

Mr A. Morley
Environmental Protection Officer
Environmental Health Services Division
Huntingdon District Council
Pathfinder House
Huntingdon
PE18 6TN



January 13, 2006

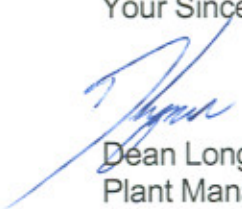
Dear Aaron,

Please find enclosed the following documents:

- Part A - Particulate monitoring for period January 2005 to December 2005
Please note that particulate monitoring data is not included for the period 25th February 2005 to 17th July 2005, as explained in my letter dated 4th November 2005.
- Part B - St. Neots VOC Emissions for period January 2005 to December 2005.
The calculation is based on the efficiencies measured during the September monitoring when it was observed that the vapour ring efficiency was 99.4 % to 99.9%.
Net effect of these calculations gives an annual VOC emission figure of 11072kg compared to 111087kg in 2004.
- Part C - Vent Measurements (8th September 2005)
This is the data from VOC vent monitoring carried out during your September visit and shows how the vent efficiencies have been calculated.
- Part D - Solvent/Product Analysis 2005
This data includes opening and closing inventory, material receipts and usage that have been used to calculate the emission data provided in Part B.

If you have any questions regarding the above information please do not hesitate to contact me.

Your Sincerely


Dean Longman
Plant Manager

PART A .

E P A R E P O R T Channel: Banbury (Address 01) (revision 6.2e 07.03.2000)

Date: 13 Jan 2006

Company: DAREX UK LIMITED
5 CROMWELL ROAD, ST. NEOTS
CAMBS. PE19 1QL

Contact: MR. G. DRAPER
(01480) 324459

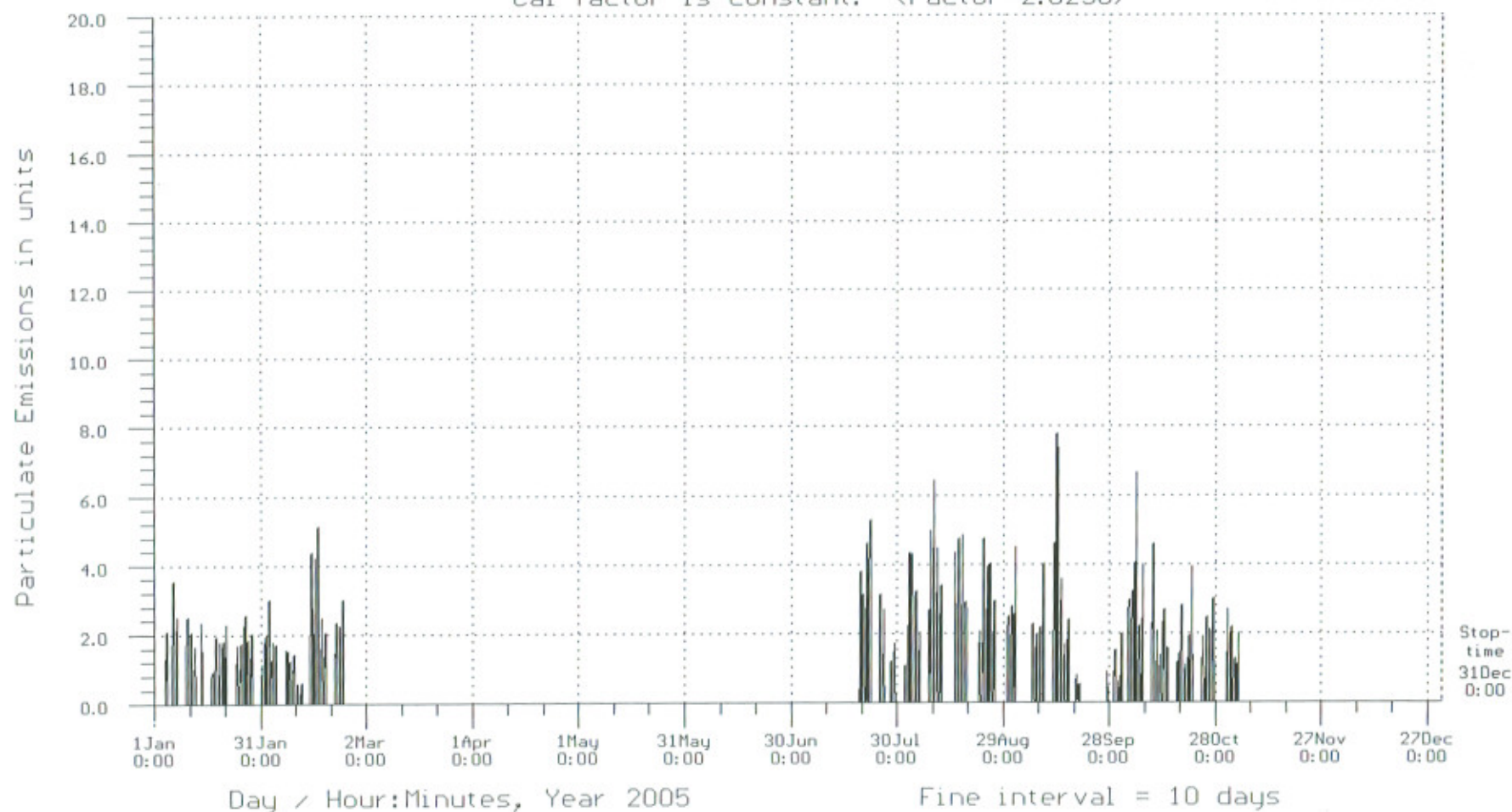
EPA authorisation number(s): 19/93

Requested Data averaging time period: 3.00 hours

Average emission level: 0.869

Maximum time-weighted average emission level: 7.78

Cal factor is constant. (Factor=2.6290)



