Table D.11: Distribution of Paint and Lining Emissions

Stack ID	Process	Source Description	Paint Usage (L/hr)	Lining Usage (L/hr)	Paint Breakdown (%)	Lining Breakdown (%)
14	External Coating Line	Paint Spray Booth	40.9	0	33%	0%
15		Paint Spray Booth Rear Exhaust			8%	0%
23		Curing (Epcon) Oven - Preheat			0%	0%
24		Curing (Epcon) Oven - Entrance			15%	0%
25		Curing (Epcon) Oven - Middle			0%	0%
27		Curing (Epcon) Oven - Fire Box			1%	0%
19	Internal Coating Line	Paint Spray Booth	0	42.6	0%	1%
5		Curing (High Bake) Oven - Rear			0%	7%
12		Curing (High Bake) Oven - Front 2			0%	16%
13		Curing (High Bake) Oven - Front 1			0%	37%
20	Drum tops/bottoms (wicket oven)	paint booth (parts)	27	27	14%	15%
7		wicket oven			1%	1%
8		wicket oven			1%	1%
10		wicket oven			1%	1%
11		wicket oven			9%	9%
18	Batch Oven	Batch Oven			12%	12%
1	Paint touch-up booth	Paint booth	4	0	6%	0%

Sample Calculation for Stack ID 14

Paint Breakdown = (Paint Usage (L/hr) / Total Paint Usage (L/hr)) x % THC (40.9/71.9) x 58.1%
= 33%

Table D.12: Distribution of Fugitive Emissions

Source ID	Stack ID	Process	Source Description	Flow Rate (m^3/s)	Glue & Seam Sealer Breakdown (%)
S1	14	External Coating Line	Paint Spray Booth	3.63	11.24%
S1	15		Paint Spray Booth Rear Exhaust	1.09	3.38%
S2	23		Curing (Epcon) Oven - Preheat	0.46	1.42%
S2	24		Curing (Epcon) Oven - Entrance	2.73	8.45%
S2	25		Curing (Epcon) Oven - Middle	3.91	12.11%
S2	27		Curing (Epcon) Oven - Fire Box	0.24	0.74%
S3	19	Internal Coating Line	Paint Spray Booth	2.56	7.93%
S4	5		Curing (High Bake) Oven - Rear	0.45	1.39%
S8	12		Curing (High Bake) Oven - Front 2	0.49	1.52%
S9	13		Curing (High Bake) Oven - Front 1	1.80	5.57%
S5	20	Drum tops/bottoms (wicket oven)	paint booth (parts)	4.68	14.49%
S6	7		wicket oven	1.63	5.05%
S6	8		wicket oven	0.51	1.58%
S6	10		wicket oven	1.03	3.19%
S6	11		wicket oven	1.24	3.84%
S7	18	Batch Oven	Batch Oven	2.80	8.67%
S8	1	Paint touch-up booth	Paint booth	3.04	9.41%

ATTACHMENT E

Modelling Files
(4 pages + USB Drive)

E.1 Model Inputs and Outputs

As required by the HPAQB, the model was re-run for two scenarios: average annual emissions and worst case (maximal) annual emissions. Stack parameters including heights, locations, exit velocity, exit temperature and emission rates were provided by ORTECH for both emissions scenarios. BPIP was run for the facility to account for downwash. Modelling results have been provided for both the emission scenarios (annual average and maximal emissions) for both the facility induced concentration, and combined concentration including background levels. Numerical summary values and mapping have been provided for the four cases.

All CALPUFF model settings were adopted based on the Oakville By-Law, including:

a. Updated using U.S. EPA-approved version of CALPUFF(v5.8)
b. Applied MESOPUFF mechanism
c. Applied Oakville provided background values for $PM_{2.5}$, ozone and ammonia (NH_3)
d. Specified sources for plant area and office area based on ORTECH's updated information
e. Performed a separate model run using 5-species SOA chemistry

	Default used	Non-Default
Meteorological Data	☑	☐
Receptor Grid	☑	☐
Land Use Data	☑	☐
Terrain Data	☑	☐
Coastline Data	☑	☐
Background Concentrations		
Ozone	☑	☐
Ammonia	☑	☐
FPM	☑	☐

Chemistry Models and Species

☑ 5-Species MESOPUFF	☑ SOA
☑ NOx	☑ Toluene
☑ SO2	☑ Xylene
☑ NH_3	
☑ FPM	

Note: If any non-default options are used in the modeling supporting documentation must be provided.

Table E-1: CALPUFF Input and Output Files

Parameter	Description	Folder	Input File
Input File	Coastline for Lake Ontario. Provided by Town	CALPUFF\input	Coastline.dat
Input File	Background ozone concentrations. Provided by Town	CALPUFF\input	Ozone.dat
Input File	Gridded meteorological data. Provided by Town	CALPUFF\input	Calmet.dat
Input File	CALPUFF input file for annual average scenarios	CALPUFF\input	calpuff_ann_avg_jv.mesopuff.inp
Input File	CALPUFF input file for annual maximal scenarios	CALPUFF\input	calpuff_ann_max_jv.mesopuff.inp
Input File	CALPUFF input file for SOA annual average scenarios	CALPUFF\input	calpuff_ann_avg.jv.SOA.inp
Input File	CALPUFF input file for SOA annual maximal scenarios	CALPUFF\input	calpuff_ann_max.jv.SOA.inp
Output File	CALPUFF output concentration. Annual average.	CALPUFF\input	ann_avg.mesopuff.con
Output File	List file for CALPUFF output Annual average.	CALPUFF\output	ann_avg.mesopuff.lst
Output File	CALPUFF output concentration. Annual maximal.	CALPUFF\output	ann_max.mesopuff.con
Output File	List file for CALPUFF output Annual Maximal.	CALPUFF\output	ann_max.mesopuff.lst
Output File	CALPUFF output SOA concentration. Annual average.	CALPUFF\output	ann_avg.bdg.vl.soa.con
Output File	List file for CALPUFF SOA output Annual average.	CALPUFF\output	ann_avg.bdg.vl.soa.lst
Output File	CALPUFF output SOA concentration. Annual maximal.	CALPUFF\output	ann_max.bdg.vl.soa.con
Output File	List file for CALPUFF SOA output Annual Maximal.	CALPUFF\output	ann_max.bdg.vl.soa.lst

