DJB

Grace Darex Packaging Technologies

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Annual emissions monitoring results

GRACE

17th Febuary 2010
Dave Bass.
Environmental Protection Officer
Huntingdonshire District Council

Dear Dave,

Please find enclosed monitoring result for 2010 along with solvent usages.

Yours Sincerely
Glenn Draper

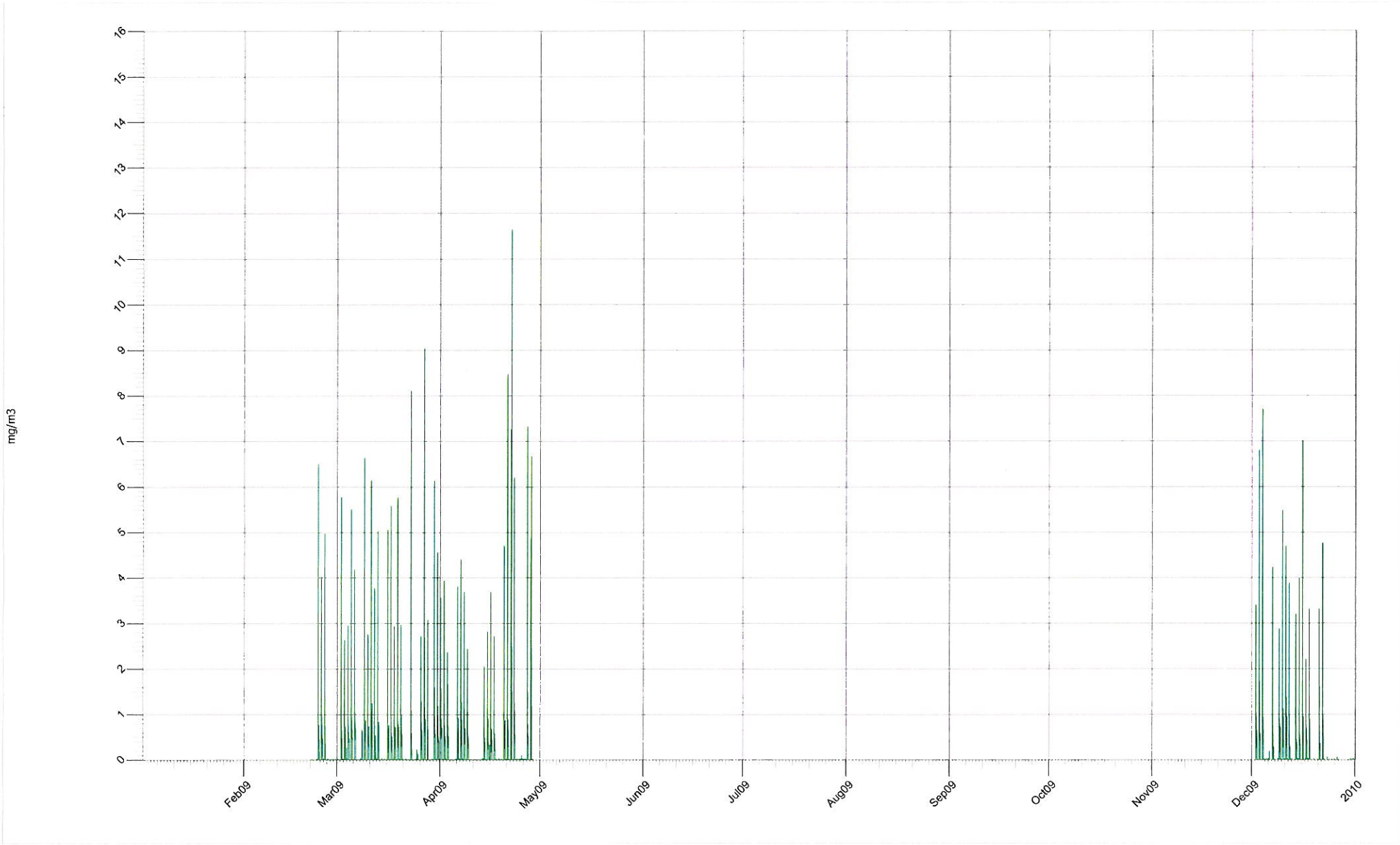
Emission Report

Company:Darex Uk LTD ContactGlenn Draper

Authorisation number (s):Permit Ref No. B19/93

From:01 Jan 09 15:15:00 To:01 Jan 10 08:40:00

Device 0 : --- CONV Cal Factor: 7.22 (constant) Average:0.152 Averaging Period:10 mins Maximum:11.65