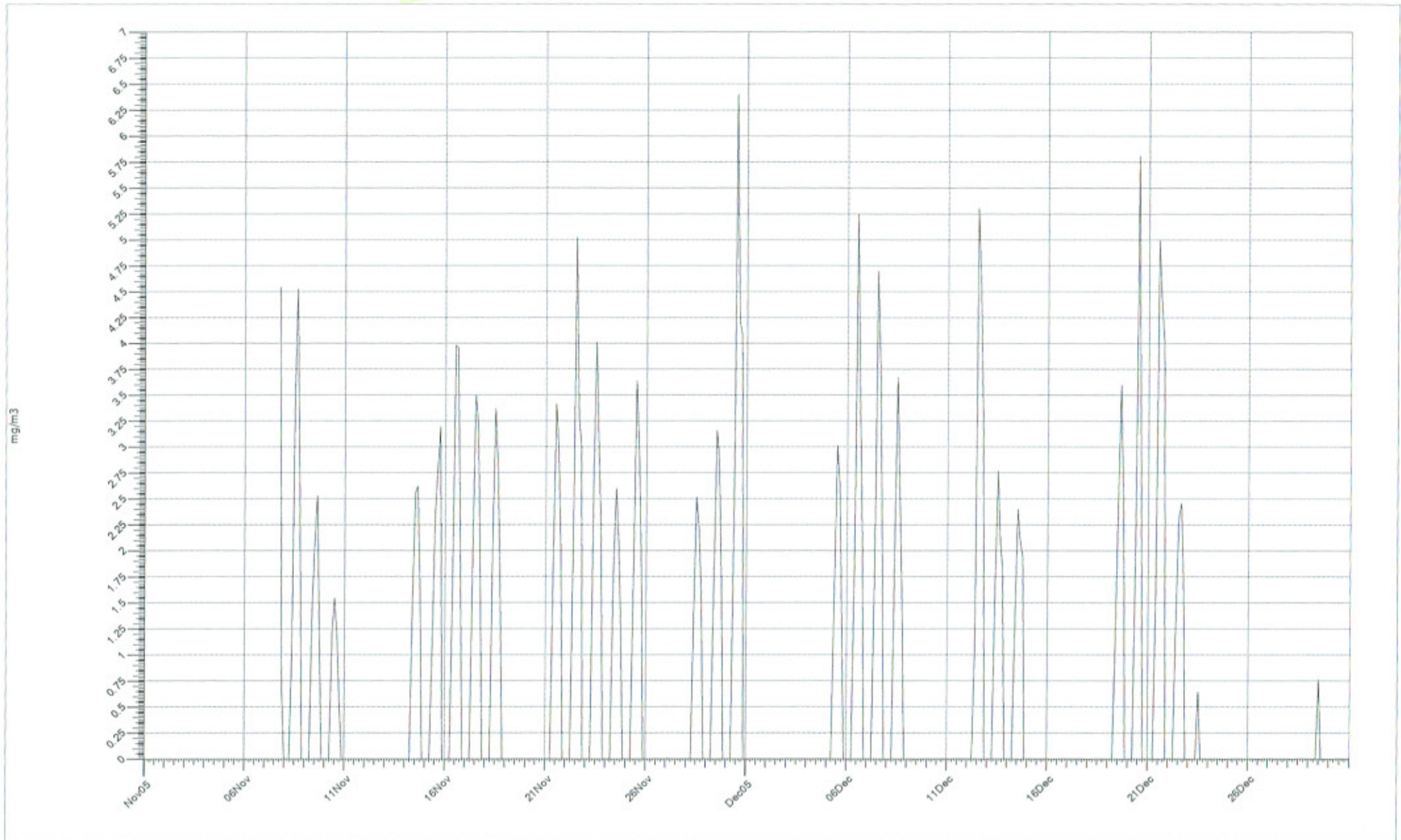
Emission Report

Company:Darex UK Limited Contact: Mr. G. Draper (01480 324459)

Authorisation number (s): 19/93

From:01 Nov 05 00:00:00 To:31 Dec 05 00:00:00

Device 0 : --- Banbury Cal Factor: 2.63 (constant) Average:0.6668 Averaging Period:3 hrs Maximum:6.4



E P A R E P O R T Channel: Conveyor (Address 02) (revision 6.2e 07.03.2000)

