Environmental Resources Management

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18 November 2011

Michael J. Hinton, P.E.
Environmental Engineer 2
New York State Department of Environmental Conservation
Division of Environmental Remediation - Region 9
270 Michigan Avenue
Buffalo, New York 14203

RE: Monthly Progress Report – October 2011
Greif, Inc. Facility – Tonawanda, New York
NYSDEC VCP Number V00334-9

Key Actions This Period:

- Performed routine operations and maintenance (O&M) on the Pilot Sub-Slab Depressurization (SSD) system and dense, non-aqueous phase liquid (DNAPL) recovery equipment. Collected and recorded relevant data. Data collected included liquid level measurements in selected Site wells and monitoring points (Table 1), vacuum readings in vacuum monitoring points (Table 2), treatment system operational data (Table 3), and analytical results from the September 2011 groundwater sampling event. The locations of wells and other sampling and monitoring points are presented in Figure 1. A map showing the estimated distribution of vacuum in the sub-slab on 28 October 2011 is presented in Figure 2.
- Completed evaluation of Pilot SSD System data for preparation of a report outlining proposed SSD system modifications. The SSD System Pilot Report is attached. Please review the report and provide us with your comments.
- Receipt of a letter from the NYSDEC dated 19 October 2011 providing closure for potential issues identified during the hazardous waste compliance inspection performed by the NYSDEC on 30 August 2011.

Problems / Resolutions:

- None.

Analytical Data Received:

- Analytical results for ground water samples collected at the Site in September 2011 are summarized in Table 4.

Documents Submitted:

- Monthly Progress Report for September 2011 dated 13 October 2011.

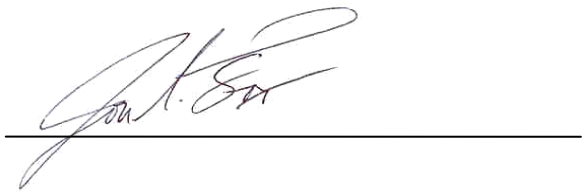
Anticipated Actions – November 2011:

- Routine O&M of the Pilot SSD System and DNAPL recovery equipment and adjustment of extraction and recovery parameters as necessary based on Site data and observations.
- Submission of a SSD System Pilot Report outlining proposed modifications to the SSD System (attached).
- Preparation to initiate SSD System modifications after receipt of NYSDEC approval.
- Compilation of data from remedial construction activities and planning for preparation of a Site Management Plan and Final Engineering Report.
- Coordination with NYSDEC and Greif on their preparation of a deed restriction for the Site.

NYSDEC-Approved Field Decisions:

- None.

Prepared By:



Jon S. Fox, P.G.
Senior Consultant

Date: 18 November 2011

Cc: Pete Gruene (Sonoco)
Mike Sunderland (Sonoco)
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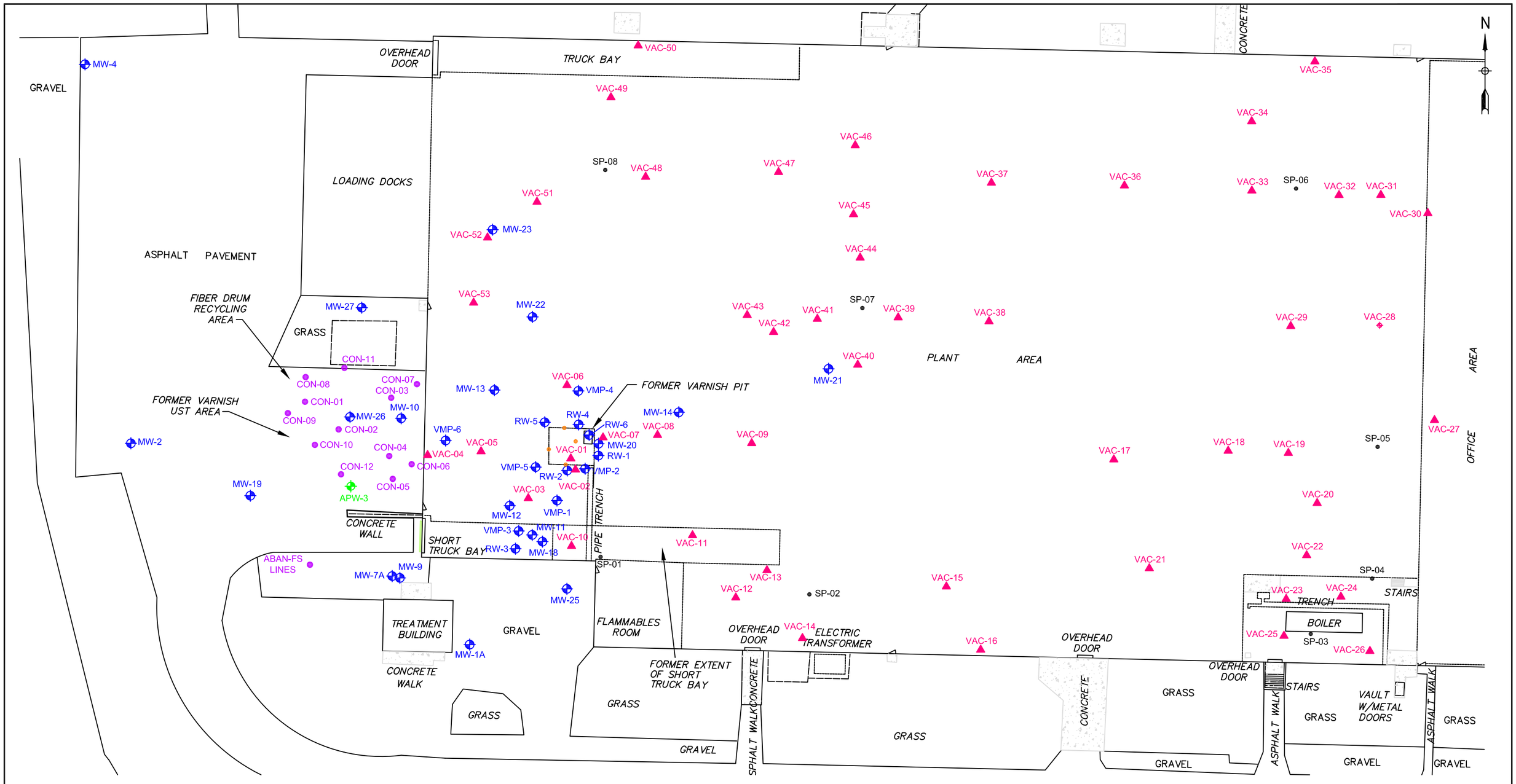
John Mohlin, P.E. (ERM)
Rob Sents (ERM)
Jason Reynolds (ERM)



LEGEND

- Vacuum Monitoring Point Location
- Monitoring or Recovery Well Location
- Antenna Placement Well
- Suction Point Location
- Horizontal Suction Point Location
- Soil Confirmation Location
- Former Varnish Pit
- Man Door
- Concrete Pad

0 20 30 40 60 80

GRAPHIC SCALE IN FEET

Map Source: Wm. Schutt & Associates, P.C., 37 Central Ave, Lancaster, NY; Survey File: D/01351/03, WSA Proj.#01351.

TITLE

SAMPLE AND MEASUREMENT LOCATIONS
GREIF FACILITY-TONAWANDA, NEW YORK
NYSDEC VCP NUMBER V00334-9

PREPARED FOR

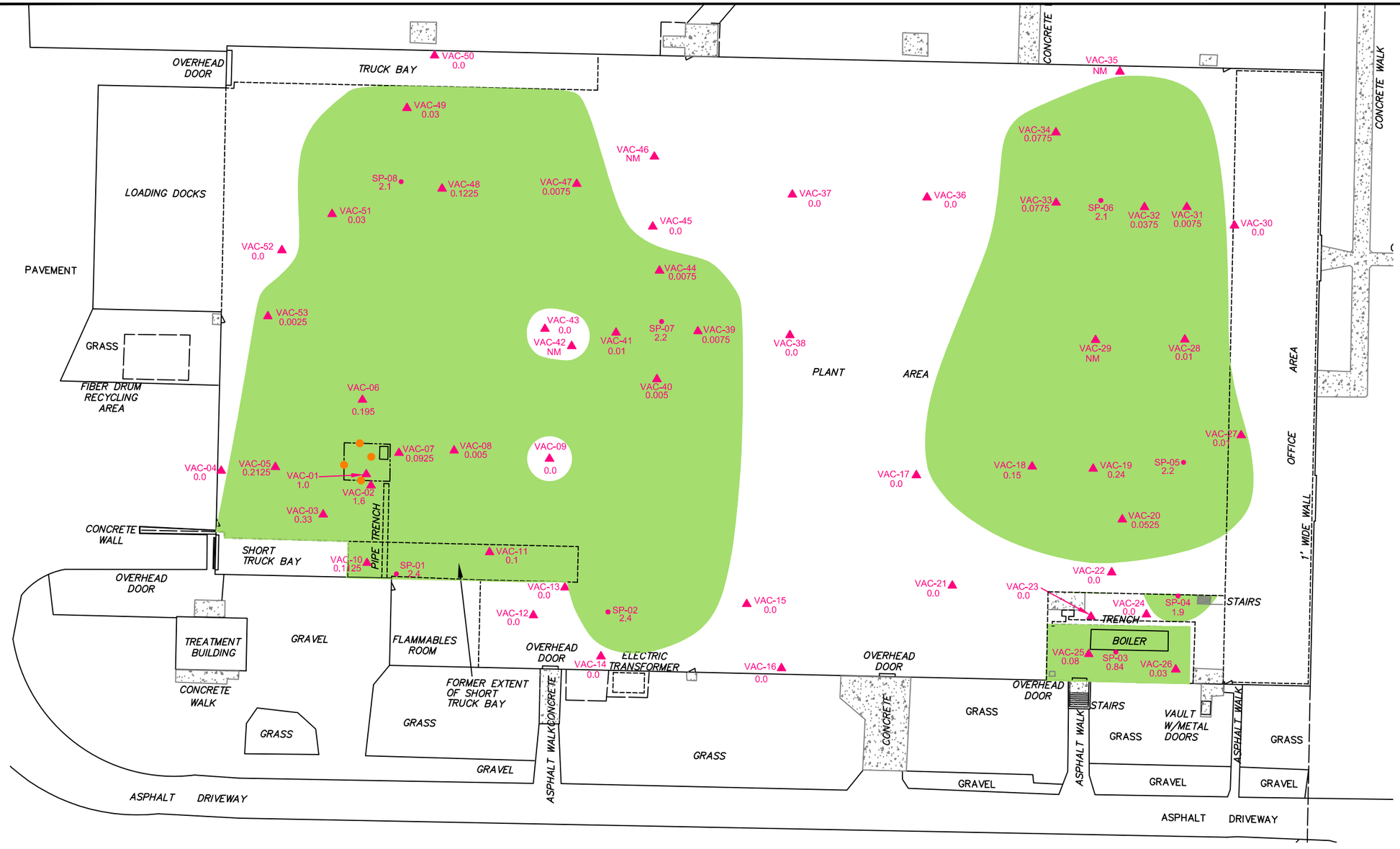
SONOCO PRODUCTS COMPANY

Environmental Resources Management

SCALE	FIGURE
GRAPHIC	1

DATE: 06-Oct-2011

DRAWN:	JOB NO.:	FILE NAME:
EMF	0129254.01	0129254-01-007



LEGEND

- Horizontal Suction Point Location
- Vertical Suction Point Location
- 0.15 Vacuum Monitoring Point Location (vacuum in " H_2O)
- NM Not Measured
- Estimated Extent of Sub-Floor Vacuum
- Former Varnish Pit
- Man Door
- Concrete Pad

NOTES:

1. " H_2O = inches of water column

Map Source: Wm. Schutt & Associates, P.C., 37 Central Ave, Lancaster, NY. Survey File: D/01351/03, WSA Proj.#01351.

0 25 50 100

Scale (1"=50')
Graphic Scale in Feet

TITLE

SUBSURFACE VACUUM DISTRIBUTION
28 OCTOBER 2011
GREIF FACILITY-TONAWANDA, NEW YORK

PREPARED FOR
SONOCO PRODUCTS COMPANY

Environmental Resources Management

DRAWN:	JOB NO.:	FILE NAME:	SCALE	FIGURE
EMF	01127477.01	0129254-01-014	GRAPHIC	2
			DATE 15-NOV. 2011	

R:\Scout\Projects\Sonoco - Greif Bros. Facility\CAD\2011\01129254-01-014 October 2011 Vacuum Dist.dwg (11/15/2011 - 11:43am Melville)

Table 1
Summary of Non-Aqueous Phase Liquid Thicknesses in Wells
Greif Facility - Tonawanda, New York
NYSDEC VCP Number V00334-9

WELL	RW-1 (ft.) (DNAPL)	RW-2 (ft.) (DNAPL)	RW-4 (ft.) (DNAPL)	RW-5 (ft.) (LNAPL)	RW-6 (ft.) (DNAPL)	VMP-2 (ft.) (DNAPL)	VMP-5 (ft.) (DNAPL)	MW-20 (ft.) (DNAPL)	MW-23 (ft.) (LNAPL)
Date									
19-May-08	0.00	0.00	0.00	0.00	NI	0.00	HS	0.09	0.14
30-May-08	0.00	0.16	0.00	0.00	NI	0.00	HS	0.03	0.14
16-Jun-08	0.00	0.14	0.00	0.02	NI	0.00	0.02	0.07	0.13
25-Jun-08	0.00	0.16	0.00	0.02	NI	0.00	HS	0.07	0.26
3-Jul-08	0.00	0.16	0.00	0.02	NI	0.00	HS	0.09	0.18
23-Jul-08	0.00	0.16	0.00	0.02	NI	0.00	HS	0.10	0.09
6-Aug-08	0.03	0.16	0.00	0.04	NI	0.00	HS	0.11	0.09
19-Aug-08	0.03	0.16	0.00	0.04	NI	0.00	HS	0.13	0.11
21-Nov-08	HS	0.11	0.00	0.00	NI	0.00	HS	0.22	0.29
17-Dec-08	HS	0.11	0.00	0.00	NI	0.00	HS	0.24	0.29
14-Jan-09	0.00	0.00	0.00	0.00	NI	0.00	0.00	HS	0.13
26-Feb-09	0.00	0.00	0.00	0.00	NI	0.00	0.00	0.01	0.24
12-Mar-09	0.00	0.00	0.00	0.00	NI	0.00	0.00	0.00	0.09
22-Apr-09	0.00	0.00	0.00	0.00	NI	0.00	0.00	0.00	0.11
13-May-09	0.00	0.00	0.00	0.00	NI	0.00	0.00	0.00	0.09
25-Jun-09	NM	0.00	NM	0.00	NI	0.00	0.00	NM	0.12
17-Jul-09	NM	0.00	NM	0.00	NI	0.00	0.00	NM	0.11
27-Aug-09	0.00	0.00	0.00	0.00	NI	0.00	NM	NM	0.09
25-Sep-09	0.00	0.00	0.00	0.00	NM	0.00	NM	0.04	0.11
16-Oct-09	NM	0.00	0.00	0.00	NM	0.00	NM	NM	0.11
19-Nov-09	NM	0.00	NM	NM	NM	0.00	NM	NM	0.21
17-Dec-09	0.00	0.00	NM	NM	NM	0.00	0.00	0.01	0.23
14-Jan-10	0.00	0.00	0.00	NM	NM	0.00	0.00	0.01	0.21
17-Feb-10	0.00	0.00	NM	NM	NM	0.00	0.00	0.01	0.17
18-Mar-10	0.00	0.00	0.00	0.00	NM	0.00	0.00	0.01	0.09
13-Apr-10	0.00	0.00	0.00	0.00	0.49	0.00	0.00	0.01	0.12
18-May-10	0.00	0.00	0.00	0.00	0.53	0.00	NM	0.01	0.08
15-Jun-10	0.00	0.00	0.00	NM	0.01*	0.00	0.00	0.01	0.07
14-Jul-10	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.07
13-Aug-10	0.00	NM	0.00	NM	0.08	0.00	0.00	HS	0.10
14-Sep-10	0.00	NM	0.00	NM	0.04	0.00	0.00	NM	0.06
14-Oct-10	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.01	0.08
22-Nov-10	0.00	0.00	NM	0.00	0.04	0.00	0.00	0.01	0.14
15-Dec-10	0.00	0.00	0.00	NM	0.01	0.00	NM	0.01	0.09
18-Jan-11	0.00	0.00	0.00	NM	HS	0.00	NM	0.02	0.09
21-Feb-11	NM	0.00	0.00	0.00	0.03	0.00	0.00	0.03	0.04
11-Mar-11	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.04	0.03
21-Apr-11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
24-May-11	0.00	0.00	0.00	NM	0.15	0.3	0.00	0.1	0.1
21-June-11	0.00	0.00	0.00	0.00	0.1	0.00	0.00	0.03	0.08
21-July-11	0.00	0.00	0.00	NM	HS	0.00	0.00	0.01	0.06
29-Aug-11	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	HS
26-Sept-11	0.00	NM	0.00	0.00	0.10	0.00	NM	0.04	HS
28-Oct-11	0.00	0.00	NM	0.00	0.03	0.00	0.00	0.02	HS

Notes:

All values are reported in feet as measured with an electronic interface probe.

HS - heavy sheen but no measureable thickness.

NM - not measured; was covered with pallets or other surface obstruction.

NI - not installed as of this date.

* - Product level after ERM initiated DNAPL recovery test

Table 2
Summary of VAcuum/Pressure Readigns
Greif Inc. Tonawanda, NY
NYSDEC VCP Number V00334-9

Location	Vac-01	Vac-02	Vac-03	Vac-04	Vac-05	Vac-06	Vac-07	Vac-08	Vac-09	Vac-10	Vac-11	Vac-12	Vac-13	Vac-14
Date														
16-Jun-10	0.1175	0.1375	0.1375	0	0.1425	0.1625	0.095	0.0325	0	0.10	0.0950	0	NM	0
14-Jul-10	1.65	1.45	0.47	0	0.68	0.46	0.125	0.0525	0	0.1625	0.16	0	0	0
13-Aug-10	1.3	1.25	0.46	0	0.65	0.45	0.135	0.07	0	0.19	0.175	0	0	NM
14-Sep-10	0.8	NM	0.29	0	0.28	0.195	0.055	0.015	0	NM	0.125	0	0	0
14-Oct-10	0.82	0.84	0.29	0	0.28	0.185	0.05	0.015	0	0.1375	0.12	0	0	NM
22-Nov-10	0.29	2.3	0.49	0	0.35	0.28	0.105	0.0025	0	0.155	0.135	0	NM	NM
16-Dec-10	0.26	2.1	0.42	0	0.2	0.14	0.075	0	0	0.13	0.105	0	0	NM
19-Jan-11	0.77	2	0.41	0	0.24	0.18	0.1	NM	0	0.155	0.125	0	NM	0
21-Feb-11	1.35	1.8	0.4	0	NM	0.17	0.1	0	0	NM	0.12	NM	0	0
11-Mar-11	1.8	2.25	0.5	0	NM	0.22	NM	0.01	0	NM	0.12	0	0	NM
21-Apr-11	1.35	2	0.45	0	0.25	0.2	0.1025	0	0	0.155	0.135	0	0	0
24-May-11	2.15	2.05	0.47	0	0.35	0.28	0.1325	0.0275	0	0.1625	0.15	0	NM	0
21-Jun-11	2.05	2.1	0.46	0	0.45	0.4	0.165	0.0575	0	0.19	0.18	0	NM	0
21-Jul-11	2.55	2.25	0.46	0	0.62	0.55	0.2	0.1	0	0.21	0.21	0	0	0
29-Aug-11	2.3	2.2	0.44	0	0.48	0.4	0.155	0.055	0	0.15	0.145	0	0	0
26-Sep-11	1.3	NM	0.46	0	0.44	0.36	0.155	0.06	0	0.1775	0.16	0	0.0025	0
28-Oct-11	1	1.6	0.33	0	0.2125	0.195	0.0925	0.005	0	0.1125	0.1	0	0	0