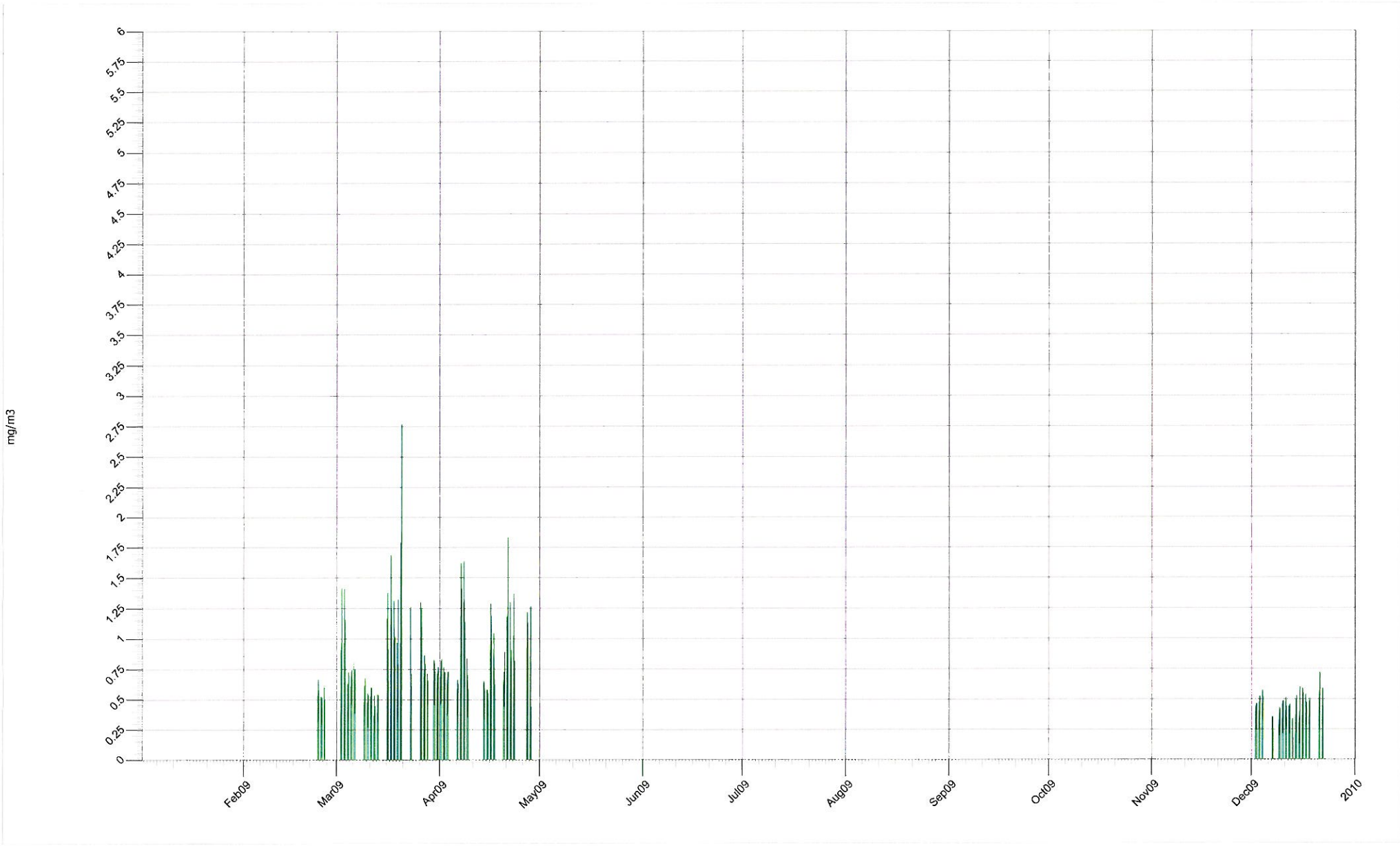
Emission Report

Company:Darex Uk LTD ContactGlenn Draper

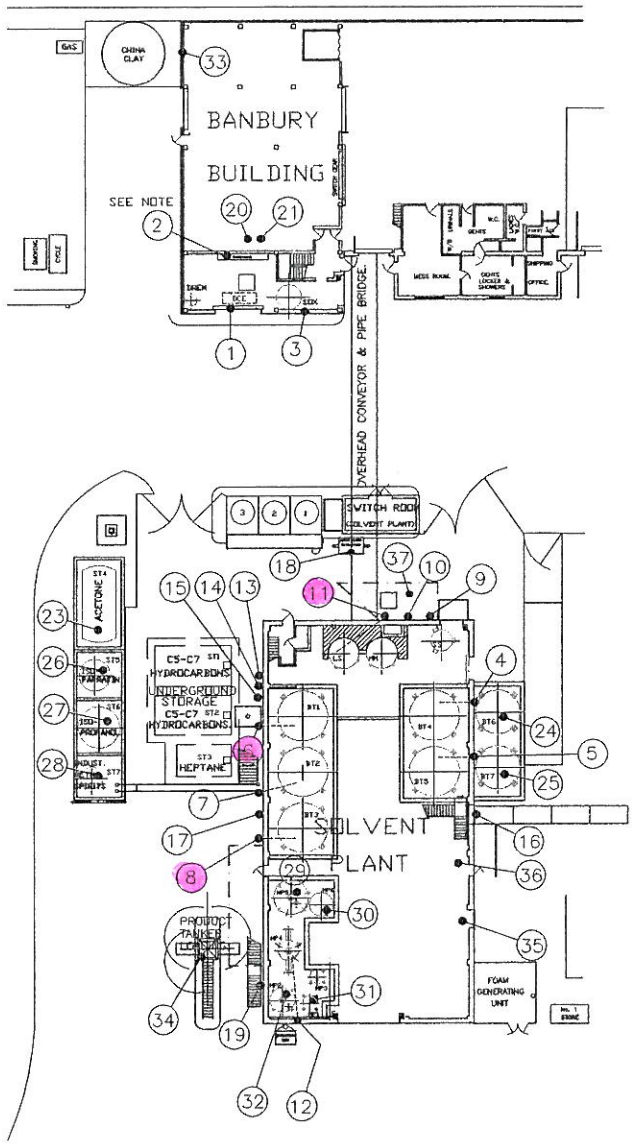
Authorisation number (s):Permit Ref No. B19/93

From:01 Jan 09 15:15:00 To:01 Jan 10 08:40:00

Device 0 : --- BANBURY Cal Factor: 0.36 (constant) Average:0.114 Averaging Period:10 mins Maximum:2.770



REV NO	DESCRIPTION	ECO NO	MADE BY	CHK'D BY	DATE



Emission Points Database – St Neots

Source Description	ID	ID Point Type	Process/Area	
Banbury extraction	1	Air filter vent	Banbury Building	
Chipper extraction	2	Air filter vent	Banbury Building	Internally Vented
Rubber chip conveyor extraction	3	Air vent	Banbury Building	
Blend Tank 4	4	Conservation vent	Solvent Plant	
Blend Tank 5	5	Conservation vent	Solvent Plant	
Blend Tank 1	6	Conservation vent	Solvent Plant	
Blend Tank 2	7	Conservation vent	Solvent Plant	
Blend Tank 3	8	Conservation vent	Solvent Plant	
Small SW (SSW)	9	Conservation vent	Solvent Plant	
Master Mix	10	Conservation vent	Solvent Plant	
Struthers Wells (SW)	11	Conservation vent	Solvent Plant	
Misc. Products MP4	12	Air filter vent	Solvent Plant	
Storage Tank 3	13	Conservation vent	Solvent Plant	