Date: 13 Jan 2006

Company: DAREX UK LIMITED
5 CROMWELL ROAD, ST. NEOTS
CAMBS. PE19 1QL

Contact: MR. G. DRAPER
(01480) 324459

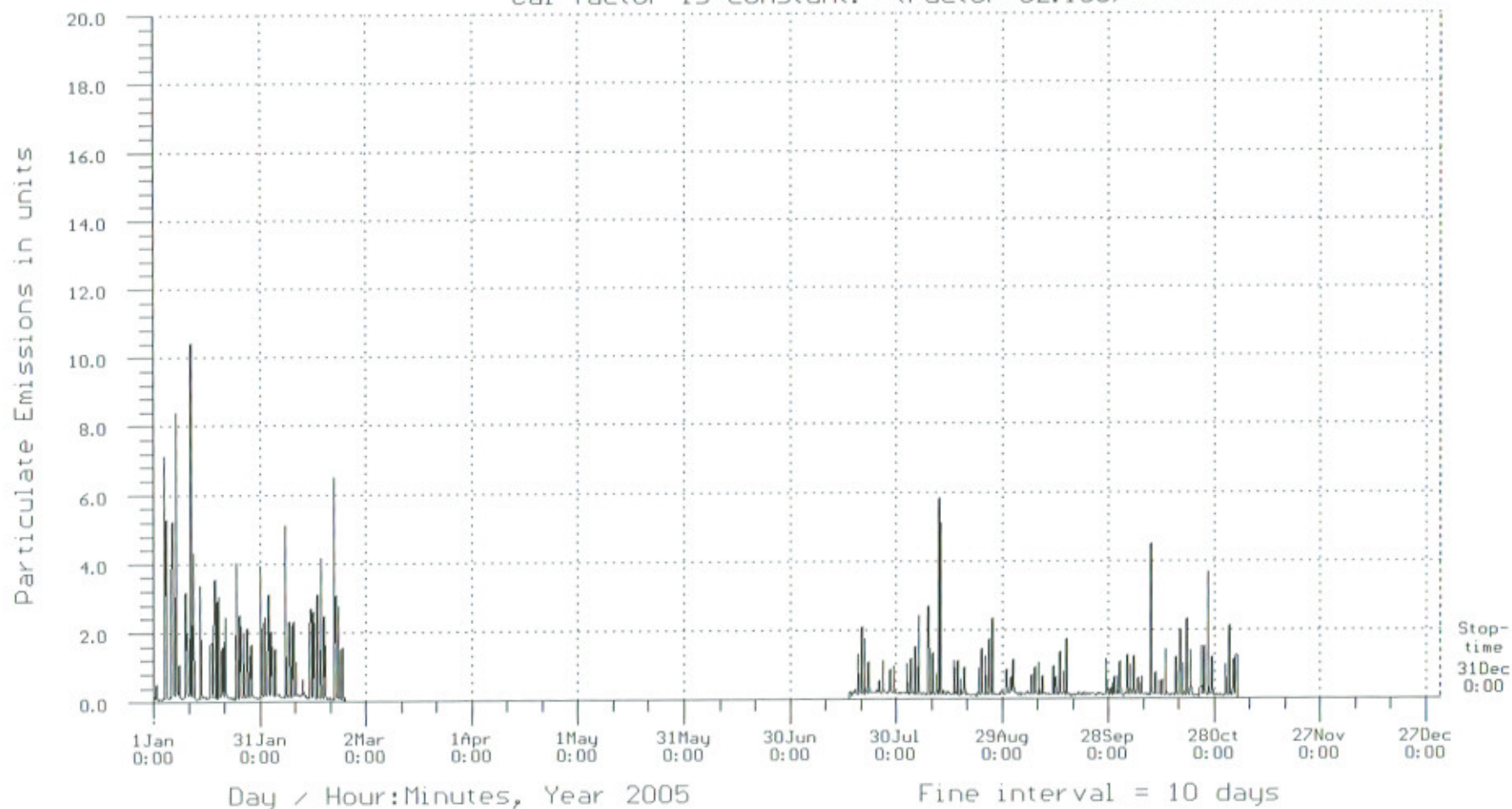
EPA authorisation number(s): 19/93

Requested Data averaging time period: 3.00 hours

Average emission level: 0.444

Maximum time-weighted average emission level: 10.42

Cal factor is constant. (Factor=62.150)