Location	Vac-15	Vac-16	Vac-17	Vac-18	Vac-19	Vac-20	Vac-21	Vac-22	Vac-23	Vac-24	Vac-25	Vac-26	Vac-27	Vac-28
Date														
16-Jun-10	0	NM	0.0025	0.25	0.42	0.175	0	0.0075	0	0	0.089	0.020	0.005	0.0175
14-Jul-10	0	0	NM	0.31	0.54	0.205	0	0	NM	NM	NM	NM	0.005	0.01
13-Aug-10	0	0	0.0025	0.31	0.52	NM	0	0	0	0	0.08	0.02	0.005	0.025
14-Sep-10	0	0	0	0.165	0.31	0.075	0	0	0	0	0.08	0.015	0.005	0.005
14-Oct-10	NM	0	0	0.18	0.35	0.105	0	0	0	0	0.08	0.015	0.0025	0.005
22-Nov-10	0	0	0	0.2	0.35	0.1	0	0	0	0	0.08	0.02	0.0025	0.0025
16-Dec-10	0	0	0	0.145	0.29	0.08	0	0	0	0	0.055	0.01	0	0.0025
19-Jan-11	0	0	0	0.15	0.29	0.08	0	0	0	0	0.075	0.02	0	0.0075
21-Feb-11	0.005	0	NM	0.18	0.35	NM	0	0.0125	0	0	0.0675	0.035	0.015	0.01
11-Mar-11	0	0	0	0.1875	0.34	0.12	0	0	0	0	0.08	0.0.25	0.01	0.02
21-Apr-11	0	0	0	0.18	0.32	0.105	0	0.01	0	0	0.08	0.0325	0.01	0.0125
24-May-11	0	0	0	0.215	0.36	0.1475	0	0	0	0	0.0775	0.03	0.015	0.0175
21-Jun-11	0	0	NM	0.23	0.39	0.16	0	0	0	0	0.085	0.03	0.02	0.02
21-Jul-11	0	0	NM	0.24	0.39	0.17	0	0.0175	0	0	0.1	0.025	0.02	0.035
29-Aug-11	0	0	NM	0.21	0.32	0.12	0	0	0	0	0.09	0.0225	0.0175	0.02
26-Sep-11	0	0	NM	0.205	0.32	0.12	0.0025	0	0	0	0.0725	0.025	0.0175	0.0175
28-Oct-11	0	0	0	0.15	0.24	0.0525	0	0	0	0	0.08	0.03	0.01	0.01

Table 2
Summary of VAcuum/Pressure Readigns
Greif Inc. Tonawanda, NY
NYSDEC VCP Number V00334-9

Location	Vac-29	Vac-30	Vac-31	Vac-32	Vac-33	Vac-34	Vac-35	Vac-36	Vac-37	Vac-38	Vac-39	Vac-40	Vac-41	Vac-42
Date														
16-Jun-10	0.040	0	0	0.040	0.0675	0.0225	NM	0	0.030	NM	0.025	0.0275	0.0525	0.0025
14-Jul-10	NM	NM	NM	NM	0.125	0.0325	0	0	0	NM	0.03	0.0325	NM	0.005
13-Aug-10	0.0725	0	0.0375	0.0875	0.1625	0.05	0	0	0	0	0.05	0.04	0.0875	0.015
14-Sep-10	0.025	0	0.01	0.03	0.06	0.015	0	0	0	0	0.02	0.0075	0.025	0.0025
14-Oct-10	0.025	0	0.005	0.03	0.055	0.01	0	0	0	0	0.01	0.01	0.025	NM
22-Nov-10	0.015	0	0.0025	0.025	0.065	0.01	0	NM	0	0	0.005	NM	0.015	NM
16-Dec-10	0.02	NM	0.005	0.035	0.055	0.015	0	NM	0	0	0.005	NM	0.0125	NM
19-Jan-11	0.02	NM	0.0075	0.03	0.04	0.015	0	0	0	0	0.01	NM	0.0125	NM
21-Feb-11	0.015	0	0.01	0.035	0.0325	NM	NM	0	0	0.0025	0.015	0.01	0.0175	NM
11-Mar-11	0.02	0	0.02	0.0425	0.0625	0.03	0	0	0	0	0.0225	0.02	0.02	NM
21-Apr-11	0.0175	0	0.01	0.035	0.06	NM	NM	0	0	0	0.01	0.005	0.0125	0
24-May-11	0.0325	0	0.0225	0.0525	0.075	NM	NM	0	0	NM	0.0125	NM	0.035	0
21-Jun-11	0.04	0	0.03	0.075	0.11	0.04	NM	0	0	0	0	0.0225	0.0425	0
21-Jul-11	0.055	0	0.05	0.1025	0.17	0.06	0	0.0125	0	0	0.0325	0.035	0.08	0.0075
29-Aug-11	0.0375	0	0.0325	0.07	0.13	0.0375	0	0	0	0	NM	0.02	0.035	0.05
26-Sep-11	0.045	0	0.03	0.06	0.1175	0.035	0	0	NM	0	0	NM	NM	0.01
28-Oct-11	NM	0	0.0075	0.0375	0.0775	0.0775	NM	0	0	0	0.0075	0.005	0.01	NM

Location	Vac-43	Vac-44	Vac-45	Vac-46	Vac-47	Vac-48	Vac-49	Vac-50	Vac-51	Vac-52	Vac-53
Date											
16-Jun-10	0.0025	0.0425	0.015	0.0125	NM	0.2125	0.0925	0	0.080	0.0125	0.0125
14-Jul-10	0	NM	NM	0.0125	NM	0.21	0.0875	NM	0.8	0.0175	0.0225
13-Aug-10	0	NM	NM	NM	NM	0.22	0.0925	0	0.085	NM	0.0225
14-Sep-10	0	NM	NM	0.0025	NM	0.1275	0.05	0	0.04	0.005	0
14-Oct-10	NM	NM	0	NM	NM	0.11	0.0375	0	0.03	0	0
22-Nov-10	0	NM	0	0	NM	0.135	0.0475	0	0.03	0.0025	0
16-Dec-10	0	0.015	0	0	NM	0.09	0.02	0	NM	0	0
19-Jan-11	0	NM	0	0	NM	0.12	0.035	0	0.03	0.0025	0
21-Feb-11	0	0.0325	0.01	0	0	0.125	0.035	0	0.03	0	0
11-Mar-11	0	NM	0.02	NM	0.005	0.16	0.0575	NM	0.05	0.03	0.01
21-Apr-11	0	NM	0	NM	0	0.1375	0.045	NM	0.025	0	0
24-May-11	0	0.03	0.005	NM	0.0075	0.175	0.06	0	0.055	0.005	0.0125
21-Jun-11	NM	NM	0.0175	NM	0.02	0.195	0.0675	0	0.065	0.0175	0.03
21-Jul-11	0.0125	0.0525	0.0375	0.025	0.035	0.235	0.0875	0	0.07	0.02	0.06
29-Aug-11	0	0.0325	NM	NM	NM	0.185	0.07	0	0.06	0.03	0.09
26-Sep-11	0.0075	NM	0.005	NM	0.0125	0.17	0.07	0	0.055	0.175	0.0325
28-Oct-11	0	0.0075	0	NM	0.0075	0.1225	0.03	0	0.03	0	0.0025

Notes:
- All vacuum and/or pressure readings are reported in inches of water column ("H2O).
NM = not measured; was covered with pallets or other surface obstructions

Table 3
Summary of Treatment System Data
Greif Facility - Tonawanda, New York
NYSDEC VCP Number V00334-9
Page 1 of 2

	Header Vacuum						Header Air Flow					
Location	**PG-101**	**PG-102**	**PG-103**	**PG-104**	**PG-105**	**PG-106**	**PG-101**	**PG-102**	**PG-103**	**PG-104**	**PG-105**	**PG-106**
Units	**" H_2O**	**" H_2O**	**" H_2O**	**" H_2O**	**" H_2O**	**" H_2O**	**cfm**	**cfm**	**cfm**	**cfm**	**cfm**	**cfm**
Date												
17-Dec-09	NF	-11.5	NM	NF	NF	NF	NF	NM	NM	NF	NF	NF
14-Jan-10	NF	-40	NM	NF	NF	NF	NF	94	NM	NF	NF	NF
17-Feb-10	NF	-4.2	NM	NF	NF	NF	NF	16	NM	NF	NF	NF
18-Mar-10	NF	-1.95	NM	NF	NF	NF	NF	15	NM	NF	NF	NF
13-Apr-10	NF	-2.85	-13.0	NF	NF	NF	NF	73	233	NF	NF	NF
18-May-10	NF	-3.95	-13.0	NF	NF	NF	NF	83	212	NF	NF	NF
15-Jun-10	NF	-2.60	-15.5	NF	NF	NF	NF	65	225	NF	NF	NF
14-Jul-10	NM	-1.75	-4.10	NM	NM	NF	NM	26	75	NM	NM	NF
13-Aug-10	-3.75	-1.30	-3.75	-3.70	-3.75	NF	67	19	73	65	82	NF
14-Sep-10	-3.15	-0.85	-3.25	-3.15	-3.2	NF	68	18	74	65	72	NF
14-Oct-10	-3.45	-0.91	-3.50	-3.45	-3.55	NF	70	32	76	66	72	NF
22-Nov-10	-4.05	-0.30	-4.15	-4.00	-4.2	NF	76	14	80	70	82	NF
16-Dec-10	-4.05	-0.30	-4.05	-3.95	-4.05	NF	70	14	85	75	94	NF
19-Jan-11	-3.55	-0.85	-3.60	-3.55	-3.6	NF	82	39	135	92	164	NF
21-Feb-11	-3.4	-1.55	-3.50	-3.40	-3.5	NF	116	36	105	78	144	NF
11-Mar-11	-3.35	-2.00	-3.35	-3.35	-3.4	NF	98	73	65	76	141	NF
21-Apr-11	-3.1	-1.65	-3.10	-3.05	-3.15	NF	97	84	103	106	170	NF
24-May-11	-3.0	-2.60	-3.10	-3.00	-3.10	NF	89.61	53.94	89.61	71.34	87.87	NF
21-Jun-11	-3.0	-2.70	-3.00	-3.00	-3.10	NF	115.71	90.48	106.14	87.87	96.57	NF
21-Jul-11	-3.1	-2.80	-3.20	-3.10	-3.10	NF	113.97	87.00	100.92	80.48	140.07	NF
29-Aug-11	-3.00	-2.90	-3.00	-3.00	-3.00	NF	106.14	69.60	93.09	75.17	100.31	NF
26-Sep-11	-2.90	-1.40	-2.90	-2.90	-2.90	NF	95.70	63.95	105.27	90.48	127.02	NF
28-Oct-11	-2.70	-1.20	-2.80	-2.70	-2.80	NF	63.51	39.67	101.79	86.13	114.84	NF

Location Key

PG-101 = Suction Pits 05, 06, 07 and 08 (pipe 1 of 2).

PG-102 = interior of former varnish pit.

PG-103 = horizontal suction points through former varnish pit's north, west, and south walls.

PG-104 = Suction Pit 05, 06, 07, and 08 (pipe 2 of 2).

PG-105 = Suction Pit 01 and 02.

PG-106 = not connected.

Notes:

- Vacuum and pressure data are reported in inches of water; negative data represent vacuum; positive data represent pressure.
- Air flow data are based on measured air velocity and are reported in cubic feet per minute.
- NM = not measured
- NF = no flow as the piping associated with these measurement locations was not open/ connected at the time of measurment.

Table 3 (Continued)
Summary of Treatment System Data
Greif Facility - Tonawanda, New York
NYSDEC VCP Number V00334-9
Page 2 of 2

	Pre-Carbon			Mid-Carbon		Post-Carbon		
Location	**Pressure**	**Temp**	**PID**	**Temp**	**PID**	**Temp**	**PID**	**Flow**
Units	**" H_2O**	**°F**	**ppm**	**°F**	**ppm**	**°F**	**ppm**	**cfm**
Date								
17-Dec-09	+10.5	103	0.0	98	0.0	67	0.0	120
14-Jan-10	+7.5	114	46.5	102	18.7	91	13.9	73
17-Feb-10	+9.5	114	0.0	111	0.0	99	0.0	88
18-Mar-10	+9.0	115	0.0	108	0.0	98	0.0	98
13-Apr-10	+9.0	118	4.7	109	2.0	98	1.1	225
18-May-10	+8.5	108	3.0	103	2.2	94	1.7	220
15-Jun-10	+10.0	114	3.3	103	0.0	89	0.0	245
14-Jul-10	+11.0	112	5.2	106	4.1	98	1.9	263
13-Aug-10	+10.5	118	2.6	112	2.0	103	1.3	255
14-Sep-10	+13.0	100	2.2	90	1.1	NM	0.5	461
14-Oct-10	+15.5	104	0.3	104	0.0	NM	0.0	475
22-Nov-10	+15.5	102	0.4	97	0.0	94	0.0	490
16-Dec-10	+15.5	94	15.1	89	11.8	88	3.2	493
19-Jan-11	+16.5	94	1.0	88	1.1	86	0.2	516
21-Feb-11	+16	91	0.7	85	0	84	0	462
11-Mar-11	+15.5	97	189	91	69.2	91	5.7	522
21-Apr-11	+22.5	98	1.1	NM	0	97	0	220
24-May-11	+28.5	111	6.3	NM	1.5	104	0	202.71
21-Jun-11	+30	127	4.4	NM	0.7	112	0.1	181.83
21-Jul-11	+41	137	0.0	NM	0.0	120	0.0	175.74
29-Aug-11	+39	132	5.3	NM	0.0	121	0.0	176.61
26-Sep-11	+46	132	1.1	NM	1.0	116	0.0	172.26
28-Oct-11	+46	116	7	NM	4.6	99	0.0	186.18

Notes:

- Vacuum and pressure data are reported in inches of water; negative data represent vacuum; positive data represent pressure.
- Air flow data are based on measured air velocity and are reported in cubic feet per minute.
- Temperature reported in degrees Fahrenheit.
- PID = photoionization detector reading reported in parts per million.
- NM = not measured

TABLE 4
SUMMARY OF VOLATILE ORGANIC COMPOUNDS DETECTIONS IN GROUND WATER
GROUND WATER SAMPLING EVENT 22 AND 23 SEPTEMBER 2011
GREIF FACILITY - TONAWANDA, NEW YORK
NYSDEC VCP NUMBER V00334-9

Sample Designation	MW-1A	MW-3	MW-18	MW-24	MW-25	MW-12	MW-13	DUP-01	MW-14	MW-19	MW-21I	MW-21S	MW-26	RW-5	APW-3	MW-22	VMP-6	NYSDEC
Collection Date	22-Sep-11	22-Sep-11	22-Sep-11	22-Sep-11	22-Sep-11	23-Sep-11	23-Sep-11	23-Sep-11	23-Sep-11	23-Sep-11	23-Sep-11	23-Sep-11	23-Sep-11	23-Sep-11	23-Sep-11	23-Sep-11	23-Sep-11	Standard (µg/L)
VOCs (µg/L)																		
Acetone	----	----	----	----	----	----	**94.0**	**74.0**	----	----	----	----	----	----	----	----	----	50
Benzene	----	----	----	**19.0**	----	----	**5.9**	**5.7**	0.83 J	----	----	----	----	0.83 J	----	----	----	1
2-Butanone	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	5
Chloroethane	----	----	----	----	----	1.8	1.6	1.6	0.70 J	----	----	----	----	**73.0**	----	----	----	5
Chloroform	----	----	----	----	----	1.0	**44**	**41.0**	2.8	----	----	----	----	**59.0**	----	----	----	7
1,1-Dichloroethane	----	----	**20.0**	**15.0**	3.9	**1600**	**11000**	**11000.0**	**2400.0**	----	----	3.0	----	**13000.0**	**2100.0**	**81.0**	**31.0**	5
1,2-Dichloroethane	----	----	----	----	----	**4.0**	----	----	**1.3**	----	----	----	----	----	----	----	----	0.6
1,1-Dichloroethene	----	----	3.3	**9.2**	----	**640**	**20000**	**17000.0**	**1500.0**	----	----	4.2	----	**22000.0**	**580.0**	1.9	----	5
cis-1,2-Dichloroethene	----	----	**5.8**	**2500.0**	**33.0**	**2500**	**13000.0**	**13000.0**	**2200.0**	----	----	4.8	----	**90000.0**	----	1.3	----	5
trans-1,2-Dichloroethene	----	----	----	**19.0**	----	**46**	----	----	**24.0**	----	----	----	----	----	----	----	----	5
Ethylbenzene	----	----	----	1.6	----	----	**19.0**	**18.0**	**9.7**	----	----	----	----	**55.0**	----	----	**1600.0**	5
Methylene chloride	----	----	----	----	----	----	**15.0**	**14.0**	----	----	----	----	----	**20.0**	----	----	----	5
4-Methyl-2-pentanone	----	----	----	----	----	----	13.0	13.0	----	----	----	----	----	56.0	----	----	----	NS
Tetrachloroethene	----	----	----	----	----	----	**6.1**	**6.0**	**7.8**	----	----	----	----	**9.5**	----	----	----	0.7
Toluene	----	----	----	**5.7**	----	----	**15.0**	**14.0**	**16.0**	----	----	----	----	**35.0**	----	----	----	5
1,1,1-Trichloroethane	----	----	**8.1**	----	----	**950**	**48000.0**	**44000.0**	**83.0**	----	----	2.1	----	**120000.0**	**2400.0**	----	----	5
1,1,2-Trichloroethane	----	----	----	----	----	0.77 J	**7.9**	**7.6**	----	----	----	----	----	**25.0**	----	----	----	5
Trichloroethene	----	----	**5.3**	**1800.0**	0.67 J	**920**	**53000.0**	**54000.0**	**57000.0**	----	0.64 J	**170.0**	----	**6700.0**	----	**32.0**	----	5
1,2,4-Trimethylbenzene	----	----	----	----	----	----	**20.0**	**18.0**	----	----	----	----	----	**18.0**	----	----	**180.0**	5
Vinyl chloride	----	----	**3.7**	**1100.0**	**38.0**	**60**	----	----	**5.9**	----	----	----	----	----	----	----	----	2
Xylene (total)	----	----	----	3.2	----	----	**61.0**	**56.0**	**23.0**	----	----	----	----	**240.0**	----	----	**2200.0**	5

NOTES:

All analyte concentrations are reported in micrograms per liter (parts per billion) unless otherwise noted.

----- = Compound was not detected above the laboratory quantitation limit.

Bold = Represents an exceedance of standard for non-estimated results.

J = Indicates an estimated value.

NS= Not Specified

SPECIFICATIONS FOR SUB-SLAB DEPRESSURIZATION SYSTEM
Greif, Inc. Facility - Tonawanda, New York
NYSDEC VCP Site Number V00334-9

BACKGROUND

The Greif, Inc. (Greif) facility is an active industrial Site located in a mixed industrial/commercial/residential area at 2122 Colvin Boulevard in the Town of Tonawanda, Erie County, New York (the Site). The construction of the building at the Site was started in 1948. From 1948 to 1985 the Site was owned and operated by Continental Fiber Drum and Continental Can Corporation. Historical manufacturing operations at this time consisted of the production of fiber drums with associated maintenance, support and administrative activities.

Sonoco Products Company (Sonoco) acquired the Fiber Drum Division in 1985. The major existing manufacturing operations reportedly continued generally unchanged until the early 1990s. Volatile organic compounds (VOCs) were released into soil and ground water at the Site primarily as a result of varnishing and degreasing operations. These activities were discontinued in May 1995.

Environmental assessments were conducted at the Site during a property transfer in 1998 between Sonoco and Greif; several Areas of Concern (AOCs) were identified. The environmental assessments identified several VOCs and semivolatile organic compounds (SVOCs) that were present in soil and ground water in some AOCs at the Site at concentrations above applicable NYSDEC standards, criteria, and guidance (SCGs). The primary VOCs include 1,1,1-trichloroethane (1,1,1-TCA), trichloroethene (TCE), and xylenes.

Environmental activities are being performed at the Site pursuant to a Voluntary Cleanup Agreement (VCA) between Sonoco, Greif, and the New York State Department of Environmental Conservation (NYSDEC). The NYSDEC identified the Site as Voluntary Cleanup Program (VCP) Number V00334-9. ERM Consulting and Engineering, Inc. (ERM) is providing environmental services at the Site on behalf of Sonoco.

A Remedial Investigation (RI) and a follow-up Data Gap Investigation (DGI) were conducted between 2000 and 2003 to further refine the extent of affected soil and ground water at the Site. Based on the results of the RI and DGI, two Interim Remedial Measures (IRMs) were conducted between 2004 and 2008 in the Former Varnish Pit Area (DNAPL Recovery IRM) and the Former Drum Storage Area (Soil Excavation IRM) to address

identified source areas and reduce the mass, toxicity, and mobility of contaminants identified during environmental investigations at the Site. These IRMs were successfully completed with the approval of the NYSDEC.

Subsequent to the completion of the IRMs, a detailed analysis of remedial alternatives was completed in 2009 to further address affected soil and ground water in the following AOCs:

- the Varnish Pit Area; and
- the Former Varnish UST Area.