Table E-2: POSTUTIL Input and Output Files

Parameter	Description	Folder	Input File
Input file	Calculated total FPM using primary PM, SOA, sulfate and nitrate in POSTUTIL. Annual Average scenario	Postutil\input	postutil_ann_avg.inp
Input file	Calculated total FPM using primary PM, SOA, sulfate and nitrate in POSTUTIL. Annual Maximal scenario	Postutil\input	postutil_ann_max.inp
Concentration	Total lumped FPM by POSTUTIL. Annual Average.	Postutil\output	ann_avg.fpm.con
Concentration	Total lumped FPM by POSTUTIL. Annual Maximal.	Postutil\output	ann_max.fpm.con
List File	List file for FPM by lumping primary FPM, SOA, sulfate and nitrate in POSTUTIL. Annual Average.	Postutil\output	postutil_ann_avg.lst
List File	List file for FPM by lumping primary FPM, SOA, sulfate and nitrate in POSTUTIL. Annual Maximal.	Postutil\output	postutil_ann_max.lst

Table E-3: CALPOST Input and Output Files

Parameter	Description	Folder	Input File
Input File	Background $PM_{2.5}$ levels. Provided by Town	CALPOST\input	back.dat
Input File	CALPOST input file for annual average MTFI scenarios	CALPOST\input	calpost.ann_avg.fpm.inp
Input File	CALPOST input file for annual maximal MTFI scenarios	CALPOST\input	calpost.ann_avg+bg.fpm.inp
Input File	CALPOST input file for annual average MC scenarios	CALPOST\input	calpost.ann_max.fpm.inp
Input File	CALPOST input file for annual maximal MC scenarios	CALPOST\input	calpost.ann_max+bg.fpm.inp
Output File	CALPOST output contour files. Annual average MTFI.	CALPOST\output\ann_avg	rank(all)_fpm_8760hr_conc.dat
Output File	List file for CALPOST output Annual average MTFI.	CALPOST\output\ann_avg	calpost_ann_avg.fpm.lst
Output File	CALPOST output contour files. Annual average w/ background MC.	CALPOST\output\ann_avg+bg	rank(all)_fpm_8760hr_conc.dat
Output File	List file for CALPOST output Annual average w/ background MC.	CALPOST\output\ann_avg+bg	calpost_ann_avg+bg.fpm.lst
Output File	CALPOST output contour files. Annual maximal MTFI.	CALPOST\output\ann_max	rank(all)_fpm_8760hr_conc.dat
Output File	List file for CALPOST output Annual maximal MTFI.	CALPOST\output\ann_max	calpost_ann_max.fpm.lst
Output File	CALPOST output contour files. Annual maximal w/ background MC.	CALPOST\output\ann_max+bg	rank(all)_fpm_8760hr_conc.dat
Output File	List file for CALPOST output Annual maximal w/ background MC.	CALPOST\output\ann_max+bg	calpost_ann_max+bg.fpm.lst

ATTACHMENT F

THC Results
(1 page)

Source ID	Stack ID	Process	Source Descriptions	External Coating Line Paint (% of THC)	Internal Coating Line Lining (% of THC)	Parts Coating Line Paint/Lining (% of THC)	Touch-up Paint (% of THC)
S1	14	External Coating Line	Paint Spray Booth	58.1	-	-	-
S1	15		Paint Spray Booth Rear Exhaust	14	-	-	-
S2	23		Curing (Epcon) Oven - Preheat	0.1	-	-	-
S2	24		Curing (Epcon) Oven - Entrance	26.3	-	-	-
S2	25		Curing (Epcon) Oven - Middle	0.4	-	-	-
S2	27		Curing (Epcon) Oven - Fire Box	0.9	-	-	-
S3	19	Internal Coating Line	Paint Spray Booth	-	1.5	-	-
S4	5		Curing (High Bake) Oven - Rear	-	10.9	-	-
S8	12		Curing (High Bake) Oven - Front 2	-	26.8	-	-
S9	13		Curing (High Bake) Oven - Front 1	-	60.8	-	-
S5	20	Drum tops/bottoms (wicket oven)	Paint booth (parts)	-	-	38.3	-
S6	7		wicket oven	-	-	2.7	-
S6	8		wicket oven	-	-	3.1	-
S6	10		wicket oven	-	-	1.5	-
S6	11		wicket oven	-	-	23.5	-
S7	18	Batch Oven	Batch Oven	-	-	30.8	-
S8	1	Paint touch-up booth	Paint booth	-	-	-	100

Total hydrocarbon levels (THC) in each exhaust stream from the various lines were previously measured using a calibrated Flame Ionization Detector (FID). Based on those measurements, the percentage of volatile contaminants attributable to each source was determined. The same percentage was used for the attribution of particulate matter emitted.

Taken from "Application for Amendment to Certificate of Approval," Stephen Lamming Associates Ltd., August, 2003.