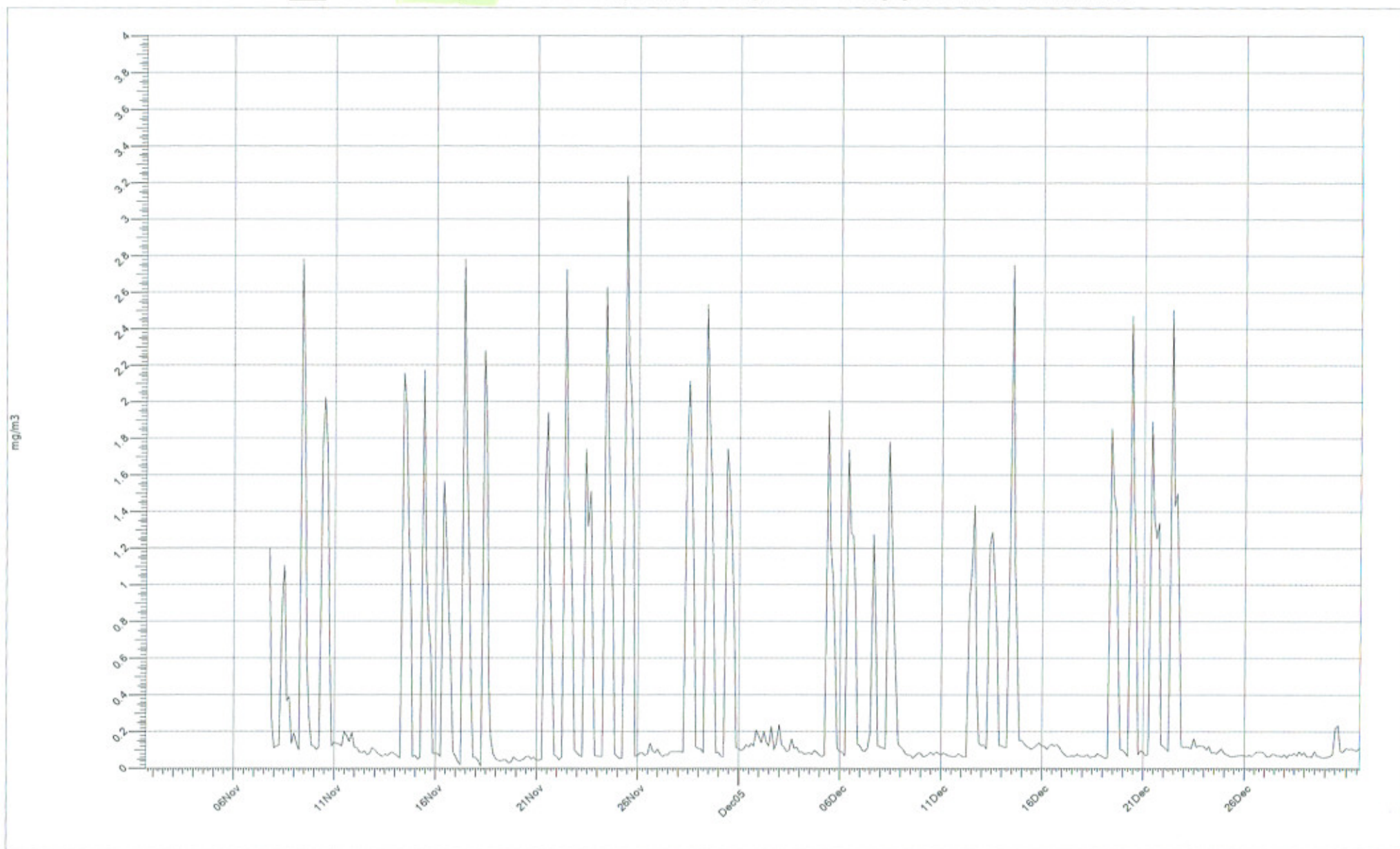
Emission Report

Company:Darex UK Limited Contact: Mr. G. Draper (01480 324459)

Authorisation number (s):19/93

From:01 Nov 05 15:15:00 To:31 Dec 05 15:15:00

Device 0 : --- Conveyor Cal Factor: 62.15 (constant) Average:0.4063 Averaging Period:3 hrs Maximum:3.235



E P A R E P O R T Channel: Chipper (Address 03) (revision 6.2e 07.03.2000)

Date: 13 Jan 2006

Company: DAREX UK LIMITED
5 CROMWELL ROAD, ST. NEOTS
CAMBS. PE19 1QL

Contact: MR. G. DRAPER
(01480) 324459

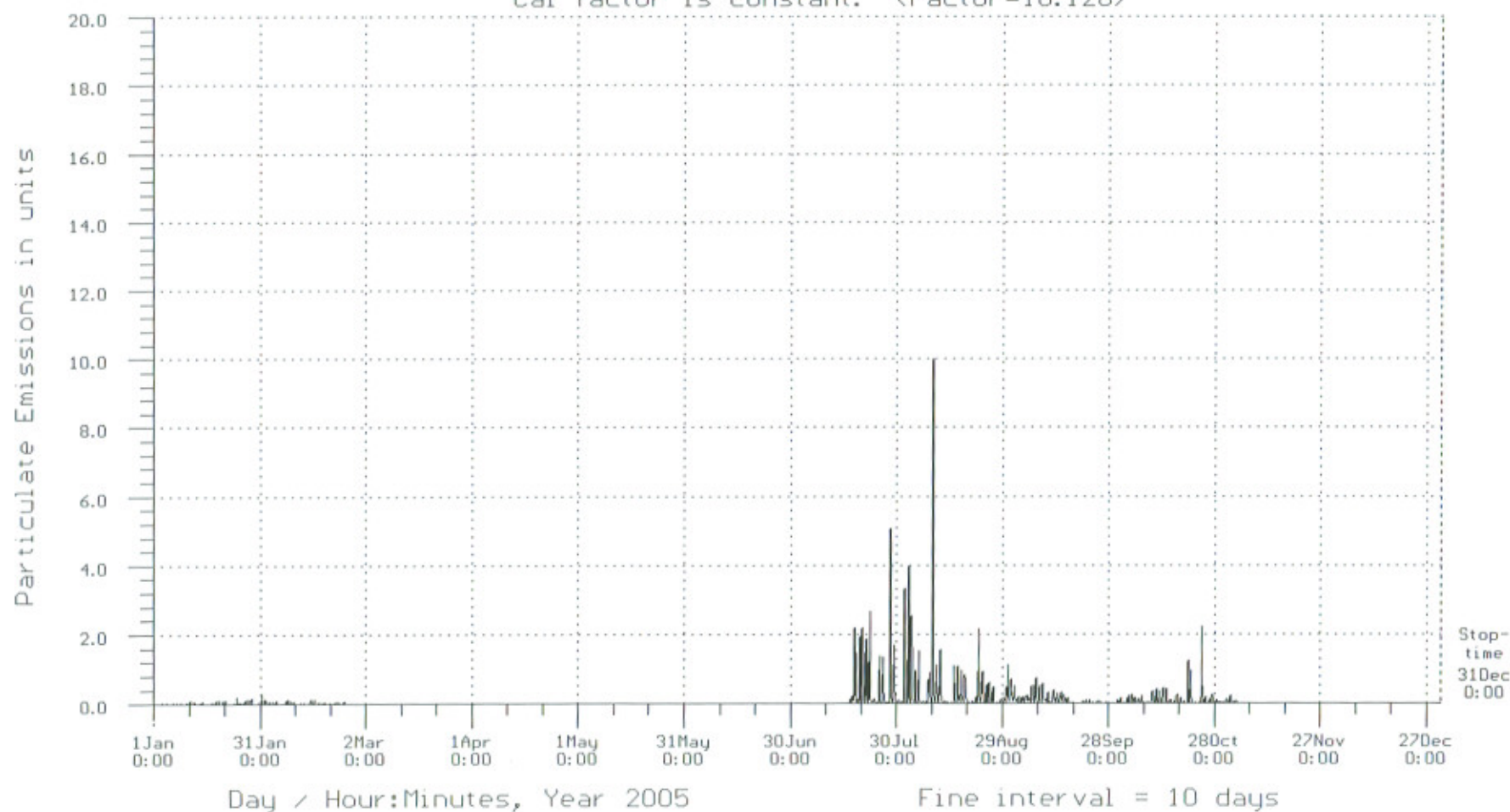
EPA authorisation number(s): 19/93

Requested Data averaging time period: 3.00 hours

Average emission level: 0.142

Maximum time-weighted average emission level: 9.99

Cal factor is constant. (Factor=10.128)