The results of the detailed analysis of remedial alternatives were presented in a Focused Feasibility Study (FFS) Report (ERM, 2009a). Upon receipt of NYSDEC approval of the FFS Report, a Remedial Action Work Plan (RAWP) was prepared in 2009 outlining the details and approach to implement the NYSDEC-approved remedy for the Site (ERM, 2009b). The approved remedy outlined in the RAWP contained three main components:

- construction of a sub-slab depressurization (SSD) system for the main building;
- in-situ thermal treatment (ISTT) of affected soil in the Former Varnish UST Area; and
- monitored natural attenuation (MNA) of Site ground water.

The proposed remedy of ISTT of affected soil in the Former Varnish UST Area was changed due to new data collected during the construction of the ISTT well network. Details of the change to the selected remedy in the Former Varnish UST Area are outlined in Technical Memorandum: Proposed Change in Selected Remedy dated August 2010 (ERM, 2010). With NYSDEC approval, ERM completed a remedial excavation of the Former Varnish UST Area in May 2011. ERM installed monitoring wells in the Former Varnish UST Area in August 2011 and initiated MNA ground water sampling in September 2011.

Construction of a Pilot SSD system was initiated in the Spring of 2010 and ERM has been collecting data which has been presented to the NYSDEC in Monthly Progress Reports. Details of the final SSD system design are outlined in this report.

SYSTEM OVERVIEW

In Spring 2010, a Pilot SSD system was installed within the building structure to evaluate the potential to mitigate current and potential VOC vapor migration. This system uses a blower to apply a vacuum to suction points installed beneath the building in accordance with the *Remedial Action Work Plan* (ERM, 2009). The SSD system generates a negative pressure field directly beneath the building in relation to the building's ambient air pressure. The negative pressure field acts as a "sink" for air in the vicinity of the structure and facilitates the decrease of migration potential of VOC vapors into the building. The objective of the SSD system is to prevent soil vapor from migrating into the building by creating a minimum sub-slab vacuum of 0.025-inches water column (w.c.) across the building footprint. This vacuum of 0.025-inches w.c. is derived from ASTM E2121-09 *Standard Practice for Installing Radon Mitigation Systems in Existing Low-Rise Residential Buildings*; it is designed to maintain a negative pressure (i.e., vacuum) beneath the slab when the building is sealed, and exhaust fans are operating. However, the influence of the SSD system extends beyond the 0.025-inch w.c. goal. If measureable vacuum is obtained during such conditions, the SSD will be considered to be effectively influencing that area.

The SSD system is not intended to act as a remediation solution for soil or ground water beneath the building, however, VOC mass removal is a secondary effect and benefit of the system.

PILOT STUDY RESULTS

Initial pilot testing was conducted on 14 June through 22 June 2010. System parameters were modified as deemed appropriate based on the results of routine operations and maintenance monitoring performed subsequent to the initial pilot testing. The testing was performed to obtain design parameters for a full-scale system including:

- number and placement of suction points;
- vacuum coverage under the building slab with the existing system;
- vacuum radius of influence at individual suction points; and
- vacuum and flow rate of the blower.

Eight pilot test suction points (SP-01 thru SP-08) were installed and 53 vacuum measurement points (VAC-01 thru VAC-53) were drilled at varying distances from the test suction points (Figure 1). In addition, four suction points were installed at the varnish pit (three outside the pit and one inside the pit); each suction point consists of a short length of PVC

well screen. Suction points SP-03 and SP-04 each have their own radon-type in-line fan (Fantech HP220), and operate independently of the rest of the system. The other six points are manifolded together and are connected to the same blower (Figure 3).

Prior to conducting the pilot test, a set of baseline vacuum measurements beneath the floor slab were obtained while the blower and fans were offline. During pilot testing, sub-slab vacuum measurements were obtained at each measurement point at different levels of applied blower vacuum for each individual suction point (manifolded points were isolated during this portion of the test). For SP-03 and SP-04 connected to the in-line fans, only one test was conducted with the fans operating at full-speed. Table 1 details all vacuum measurements collected during this phase of the pilot test. In addition to the isolated measurements, data were also collected while extracting from all suction points. Tables 2 and 3 detail all vacuum measurements collected during the combined pilot test.

Pilot test results determined that the current blower and fans operating at their maximum capacity would generate the target sub-slab vacuum of 0.025-inches w.c. across approximately 65% of the building footprint. As shown in Figure 1, there is greater subsurface vacuum distribution in the western portion of the building, which is also the primary location of the source of VOCs (the former varnish pit). Pilot testing was also conducted at individual suction points. During these tests, vacuum was increased to levels greater than what was applied during the applied testing. At these increased levels, the vacuum response was not found to increase significantly beyond what was observed at the lower vacuums. Therefore, an increase in blower size alone will likely not effectively increase vacuum response across the building footprint. Additional suction points in areas of little to no vacuum response, along with a possible increase in blower size, will be needed to increase the extent of vacuum distribution.

This information, as well as information gathered on the building layout, was used to evaluate the final SSD system design. Figure 2 shows the proposed locations chosen for the new SSD system suction points and each corresponding estimated radius of influence. Also shown are eight newly-proposed measurement points in order to measure vacuum influence in the vicinity of the new suction points. These points will also aid in the analysis of the vacuum distribution, and the evaluation of the need for a larger blower.

During the pilot test, one grab sub-slab vapor sample was collected from the following locations and analyzed for VOCs by United States Environmental Protection Agency (USEPA) Method TO-17:

- suction point SP-03 in the boiler room;
- suction point SP-04 in the boiler;
- suction point SP-06;
- exterior of the varnish pit (PG-103);
- sample port SP-503 - Combined influent from all suction points (except SP-03 and SP-04);
- combined vapors after treatment by the primary carbon vessel; and
- combined vapors after treatment by both carbon vessels.

Results indicated that the maximum VOC concentrations occurred at test point PG-103 (exterior of the varnish pit). The analytical results from the combined influent were used to evaluate if it would be necessary to treat the extracted vapor prior to emission to ambient air through the exhaust stack. Air emission calculations for the proposed SSD system based on these air concentrations are discussed below in the section entitled "Activated Carbon". Laboratory analytical results from the pilot study are included in Appendix A and are summarized in Table 4.

EXISTING & PROPOSED SYSTEM COMPONENTS

Figures 2 and 3 present the location of the system components in relation to the current building layout as well as the location of proposed piping and suction points. The existing system constructed for the pilot test consists of the following elements which are discussed in further detail below:

- eight sub-slab suction points (SP-01 thru SP-08) measuring up to 1-foot by 1-foot by 1-foot, piping and manifold;
- three suction points outside the varnish pit, and one point inside the varnish pit, consisting of short lengths of slotted pipe;
- one regenerative blower;
- two in-line radon-type fans;
- two vapor granular activated carbon drums;
- three exhaust stacks consisting of four-inch schedule 40 PVC piping; and,
- supporting equipment, instrumentation, utilities and power.

In order to provide greater coverage in the central part of the building as requested by the NYSDEC and the New York State Department of Health (NYSDOH), three new suction points will be installed and connected as shown in Figure 2.

Suction Point Installation and Piping

In addition to the suction points associated with the varnish pit, eight sub-slab suction points were installed at the locations shown in Figure 1. The suction points were installed inside and outside of the varnish pit to provide sub-slab depressurization in this area of elevated VOCs. The other eight suction points were installed to provide for coverage across much of the building footprint. The current suction point network and existing blowers provide coverage of approximately 65% of the building footprint (relative to the 0.025-inch w.c. goal) with the greatest gap in the coverage being located in the middle of the building. Three new suction points are being proposed within this area in order to fill in the gap. The spacing of these suction points was established based on subsurface conditions measured during the pilot testing as well as the current building floor plan. An average of the nearest suction points' influence radii was utilized to approximate the projected influence radii of the three proposed suction points SP-09 thru SP-11 (Figure 2). With the addition of the proposed points, it is estimated that 85% coverage of the building footprint will be obtained relative to the 0.025-inch w.c. goal (the total area of influence is greater as it extends to any area where vacuum is measureable). The proposed extent is considered to be technically practicable given the location of source areas, existing site conditions and operations, and building layout.

The expansion of vacuum depressurization beneath the facility's office space and cafeteria on the eastern side of the building is currently not proposed due to the results of the vapor intrusion evaluation in this area which suggested that vapor mitigation may not be required in the eastern portion of the facility (ERM, 2009c). Additionally, the currently-existing SSD system installed subsequent to the vapor intrusion investigation performed in 2009 may promote migration of sub-slab vapors, if any, away from the office and cafeteria areas. ERM proposes to evaluate this approach through the collection of co-located sub-slab and indoor air samples in the office space and cafeteria areas of the building. These samples will be collected during pilot testing to be performed subsequent to the installation of the three new suction points in the central portion of the facility.

Figure 2 shows a layout of the suction points to be installed in the Property's currently existing concrete floor as well as their projected influence radii. All points will be placed adjacent to building columns or structures to minimize the necessity for horizontal piping out of the suction points. Suction points will be installed in accordance with the *Remedial Action Work Plan* and will generally match the existing pilot test suction points.

SSD Blower

As stated in the Remedial Action Work, the goal of the full-scale SSD system is to achieve a minimum sub-slab vacuum of 0.025 in. w.c. across the building footprint to the extent practicable. As discussed in the System Overview, this vacuum is designed to maintain a negative pressure (i.e., vacuum) beneath the slab when the building is sealed, and exhaust fans are operating. If measureable vacuum is obtained during such conditions, the SSD will be considered to be effectively influencing that area. If the results of the pilot test indicate that achieving measureable vacuum across the entire building is not practicable, alternatives may be considered if required.

Based on the results of the pilot test, the blower operates at a vacuum of 66 in. WC and a flow rate of 325 cfm when extracting from the varnish pit and SP-01, SP-02, & SP-05 thru SP-08. At these operating conditions, the target sub-slab vacuum was achieved across 65% of the building. It was observed however that as the applied vacuum increased, there was little to no gain in influence at the measurement points. Therefore, increasing the blower's size would not appreciably increase vacuum response. Subsequently the reverse may hold true that the decrease in pressure at existing points due to the redistribution of flow by adding three new points may not reduce the coverage from those existing points significantly. It is possible that the existing blower may generate sufficient building coverage but this cannot be determined until after installing the new points and field testing the new system for vacuum distribution. If it is determined during the field testing that the influence has decreased significantly at the existing points, then a new, larger blower will be specified in a revision of this document.

The blower is part of a soil vapor extraction trailer parked within the treatment building outside the Property's main building as detailed in Figures 1, 2, and 3. The treatment building is a locked enclosure measuring approximately 24-feet wide by 32-feet long by 10-feet high with a ventilation and heating system that will contain all remediation system equipment including the carbon vessels (see below).

Activated Carbon

Air emission calculations were performed to evaluate if remediation is needed on the extracted vapor prior to emission through the exhaust stack. Calculations were performed using the DAR-1 Air Guide 1 Ambient Air Quality Impact Screening Analysis developed by the NYSDEC. The model uses the concentrations of all VOCs detected at the

combined influent (i.e., SP-01 through SP-08 and the vapors extracted from the former varnish pit) and, the concentrations and flow rates from SP-03 and SP-04 (i.e., the separate points in the boiler room). Both the Basic Cavity Impact Analysis and the Point Source Method were run for the proposed system. Results of the Point Source method indicate that the Maximum Potential Annual Impact will exceed NYSDEC published guidelines for TCE only if the combined flow rate exceeds 795 cfm from the varnish pit, SP-01, SP-02, and SP-05 thru SP-08. The existing blower operates at approximately 325 cfm; thus air treatment is not necessary for the extracted vapor. The existing activated carbon treatment will continue to be provided until the final system can be tested with the additional points. The modeling spreadsheets are included in Appendix B.

OPERATION AND MAINTENANCE

The SSD system will be operated and maintained over the long term as an on-going engineering control following remediation. On a monthly basis, the SSD system will be visited to ensure the proper operation of the SSD system. The following activities will typically be performed:

- visual inspection of the complete system (e.g., vent fan, piping, warning device, labeling on systems, etc.);
- identification and repair of leaks;
- inspection of the exhaust or discharge point to verify no air intakes have been located nearby;
- collection of field VOC measurements from the outlet of the blower and all activated carbon vessels to assess the need to change the carbon; and
- change-out of the carbon emission controls.

Once the final operating scenario is in place (i.e., either the existing blower can achieve the necessary sub-slab vacuum, or a new blower is installed), air samples from the following locations will be collected:

- SP-03 exhaust;
- SP-04 exhaust;
- SP-503 - combined influent from all suction points (except SP-03 and SP-04);
- combined vapors after treatment by the primary carbon vessel; and
- combined vapors after treatment by both carbon vessels.

Samples will be collected approximately 15 days after system start-up and will be analyzed for VOCs using USEPA Method TO-15 or TO-17. The data will be utilized with the NYSDEC DAR-1 Ambient Air Quality

Impact Screening Analyses to assess the need for continued air emission controls. If the screening shows that air emission controls are no longer necessary, the activated carbon vessels will be taken offline. The NYSDEC Project Manager will be notified in writing prior to removal of any emission controls. After this initial sampling event, samples will be collected on a semi-annual basis from the outlet of the blower and fans, as well as the carbon vessels (if still in use). These samples will be used to determine if VOC concentrations are decreasing in the subsurface. If activated carbon is in use, these data also will be evaluated following the DAR-1 emissions analyses to determine if the carbon is still necessary.

An annual certification of the SSD system operation will be submitted to the NYSDEC. This certification will be prepared and submitted by a professional engineer registered in New York State to affirm that the engineering controls are in place and nothing has occurred that would impair the ability of such controls to protect the public health and environment, or constitute a violation or failure to comply with any Operations, Maintenance, and Monitoring (OM&M) Plan for such controls.

The SSD system will continue to operate until it is demonstrated to the NYSDEC that the system is no longer necessary based on sub-slab vapor concentrations.

REFERENCES AND RESOURCES

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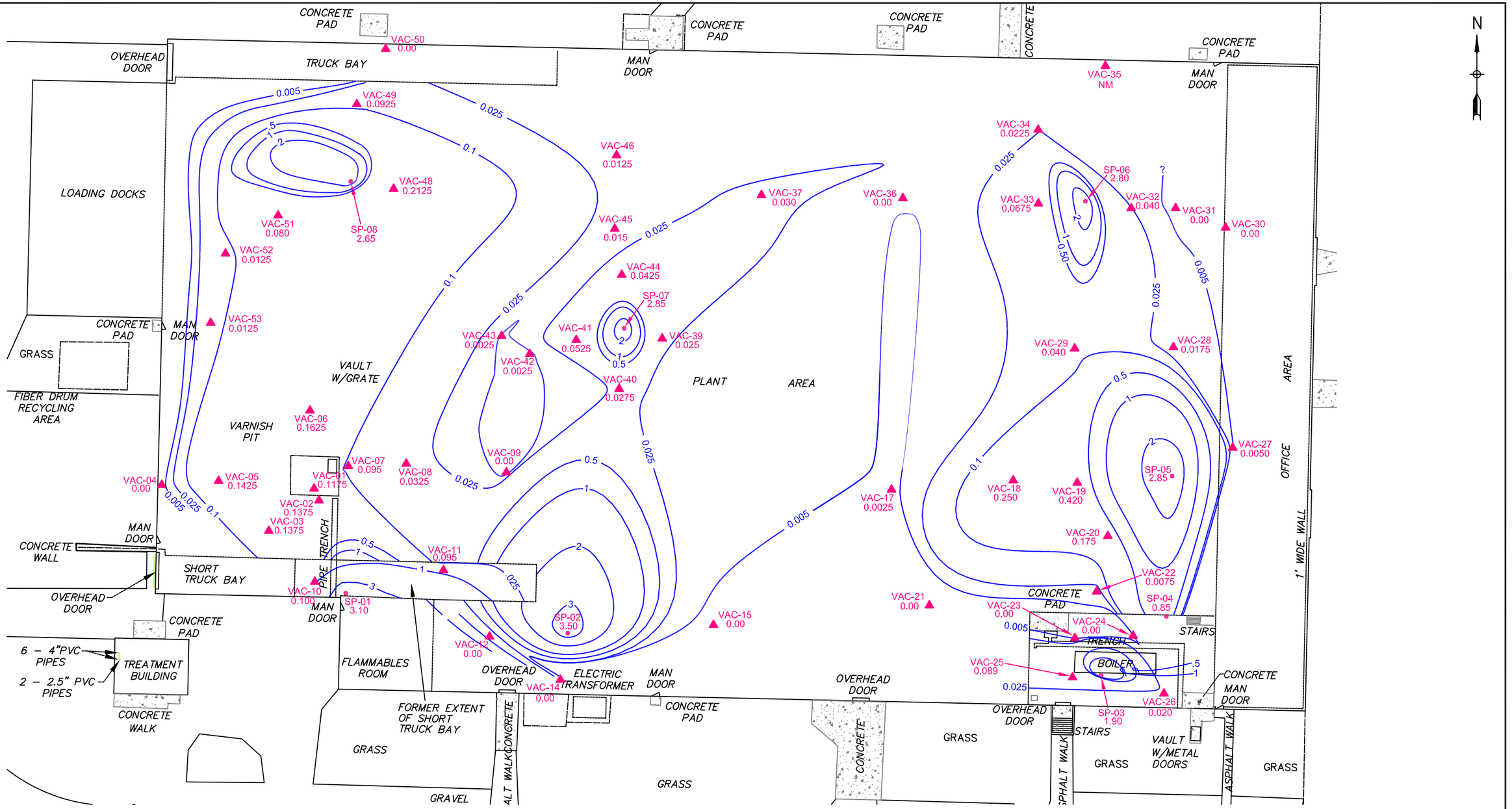
FIGURES

Figure 1 – Pilot Study Layout & Subsurface Vacuum Response (16 June 2010)

Figure 2 – Proposed SSDS Layout & Projected Subsurface Vacuum Response

Figure 3 – Proposed SSDS Piping



LEGEND

- Suction Point Location
- 0.040 — Vacuum Monitoring Point Location (with measured vacuum in " H_2O)
- NM — Not Measured
- 0.5 — Vacuum Contour (" H_2O)
- Former Varnish Pit

NOTES:

1. " H_2O = inches of water column

Map Source: Wm. Schutt & Associates, P.C., 37 Central Ave, Lancaster, NY. Survey File: D/01351/03, WSA Proj.#01351.