Storage Tank 2	14	Conservation vent	Solvent Plant	
Storage Tank 1	15	Conservation vent	Solvent Plant	
East side room extraction	16	Air vent	Solvent Plant	
West side room extraction	17	Air vent	Solvent Plant	
Mixer floor extraction	18	Air vent	Solvent Plant	
Misc. Products MP3 extraction	19	Air vent	Solvent Plant	
Powder hopper dust box vent A	20	Air filter vent	Banbury Building	
Powder hopper dust box vent B	21	Air filter vent	Banbury Building	
Storage Tank 4	23	Conservation vent	Solvent Plant	
Blend Tank 6	24	Conservation vent	Solvent Plant	
Blend Tank 7	25	Conservation vent	Solvent Plant	
Storage Tank 5	26	Conservation vent	Solvent Plant	
Storage Tank 6	27	Conservation vent	Solvent Plant	
Storage Tank 7	28	Conservation vent	Solvent Plant	
Misc. Products MP5	29	OEL	Solvent Plant	
Misc. Products MP6	30	OEL	Solvent Plant	
Misc. Products MP1	31	OEL	Solvent Plant	
Misc. Products MP2	32	OEL	Solvent Plant	
Clay silo vent	33	Air filter vent	Banbury Building	
Tanker packing	34	Fugitive	Solvent Plant	
IBC packing	35	Fugitive	Solvent Plant	
Drum packing	36	Fugitive	Solvent Plant	
Sack Tipping Station	37	Air filter vent	Solvent Plant	