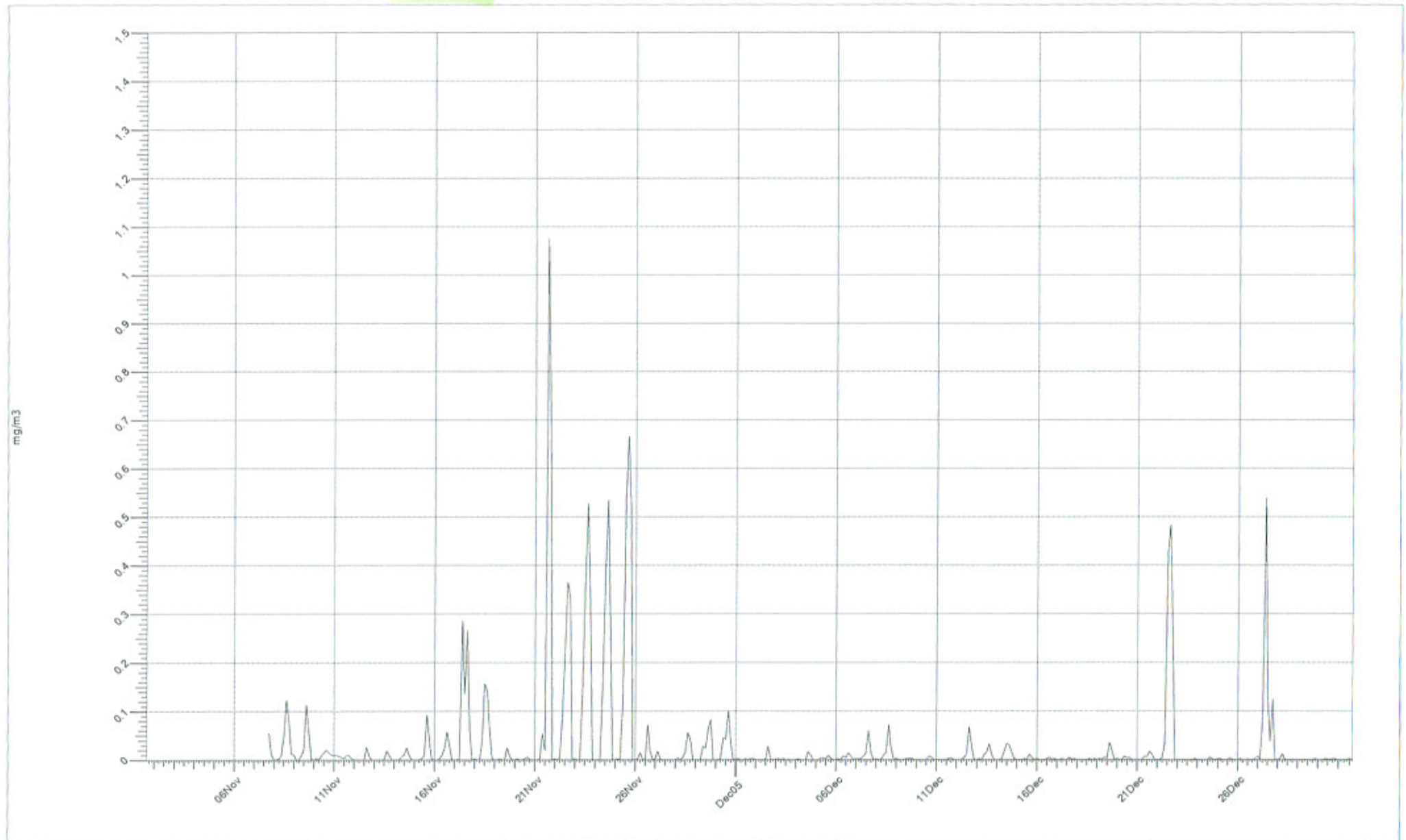
Emission Report

Company:Darex UK Limited Contact: Mr. G. Draper (01480 324459)

Authorisation number (s):19/93

From:01 Nov 05 15:15:00 To:31 Dec 05 15:15:00

Device 0 : --- Chipper Cal Factor: 10.13 (constant) Average:0.03075 Averaging Period:3 hrs Maximum:1.075



Part B

VOC Emissions Inventory (January 2005 - December 2005)

Input Data Sheet

Period for Calculation:

Start Date: Jan-05
End Date: Dec-05

Solvent Receipts:

	<u>Material</u>	<u>Received (kg)</u>	<u>Excel Var.</u>
ST 1	PENTO	75,736	tank1
ST 2	SQUO	1,291,710	tank2
ST 3	SQUO	1,291,710	tank3
ST 4	ACET	64,220	tank4
ST 6	IPA	23,300	tank6
ST 7	SOX	5,993	tank7

Solvent Used in SLC Production:

	<u>Material</u>	<u>Used (kg)</u>	<u>Excel Var.</u>
	ACET	67,927	acet
	IPA	21,259	ipa
	PENTO	66,430	pento
	SOX	4,013	sox
	SQUO	2,578,333	squo

Solvent Production:

	<u>Produced (kg)</u>	<u>Excel Var.</u>
All SLC	4,460,351	slc

SLC Packaging:

	<u>Produced (kg)</u>	<u>Excel Var.</u>
Bulk	384,013	bulk
IBCs	40,886	ibc
Drums	3,988,613	drum
All Other	46,839	other

Results of Annual VBS Monitoring

	<u>Monitored E%</u>	<u>Excel Var.</u>
Mixer solvent loading	99.998%	mixer_e
BT SF loading	99.941%	btsf_e
BT homogenization	99.977%	bthomo_e

Summary of Emissions Estimates (January 2005 - December 2005)

Calculated for following period:

Start Date: Jan-05

End Date: Dec-05

Emission Group	Estimation Technique	VBS E% Max	VBS E% Actual	Estimated Emission, Kg/Yr
Solvent Storage Tanks	EPA AP-42 Breathing & Loading	100%	0.00%	2,103
Mixers: Solvent Loading	EPA AP-42 Loading	100%	100.00%	0
Mixers: Solids Loading & Solvation	EIIP Model	0%	0.00%	6,380
Bulk Tanks: SF Loading	EPA AP-42 Loading	100%	99.94%	9
Bulk Tanks: Homogenization	EPA AP-42 Loading	100%	99.98%	5
Bulk Tanks: Breathing	EPA AP-42 Breathing	0%	0.00%	727
Bulk Packing	EPA AP-42 Loading	100%	75.00%	154
Tote Packing	EPA AP-42 Loading	100%	75.00%	16
Drum Packing	EPA AP-42 Loading	100%	75.00%	1,602
Misc. Packing	EPA AP-42 Loading	0%	0.00%	75
Total Plant				11,072

St. Neots VOC Emissions Estimates

Equipment	Matl.	T-put, Kg/yr	Pre- Vapour Balance						Post-VBS			
			Working Losses		Breathing Losses		Total Losses		Subtotal	VBS E%	Kg/yr	Subtotal Kg/yr
			Lbs/yr	Kg/yr	Lbs/yr	Kg/yr	Lbs/yr	Kg/yr				
Bulk Solvents at Storage Conditions -- 13 C (55 F)												
ST 3	SQUO	1,291,710	1,982	901	-	-	1,982	901		0%	901	
ST 2	SQUO	1,291,710	1,982	901	-	-	1,982	901		0%	901	
ST 1	PENTO	75,736	20	9	-	-	20	9		0%	9	
ST 4	ACET	64,220	149	68	435	198	584	266		0%	266	
ST 6	IPA	23,300	5	2	40	18	45	20		0%	20	
ST 7	SOX	5,993	1	1	14	6	15	7		0%	7	
Solvent Loading to Mixers -- 13 C (55 F)												
	ACET	67,927	158	72	-	-	158	72		100.00%	0	
	IPA	21,259	4	2	-	-	4	2		100.00%	0	
	PENTO	66,430	17	8	-	-	17	8		100.00%	0	
	SOX	4,013	1	0	-	-	1	0		100.00%	0	
	SQUO	2,578,333	3,956	1,798	-	-	3,956	1,798		100.00%	0	
Mix Solv Load 1,880												
SLC Products at B/T Loading (SF Reception) Conditions -- 60 C (140 F)												
BT 1	SLC	637,193	4,944	2,247	-	-	4,944	2,247		99.94%	1	
BT 2	SLC	637,193	4,944	2,247	-	-	4,944	2,247		99.94%	1	
BT 3	SLC	637,193	4,944	2,247	-	-	4,944	2,247		99.94%	1	
BT 4	SLC	637,193	4,944	2,247	-	-	4,944	2,247		99.94%	1	
BT 5	SLC	637,193	4,944	2,247	-	-	4,944	2,247		99.94%	1	
BT 6	SLC	637,193	4,944	2,247	-	-	4,944	2,247		99.94%	1	
BT 7	SLC	637,193	3,754	1,706	-	-	3,754	1,706		99.94%	1	
B/T Loading 15,190												
SLC Products at B/T Homog Pass Conditions -- 60 C (122 F) Working Losses x 2 Passes												
BT 1	SLC	637,193	7,082	3,219	-	-	7,082	3,219		99.98%	1	
BT 2	SLC	637,193	7,082	3,219	-	-	7,082	3,219		99.98%	1	
BT 3	SLC	637,193	7,082	3,219	-	-	7,082	3,219		99.98%	1	
BT 4	SLC	637,193	7,082	3,219	-	-	7,082	3,219		99.98%	1	
BT 5	SLC	637,193	7,082	3,219	-	-	7,082	3,219		99.98%	1	
BT 6	SLC	637,193	7,082	3,219	-	-	7,082	3,219		99.98%	1	
BT 7	SLC	637,193	5,277	2,399	-	-	5,277	2,399		99.98%	1	
B/T Homo 21,714												
SLC Products at B/T Breathing Conditions -- 22 C (72 F)												
BT 1	SLC	637,193	-	-	241	110	241	110		0%	110	
BT 2	SLC	637,193	-	-	241	110	241	110		0%	110	
BT 3	SLC	637,193	-	-	241	110	241	110		0%	110	
BT 4	SLC	637,193	-	-	241	110	241	110		0%	110	
BT 5	SLC	637,193	-	-	241	110	241	110		0%	110	
BT 6	SLC	637,193	-	-	220	100	220	100		0%	100	
BT 7	SLC	637,193	-	-	173	78	173	78		0%	78	
B/T Breathing 727												
SLC Products at Packaging Conditions -- 20 C (68 F)												
Bulk	SLC	384,013	1,357	617	-	-	1,357	617		75%	154	
IBCs	SLC	40,886	144	66	-	-	144	66		75%	16	
Drums	SLC	3,988,613	14,096	6,407	-	-	14,096	6,407		75%	1,602	
All Other	SLC	46,839	166	75	-	-	166	75		0%	75	
Pkg 7,165												
TOTAL EMISSIONS 46676 4692												