0 20 30 40 60 80

SCALE: 1"=20'
GRAPHIC SCALE IN FEET

TITLE

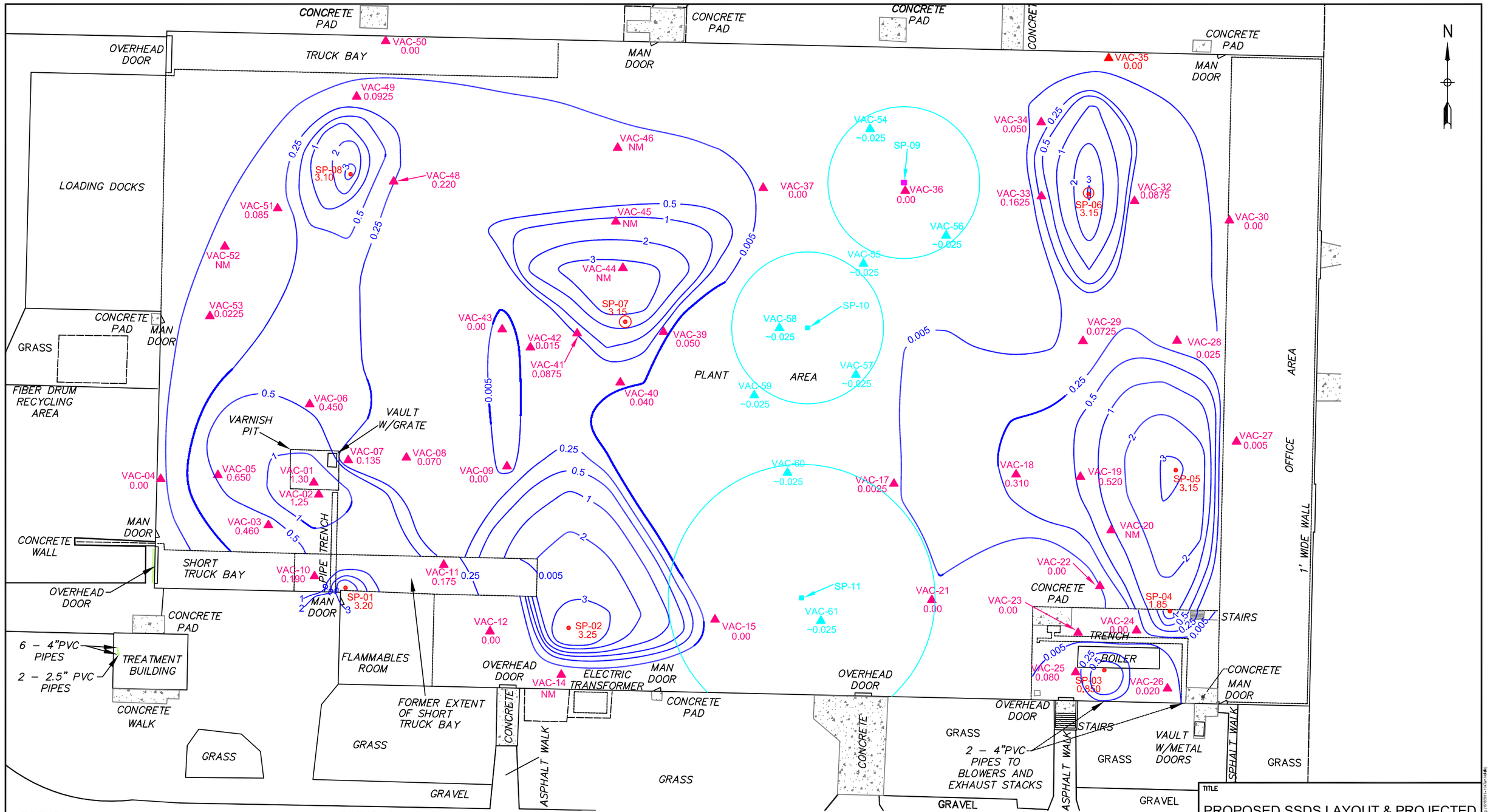
PILOT STUDY LAYOUT & SUBSURFACE VACUUM RESPONSE (16 JUNE 2010) GREIF FACILITY-TONAWANDA, NEW YORK

PREPARED FOR

SONOCO PRODUCTS COMPANY

Environmental Resources Management

DRAWN:	JOB NO.:	FILE NAME:	SCALE	DATE	FIGURE
EMF	0112477.01	0112477-01-008	GRAPHIC	18-Oct-2010	1



LEGEND

- Suction Point Location
- Proposed Suction Point Location
- 0.040 — Vacuum Monitoring Point Location (with measured vacuum in " H_2O)
- ~0.025 — Proposed Vacuum Monitoring Point Location (with anticipated vacuum in " H_2O)
- NM — Not Measured

LEGEND (Continued)

- 0.5 — Vacuum Contour (" H_2O) 13 August 2010
- Former Varnish Pit
- Projected Vacuum Contour (min 0.025" H_2O)

NOTES:

1. " H_2O = inches of water column

Map Source: Wm. Schutt & Associates, P.C., 37 Central Ave, Lancaster, NY, Survey File: D/01351/03, WSA Proj#01351,

0 20 30 40 60 80

GRAPHIC SCALE IN FEET

TITLE

PROPOSED SSDS LAYOUT & PROJECTED SUBSURFACE VACUUM RESPONSE GREIF FACILITY-TONAWANDA, NEW YORK

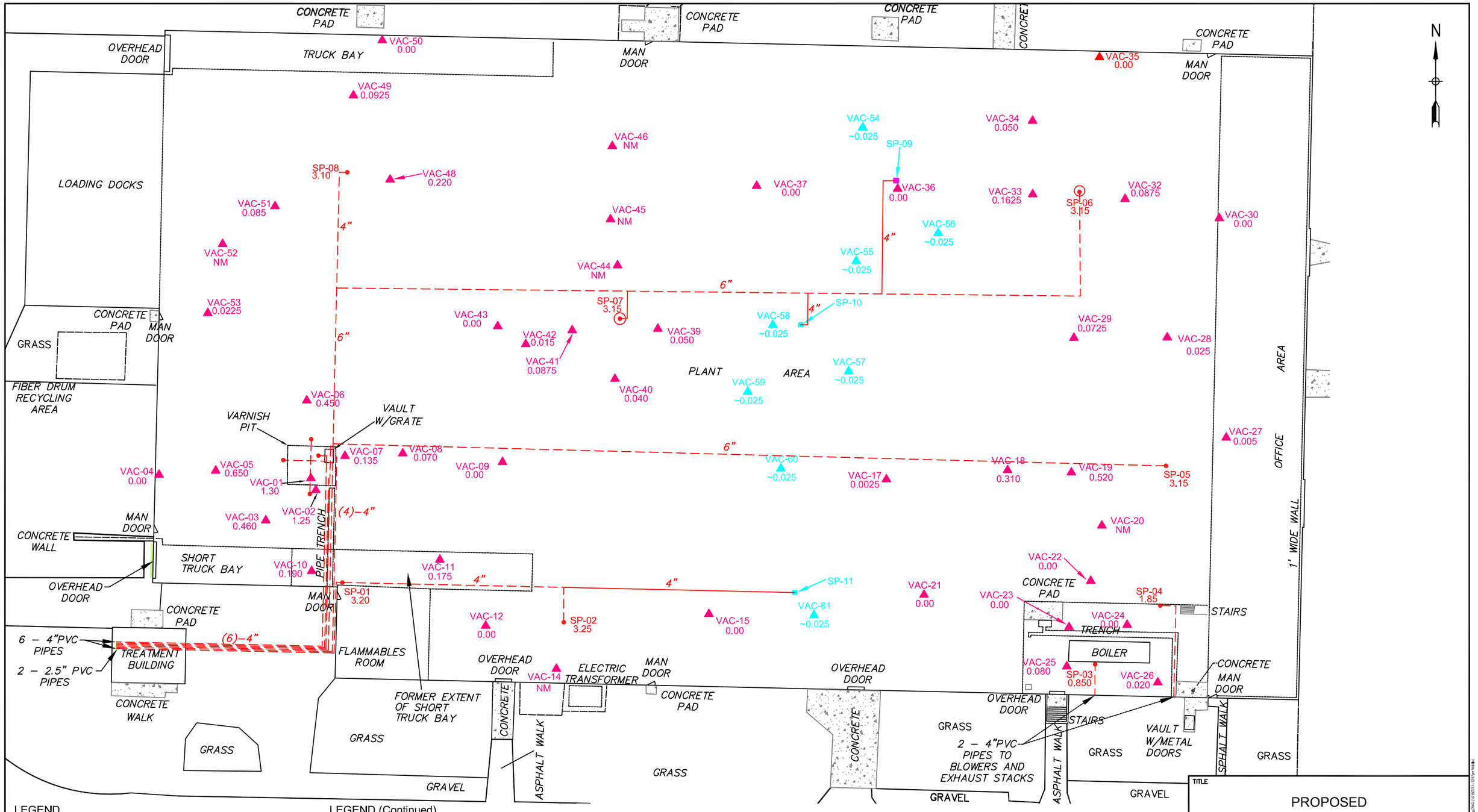
PREPARED FOR

SONOCO PRODUCTS COMPANY

Environmental Resources Management

DRAWN:	JOB NO.:	FILE NAME:	SCALE	FIGURE
JMC	0112477.01	0112477-01-010 R	GRAPHIC	2

DATE: 18-Oct-2011



LEGEND

- Suction Point Location
- Proposed Suction Point Location
- 0.040 — Vacuum Monitoring Point Location (with measured vacuum in " H_2O)
- ~0.025 — Proposed Vacuum Monitoring Point Location (with anticipated vacuum in " H_2O)
- NM — Not Measured

LEGEND (Continued)

- Proposed SSD Piping (Schedule 40 PVC Piping)
- Existing SSD Piping (Schedule 40 PVC Piping)
- Former Varnish Pit

NOTES:

1. " H_2O = inches of water column

Map Source: Wm. Schutt & Associates, P.C., 37 Central Ave, Lancaster, NY; Survey File: DI01351/03, WSA Proj.#01351.

TITLE

PROPOSED SSDS PIPING GREIF FACILITY-TONAWANDA, NEW YORK

PREPARED FOR

SONOCO PRODUCTS COMPANY

ERM Environmental Resources Management

DRAWN:	JOB NO.:	FILE NAME:	SCALE	FIGURE
JMC/EMF	012954.01	012954-01-009	GRAPHIC	3

DATE: 18-Oct-2011

TABLES

Table 1
SSD System Pilot Study Vacuum and Treatment System Data
Greif Inc. Tonawanda, NY
NYSDEC VCP Number V00334-9

Pilot Study Vacuum Data				
Sampling Location	**Background**	**SP-01**	**SP-01**	**SP-01**
Operating Scenario	**1**	**2**	**3**	**4**
Flow Speed	*Static	low flow	medium flow	max flow
Date/Time Sampled	14-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10
Suction Point PID (ppm)	—	0	0	0
Suction Point Vacuum ("H_2O)	—	5	11.5	15.5
[1]Suction Point Velocity (fpm)	—	1130	1690	1930
Flow Rate (cfm)	—	224.17	335.26	382.87
Measurement Point I.D.				
VAC-01	0.00	0.00	0.00	0.00
VAC-02	0.00	covered	covered	covered
VAC-03	0.00	0.00	0.00	0.00
VAC-04	0.00	0.00	0.00	0.00
VAC-07	0.00	0.00	0.00	0.00
VAC-08	0.00	0.00	0.00	0.00
VAC-09	0.00	0.00	0.00	0.00
VAC-10	0.00	0.1625	0.31	0.420
VAC-11	0.00	0.1475	0.28	0.390
VAC-12	0.00	0.00	0.00	0.00
Treatment System Data				
Parameter	Unit			
Headers				
Vacuum @ PG-105	"H_20	8.2	15	20
[2]Air Velocity @ PG-105	fpm	1210	1740	2180
Flow Rate	cfm	105.48	151.68	190.03
Vacuum @ PG-101	"H_20	—	—	—
[2]Air Velocity @ PG-101	fpm	—	—	—
Flow Rate	cfm	—	—	—
Panel				
Building Temp	^oF	80.6	80.8	78.1
LEL	%	5	5	5
Knock-out Pot				
Vacuum	"H_20	16	24	29
Blower				
Temp in	^oF	81	80	78
Vacuum pre-filter	"H_20	21	28	32
Vacuum post-filter	"H_20	66	66	66
Temp out	^oF	135	122	123

Notes:

*static = indicates treatment system blower was turned off

low flow = dilution valve open 100%

medium flow = dilution valve open 50%

max flow = dilution valve open 25%

ppm = parts per million

— = not measured

"H_2O = inches of water column

fpm = feet per minute

cfm = cubic feet per minute

LEL = Lower Explosion Limit

^oF = degrees Fahrenheit

[1] = 6" pipe diameter

[2]= 4" pipe diameter

Table 1 (continued)
SSD System Pilot Study Vacuum and Treatment System Data
Greif Inc. Tonawanda, NY
NYSDEC VCP Number V00334-9

Carbon System				
Operating Scenario	**1**	**2**	**3**	**4**
Pre-carbon Pressure	"H_20	13.5	9	9
Pre-carbon Temperature	^oF	129	127	125
Pre-carbon PID reading	ppm	0.0	0.0	0.0
Pre-carbon Relative Humidity	%	35.5	42	30.9
[2]Pre-carbon Air Velocity	fpm	2720	2600	3180
Flow Rate	cfm	539.59	515.79	630.85
Mid-carbon Pressure	"H_20	7	4	3
Mid-carbon Temperature	^oF	129	118	115
Mid-carbon PID reading	ppm	0.0	0.0	0.0
Mid-carbon Relative Humidity	%	27.7	35.5	41.3
[2]Mid-carbon Air Velocity	fpm	278	2800	2680
Flow Rate	cfm	55.15	555.46	531.66
Post-carbon Pressure	"H_20	0.32	0.38	0.30
Post-carbon Temperature	^oF	110	114	113
Post-carbon PID reading	ppm	0.0	0.0	0.0
Post-carbon Relative Humidity	%	28.5	35.4	38.9
[2]Post-carbon Air Velocity	fpm	1150	995	1120
Flow Rate	cfm	228.14	197.39	222.19

Notes:

*static = indicates treatment system blower was turned off

low flow = dilution valve open 100%

medium flow = dilution valve open 50%

max flow = dilution valve open 25%

ppm = parts per million

— = not measured

"H_2O = inches of water column

fpm = feet per minute

cfm = cubic feet per minute

LEL = Lower Explosion Limit

^oF = degrees Fahrenheit

[1] = 6" pipe diameter

[2]= 4" pipe diameter

Table 1
SSD System Pilot Study Vacuum and Treatment System Data
Greif Inc. Tonawanda, NY
NYSDEC VCP Number V00334-9

Pilot Study Vacuum Data				
Sampling Location	**Background**	**SP-02**	**SP-02**	**SP-02**
Operating Scenario	**4**	**5**	**6**	**7**
Flow Speed	*Static	low flow	medium flow	max flow
Date/Time Sampled	15-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10
Suction Point PID (ppm)	—	0.0	0.0	0.0
Suction Point Vacuum ("H_2O)	—	11	28.5	45.0
[1]Suction Point Velocity (fpm)	—	10.6	250	360
Flow Rate (cfm)	—	2.10	49.60	71.42
Measurement Point I.D.				
VAC-09	0.00	0.00	0.00	0.00
VAC-11	0.00	0.00	0.00	0.00
VAC-12	0.00	0.00	0.00	0.00
VAC-13	covered	covered	covered	covered
VAC-14	0.00	covered	covered	covered
VAC-15	0.00	0.00	0.00	0.00
VAC-16	0.00	0.00	0.00	0.00
Treatment System Data				
Parameter	Unit			
Headers				
Vacuum @ PG-105	"H_20	13	30.5	48
[2]Air Velocity @ PG-105	fpm	815	1250	525
Flow Rate	cfm	71.04	108.96	45.76
Vacuum @ PG-101	"H_20	—	—	—
[2]Air Velocity @ PG-101	fpm	—	—	—
Flow Rate	cfm	—	—	—
Panel				
Building Temp	°F	77.4	76.5	79.3
LEL	%	5	5	5
Knock-out Pot				
Vacuum	"H_20	22	39	50
Blower				
Temp in	°F	79	70	2
Vacuum pre-filter	"H_20	26	42	56
Vacuum post-filter	"H_20	66	66	66
Temp out	°F	121	125	147

Notes:

*static = indicates treatment system blower was turned off

low flow = dilution valve open 100%

medium flow = dilution valve open 50%

max flow = dilution valve open 25%

ppm = parts per million

— = not measured

"H_2O = inches of water column

fpm = feet per minute

cfm = cubic feet per minute

LEL = Lower Explosion Limit

°F = degrees Fahrenheit

[1] = 6" pipe diameter

[2]= 4" pipe diameter

Table 1 (continued)
SSD System Pilot Study Vacuum and Treatment System Data
Greif Inc. Tonawanda, NY
NYSDEC VCP Number V00334-9

Carbon System				
Operating Scenario	**4**	**5**	**6**	**7**
Pre-carbon Pressure	"H_20	12.5	10.5	8.5
Pre-carbon Temperature	^oF	127	125	142
Pre-carbon PID reading	ppm	0.0	0.0	0.0
Pre-carbon Relative Humidity	%	23.1	30.5	22
[2]Pre-carbon Air Velocity	fpm	2970	1950	1790
Flow Rate	cfm	258.89	169.98	156.03
Mid-carbon Pressure	"H_20	6.5	6	5
Mid-carbon Temperature	^oF	119	124	125
Mid-carbon PID reading	ppm	0.0	0.0	0.0
Mid-carbon Relative Humidity	%	29.2	36.0	31.8
[2]Mid-carbon Air Velocity	fpm	2820	2310	1750
Flow Rate	cfm	245.82	201.36	152.55
Post-carbon Pressure	"H_20	0.25	0.18	0.24
Post-carbon Temperature	^oF	102	105	109
Post-carbon PID reading	ppm	0.0	0.0	0.0
Post-carbon Relative Humidity	%	24.5	28.5	31.5
[2]Post-carbon Air Velocity	fpm	980	925	875
Flow Rate	cfm	85.43	80.63	76.27

Notes:
*static = indicates treatment system blower was turned off
low flow = dilution valve open 100%
medium flow = dilution valve open 50%
max flow = dilution valve open 25%
ppm = parts per million
— = not measured
"H_2O = inches of water column
fpm = feet per minute
cfm = cubic feet per minute
LEL = Lower Explosion Limit
^oF = degrees Fahrenheit
[1] = 6" pipe diameter
[2]= 4" pipe diameter

Table 1
SSD System Pilot Study Vacuum Data - Boiler Room
Greif Inc. Tonawanda, NY
NYSDEC VCP Number V00334-9

Pilot Study Vacuum Data				
Sampling Location	**Background**	**SP-03**	**SP-03**	**SP-03**
Operating Scenario	**8**	**9**	**10**	**11**
Flow Speed	*Static	low flow	medium flow	max flow
Date/Time Sampled	15-Jun-10	—	—	22-Jun-10
Suction Point PID (ppm)	—	—	—	0.0
Suction Point Vacuum ("H_2O)	—	—	—	0.85
[1]Suction Point Velocity (fpm)	—	—	—	1060
Flow Rate (cfm)	—	—	—	92.40
Measurement Point I.D.				
VAC-23	0.00	—	—	0.00
VAC-24	0.00	—	—	0.00
VAC-25	0.00	—	—	0.075
VAC-26	0.00	—	—	0.0175

Notes:
*static = indicates treatment system blower was turned off
low flow = dilution valve open 100%
medium flow = dilution valve open 50%
max flow = dilution valve open 25%
ppm = parts per million
— = not measured
"H_2O = inches of water column
fpm = feet per minute
cfm = cubic feet per minute
[1]= 4" pipe diameter

Table 1
SSD System Pilot Study Vacuum Data - Boiler Room
Greif Inc. Tonawanda, NY
NYSDEC VCP Number V00334-9

Pilot Study Vacuum Data				
Sampling Location	**Background**	**SP-04**	**SP-04**	**SP-04**
Operating Scenario	**12**	**13**	**14**	**15**
Flow Speed	*Static	low flow	medium flow	max flow
Date/Time Sampled	15-Jun-10	—	—	22-Jun-10
Suction Point PID (ppm)	—	—	—	0.0
Suction Point Vacuum ("H_2O)	—	—	—	1.9
[1]Suction Point Velocity (fpm)	—	—	—	184
Flow Rate (cfm)	—	—	—	16.04
Measurement Point I.D.				
VAC-23	0.00	—	—	0.00
VAC-24	0.00	—	—	0.00
VAC-25	0.00	—	—	0.00
VAC-26	0.00	—	—	0.00

Notes:
*static = indicates treatment system blower was turned off
low flow = dilution valve open 100%
medium flow = dilution valve open 50%
max flow = dilution valve open 25%
ppm = parts per million
— = not measured
"H_2O = inches of water column
fpm = feet per minute
cfm = cubic feet per minute
[1]= 4" pipe diameter

Table 1
SSD System Pilot Study Vacuum and Treatment System Data
Greif Inc. Tonawanda, NY
NYSDEC VCP Number V00334-9

Pilot Study Vacuum Data				
Sampling Location	**Background**	**SP-05**	**SP-05**	**SP-05**
Operating Scenario	**16**	**17**	**18**	**19**
Flow Speed	*Static	low flow	medium flow	max flow
Date/Time Sampled	15-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10
Suction Point PID (ppm)	—	0.0	0.0	0.0
Suction Point Vacuum ("H_2O)	—	8.0	15.5	28.5
[1]Suction Point Velocity (fpm)	—	845	1150	1540
Flow Rate (cfm)	—	167.63	228.14	305.51
Measurement Point I.D.				
VAC-17	0.00	0.015	0.0175	0.035
VAC-18	0.00	0.490	0.76	1.05
VAC-19	0.00	0.880	1.45	2.05
VAC-20	0.00	0.340	0.57	0.79
VAC-21	0.00	0.00	0.00	0.00
VAC-22	0.00	0.00	0.0025	0.00
Treatment System Data				
Parameter	Unit			
Headers				
Vacuum @ PG-104	"H_20	8	18.5	30
[2]Air Velocity @ PG-104	fpm	815	785	915
Flow Rate	cfm	71.04	68.43	79.76
Vacuum @ PG-101	"H_20	9	11.5	30
[2]Air Velocity @ PG-101	fpm	1090	1430	905
Flow Rate	cfm	95.02	124.65	78.89
Panel				
Building Temp	^oF	72.5	73.3	75.7
LEL	%	5	5	5
Knock-out Pot				
Vacuum	"H_20	19	28	39
Blower				
Temp in	^oF	75	75	77
Vacuum pre-filter	"H_20	23	31	42
Vacuum post-filter	"H_20	66	66	66
Temp out	^oF	112	118	126