SCALE 1:100 (A1 SIZE SHEET)

CONFIDENTIAL

DIMENSIONAL TOLERANCES UNLESS OTHERWISE SPECIFIED					
FUNCTION		MACHINING	WELDING	CASTING	SHT. METAL
DECIMAL	0-20	±0.5	±1.0	±1.5	±0.5
	21-315	±0.5	±1.5	±2.0	±1.0
	316-2000	±1.0	±3.0	±3.0	±2.0
	over 2000	±2.0	±4.0	±5.0	±3.0
ANGULAR		±1/2°	±1°	±1°	±1/2°

QTY	FIND NO.	DETAIL NO.	MATERIAL OR PART DESCRIPTION
PROJ. ID		MADE FROM: K140P006	PROPERTY OF DAREX UK LTD CONTAINER PRODUCTS DIVISION, W.R. GRACE – CONN
DATE: 19/01/09		TITLE: CONTAINER PLANT – EMISSION POINTS	
INV. NO.		ENGINEER G.DRAPER DRAFTER R.WEST	SIGN OFF
		DRAWING NO. K140P009/2	REV

Vent Measurements: 15th October 2009

	Activity	Mixer to Buk Tank	Solvent Tank to Mixer	Homogenisation Tank to Tank
	Tanks	MM to BT3	ST2 to LS	BT2 to BT1
Reading Seq.	Interval (secs)	Unit		
		ppm	ppm	ppm
1	6	1	1	7
2	12	0	0	8
3	18	0	1	7
4	24	0	1	9
5	30	0	1	9
6	36	0	1	7
7	42	0	1	9
8	48	0	2	8
9	54	0	1	7
10	60	0	2	7
11	66	0	2	7
12	72	0	1	7
13	78	0	1	8
14	84	0	2	7
15	90	0	1	8
16	96	0	0	8
17	102	0	1	9
18	108	0	1	10
19	114	0	1	8
20	120	0	1	9
21	126	0	1	10
22	132	0	1	10
23	138	0	0	11
24	144	0	0	11
25	150	0	1	11
26	156	0	0	11
27	162	0	0	13
28	168	0	1	10
29	174	0	0	13
30	180	0	0	11
31	186	0	0	11
32	192	0	1	9
33	198	0	0	9
34	204	0	1	9
35	210	0	0	8
36	216	0	0	8
37	222	0	0	9
38	228	1	0	9
39	234	1	0	7
40	240	1	0	7
41	246	0	0	8
42	252	1	0	9
43	258	1	0	7
44	264	0	0	8
45	270	1	0	8
46	276	0	0	9
47	282	0	0	12
48	288	1	1	11
49	294	1	0	11
50	300	1	0	11
51	306	1	1	10
52	312	1	1	9
53	318	1	0	8
54	324	0	0	9
55	330	1	0	6
56	336	0	0	7
57	342	1	0	9
58	348	1	0	8
59	354	1	1	6
60	360	1	0	8
61	366	2	0	9
62	372	3	1	7
63	378	3	0	7
64	384	3	0	6
65	390	3	0	7
66	396	4	0	7
67	402	4	1	8
68	408	6	3	7
69	414	7	3	9
70	420	8	4	9
71	426	8	5	9
72	432	11	5	8
73	438	10	5	8
74	444	13	5	9
75	450	14	6	8
76	456	14	5	7
77	462	15	5	7
78	468	17	5	8
79	474	16	5	8