Mixer Emissions Calculations

Using methods based on:

Emission Inventory Improvement Program

Preferred and Alternative Methods for Estimating Air Emissions from Paint and Ink Manufacturing Facilities
USEPA

4.1.1 Material Loading (loading of solids only)

[equation 8.4-1] $E(\text{VOC}) = 12.46 * S * P * M * Q / T$

variable	value	units	comment
E(VOC)	2448.13256	lb	
S	1	dim'less	assume S = 1 (overestimate)
P	2.00	psia	VP hexane at T=55 F
M	86.00	lb/lb-mol	
Q	588.30	1000 gal	throughput for all mixers x 40%
T	515	T(R)	=T(F) + 460

4.1.2 Heat-up Losses

[equation 8.4-10] $E(\text{VOC}) = \frac{(\text{TVP}, T1 / (14.7 - \text{TVP}, T1)) + (\text{TVP}, T2 / (14.7 - \text{TVP}, T2)) * dn * Ma * \text{CYC}}{2}$

variable	value	units	comment			
E(VOC)	9904.29937	lb			T	VP
TVP, T1	2	psia	VP at initial batch temp	T1	55	2
TVP, T2	11.7	psia	VP at final batch temp	T2	140	11.7
dn	0.04899102	lb-mol/cycle	calc'd by equation 8.4-11, below			
Ma	86	lb/lb-mol	molecular weight		BS	
CYC	1205.50027	cycles	batches per period = tput/3700 (avg capacity)	SSW	2400	Kg
				LSW	4800	
				MM	4800	
				ACET SW	2800	
				"Avg"	14800	

[equation 8.4-11] $dn = (V / R) * ((Pa1 / T1) - (Pa2 / T2))$

variable	value	units	comment
dn	0.04899102	lb-mol/cycle	
V	26.7379679	ft^3	mixer nominal - working capacity = 200 gal
R	10.73	psia "ft^3/lb-mol" R	ideal gas constant
Pa1	12.7	psia	14.7 - TVP, T1 (from above)
Pa2	3	psia	14.7 - TVP, T2 (from above)
T1	515	T(R)	T1 = 55 F
T2	600	T(R)	T2 = 140 F

4.1.4 Surface Evaporation

[equation 8.4-18] $Ex = Mx * Kx * A * Px * 3600 * H * B / R * T$

variable	value	units	comment
Ex	1683.5937	lb	calculate for all species based on tvp and amw
Mx	86	lb/lb-mol	average molecular weight
Kx	0.00446549	ft/sec	calc'd below from equation 8.4-17
A	1.39555556		based on 18" ID mixer hatch
Px	2		calc'd at Tav
H	2	hr/batch	open vessel batch time = 2 hrs/batch
B	1205.50027		batches per period
R	10.73	psia "ft^3/lb-mol" R	
T	515		use T1

[equation 8.4-17] $Kx = 0.00438 * U^{0.78} * (18/Mx)^{0.333}$

variable	value	units	comment
Kx	0.00446549	ft/sec	
U	2	mile/hr	assume wind speed in closed vessel is 2 mph
Mx	86	lb/lb-mol	average molecular weight

St. Neots VOC Emissions Inventory

Material Properties

Bulk Solvents at Storage Conditions -- 13 C (55 F)

Matl.	Annual Avg. Storage Temp., F	Avg. Diurnal Temp. Change, F	TVP, psia	Avg. MW, lbs/lb-mol	Note	Temp. Con.	
						C	F
SQUO	55	0	2	82.4	Bulk Storage	13	55
ACET	55	0	2.9	58	Packaging	20	68
PENTO	55	13.5	0.5	100	B/T Breathing	22	72

SLC Products at B/T Loading (SF Reception) Conditions -- 60 C (140 F)

initial bp, SQUO

Matl.	Annual Avg. Storage Temp., F	Avg. Diurnal Temp. Change, F	TVP, psia	Avg. MW, lbs/lb-mol	Note
100A	140	na	11.7	83.8	100% SQUO
9291	140	na	11.7	83.8	100% SQUO
235	140	na	8.1	91.9	50:50 SQUO:PENTO
239	na	na	na	na	100% ACET

SLC Products at B/T Homog Pass Conditions -- 50 C (122 F)

Matl.	Annual Avg. Storage Temp., F	Avg. Diurnal Temp. Change, F	TVP, psia	Avg. MW, lbs/lb-mol	Note
100A	122	na	8.4	83.6	100% SQUO
9291	122	na	8.4	83.6	100% SQUO
235	122	na	5.7	91.8	50:50 SQUO:PENTO
239	na	na	na	na	100% ACET

SLC Products at B/T Breathing Conditions -- 22 C (72 F)

Matl.	Annual Avg. Storage Temp., F	Avg. Diurnal Temp. Change, F	TVP, psia	Avg. MW, lbs/lb-mol	Note
100A	72	6	2.9	82.7	100% SQUO
9291	72	6	2.9	82.7	100% SQUO
235	72	6	1.9	91.4	50:50 SQUO:PENTO
239	na	na	na	na	100% ACET

SLC Products at Packaging Conditions -- 20 C (68 F)

Matl.	Annual Avg. Storage Temp., F	Avg. Diurnal Temp. Change, F	TVP, psia	Avg. MW, lbs/lb-mol	Note
100A	68	na	2.7	82.7	100% SQUO
9291	68	na	2.7	82.7	100% SQUO
235	68	na	1.7	91.4	50:50 SQUO:PENTO
239	68	na	na	na	100% ACET