Notes:

*static = indicates treatment system blower was turned off

low flow = dilution valve open 100%

medium flow = dilution valve open 50%

max flow = dilution valve open 25%

ppm = parts per million

— = not measured

"H_2O = inches of water column

fpm = feet per minute

cfm = cubic feet per minute

LEL = Lower Explosion Limit

^oF = degrees Fahrenheit

[1] = 6" pipe diameter

[2]= 4" pipe diameter

Table 1 (continued)
SSD System Pilot Study Vacuum and Treatment System Data
Greif Inc. Tonawanda, NY
NYSDEC VCP Number V00334-9

Carbon System				
Operating Scenario	**16**	**17**	**18**	**19**
Pre-carbon Pressure	"H_20	11	11.5	105
Pre-carbon Temperature	^oF	119	120	129
Pre-carbon PID reading	ppm	0.0	0.0	0.0
Pre-carbon Relative Humidity	%	34.1	34.7	32.9
[2]Pre-carbon Air Velocity	fpm	3450	2680	2510
Flow Rate	cfm	300.74	233.62	218.80
Mid-carbon Pressure	"H_20	5	6.5	5
Mid-carbon Temperature	^oF	111	110	125
Mid-carbon PID reading	ppm	0.0	0.0	0.0
Mid-carbon Relative Humidity	%	43.6	43.4	45.6
[2]Mid-carbon Air Velocity	fpm	3220	2980	2490
Flow Rate	cfm	280.69	259.77	217.05
Post-carbon Pressure	"H_20	0.36	0.34	0.29
Post-carbon Temperature	^oF	100	100	101
Post-carbon PID reading	ppm	0.0	0.0	0.0
Post-carbon Relative Humidity	%	42.5	29.0	291
[2]Post-carbon Air Velocity	fpm	1060	1060	995
Flow Rate	cfm	92.40	92.40	86.73

Notes:
*static = indicates treatment system blower was turned off
low flow = dilution valve open 100%
medium flow = dilution valve open 50%
max flow = dilution valve open 25%
ppm = parts per million
— = not measured
"H_2O = inches of water column
fpm = feet per minute
cfm = cubic feet per minute
LEL = Lower Explosion Limit
^oF = degrees Fahrenheit
[1] = 6" pipe diameter
[2]= 4" pipe diameter

Table 1
SSD System Pilot Study Vacuum and Treatment System Data
Greif Inc. Tonawanda, NY
NYSDEC VCP Number V00334-9

Pilot Study Vacuum Data				
Sampling Location	**Background**	**SP-06**	**SP-06**	**SP-06**
Operating Scenario	**20**	**21**	**22**	**23**
Flow Speed	*Static	low flow	medium flow	max flow
Date/Time Sampled	15-Jun-10	17-Jun-10	17-Jun-10	17-Jun-10
Suction Point PID (ppm)	—	—	—	—
Suction Point Vacuum ("H_2O)	—	9.0	24.0	39
[1]Suction Point Velocity (fpm)	—	495	910	1100
Flow Rate (cfm)	—	98.20	180.53	218.22
Measurement Point I.D.				
VAC-28	0.00	0.000	0.000	0.000
VAC-29	0.00	covered	0.000	0.000
VAC-30	0.00	0.000	0.000	0.000
VAC-31	0.00	covered	covered	covered
VAC-32	covered	0.105	0.195	0.290
VAC-33	0.00	0.150	0.300	0.440
VAC-34	0.00	0.035	0.090	0.125
VAC-35	—	covered	covered	covered
VAC-36	—	0.000	0.000	0.000
Treatment System Data				
Parameter	Unit			
Headers				
Vacuum @ PG-104	"H_20	9	24.5	40.5
[2]Air Velocity @ PG-104	fpm	405	1550	1870
Flow Rate	cfm	35.30	135.11	163.01
Vacuum @ PG-101	"H_20	9	25	40
[2]Air Velocity @ PG-101	fpm	1040	1380	1630
Flow Rate	cfm	90.66	120.29	142.09
Panel				
Building Temp	°F	70.2	72.6	73
LEL	%	5	5	5
Knock-out Pot				
Vacuum	"H_20	22	44	51
Blower				
Temp in	°F	72	74	76
Vacuum pre-filter	"H_20	25	41	52
Vacuum post-filter	"H_20	66	66	66
Temp out	°F	109	120	140

Notes:

*static = indicates treatment system blower was turned off

low flow = dilution valve open 100%

medium flow = dilution valve open 50%

max flow = dilution valve open 25%

ppm = parts per million

— = not measured

"H_2O = inches of water column

fpm = feet per minute

cfm = cubic feet per minute

LEL = Lower Explosion Limit

°F = degrees Fahrenheit

[1] = 6" pipe diameter

[2]= 4" pipe diameter

Table 1 (continued)
SSD System Pilot Study Vacuum and Treatment System Data
Greif Inc. Tonawanda, NY
NYSDEC VCP Number V00334-9

Carbon System				
Operating Scenario	**20**	**21**	**22**	**23**
Pre-carbon Pressure	"H_20	11	9	4
Pre-carbon Temperature	^oF	112	124	150
Pre-carbon PID reading	ppm	0.0	0.0	0.0
Pre-carbon Relative Humidity	%	23.3	39.8	53.6
[2]Pre-carbon Air Velocity	fpm	—	—	—
Flow Rate	cfm	—	—	—
Mid-carbon Pressure	"H_20	5	9.5	13.5
Mid-carbon Temperature	^oF	104	110	116
Mid-carbon PID reading	ppm	0.0	0.0	0.0
Mid-carbon Relative Humidity	%	40.2	43.5	35.6
[2]Mid-carbon Air Velocity	fpm	—	—	—
Flow Rate	cfm	—	—	—
Post-carbon Pressure	"H_20	0.25	0.21	0.12
Post-carbon Temperature	^oF	92	98	102
Post-carbon PID reading	ppm	0.0	0.0	0.0
Post-carbon Relative Humidity	%	27.1	29.2	25.7
[2]Post-carbon Air Velocity	fpm	1210	1110	890
Flow Rate	cfm	105.48	96.76	77.58

Notes:

*static = indicates treatment system blower was turned off

low flow = dilution valve open 100%

medium flow = dilution valve open 50%

max flow = dilution valve open 25%

ppm = parts per million

— = not measured

"H_2O = inches of water column

fpm = feet per minute

cfm = cubic feet per minute

LEL = Lower Explosion Limit

^oF = degrees Fahrenheit

[1] = 6" pipe diameter

[2]= 4" pipe diameter

Table 1
SSD System Pilot Study Vacuum and Treatment System Data
Greif Inc. Tonawanda, NY
NYSDEC VCP Number V00334-9

Pilot Study Vacuum Data				
Sampling Location	**Background**	**SP-07**	**SP-07**	**SP-07**
Operating Scenario	**24**	**25**	**26**	**27**
Flow Speed	*Static	low flow	medium flow	max flow
Date/Time Sampled	15-Jun-10	16-Jun-10	16-Jun-10	16-Jun-10
Suction Point PID (ppm)	—	0.0	0.0	0.0
Suction Point Vacuum ("H_2O)	—	12	31.5	50+
[1]Suction Point Velocity (fpm)	—	230	430	790
Flow Rate (cfm)	—	45.63	85.30	156.72
Measurement Point I.D.				
VAC-37	covered	covered	covered	covered
VAC-38	covered	covered	covered	covered
VAC-39	0.00	0.0825	0.1975	0.315
VAC-40	—	0.075	0.205	0.33
VAC-41	0.00	0.190	0.375	0.615
VAC-42	0.00	0.0275	0.065	0.100
VAC-43	0.00	0.000	0.00	0.00
VAC-44	covered	0.090	0.260	0.19
VAC-45	0.00	0.0225	0.0675	0.125
VAC-46	0.00	0.00	0.005	0.0025
VAC-47	—	0.00	0.00	0.00
Treatment System Data				
Parameter	Unit			
Headers				
Vacuum @ PG-104	"H_20	12	31.5	50+
[2]Air Velocity @ PG-104	fpm	375	845	1230
Flow Rate	cfm	32.69	73.66	107.22
Vacuum @ PG-101	"H_20	16	31.5	50+
[2]Air Velocity @ PG-101	fpm	1270	1050	1710
Flow Rate	cfm	110.71	91.53	149.06
Panel				
Building Temp	^oF	76	78.3	66.5
LEL	%	5	5	4
Knock-out Pot				
Vacuum	"H_20	23	42	78
Blower				
Temp in	^oF	78	81	72
Vacuum pre-filter	"H_20	28	45	78
Vacuum post-filter	"H_20	66	66	66
Temp out	^oF	115	133	158

Notes:

*static = indicates treatment system blower was turned off

low flow = dilution valve open 100%

medium flow = dilution valve open 50%

max flow = dilution valve open 25%

ppm = parts per million

— = not measured

"H_2O = inches of water column

fpm = feet per minute

cfm = cubic feet per minute

LEL = Lower Explosion Limit

^oF = degrees Fahrenheit

[1] = 6" pipe diameter

[2]= 4" pipe diameter

Table 1 (continued)
SSD System Pilot Study Vacuum and Treatment System Data
Greif Inc. Tonawanda, NY
NYSDEC VCP Number V00334-9

Carbon System				
Operating Scenario	**24**	**25**	**26**	**27**
Pre-carbon Pressure	"H_20	10.5	8.5	3.5
Pre-carbon Temperature	^oF	120	134	149
Pre-carbon PID reading	ppm	0.0	0.0	0.0
Pre-carbon Relative Humidity	%	34	25.7	20.6
[2]Pre-carbon Air Velocity	fpm	3640	2940	1310
Flow Rate	cfm	317.30	256.28	114.19
Mid-carbon Pressure	"H_20	4.7	3.8	1.5
Mid-carbon Temperature	^oF	106	121	98
Mid-carbon PID reading	ppm	0.0	0.0	9.9
Mid-carbon Relative Humidity	%	55.7	44.4	72.2
[2]Mid-carbon Air Velocity	fpm	3290	2630	2420
Flow Rate	cfm	286.79	229.26	210.95
Post-carbon Pressure	"H_20	0.26	0.20	0.02
Post-carbon Temperature	^oF	93	102	85
Post-carbon PID reading	ppm	0.0	0.0	6.2
Post-carbon Relative Humidity	%	36	23.5	37.6
[2]Post-carbon Air Velocity	fpm	1130	935	570
Flow Rate	cfm	98.50	81.50	49.69

Notes:
*static = indicates treatment system blower was turned off
low flow = dilution valve open 100%
medium flow = dilution valve open 50%
max flow = dilution valve open 25%
ppm = parts per million
— = not measured
"H_2O = inches of water column
fpm = feet per minute
cfm = cubic feet per minute
LEL = Lower Explosion Limit
^oF = degrees Fahrenheit
[1] = 6" pipe diameter
[2]= 4" pipe diameter

Table 1
SSD System Pilot Study Vacuum and Treatment System Data
Greif Inc. Tonawanda, NY
NYSDEC VCP Number V00334-9

Pilot Study Vacuum Data				
Sampling Location	**Background**	**SP-08**	**SP-08**	**SP-08**
Operating Scenario	**28**	**29**	**30**	**31**
Flow Speed	*Static	low flow	medium flow	max flow
Date/Time Sampled	15-Jun-10	17-Jun-10	17-Jun-10	17-Jun-10
Suction Point PID (ppm)	—	0.0	0.0	0.0
Suction Point Vacuum ("H_2O)	—	6.0	11.0	16.0
[1]Suction Point Velocity (fpm)	—	1240	1760	2120
Flow Rate (cfm)	—	245.99	349.15	420.57
Measurement Point I.D.				
VAC-39	0.00	0.00	0.00	0.00
VAC-41	0.00	0.00	0.00	0.00
VAC-42	0.00	0.00	0.00	0.00
VAC-43	0.00	0.00	0.00	0.00
VAC-44	covered	0.005	0.0125	0.040
VAC-45	0.00	0.005	0.025	0.0125
VAC-46	0.00	0.045	0.050	0.0775
VAC-47	—	0.155	0.0950	0.1325
VAC-48	0.00	0.360	0.620	0.830
VAC-49	0.00	0.155	0.260	0.370
VAC-50	0.00	0.000	0.000	0.00
VAC-51	0.00	covered	covered	0.310
VAC-52	0.00	0.015	0.040	0.0775
VAC-53	0.00	0.000	0.000	0.0025
Treatment System Data				
Parameter	Unit			
Headers				
Vacuum @ PG-104	"H_20	7	14	19
[2]Air Velocity @ PG-104	fpm	825	1130	1150
Flow Rate	cfm	71.92	98.50	100.25
Vacuum @ PG-101	"H_20	6.5	13	18
[2]Air Velocity @ PG-101	fpm	815	935	1110
Flow Rate	cfm	71.04	81.50	96.76
Panel				
Building Temp	^oF	74.9	75	70.6
LEL	%	5	5	5
Knock-out Pot				
Vacuum	"H_20	18	24	30
Blower				
Temp in	^oF	77	76	72
Vacuum pre-filter	"H_20	18	28	34
Vacuum post-filter	"H_20	66	66	66
Temp out	^oF	116	116	116

Notes:

*static = indicates treatment system blower was turned off

low flow = dilution valve open 100%

medium flow = dilution valve open 50%

max flow = dilution valve open 25%

ppm = parts per million

— = not measured

"H_2O = inches of water column

fpm = feet per minute

cfm = cubic feet per minute

LEL = Lower Explosion Limit

^oF = degrees Fahrenheit

[1] = 6" pipe diameter

[2]= 4" pipe diameter

Table 1 (continued)
SSD System Pilot Study Vacuum and Treatment System Data
Greif Inc. Tonawanda, NY
NYSDEC VCP Number V00334-9

Carbon System				
Operating Scenario	**28**	**29**	**30**	**31**
Pre-carbon Pressure	"H_20	11.5	10.5	10
Pre-carbon Temperature	^oF	120	119	121
Pre-carbon PID reading	ppm	0.0	0.0	0.0
Pre-carbon Relative Humidity	%	39.1	45	36.5
[2]Pre-carbon Air Velocity	fpm	3610	2850	3210
Flow Rate	cfm	314.68	248.43	279.82
Mid-carbon Pressure	"H_20	5	5	4
Mid-carbon Temperature	^oF	119	112	112
Mid-carbon PID reading	ppm	0.0	0.0	0.0
Mid-carbon Relative Humidity	%	35.5	43.5	55.3
[2]Mid-carbon Air Velocity	fpm	3070	3220	2760
Flow Rate	cfm	267.61	280.69	240.59
Post-carbon Pressure	"H_20	0.38	0.24	0.32
Post-carbon Temperature	^oF	111	101	95
Post-carbon PID reading	ppm	0.0	0.0	0.0
Post-carbon Relative Humidity	%	33.5	35.8	52.3
[2]Post-carbon Air Velocity	fpm	1110	1050	1090
Flow Rate	cfm	96.76	91.53	95.02

Notes:
*static = indicates treatment system blower was turned off
low flow = dilution valve open 100%
medium flow = dilution valve open 50%
max flow = dilution valve open 25%
ppm = parts per million
— = not measured
"H_2O = inches of water column
fpm = feet per minute
cfm = cubic feet per minute
LEL = Lower Explosion Limit
^oF = degrees Fahrenheit
[1] = 6" pipe diameter
[2]= 4" pipe diameter

Table 2
SSD System Pilot Study Vacuum Data - Combined
Greif Inc. Tonawanda, NY
NYSDEC VCP Number V00334-9

Testing Conditions	Combined - All Suction Points Open							
Testing Start Time	0830							
Testing Start Date	16-Jun-10							
Sample Location	**SP-01**	**SP-02**	**SP-03**	**SP-04**	**SP-05**	**SP-06**	**SP-07**	**SP-08**
Suction Point Vacuum ("H_2O)	3.1	3.5	1.9	0.85	2.85	2.8	2.85	2.65
Suction Point Velocity (fpm)	765	65	1030	220	420	885	64	730
Flow Rate (cfm)								
PID (ppm)	—	—	—	—	—	—	—	—

Measurement Point ID	Measurement Time	Vacuum ("H2O)
VAC-01	0845	0.1175
VAC-02	0859	0.1375
VAC-03	0901	0.1375
VAC-04	0903	0.00
VAC-05	0905	0.1425
VAC-06	0908	0.1625
VAC-07	0909	0.095
VAC-08	0913	0.0325
VAC-09	0914	0.00
VAC-10	1115	0.10
VAC-11	1011	0.0950
VAC-12	1017	0.00
VAC-13	1018	—
VAC-14	1015	0.00
VAC-15	1021	0.00
VAC-16	—	—
VAC-17	1030	0.0025
VAC-18	1028	0.25
VAC-19	1026	0.42
VAC-20	1024	0.175
VAC-21	1033	0.00
VAC-22	1035	0.0075
VAC-23	1111	0.00
VAC-24	1112	0.00
VAC-25	1109	0.089
VAC-26	1108	0.020
VAC-27	1041	0.005
VAC-28	1058	0.0175
VAC-29	1059	0.040
VAC-30	1043	0.00

Notes:
"H_2O = inches of water column
fpm = feet per minute
cfm = cubic feet per minute
ppm = parts per million
— = not measured

Table 2 (continued)
SSD System Pilot Study Vacuum Data - Combined
Greif Inc. Tonawanda, NY
NYSDEC VCP Number V00334-9

Measurement Point ID	Measurement Time	Vacuum ("H2O)
VAC-31	1050	0.00
VAC-32	1048	0.040
VAC-33	1046	0.0675
VAC-34	1053	0.0225
VAC-35	1054	—
VAC-36	1055	0.00
VAC-37	1101	0.030
VAC-38	0943	—
VAC-39	0928	0.025
VAC-40	1104	0.0275
VAC-41	0926	0.0525
VAC-42	0924	0.0025
VAC-43	0944	0.0025
VAC-44	0931	0.0425
VAC-45	0935	0.015
VAC-46	0936	0.0125
VAC-47	0941	—
VAC-48	0949	0.2125
VAC-49	0956	0.0925
VAC-50	0958	0.00
VAC-51	0951	0.080
VAC-52	0953	0.0125
VAC-53	1007	0.0125
VAC-54	—	—
VAC-55	—	—
VAC-56	—	—

Notes:
"H_2O = inches of water column
fpm = feet per minute
cfm = cubic feet per minute
ppm = parts per million
— = not measured

Table 3
SSD System Pilot Study Treatment System Data - Combined
Greif Inc. Tonawanda, NY
NYSDEC VCP Number V00334-9

* Treatment System Data		
Parameter	Unit	Reading
Headers		
Vacuum @ PG-101	"H_20	3.6
[1]Air Velocity @ PG-101	fpm	730
Flow Rate	cfm	63.63
Vacuum @ PG-102	"H_20	1.5
[1]Air Velocity @ PG-102	fpm	401
Flow Rate	cfm	34.96
Vacuum @ PG-103	"H_20	3.6
[1]Air Velocity @ PG-103	fpm	790
Flow Rate	cfm	68.86
Vacuum @ PG-104	"H_20	3.6
[1]Air Velocity @ PG-104	fpm	815
Flow Rate	cfm	71.04
Vacuum @ PG-105	"H_20	3.6
[1]Air Velocity @ PG-105	fpm	830
Flow Rate	cfm	72.35
Panel		
Building Temp	^oF	69.0
LEL	%	5
Knock-out Pot		
Vacuum	"H_20	15

Notes:
* = indicates PG-101, PG-103, PG-104 and PG-105 100% open, PG-102 ~30% open, SP-01 - SP-08 open, boiler room blowers on.
ppm = parts per milion
"H_2O = inches of water column
fpm = feet per minute
cfm = cubic feet per minute
LEL = Lower Explosion Limit
^oF = degrees Fahrenheit
[1] = 4" pipe diameter

Table 3 (continued)
SSD SystemPilot Study Treatment System Data - Combined
Greif Inc. Tonawanda, NY
NYSDEC VCP Number V00334-9

Blower		
Temp in	^{o}F	70
Vacuum pre-filter	"H_20	19.8
Vacuum post-filter	"H_20	65.9
Temp out	^{o}F	104
Carbon System		
Pre-carbon Pressure	"H_20	11.5
Pre-carbon Temperature	^{o}F	112
Pre-carbon PID reading	ppm	3.3
Pre-carbon Relative Humidity	%	45.8
[1]Pre-carbon Air Velocity	fpm	3670
Flow Rate	cfm	319.91
Mid-carbon Pressure	"H_20	5.0
Mid-carbon Temperature	^{o}F	105
Mid-carbon PID reading	ppm	1.3
Mid-carbon Relative Humidity	%	67.5
[1]Mid-carbon Air Velocity	fpm	3760
Flow Rate	cfm	327.76
Post-carbon Pressure	"H_20	0.29
Post-carbon Temperature	^{o}F	96
Post-carbon PID reading	ppm	0.1
Post-carbon Relative Humidity	%	39.7
[1]Post-carbon Air Velocity	fpm	1160
Flow Rate	cfm	101.12

Notes:

* = indicates PG-101, PG-103, PG-104 and PG-105 100% open, PG-102 ~30% open, SP-01 - SP-08 open, boiler room blowers on.