80	**480**	17	6	9
81	**486**	18	6	8
82	**492**	20	5	7
83	**498**	21	6	6
84	**504**	21	5	7
85	**510**	20	5	7
86	**516**	20	5	7
87	**522**	21	4	8
88	**528**	20	5	7
89	**534**	23	5	9
90	**540**	22	4	9
91	**546**	25	5	9
92	**552**	26	6	11
93	**558**	23	5	8
94	**564**	23	4	9
95	**570**	22	5	8
96	**576**	24	4	8
97	**582**	23	5	8
98	**588**	22	6	7
99	**594**	22	6	7
100	**600**	24	5	7
101	**606**	25	5	8
102	**612**	27	5	8
103	**618**	27	5	6
104	**624**	28	5	7
105	**630**	24	4	9
106	**636**	24	5	8
107	**642**	25	5	8
108	**648**	27	5	8
109	**654**	28	5	10
110	**660**	26	5	10
111	**666**	25	5	11
112	**672**	35	5	13
113	**678**	43	4	11
114	**684**	35	5	10
115	**690**	35	5	9
116	**696**	27	5	10
117	**702**	36	5	9
118	**708**	26	4	8
119	**714**	27	5	9
120	**720**	28	5	9
121	**726**	28	4	8
122	**732**	32	5	7
123	**738**	28	5	8
124	**744**	33	5	8
125	**750**	29	6	7
126	**756**	29	5	9
127	**762**	30	4	8
128	**768**	30	5	9
129	**774**	28	5	11
130	**780**	28	6	12
131	**786**	32	6	10
132	**792**	34	6	10
133	**798**	37	6	10
134	**804**	29	6	11
135	**810**	32	6	12
136	**816**	33	4	13
137	**822**	29	4	11
138	**828**	26	5	12
139	**834**	29	4	12
140	**840**	29	4	12
141	**846**	30	5	12
142	**852**	31	6	12
143	**858**	33	5	13
144	**864**	30	4	12
145	**870**	30	4	13
146	**876**	28	5	11
147	**882**	28	5	11
148	**888**	29	6	12
149	**894**	27	5	10
150	**900**	30	5	12

TOTAL	**2115.00**	**445.00**	**1343.00**
Mean	**14.10**	**2.97**	**8.95**
Flow Rate (m3/sec)	**1.0**	**1.0**	**1.0**
Flow Volume (m3/min)	**1.89**	**1.89**	**1.89**

Foot Note:

Radius	0.1
Pie	3.142

Vent Measurements: 15th October 2009

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
		ST2 to MM	SS to BT6	BT3 to BT2
Mean ppm	**ppm**	**14.10**	**2.97**	**8.95**
Flow Volume	**m3/min**	**1.89**	**1.89**	**1.89**
Emission rate	**gm/min**	0.09951	0.02094	0.06319
Emission Rate MR	**kg/min**	0.00010	0.00002	0.00006
Prebalanced Rate (PBR)	**kg/min**	0.18000	0.18000	0.04400
MR/PBR		0.00055	0.00012	0.00144
Efficiency 1-MR/PBR		0.99945	0.99988	0.99856
EFFICIENCY PERCENT	**%**	**99.945**	**99.988**	**99.856**

Part D

Solvent/Product Analysis: 2009 *(Base Data for VOC Calculation)*

Solvent Analysis

Solvent	Op. Bal.	Receipts	Cl. Bal.	Usage		
ACETONE	7841	16100	3174	20766		
ISOPROPANOL	1876	13840	3148	12568	13465	
N-PROPANOL	303	660	66	897		
HEPTANES	370	3446	0	3816		
HEXANES	61057	2261104	71251	2250910	2404730	1202365
CYCLOHEXANE	6	15327	1540	13794		
HYDROCARBON	3646	136840	459	140027		
ETHANOL (IMS)	4800	0	2636	2164		
TOTAL	**79899**	**2447318**	**82274**	**2444942**	**1,377,650**	**36.04%**

Production Analysis

Production Volume Jan - Dec 2009					
Product	**Tanker**	**IBC**	**Drum**	**Poly**	**Total**
SLC 100A	145,520	39,565	2,102,715	1,136	**2,288,936**
SLC 160	-	-	682,720	-	**682,720**
SLC 235	223,180	-	392,020	1,664	**616,864**
SLC 239G	-	-	28,310	-	**28,310**
SLC 9291ES	-	-	2,560	-	**2,560**
SOLV 1E	-	-	5,896	576	**6,472**
SOLV 3	-	-	4,480	-	**4,480**
NDF 20/27T DF	-	-	24,648	2,160	**26,808**
SP 1427	-	34,500	104,800	19	**139,319**
DL	-	-	171	1,680	**1,851**
LF	-	-	-	272	**272**
NW	-	-	900	5,878	**6,778**
CSF	-	-	-	3,190	**3,190**
DREM	-	-	-	14,032	**14,032**
Total	**368,700**	**74,065**	**3,349,220**	**30,607**	**3,822,592**