Part C

Vent Measurements: 8th September 2005

Mass Emission is calculated from Ideal Gas Law

mass emission mg/min = ppm x flow rate x molecular weight x P /RT

$n = PV/RT$

V = measured flow rate (m3/min)	
P = 101325 Pa (760 mm Mercury)	101325
T = 293 K	293
R = molar gas constant 8.314 (m3Pa/mol K)	8.314
Molecular weight for solvent = 90	90
R x T	2436.002
P/RxT	41.595

		Solvent Tank to Mixer	Mixer to Buk Tank	Homogenisation Tank to Tank
		ST? to SS	LS to BT2	BT2 to BT4
Mean ppm	ppm	0.44	13.62	1.31
Flow Volume	m3/min	2.07	2.07	2.07
Emission rate	gm/min	0.00342	0.10573	0.01017
Emission Rate MR	kg/min	0.00000	0.00011	0.00001
Prebalanced Rate (PBR)	kg/min	0.18000	0.18000	0.04400
MR/PBR		0.00002	0.00059	0.00023
Efficiency 1-MR/PBR		0.99998	0.99941	0.99977
EFFICIENCY PERCENT	%	99.998	99.941	99.977

Vent Measurements: 8th September 2005

Reading Seq.	Interval (secs)	Activity	Solvent Tank to Mixer	Mixer to Buk Tank	Homogenisation Tank to Tank
		Tanks	ST? to SS	LS to BT2	BT2 to BT4
		Unit			
		ppm	ppm	ppm	
1	15	0.0	0.0	0.0	
2	30	0.0	0.0	0.7	
3	45	0.0	0.0	0.0	
4	60	0.0	0.0	0.0	
5	75	0.0	0.0	2.3	
6	90	0.0	0.0	1.5	
7	105	0.0	0.7	0.0	
8	120	0.3	1.2	3.6	
9	135	0.0	0.4	0.0	
10	150	0.0	1.3	0.0	
11	165	0.0	2.7	0.9	
12	180	0.0	1.7	0.8	
13	195	3.3	1.7	0.0	
14	210	1.1	3.1	0.0	
15	225	0.0	2.4	0.0	
16	240	0.0	1.3	0.3	
17	255	0.0	4.4	1.2	
18	270	0.0	5.1	0.0	
19	285	0.6	3.8	0.0	
20	300	1.0	4.0	0.0	
21	315	0.2	5.1	0.0	
22	330	0.7	5.7	0.0	
23	345	0.3	5.0	2.1	
24	360	1.1	5.9	0.0	
25	375	0.8	5.5	0.0	
26	390	2.0	6.8	0.0	
27	405	0.8	6.3	1.0	
28	420	0.2	4.5	2.2	
29	435	1.1	6.6	4.6	
30	450	0.0	6.4	1.3	
31	465	0.0	7.1	0.0	
32	480	1.0	10.3	0.0	
33	495	0.0	10.2	0.2	
34	510		11.2	0.0	
35	525		8.5	0.0	
36	540		12.4	3.9	
37	555		10.9	0.0	
38	570		12.4	0.0	
39	585		18.5	0.7	
40	600		16.2	1.1	
41	615		17.6	0.0	
42	630		23.8	0.0	
43	645		22.7	0.7	
44	660		23.6	2.0	
45	675		25.8	5.2	
46	690		27.0	2.7	
47	705		29.1	2.9	
48	720		29.4	0.0	
49	735		32.8	1.7	
50	750		35.1	2.0	
51	765		37.7	1.4	
52	780		33.1	5.4	
53	795		31.0	5.4	
54	810		23.6	5.7	
55	825		38.3	3.0	
56	840		38.0	4.7	
57	855		35.3	0.4	
58	870		33.5	3.9	
59	885		36.4	0.0	
60	900		34.0	4.5	
61	915			0.0	

TOTAL	14.50	817.10	80.00
Mean	0.44	13.62	1.31
Flow Rate (m3/sec)	1.1	1.1	1.1
Flow Volume (m3/min)	2.07	2.07	2.07

Foot Note:
Radius 0.1
Pie 3.142

Part D

Solvent/Product Analysis: 2005 (Base Data for VOC Calculation)

Solvent Analysis

Solvent	Op. Bal.	Receipts	Cl. Bal.	Usage		
ACETONE	11698	64220	7991	67927		
ISOPROPANOL	5410	20000	7198	18212	21259	
N-PROPANOL	418	3300	671	3047		
HEPTANES	5155	75736	14461	66430		
HEXANES	2209	120331	2209	120331		
CYCLOHEXANE	0	16848	0	16848	2578333	1289167
HYDROCARBON	37283	2446240	42369	2441154		
IMS	875	5993	2855	4013		
TOTAL	63048	2752668	77754	2737962	1,722,389	38.62%

Production Analysis

Production Volume Jan - Dec 2005					
Product	Tanker	IBC	Drum	Poly	Total
SLC 100A	120,820	40,886	2,298,799	2,800	2,463,305
SLC 160	-	-	1,008,800	-	1,008,800
SLC 235	263,193	-	334,390	1,600	599,183
SLC 239G	-	-	96,900	64	96,964
SLC 9291ES	-	-	150,304	-	150,304
SOLV 1E	-	-	11,256	160	11,416
SOLV 3	-	-	12,000	960	12,960
NDF 20/27T DF	-	-	37,604	2,160	39,764
SP 1427	-	-	36,216	304	36,520
DL	-	-	1,084	9,621	10,705
LF	-	-	-	234	234
NW	-	-	1,260	8,112	9,372
CSF	-	-	-	3,256	3,256
DREM	-	-	-	17,568	17,568
Total	384,013	40,886	3,988,613	46,839	4,460,351