"H_2O = inches of water column

fpm = feet per minute

cfm = cubic feet per minute

LEL = Lower Explosion Limit

^{o}F = degrees Fahrenheit

[1] = 4" pipe diameter

Table 4
Summary of Laboratory Analytical Results
Greif Inc. Tonawanda, NY
NYSDEC VCP Number V00334-9

Sample Location	SP-03	SP-04	SP-06	SP-503	PG-103	Mid-Carbon	Post-Carbon
Sample Date	17-Jun-10	17-Jun-10	17-Jun-10	17-Jun-10	17-Jun-10	22-Jun-10	22-Jun-10
Sample ID:	Mi120018	Mi120013	Mi120012	Mi120017	Mi120016	Mi120015	Mi120014
Analyte	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)	(µg/m^3)
Acetone	126.7	ND	129.4	161.9	70.2	95.7	94.1
Benzene	5.6 J	3.8 J	4.4 J	6.1 J	4.7 J	11.0 J	3.9
2-Butanone	3.5	ND	24.7	80.3	66.2	189.6	19.2
Chloroethane	ND	ND	ND	3.1 J	4.2 J	5.6 J	ND
Chloroform	ND	ND	16.3	13.1	9.6	10.3	ND
1,1-Dichloroethane	ND	1.1	1.5	288.2	491.8	355.5	10.3
1,2-Dichloroethane	ND	ND	ND	4.9	ND	4.3	ND
1,1-Dichloroethylene	1.8 B	12.3 B	22.8 B	2980.0 B,J	6607.3 B,J	5096.3 B,J	674.3 B, J
cis-1,2-Dichloroethylene	ND	1.2	ND	190.8	274.0	217.2	11.3
trans-1,2-Dichloroethylene	ND	ND		17.6 B	21.4 B	18.2 B	ND
Ethylebenzene	ND	ND	1.4	2.5	1.9	ND	ND
4-Methyl-2-Pentanone	2.2	3.5	7.6	6.3	4.5	1.7	1.1
Methylene Chloride	147.3	ND	88.6	133.0	34.2	58.4	0.4
Tetrachloroethylene	5.2	11.0	7.1	9.0	6.8	ND	ND
Toluene	2.2	2.8	30.3	33.2	23.4	2.8	2.0
1,1,1-Trichloroethane	ND	14.8 B	279.3 B	8235.7 B	10276.8 B	11469.4 B	469.3 B
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND
Trichloroethylene	4.7 B	103.1 B	240.3 B	4150.3 B,J	5832.5 B,J	7918.1 B, J	681.7 B, J
1,2,4-Trimethylbenzene	ND	ND	2.9	5	3.1	ND	ND
Vinyl Chloride	ND	ND	26.2	ND	ND	ND	ND
m,p-Xylenes	ND	ND	2.4	3.9	3.2	ND	ND
o-Xylene	ND	ND	1.6	3.6	2.7	ND	ND

Notes:

µg/m^3 - micrograms per cubic meter

SP-03 = Suction point in boiler room; SP-04 = Suction Point SP-04 in boiler room; SP-06 = Suction Point SP-06; SP-503 = Sub-slab vapors from varnish pit exterior; Mid-Carbon = Combined vapors from all suction points treated with primary carbon vessel; Post Carbon = Combined vapors from all suction points treated with both carbon vessels

Blue font = estimated concentrations of tentatively identified compounds

ND = non-detect

J = the analyte was positively identified and the numerical value is the approximate concentration of the analyte in the sample

B = the method blank contained trace levels of analyte

APPENDIX A

Pilot Study Analytical Data

VaporTrail Analytics

Volatiles and Semi-Volatiles Characterization

179 Lake Avenue
Rochester, NY 14608 USA
Tel: (585) 727-2825
www.vaportrailanalytics.com

10-Aug-2010

Analytical Results
Report Cover Sheet

For VTA Project Number 201019 - R1

REISSUE OF VTA PROJECT 201019 REPORT DATED 21 July 2010

Total Number of Pages Including This Cover: 21

Please refer to the bottom of each page for identification of the individual page number.

The results in this report refer to samples collected by the Client.

Results from samples collected by the Client or an associated party relate to the samples or components within as received by the laboratory.

Please refer to the chain of custody for additional sample information.

Any deviations from, additions to, exclusions from, or non-standard conditions that may affect the quality of the results are communicated in the report in text or qualifier form. The following data qualifiers are defined and, where necessary, are utilized on an individual analyte basis in the report:

B The method blank contained trace levels of analyte; refer to the method blank report.

E The calibration limit was exceeded; the associated numerical value is the approximate concentration of analyte in the sample.

J The associated numerical value is the approximate concentration of analyte in the sample.

I The field blank result contained at least one non-artifact compound with a peak area at 10% or greater of the sampled result; the associated numerical value is the approximate concentration of analyte in the sample.

VaporTrail Analytics
Volatiles and Semi-Volatiles Characterization

179 Lake Avenue
Rochester, NY 14608 USA
Tel: (585) 727-2825
www.vaportrailanalytics.com

10-Aug-2010

Case Narrative
For VTA Project Number 201019-R1

Examination of 201019 results by the Client expressed concern over levels of target analytes found in field and lab blank samples. The level of the analytes 1,1,1-TCA, 1,1-DCE and TCE found in a single field blank (sample 1262) out of three were of particular concern.

The employed analytical technique USEPA Method TO-17 was reviewed for blank criteria. Section 13.1.1.2 states a ≥ 10% peak area criteria for VOCs on sampled tubes where an analyte is found on both field blank and sampled sorbent tubes. Literal interpretation of Section 13.1.1.2. requires invalidation of sample results where an analyte peak area is not more than a factor of ten above the field blank peak area.

Since actual masses of analyte are determined on field blanks VTA interprets invalidation as not to preclude the estimation of analyte values for the sampled tube. This is indicated on the revised report as an "I" qualifier as defined above.

The net change in this report relative to the original report issued 21 July 2010 is to qualify all positive results for samples 1261 ("SP-04") and 1263 ("SP-03") as estimates.

Regards,
Jack D. Fox, PhD
Technical Director

VaporTrail Analytics
Volatiles and Semi-Volatiles Characterization

Rochester, NY 14608 USA
Tel: (585) 727-2825
www.vaportrailanalytics.com

10-Aug-2010

Client: ERM, Inc.
Report To: Jon Fox
5788 Widewaters Parkway
Dewitt, New York 13214
phone 315.445.2554

NYSDOH ELAP ID Number: **11932**
Analytical Method: **USEPA TO-17**

Analysis Report for Air

Field ID Number: Mi120013
Field Location: SP-04
Client Project Number: 0115642
Client Job Site: Grief - Tonawanda
Sample Type: Active Vapor

Lab Sample Number: 1261
Date Sampled: 17 Jun 2010
Date Received: 21 Jun 2010
Dates Analyzed: 1,7 July 2010
Lab Project Number: 201019

Analyte	DF	($\mu g \cdot m^{-3}$) RL	($\mu g \cdot m^{-3}$) Result	(ppbv) Result	Qualifiers
1,1,1-Trichloroethane	1.1	1.0	14.8	2.7	B, I
1,1-Dichloroethane	1.1	1.0	1.1	0.3	I
1,1-Dichloroethylene	1.1	1.0	12.3	3.1	B, I
1,2,4-Trimethylbenzene	1.1	1.0	ND	ND	
1,2-Dichloroethane	1.1	1.0	ND	ND	
Benzene	1.1	1.0	3.8	1.2	J, I
Chloroethane	1.1	1.0	ND	ND	
Chloroform	1.1	1.0	ND	ND	
cis-1,2-Dichloroethylene	1.1	1.0	1.2	0.3	I
Ethylbenzene	1.1	1.0	ND	ND	
m,p-Xylenes	1.1	1.0	ND	ND	
o-Xylene	1.1	1.0	ND	ND	
Tetrachloroethylene	1.1	1.0	11.0	1.6	I
Toluene	1.1	1.0	2.8	0.8	I
trans-1,2-Dichloroethylene	1.1	1.0	ND	ND	
Trichloroethylene	17.8	17.6	103.1	19.2	B, I
Vinyl Chloride	1.1	1.0	ND	ND	

Comments: DF = Dilution Factor; RL = Reporting Limit; $\mu g \cdot m^{-3}$ = micrograms per cubic meter;
ppbv = Parts Per Billion by Volume; ND = Not Detected.
Data Files: 070110-16.D, 070710-19.D

Signature: _____
Jack D. Fox PhD, Technical Director

Note: This report is part of a multipart document, and should only be evaluated in its entirety.
Please refer to the included chain of custody for additional sample information.

VaporTrail Analytics
Volatiles and Semi-Volatiles Characterization

Rochester, NY 14608 USA
Tel: (585) 727-2825
www.vaportrailanalytics.com

10-Aug-2010

Client: ERM, Inc.
Report To: Jon Fox
5788 Widewaters Parkway
Dewitt, New York 13214
phone 315.445.2554

NYSDOH ELAP ID Number: **11932**
Analytical Method: **USEPA TO-17**

Tentatively Indentified Compounds in Air

Field ID Number: Mi120013
Field Location: SP-04
Client Project Number: 0115642
Client Job Site: Grief - Tonawanda
Sample Type: Active Vapor

Lab Sample Number: 1261
Date Sampled: 17 Jun 2010
Date Received: 21 Jun 2010
Dates Analyzed: 1,7,12 July 2010
Lab Project Number: 201019

Compound	(ng) Mass on Tube	($\mu g \cdot m^{-3}$) Estimated Concentration	(ppbv)
1,1,2-Trichloroethane	ND	ND	ND
2-Butanone	ND	ND	ND
4-Methyl-2-Pentanone	3.2	3.5	0.8
Acetone	ND	ND	ND
Methylene Chloride	ND	ND	ND

Comments: ng = nanograms; $\mu g \cdot m^{-3}$ = micrograms per cubic meter; ppbv = parts per billion by volume.

Data Files: 070110-16.D, 070710-19.D

Signature: Jack D. Fox

Jack D. Fox PhD, Technical Director

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VaporTrail Analytics
Volatiles and Semi-Volatiles Characterization

Rochester, NY 14608 USA
Tel: (585) 727-2825
www.vaportrailanalytics.com

10-Aug-2010

Client: ERM, Inc.
Report To: Jon Fox
5788 Widewaters Parkway
Dewitt, New York 13214
phone 315.445.2554

NYSDOH ELAP ID Number: **11932**
Analytical Method: **USEPA TO-17**

Analysis Report for Air

Field ID Number: Mi120018
Field Location: SP-03
Client Project Number: 0115642
Client Job Site: Grief - Tonawanda
Sample Type: Active Vapor

Lab Sample Number: 1263
Date Sampled: 17 Jun 2010
Date Received: 21 Jun 2010
Dates Analyzed: 1 July 2010
Lab Project Number: 201019

Analyte	DF	($\mu g \cdot m^{-3}$) RL	($\mu g \cdot m^{-3}$) Result	(ppbv) Result	Qualifiers
1,1,1-Trichloroethane	1.1	1.0	ND	ND	
1,1-Dichloroethane	1.1	1.0	ND	ND	
1,1-Dichloroethylene	1.1	1.0	1.8	0.5	B,I
1,2,4-Trimethylbenzene	1.1	1.0	ND	ND	
1,2-Dichloroethane	1.1	1.0	ND	ND	
Benzene	1.1	1.0	5.6	1.7	J,I
Chloroethane	1.1	1.0	ND	ND	
Chloroform	1.1	1.0	ND	ND	
cis-1,2-Dichloroethylene	1.1	1.0	ND	ND	
Ethylbenzene	1.1	1.0	ND	ND	
m,p-Xylenes	1.1	1.0	ND	ND	
o-Xylene	1.1	1.0	ND	ND	
Tetrachloroethylene	1.1	1.0	5.2	0.8	I
Toluene	1.1	1.0	2.2	0.6	I
trans-1,2-Dichloroethylene	1.1	1.0	ND	ND	
Trichloroethylene	1.1	1.0	4.7	0.9	B,I
Vinyl Chloride	1.1	1.0	ND	ND	

Comments: DF = Dilution Factor; RL = Reporting Limit; $\mu g \cdot m^{-3}$ = micrograms per cubic meter;
ppbv = Parts Per Billion by Volume; ND = Not Detected.
Data Files: 070110-18.D

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NYSDOH ELAP ID Number: **11932**
Analytical Method: **USEPA TO-17**

Tentatively Indentified Compounds in Air

Field ID Number: Mi120018
Field Location: SP-03
Client Project Number: 0115642
Client Job Site: Grief - Tonawanda
Sample Type: Active Vapor

Lab Sample Number: 1263
Date Sampled: 17 Jun 2010
Date Received: 21 Jun 2010
Dates Analyzed: 1 July 2010
Lab Project Number: 201019

	(ng)	($\mu g \cdot m^{-3}$)	(ppbv)
Compound	Mass on Tube	Estimated Concentration	
1,1,2-Trichloroethane	ND	ND	ND
2-Butanone	3.2	3.5	1.2
4-Methyl-2-Pentanone	2.0	2.2	0.5
Acetone	114.2	126.7	53.4
Methylene Chloride	132.7	147.3	42.5

Comments: ng = nanograms; $\mu g \cdot m^{-3}$ = micrograms per cubic meter; ppbv = parts per billion by volume.

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NYSDOH ELAP ID Number: **11932**
Analytical Method: **USEPA TO-17**

Analysis Report for Air

Field ID Number: Mi120012
Field Location: SP-06
Client Project Number: 0115642
Client Job Site: Grief - Tonawanda
Sample Type: Active Vapor

Lab Sample Number: 1264
Date Sampled: 17 Jun 2010
Date Received: 21 Jun 2010
Dates Analyzed: 1,7 Jul 2010
Lab Project Number: 201019

Analyte	DF	($\mu g \cdot m^{-3}$) RL	($\mu g \cdot m^{-3}$) Result	(ppbv) Result	Qualifiers
1,1,1-Trichloroethane	17.8	17.7	279.3	51.2	B
1,1-Dichloroethane	1.1	1.0	1.5	0.4	
1,1-Dichloroethylene	1.1	1.0	22.8	5.8	B
1,2,4-Trimethylbenzene	1.1	1.0	2.9	0.6	
1,2-Dichloroethane	1.1	1.0	ND	ND	
Benzene	1.1	1.0	4.4	1.4	J
Chloroethane	1.1	1.0	ND	ND	
Chloroform	1.1	1.0	16.3	3.3	
cis-1,2-Dichloroethylene	1.1	1.0	ND	ND	
Ethylbenzene	1.1	1.0	1.4	0.3	
m,p-Xylenes	1.1	1.0	2.4	0.6	
o-Xylene	1.1	1.0	1.6	0.4	
Tetrachloroethylene	1.1	1.0	7.1	1.0	
Toluene	17.8	17.7	30.3	8.1	
trans-1,2-Dichloroethylene	1.1	1.0	ND	ND	
Trichloroethylene	17.8	17.7	240.3	44.7	B
Vinyl Chloride	1.1	1.0	26.2	10.2	

Comments: DF = Dilution Factor; RL = Reporting Limit; $\mu g \cdot m^{-3}$ = micrograms per cubic meter;
ppbv = Parts Per Billion by Volume; ND = Not Detected.
Data Files: 070110-13.D, 070710-16.D

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NYSDOH ELAP ID Number: **11932**
Analytical Method: **USEPA TO-17**

Tentatively Indentified Compounds in Air

Field ID Number: Mi120012
Field Location: SP-06
Client Project Number: 0115642
Client Job Site: Grief - Tonawanda
Sample Type: Active Vapor

Lab Sample Number: 1264
Date Sampled: 17 Jun 2010
Date Received: 21 Jun 2010
Dates Analyzed: 1,7 Jul 2010
Lab Project Number: 201019

Compound	(ng) Mass on Tube	($\mu g \cdot m^{-3}$) Estimated Concentration	(ppbv)
1,1,2-Trichloroethane	ND	ND	ND
2-Butanone	22.4	24.7	8.4
4-Methyl-2-Pentanone	6.9	7.6	1.9
Acetone	116.9	129.4	54.5
Methylene Chloride	80.1	88.6	25.5

Comments: ng = nanograms; $\mu g \cdot m^{-3}$ = micrograms per cubic meter; ppbv = parts per billion by volume.

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NYSDOH ELAP ID Number: **11932**
Analytical Method: **USEPA TO-17**

Analysis Report for Air

Field ID Number: Mi120016
Field Location: PG-103
Client Project Number: 0115642
Client Job Site: Grief - Tonawanda
Sample Type: Active Vapor

Lab Sample Number: 1266
Date Sampled: 17 Jun 2010
Date Received: 21 Jun 2010
Dates Analyzed: 1,7,12 July 2010
Lab Project Number: 201019

Analyte	DF	($\mu g \cdot m^{-3}$) RL	($\mu g \cdot m^{-3}$) Result	(ppbv) Result	Qualifiers
1,1,1-Trichloroethane	1083.6	1076.1	10276.8	1884.8	B
1,1-Dichloroethane	17.8	17.7	491.8	121.6	
1,1-Dichloroethylene	1083.6	1076.1	6607.3	1667.4	B,J
1,2,4-Trimethylbenzene	1.1	1.0	3.1	0.6	
1,2-Dichloroethane	1.1	1.0	ND	ND	
Benzene	1.1	1.0	4.7	1.5	J
Chloroethane	1.1	1.0	4.2	1.6	J
Chloroform	1.1	1.0	9.6	2.0	
cis-1,2-Dichloroethylene	17.8	17.7	274.0	69.1	
Ethylbenzene	1.1	1.0	1.9	0.4	
m,p-Xylenes	1.1	1.0	3.2	0.7	
o-Xylene	1.1	1.0	2.7	0.6	
Tetrachloroethylene	1.1	1.0	6.8	1.0	
Toluene	1.1	1.0	23.4	6.2	
trans-1,2-Dichloroethylene	1.1	1.0	21.4	5.4	B
Trichloroethylene	1083.6	1076.1	5832.5	1086.0	B,J
Vinyl Chloride	1.1	1.0	ND	ND	

Comments: DF = Dilution Factor; RL = Reporting Limit; $\mu g \cdot m^{-3}$ = micrograms per cubic meter;
ppbv = Parts Per Billion by Volume; ND = Not Detected.
Data Files: 070110-14.D, 070710-17.D
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NYSDOH ELAP ID Number: **11932**
Analytical Method: **USEPA TO-17**

Tentatively Indentified Compounds in Air

Field ID Number: Mi120016
Field Location: PG-103
Client Project Number: 0115642
Client Job Site: Grief - Tonawanda
Sample Type: Active Vapor

Lab Sample Number: 1266
Date Sampled: 17 Jun 2010
Date Received: 21 Jun 2010
Dates Analyzed: 1,7,12 July 2010
Lab Project Number: 201019

Compound	(ng) Mass on Tube	($\mu g \cdot m^{-3}$) Estimated Concentration	(ppbv)
1,1,2-Trichloroethane	ND	ND	ND
2-Butanone	60.0	66.2	22.5
4-Methyl-2-Pentanone	4.1	4.5	1.1
Acetone	63.7	70.2	29.6
Methylene Chloride	31.1	34.2	9.9

Comments: ng = nanograms; $\mu g \cdot m^{-3}$ = micrograms per cubic meter; ppbv = parts per billion by volume.

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NYSDOH ELAP ID Number: **11932**
Analytical Method: **USEPA TO-17**

Analysis Report for Air

Field ID Number: Mi120017
Field Location: SP-503
Client Project Number: 0115642
Client Job Site: Grief - Tonawanda
Sample Type: Active Vapor

Lab Sample Number: 1267
Date Sampled: 17 Jun 2010
Date Received: 21 Jun 2010
Dates Analyzed: 1,7,12 July 2010
Lab Project Number: 201019

Analyte	DF	($\mu g \cdot m^{-3}$) RL	($\mu g \cdot m^{-3}$) Result	(ppbv) Result	Qualifiers
1,1,1-Trichloroethane	1083.6	1083.6	8235.7	1510.4	B
1,1-Dichloroethane	17.8	17.8	288.2	71.2	
1,1-Dichloroethylene	1083.6	1083.6	2980.0	752.0	B,J
1,2,4-Trimethylbenzene	1.1	1.0	5.0	1.0	
1,2-Dichloroethane	1.1	1.0	4.9	1.2	
Benzene	1.1	1.0	6.1	1.9	J
Chloroethane	1.1	1.0	3.1	1.2	J
Chloroform	1.1	1.0	13.1	2.7	
cis-1,2-Dichloroethylene	17.8	17.8	190.8	48.2	
Ethylbenzene	1.1	1.0	2.5	0.6	
m,p-Xylenes	1.1	1.0	3.9	0.9	
o-Xylene	1.1	1.0	3.6	0.8	
Tetrachloroethylene	1.1	1.0	9.0	1.3	
Toluene	1.1	1.0	33.2	8.8	
trans-1,2-Dichloroethylene	1.1	1.0	17.6	4.4	B
Trichloroethylene	1083.6	1083.6	4150.3	772.8	B,J
Vinyl Chloride	1.1	1.0	ND	ND	

Comments: DF = Dilution Factor; RL = Reporting Limit; $\mu g \cdot m^{-3}$ = micrograms per cubic meter;
ppbv = Parts Per Billion by Volume; ND = Not Detected.
Data Files: 070110-15.D, 070710-18.D
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NYSDOH ELAP ID Number: **11932**
Analytical Method: **USEPA TO-17**

Tentatively Indentified Compounds in Air

Field ID Number: Mi120017
Field Location: SP-503
Client Project Number: 0115642
Client Job Site: Grief - Tonawanda
Sample Type: Active Vapor

Lab Sample Number: 1267
Date Sampled: 17 Jun 2010
Date Received: 21 Jun 2010
Dates Analyzed: 1,7,12 July 2010
Lab Project Number: 201019

Compound	(ng) Mass on Tube	($\mu g \cdot m^{-3}$) Estimated Concentration	(ppbv)
1,1,2-Trichloroethane	ND	ND	ND
2-Butanone	72.4	80.3	27.3
4-Methyl-2-Pentanone	5.7	6.3	1.5
Acetone	145.9	161.9	68.2
Methylene Chloride	119.8	133.0	38.3

Comments: ng = nanograms; $\mu g \cdot m^{-3}$ = micrograms per cubic meter; ppbv = parts per billion by volume.

Data Files: 070110-15.D, 070710-18.D
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Analytical Method: **USEPA TO-17**

Analysis Report for Air

Field ID Number: Mi120015
Field Location: Mid-Carbon
Client Project Number: 0115642
Client Job Site: Grief - Tonawanda
Sample Type: Active Vapor

Lab Sample Number: 1271
Date Sampled: 22 Jun 2010
Date Received: 23 Jun 2010
Dates Analyzed: 1,7,12 July 2010
Lab Project Number: 201019

Analyte	DF	($\mu g \cdot m^{-3}$) RL	($\mu g \cdot m^{-3}$) Result	(ppbv) Result	Qualifiers
1,1,1-Trichloroethane	1083.6	1072.9	11469.4	2103.5	B
1,1-Dichloroethane	1.1	1.0	355.5	87.9	
1,1-Dichloroethylene	1083.6	1072.9	5096.3	1286.1	B,J
1,2,4-Trimethylbenzene	1.1	1.0	ND	ND	
1,2-Dichloroethane	1.1	1.0	4.3	1.1	
Benzene	1.1	1.0	11.0	3.5	J
Chloroethane	1.1	1.0	5.6	2.1	J
Chloroform	1.1	1.0	10.3	2.1	
cis-1,2-Dichloroethylene	1.1	1.0	217.2	54.8	
Ethylbenzene	1.1	1.0	ND	ND	
m,p-Xylenes	1.1	1.0	ND	ND	
o-Xylene	1.1	1.0	ND	ND	
Tetrachloroethylene	1.1	1.0	ND	ND	
Toluene	1.1	1.0	2.8	0.7	
trans-1,2-Dichloroethylene	1.1	1.0	18.2	4.6	B
Trichloroethylene	1083.6	1072.9	7918.1	1474.3	B,J
Vinyl Chloride	1.1	1.0	ND	ND	

Comments: DF = Dilution Factor; RL = Reporting Limit; $\mu g \cdot m^{-3}$ = micrograms per cubic meter;
ppbv = Parts Per Billion by Volume; ND = Not Detected.
Data Files: 070110-19.D, 070710-20.D
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NYSDOH ELAP ID Number: **11932**
Analytical Method: **USEPA TO-17**

Tentatively Indentified Compounds in Air

Field ID Number: Mi120015
Field Location: Mid-Carbon
Client Project Number: 0115642
Client Job Site: Grief - Tonawanda
Sample Type: Active Vapor

Lab Sample Number: 1271
Date Sampled: 22 Jun 2010
Date Received: 23 Jun 2010
Dates Analyzed: 1,7,12 July 2010
Lab Project Number: 201019

	(ng)	($\mu g \cdot m^{-3}$)	(ppbv)
Compound	Mass on Tube	Estimated Concentration	
1,1,2-Trichloroethane	ND	ND	ND
2-Butanone	172.5	189.6	64.3
4-Methyl-2-Pentanone	1.6	1.7	0.4
Acetone	87.1	95.7	40.3
Methylene Chloride	53.2	58.4	16.8

Comments: ng = nanograms; $\mu g \cdot m^{-3}$ = micrograms per cubic meter; ppbv = parts per billion by volume.

Data Files: 070110-19.D, 070710-20.D
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NYSDOH ELAP ID Number: **11932**
Analytical Method: **USEPA TO-17**

Analysis Report for Air

Field ID Number: Mi120014
Field Location: Post-Carbon
Client Project Number: 0115642
Client Job Site: Grief - Tonawanda
Sample Type: Active Vapor

Lab Sample Number: 1272
Date Sampled: 22 Jun 2010
Date Received: 23 Jun 2010
Dates Analyzed: 1,7,12 July 2010
Lab Project Number: 201019

Analyte	DF	($\mu g \cdot m^{-3}$) RL	($\mu g \cdot m^{-3}$) Result	(ppbv) Result	Qualifiers
1,1,1-Trichloroethane	17.8	17.6	469.3	86.1	B
1,1-Dichloroethane	1.1	1.0	10.3	2.5	
1,1-Dichloroethylene	75.0	74.3	674.3	170.2	B,J
1,2,4-Trimethylbenzene	1.1	1.0	ND	ND	
1,2-Dichloroethane	1.1	1.0	ND	ND	
Benzene	1.1	1.0	3.9	1.2	J
Chloroethane	1.1	1.0	ND	ND	
Chloroform	1.1	1.0	ND	ND	
cis-1,2-Dichloroethylene	1.1	1.0	11.3	2.9	
Ethylbenzene	1.1	1.0	ND	ND	
m,p-Xylenes	1.1	1.0	ND	ND	
o-Xylene	1.1	1.0	ND	ND	
Tetrachloroethylene	1.1	1.0	ND	ND	
Toluene	1.1	1.0	2.0	0.5	
trans-1,2-Dichloroethylene	1.1	1.0	ND	ND	
Trichloroethylene	75.0	74.3	681.7	126.9	B,J
Vinyl Chloride	1.1	1.0	ND	ND	

Comments: DF = Dilution Factor; RL = Reporting Limit; $\mu g \cdot m^{-3}$ = micrograms per cubic meter;
ppbv = Parts Per Billion by Volume; ND = Not Detected.
Data Files: 070110-20.D, 070710-21.D
071210-17.D

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NYSDOH ELAP ID Number: **11932**
Analytical Method: **USEPA TO-17**

Tentatively Indentified Compounds in Air

Field ID Number: Mi120014
Field Location: Post-Carbon
Client Project Number: 0115642
Client Job Site: Grief - Tonawanda
Sample Type: Active Vapor

Lab Sample Number: 1272
Date Sampled: 22 Jun 2010
Date Received: 23 Jun 2010
Dates Analyzed: 1,7,12 July 2010
Lab Project Number: 201019

	(ng)	($\mu g \cdot m^{-3}$)	(ppbv)
Compound	Mass on Tube	Estimated Concentration	
1,1,2-Trichloroethane	ND	ND	ND
2-Butanone	17.5	19.2	6.5
4-Methyl-2-Pentanone	1.0	1.1	0.3
Acetone	85.6	94.1	39.6
Methylene Chloride	0.4	0.4	0.1

Comments: ng = nanograms; $\mu g \cdot m^{-3}$ = micrograms per cubic meter; ppbv = parts per billion by volume.

Data Files: 070110-20.D, 070710-21.D
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VaporTrail Analytics
Volatiles and Semi-Volatiles Characterization

179 Lake Avenue
Rochester, NY 14608 USA
Tel: (585) 727-2825
www.vaportrailanalytics.com

10-Aug-2010

Client: ERM, Inc.
Report To: Jon Fox
5788 Widewaters Parkway
Dewitt, New York 13214
phone 315.445.2554

NYSDOH ELAP ID Number: **11932**
Analytical Method: **USEPA TO-17**

Field Blank Report for Air

Field ID Number: Mi107793
Field Location: Boiler
Client Project Number: 0115642
Client Job Site: Grief - Tonawanda
Sample Type: Field Blank
Dilution Factor: 1.11

Lab Sample Number: 1262
Date Sampled: 17 Jun 2010
Date Received: 21 Jun 2010
Dates Analyzed: 24Jun,1Jul2010
Lab Project Number: 201019

Compound	(ng) Mass on Tube		Compound	(ng) Mass on Tube	
1,1,1-Trichloroethane	4.8	B	Chloroform	1.1	
1,1,2-Trichloroethane	ND		cis-1,2-Dichloroethylene	ND	
1,1-Dichloroethane	ND		Ethylbenzene	ND	
1,1-Dichloroethylene	2.9	B	m,p-Xylenes	ND	
1,2,4-Trimethylbenzene	ND		Methylene Chloride	44	B
1,2-Dichloroethane	ND		o-Xylene	ND	
2-Butanone	3.5		Tetrachloroethylene	ND	
4-Methyl-2-Pentanone	ND		Toluene	ND	
Acetone	78.0	B	trans-1,2-Dichloroethylene	ND	
Benzene	4.1		Trichloroethylene	ND	
Chloroethane	6.2		Vinyl Chloride	2.0	

Comments: ng = nanograms; ND = Not Detected.

Data File: 070110-17.D

Signature: Jack D. Fox

Jack D. Fox PhD, Technical Director

Note: This report is part of a multipart document, and should only be evaluated in its entirety.
Please refer to the included chain of custody for additional sample information.

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phone 315.445.2554

NYSDOH ELAP ID Number: **11932**
Analytical Method: **USEPA TO-17**

Field Blank Report for Air

Field ID Number: Mi107791
Field Location: Blank (SP-06)
Client Project Number: 0115642
Client Job Site: Grief - Tonawanda
Sample Type: Field Blank
Dilution Factor: 1

Lab Sample Number: 1265
Date Sampled: 17 Jun 2010
Date Received: 21 Jun 2010
Dates Analyzed: 24 Jun 2010
Lab Project Number: 201019

Compound	(ng) Mass on Tube	Compound	(ng) Mass on Tube
1,1,1-Trichloroethane	ND	Chloroform	ND
1,1,2-Trichloroethane	ND	cis-1,2-Dichloroethylene	ND
1,1-Dichloroethane	ND	Ethylbenzene	ND
1,1-Dichloroethylene	ND	m,p-Xylenes	ND
1,2,4-Trimethylbenzene	ND	Methylene Chloride	212 B
1,2-Dichloroethane	ND	o-Xylene	ND
2-Butanone	ND	Tetrachloroethylene	ND
4-Methyl-2-Pentanone	ND	Toluene	ND
Acetone	ND	trans-1,2-Dichloroethylene	ND
Benzene	ND	Trichloroethylene	ND
Chloroethane	ND	Vinyl Chloride	ND

Comments: ng = nanograms; ND = Not Detected.

Data File: 062410-16.D

Signature: Jack D. Fox

Jack D. Fox PhD, Technical Director

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VaporTrail Analytics
Volatiles and Semi-Volatiles Characterization

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10-Aug-2010

Client: ERM, Inc.
Report To: Jon Fox
5788 Widewaters Parkway
Dewitt, New York 13214
phone 315.445.2554

NYSDOH ELAP ID Number: **11932**
Analytical Method: **USEPA TO-17**

Field Blank Report for Air

Field ID Number: Mi107797
Field Location: Blank (PG-103 & SP-503)
Client Project Number: 0115642
Client Job Site: Grief - Tonawanda
Sample Type: Field Blank
Dilution Factor: 1

Lab Sample Number: 1268
Date Sampled: 17 Jun 2010
Date Received: 21 Jun 2010
Dates Analyzed: 24 Jun 2010
Lab Project Number: 201019

Compound	(ng) Mass on Tube	Compound	(ng) Mass on Tube
1,1,1-Trichloroethane	ND	Chloroform	ND
1,1,2-Trichloroethane	ND	cis-1,2-Dichloroethylene	ND
1,1-Dichloroethane	ND	Ethylbenzene	ND
1,1-Dichloroethylene	ND	m,p-Xylenes	ND
1,2,4-Trimethylbenzene	ND	Methylene Chloride	ND
1,2-Dichloroethane	ND	o-Xylene	ND
2-Butanone	ND	Tetrachloroethylene	ND
4-Methyl-2-Pentanone	ND	Toluene	ND
Acetone	ND	trans-1,2-Dichloroethylene	ND
Benzene	ND	Trichloroethylene	ND
Chloroethane	ND	Vinyl Chloride	ND

Comments: ng = nanograms; ND = Not Detected.

Data File: 062410-17.D

Signature: Jack D. Fox

Jack D. Fox PhD, Technical Director

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Volatiles and Semi-Volatiles Characterization

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10-Aug-2010

Client: ERM, Inc.
Report To: Jon Fox
5788 Widewaters Parkway
Dewitt, New York 13214
phone 315.445.2554

NYSDOH ELAP ID Number: **11932**
Analytical Method: **USEPA TO-17**

Laboratory Blank Report for Air

Field ID Number: Mi107792
Field Location: NA
Client Project Number: 0115642
Client Job Site: Grief - Tonawanda
Sample Type: Lab Blank #1 (Before Samples)
Dilution Factor: 1

Lab Sample Number: 1269
Date Sampled: NA
Date Received: NA
Dates Analyzed: 24 Jun 2010
Lab Project Number: 201019

Compound	(ng) Mass on Tube	Compound	(ng) Mass on Tube
1,1,1-Trichloroethane	ND	Chloroform	ND
1,1,2-Trichloroethane	ND	cis-1,2-Dichloroethylene	ND
1,1-Dichloroethane	ND	Ethylbenzene	ND
1,1-Dichloroethylene	ND	m,p-Xylenes	ND
1,2,4-Trimethylbenzene	ND	Methylene Chloride	ND
1,2-Dichloroethane	ND	o-Xylene	ND
2-Butanone	ND	Tetrachloroethylene	2.3
4-Methyl-2-Pentanone	ND	Toluene	ND
Acetone	ND	trans-1,2-Dichloroethylene	ND
Benzene	ND	Trichloroethylene	ND
Chloroethane	ND	Vinyl Chloride	ND

Comments: NA = Not Applicable; ng = nanograms; ND = Not Detected.

Data File: 062410-15.D

Signature: Jack D. Fox

Jack D. Fox PhD, Technical Director

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VaporTrail Analytics

Volatiles and Semi-Volatiles Characterization

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10-Aug-2010

Client: ERM, Inc.
Report To: Jon Fox
5788 Widewaters Parkway
Dewitt, New York 13214
phone 315.445.2554

NYSDOH ELAP ID Number: **11932**
Analytical Method: **USEPA TO-17**

Laboratory Blank Report for Air

Field ID Number: Mi107799
Field Location: NA
Client Project Number: 0115642
Client Job Site: Grief - Tonawanda
Sample Type: Lab Blank #2 (After Samples)
Dilution Factor: 1

Lab Sample Number: 1270
Date Sampled: NA
Date Received: NA
Dates Analyzed: 24 Jun 2010
Lab Project Number: 201019

Compound	(ng) Mass on Tube	Compound	(ng) Mass on Tube
1,1,1-Trichloroethane	3.5	Chloroform	ND
1,1,2-Trichloroethane	ND	cis-1,2-Dichloroethylene	ND
1,1-Dichloroethane	ND	Ethylbenzene	ND
1,1-Dichloroethylene	3.3	m,p-Xylenes	ND
1,2,4-Trimethylbenzene	ND	Methylene Chloride	234.2
1,2-Dichloroethane	ND	o-Xylene	ND
2-Butanone	ND	Tetrachloroethylene	ND
4-Methyl-2-Pentanone	ND	Toluene	ND
Acetone	65.1	trans-1,2-Dichloroethylene	2.9
Benzene	ND	Trichloroethylene	8.7
Chloroethane	ND	Vinyl Chloride	ND

Comments: NA = Not Applicable; ng = nanograms; ND = Not Detected.

Data File: 062410-26.D

Signature: Jack D. Fox

Jack D. Fox PhD, Technical Director

Note: This report is part of a multipart document, and should only be evaluated in its entirety.
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Vapor Trail Analytics

Stratospheric Performance

CHAIN OF CUSTODY RECORD

179 Lake Avenue
Rochester, New York 14608 USA
Phone: (585) 727-2865-25

PROJECT/SITE: Greif - Tonawanda

SEND REPORT TO:

PERSON/COMPANY: ERM
ADDRESS: 5788 Widewaters PKWY
CITY: Dewitt STATE: NY ZIP: 13214
PHONE: FAX: 315.445.2554
EMAIL: jon.fox@erm.com
COMMENTS:

SEND INVOICE TO:

PERSON/COMPANY:
ADDRESS: SAME
CITY: STATE: ZIP:
PHONE: FAX:
EMAIL:

LAB PROJECT #: 201019
CLIENT PROJECT #: 0115642

REQUESTED TURNAROUND TIME
1 2 3 STD ☑ 5-7/10 SAME DAY

Quotation #

REQUESTED ANALYSIS

	Sample Identification	Sample Date	Sample Time	Sample Type	Matrix	Number Containers	cDM TO-17	Remarks	VTA Sample Number
1	Mi 120013	6.17.10	1440	vapor	air	1	✓		1261
2	107793 dup 6/23		1440						1262
3	Mi 120018		1505						1263
4	Mi 120012	6.18.10	1535						1264
5	Mi 107791		1530						1265
6	Mi 120016		1555						1266
7	Mi 120017		1610						1267
8	Mi 107797		1550						1268
9	Mi 107792							Lab Blank #1	1269
10	Mi 107799							Lab Blank #2	1270

Sample Condition: Per NELAC/ELAP 210/241/242/243/244

Receipt Parameter		NELAC Compliance
Temperature:	25°C	N/A Y ☐ N ☐
Comments:		
Holding Time:	—	N/A Y ☐ N ☐
Comments:		

General Comments:

Receiving:

Sampled By	Jason Reynolds	6.17.10 - 6.18.10 Date/Time
Relinquished By	J Petch	6.18.10 1848 Date/Time
Received By	Jack D. Fox	6/18/10 1848 Date/Time
Received At Lab By	Jack D. Fox	6/21/10 0800 Date/Time

VaporTrail Analytics

Volatiles and Semivolatiles Characterization

Office: 16015 Lomond Shores, Kendall, NY 14476 USA

179 Lake Avenue
Rochester, NY 14608 USA
Tel: (585) 727-2825
www.vaportrailanalytics.com

Rev 0 Effective 15 Apr 2008

COMPENDIUM METHOD TO-17
FIELD TEST DATA SHEET (FTDS)

I. General Information

Project: 011542 Date(s) Sampled: 6/17/10
Site: Greis Inc. Time Period Sampled: 1440-1560
Location: Tonawanda Operator: Jason Reynolds
Instrument Model No.: _____ Calibrated By: _____
Pump Serial No.: 19051 Rotameter Serial No.: _____
Rain: ☐ Yes ☒ No

Sampling Tube Adsorbent Cartridge Information

Tube Type: _____
Adsorbent(s): _____

II. Sampling Data

Tube ID	Sampling Location	Ambient Temp. (°F)	Ambient Pressure (in. Hg)	Pre-Sampling Flow Rate (mL/min)	Initial Sampling Time	Post-Sampling Flow Rate (mL/min)	Final Sampling Time	Total Time (min)	Mean Flow Rate (mL/min)	Total Sample Volume (mL) [1]
M; 12003	SP-04	77.6	-1.9	200	1440	200	1445	5	200	[redacted] 1010
Mi 107793	Boiler			—	—	—	—	—	—	—
Mi 12008	SP-03	75.9	-0.95	200	1505	200	1510	5	200	1000

III. Field Audit

Do all pre- and post-air sampling flow rates agree to within 10%? ☒ Yes ☐ No
If not, list the relevant tube IDs here: _____

Are any apparent total sampling volumes greater than 5000 mL? ☐ Yes ☒ No
If so, list the relevant tube IDs here: _____

[1] This will be verified using the rotameter calibration at the Analytical Laboratory.

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Volatiles and Semivolatiles Characterization
Office: 16015 Lomond Shores, Kendall, NY 14476 USA

Rev 0 Effective 15 Apr 2008

COMPENDIUM METHOD TO-17
FIELD TEST DATA SHEET (FTDS)

I. General Information

Project: 0115642 Date(s) Sampled: 6·18·10
Site: Greif - Tonawanda Time Period Sampled: 1520 - 1540
Location: _____ Operator: JR
Instrument Model No.: 210-1002 Calibrated By: _____
Pump Serial No.: 19051 Rotameter Serial No.: _____
Rain: ☐ Yes ☑ No

Sampling Tube Adsorbent Cartridge Information

Tube Type: _____
Adsorbent(s): _____

II. Sampling Data

Tube ID	Sampling Location	Ambient Temp. (°F)	Ambient Pressure (in. Hg)	Pre-Sampling Flow Rate (mL/min)	Initial Sampling Time	Post-Sampling Flow Rate (mL/min)	Final Sampling Time	Total Time (min)	Mean Flow Rate (mL/min)	Total Sample Volume (mL) [1]
120012	SP-06	78°	24.11	200	1535	200	1540	5	200	1003
107791	Blank	80.1	—	—	1530	—	—	—	—	—

III. Field Audit

Do all pre- and post-air sampling flow rates agree to within 10%? ☑ Yes ☐ No
If not, list the relevant tube IDs here: _____

Are any apparent total sampling volumes greater than 5000 mL? ☐ Yes ☑ No
If so, list the relevant tube IDs here: _____

[1] This will be verified using the rotameter calibration at the Analytical Laboratory.

VaporTrail Analytics

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Rev 0 Effective 15 Apr 2008

COMPENDIUM METHOD TO-17
FIELD TEST DATA SHEET (FTDS)

I. General Information

Project: ~~EPA~~ 0115642 Date(s) Sampled: 6.18.10
Site: Greit - E Time Period Sampled: 1550 - 1610
Location: Tonawanda Operator: JR
Instrument Model No.: 210-1002 Calibrated By: _____
Pump Serial No.: 19051 Rotameter Serial No.: _____
Rain: ☐ Yes ☑ No

Sampling Tube Adsorbent Cartridge Information

Tube Type: _____
Adsorbent(s): _____

II. Sampling Data

	Tube ID	Sampling Location	Ambient Temp. (°F)	Ambient Pressure (in. Hg)	Pre-Sampling Flow Rate (mL/min)	Initial Sampling Time	Post-Sampling Flow Rate (mL/min)	Final Sampling Time	Total Time (min)	Mean Flow Rate (mL/min)	Total Sample Volume (mL) [1]
Mi	107797	Blank	81.4	—	—	1550	—	—	—	—	—
Mi	120016	PG-103	80.9	-U	200	1555	200	1600	5	200	1007
Mi	120017	SP-503	105.0	14	200	1610	200	1615	5	200	1000
Mi	~~120019~~	~~SP-505~~	115.0	(10)							

III. Field Audit

Do all pre- and post-air sampling flow rates agree to within 10%? ☑ Yes ☐ No
If not, list the relevant tube IDs here: _____

Are any apparent total sampling volumes greater than 5000 mL? ☑ Yes ☑ No
If so, list the relevant tube IDs here: _____

[1] This will be verified using the rotameter calibration at the Analytical Laboratory.

Vapor Trail Analytics

Stratospheric Performance

CHAIN OF CUSTODY RECORD

179 Lake Avenue
Rochester, New York 14608 USA
Phone: (585) 727-2865 25

PROJECT/SITE: Greif- Tonawanda

SEND REPORT TO:

PERSON/COMPANY: ERM
ADDRESS: 5788 Widewaters Pkwy
CITY: DeWitt STATE: NY ZIP: 13214
PHONE: FAX: 315.445.2554
EMAIL: jon.fox@erm.com
COMMENTS:

SEND INVOICE TO:

PERSON/COMPANY:
ADDRESS: SAME
CITY: STATE: ZIP:
PHONE: FAX:
EMAIL:

LAB PROJECT #: 201019
CLIENT PROJECT #: 0115642

REQUESTED TURNAROUND TIME: STD ☑ 5/10 | SAME DAY ☐ | 1 ☐ | 2 ☐ | 3 ☐

Quotation #

REQUESTED ANALYSIS

	Sample Identification	Sample Date	Sample Time	Sample Type	Matrix	Number Containers	TO-17									Remarks	VTA Sample Number
1	Mi 120015	22 June 10	0928	vapor (grab)	air	1	X										1271
2	Mi 120014	↓	0940	vapor (grab)	air	1	X										1272
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sample Condition: Per NELAC/ELAP 210/241/242/243/244

Receipt Parameter		NELAC Compliance
Temperature:	25°C	N/A Y ☐ N ☐
Comments:		
Holding Time:	—	N/A Y ☐ N ☐
Comments:		

General Comments:

Receiving:

SP, JR	22 June 10 / 0930
Sampled By	Date/Time
Shannon Pitch	22 June 10 / 1646
Relinquished By	Date/Time
	6/22/10 1646
Received By	Date/Time
Bill Burr	6/23/10 10:53
Received At Lab By	Date/Time

Tube I.D.	Sample Location	Ambient Temp (°F)	Ambient Pressure (in H_2O)	Pre-Sampling Flow Rate (mL/min)	Initial Sampling Time
Mi 120015	Mid-carbon	90.1°	4	200	0923
Mi120014	Post-Carbon	97.5	.32	200	0935

Tube I.D. (continued)	Post Sampling Flow Rate (mL/min)	Final Sampling Time	Total Time (min)	Mean Flow Rate	Total Sample Volume (mL)'
Mi 120015	200	0928	5 min	200	1010
Mi120014	200	0940	5min	200	1013

pump used: Serial # 19060
Model # 210-1002

Received w/ COC
as FTDS
from S. Petch, ERM
J. D. Fox 6/23/10
1300

APPENDIX B

NYSDEC Air Emission Calculations

Section II - Basic Cavity Impact Analysis

Use this method only if the shortest distance from the building to the property line is less than 3 times the building height (h_b). Cavity impacts would then occur to offsite receptors.

Emission Point: SP-03

h_b - building height (ft): 33.29167 If the physical stack height is greater than 1.5 h_b, no annual or short term cavity impacts occur from this source.

Contaminant	CAS Number	Q (lb/hr)	Q_a (lb/yr)	C_c (µg/m^3)	C_{st} (µg/m^3)	AGC (µg/m^3)	SGC (µg/m^3)
1,1,1 Trichloroethane	00071-55-6	0.00E+00	0.00	0.00	0.00	1000	68000
1,1 Dichloroethane	00075-34-3	0.00E+00	0.00	0.00	0.00	0.63	--
1,1 Dichloroethylene	00156-59-2	6.39E-07	0.01	0.00	0.00	63	
1,2,4 Trimethylbenzene	00095-63-6	0.00E+00	0.00	0.00	0.00	290	--
1,2 Dichloroethane	00107-06-2	0.00E+00	0.00	0.00	0.00	0.038	--
Benzene	00071-43-2	1.99E-06	0.02	0.00	0.00	0.13	1300
Chloroethane	00075-00-3	0.00E+00	0.00	0.00	0.00	10000	--
Chloroform	00067-66-3	0.00E+00	0.00	0.00	0.00	0.043	150
cis 1,2 Dichloroethylene	00156-59-2	0.00E+00	0.00	0.00	0.00	63	--
Ethylbenzene	00100-41-4	0.00E+00	0.00	0.00	0.00	1000	54000
m,p Xylenes	108-38-3/106-42-3	0.00E+00	0.00	0.00	0.00	100	4300
o Xylene	00095-47-6	0.00E+00	0.00	0.00	0.00	100	4300
Tetrachloroethylene	00127-18-4	1.85E-06	0.02	0.00	0.00	1	1000
Toluene	00108-88-3	7.81E-07	0.01	0.00	0.00	5000	37000
trans 1,2 Dichloroethylene	00156-60-5	0.00E+00	0.00	0.00	0.00	63	--
Trichloroethylene	00079-01-6	1.67E-06	0.01	0.00	0.00	0.5	14000
Vinyl Chloride	00075-01-4	0.00E+00	0.00	0.00	0.00	0.11	180000
1,1,2 Trichloroethane	00079-00-5	0.00E+00	0.00	0.00	0.00	1.4	--
2 Butanone	00078-93-3	1.24E-06	0.01	0.00	0.00	5000	13000
4 Methyl 2 Pentanone	00107-83-5	7.81E-07	0.01	0.00	0.00	4200	350000
Acetone	00067-64-1	4.50E-05	0.39	0.00	0.04	28000	180000
Methylene Chloride	00075-09-2	5.23E-05	0.46	0.00	0.04	2.1	14000

Note: Input values only into gray cells.

Equations Used For Airguide-1 Calculations

Annual Cavity Impact

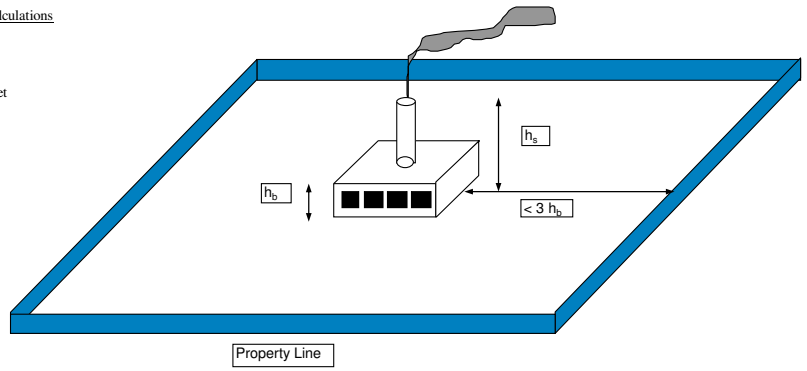
C_c (µg/m^3) = $(1.72*Q_a)/(h_b^2)$

where Q_a is in lbs/yr and h_b is in feet

Short Term Cavity Impact

C_{st} (µg/m^3) = $(904000*Q)/(h_b^2)$

where Q is lbs/hr and h_b is in feet



	ug/m3	ug/m3 to ug/ft3	lbs/ft3	cfm	lb/min	min/hr	lb/hr
		0.0282868	2.20E-09	95		60	
1,1,1 Trichloroethane	0	0	0		0		0
1,1 Dichloroethane	0	0	0.00E+00		0.00E+00		0.0000
1,1 Dichloroethylene	1.8	0.0509163	1.12E-10		1.07E-08		0.0000
1,2,4 Trimethylbenzene	0	0	0.00E+00		0.00E+00		0.0000
1,2 Dichloroethane	0	0	0.00E+00		0.00E+00		0.0000
Benzene	5.6	0.1584062	3.49E-10		3.31E-08		0.0000
Chloroethane	0	0	0		0		0
Chloroform	0	0	0		0		0
cis 1,2 Dichloroethylene	0	0	0		0		0
Ethylbenzene	0	0	0		0		0
m,p Xylenes	0	0	0.00E+00		0		0
o Xylene	0	0	0		0		0
Tetrachloroethylene	5.2	0.1470915	3.24E-10		3.078E-08		1.847E-06
Toluene	2.2	0.062231	1.371E-10		1.302E-08		7.813E-07
trans 1,2 Dichloroethylene	0	0	0		0		0
Trichloroethylene	4.7	0.1329481	2.928E-10		2.782E-08		1.669E-06
Vinyl Chloride	0	0	0		0		0
1,1,2 Trichloroethane	0	0	0		0		0
2 Butanone	3.5	0.0990039	2.181E-10		2.072E-08		1.243E-06
4 Methyl 2 Pentanone	2.2	0.062231	1.371E-10		1.302E-08		7.813E-07
Acetone	126.7	3.5839413	7.894E-09		7.499E-07		4.5E-05
Methylene Chloride	147.3	4.16665	9.178E-09		8.719E-07		5.231E-05

Note: Value of 0 is equivelant to a 'none detect'

Section III - Point Source Method - Conservative Approach

Use this method only if the stack height to building height ratio is less than 1.5 (no credit given for plume rise rise due to buoyancy or momentum).

Emission Point SP-03
h_e - stack height (ft) 33.29167

Contaminant	CAS Number	Q (lb/hr)	Q_a (lb/yr)	C_a (µg/m^3)	C_p (µg/m^3)	C_{st} (µg/m^3)	AGC (µg/m^3)	SGC (µg/m^3)
1,1,1 Trichloroethane	00071-55-6	0.00E+00	0.00	0.000	0.00	0.00	1000	68000
1,1 Dichloroethane	00075-34-3	0.00E+00	0.00	0.000	0.00	0.00	0.63	--
1,1 Dichloroethylene	00156-59-2	6.39E-07	0.01	0.000	0.00	0.00	63	
,2,4 Trimethylbenzene	00095-63-6	0.00E+00	0.00	0.000	0.00	0.00	290	--
1,2 Dichloroethane	00107-06-2	0.00E+00	0.00	0.000	0.00	0.00	0.038	--
Benzene	00071-43-2	1.99E-06	0.02	0.000	0.00	0.00	0.13	1300
Chloroethane	00075-00-3	0.00E+00	0.00	0.000	0.00	0.00	10000	--
Chloroform	00067-66-3	0.00E+00	0.00	0.000	0.00	0.00	0.043	150
s 1,2 Dichloroethylene	00156-59-2	0.00E+00	0.00	0.000	0.00	0.00	63	--
Ethylbenzene	00100-41-4	0.00E+00	0.00	0.000	0.00	0.00	1000	54000
m,p Xylenes	08-38-3/106-42-	0.00E+00	0.00	0.000	0.00	0.00	100	4300
o Xylene	00095-47-6	0.00E+00	0.00	0.000	0.00	0.00	100	4300
Tetrachloroethylene	00127-18-4	1.85E-06	0.02	0.000	0.00	0.00	1	1000
Toluene	00108-88-3	7.81E-07	0.01	0.000	0.00	0.00	5000	37000
s 1,2 Dichloroethylene	00156-60-5	0.00E+00	0.00	0.000	0.00	0.00	63	--
Trichloroethylene	00079-01-6	1.67E-06	0.01	0.000	0.00	0.00	0.5	14000
Vinyl Chloride	00075-01-4	0.00E+00	0.00	0.000	0.00	0.00	0.11	180000
1,1,2 Trichloroethane	00079-00-5	0.00E+00	0.00	0.000	0.00	0.00	1.4	--
2 Butanone	00078-93-3	1.24E-06	0.01	0.000	0.00	0.00	5000	13000
4 Methyl 2 Pentanone	00107-83-5	7.81E-07	0.01	0.000	0.00	0.00	4200	350000
Acetone	00067-64-1	4.50E-05	0.39	0.001	0.00	0.06	28000	180000
Methylene Chloride	00075-09-2	5.23E-05	0.46	0.001	0.00	0.07	2.1	14000

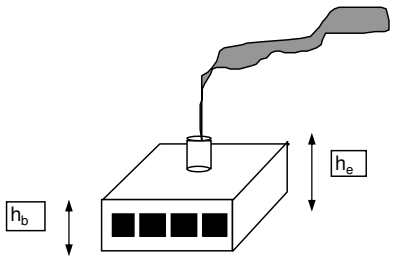
Note: Input values only into gray cells.

Equations Used For Airguide-1 Calculations

Maximum Actual Annual Impact
C_a (µg/m^3) = $(6.0*Q_a)/(h_e^{2.25})$
where Q_a is in lbs/yr and h_e is in feet

Maximum Potential Annual Impact
C_p (µg/m^3) = $(52500*Q)/(h_e^{2.25})$
where Q is lbs/hr and h_e is in feet

Maximum Short Term Impact
C_{st} (µg/m^3) = C_p * 65



Section II - Basic Cavity Impact Analysis

Use this method only if the shortest distance from the building to the property line is less than 3 times the building height (h_b). Cavity impacts would then occur to offsite receptors.

Emission Point: SP-04

h_b - building height (ft): 33.29167 If the physical stack height is greater than 1.5 h_b, no annual or short term cavity impacts occur from this source.

Contaminant	CAS Number	Q (lb/hr)	Q_a (lb/yr)	C_c (µg/m^3)	C_{st} (µg/m^3)	AGC (µg/m^3)	SGC (µg/m^3)
1,1,1 Trichloroethane	00071-55-6	1.38E-05	0.12	0.0002	0.01	1000	68000
1,1 Dichloroethane	00075-34-3	1.03E-06	0.01	0.00	0.00	0.63	--
1,1 Dichloroethylene	00156-59-2	1.15E-05	0.10	0.00	0.01	63	
1,2,4 Trimethylbenzene	00095-63-6	0.00E+00	0.00	0.00	0.00	290	--
1,2 Dichloroethane	00107-06-2	0.00E+00	0.00	0.00	0.00	0.038	--
Benzene	00071-43-2	3.55E-06	0.03	0.0000	0.00	0.13	1300
Chloroethane	00075-00-3	0.00E+00	0.00	0.0000	0.00	10000	--
Chloroform	00067-66-3	0.00E+00	0.00	0.0000	0.00	0.043	150
cis 1,2 Dichloroethylene	00156-59-2	1.12E-06	0.01	0.0000	0.00	63	--
Ethylbenzene	00100-41-4	0.00E+00	0.00	0.00	0.00	1000	54000
m,p Xylenes	108-38-3/106-42-3	0.00E+00	0.00	0.00	0.00	100	4300
o Xylene	00095-47-6	0.00E+00	0.00	0.00	0.00	100	4300
Tetrachloroethylene	00127-18-4	1.03E-05	0.09	0.00	0.01	1	1000
Toluene	00108-88-3	2.62E-06	0.02	0.0000	0.00	5000	37000
trans 1,2 Dichloroethylene	00156-60-5	0.00E+00	0.00	0.0000	0.00	63	--
Trichloroethylene	00079-01-6	9.64E-05	0.84	0.0013	0.08	0.5	14000
Vinyl Chloride	00075-01-4	0.00E+00	0.00	0.0000	0.00	0.11	180000
1,1,2 Trichloroethane	00079-00-5	0.00E+00	0.00	0.0000	0.00	1.4	--
2 Butanone	00078-93-3	0.00E+00	0.00	0.0000	0.00	5000	13000
4 Methyl 2 Pentanone	00107-83-5	2.99E-06	0.03	0.00	0.00	4200	350000
Acetone	00067-64-1	0.00E+00	0.00	0.00	0.00	28000	180000
Methylene Chloride	00075-09-2	0.00E+00	0.00	0.00	0.00	2.1	14000

Note: Input values only into gray cells.

Equations Used For Airguide-1 Calculations

Annual Cavity Impact

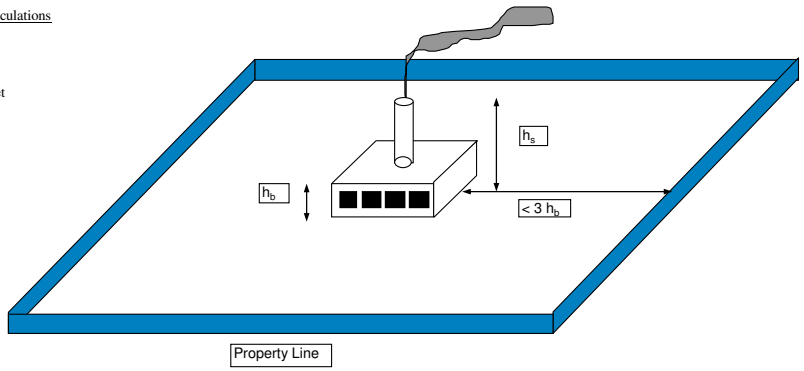
C_c (µg/m^3) = (1.72*Q_a)/(h_b^2)

where Q_a is in lbs/yr and h_b is in feet

Short Term Cavity Impact

C_{st} (µg/m^3) = (904000*Q)/(h_b^2)

where Q is lbs/hr and h_b is in feet



	ug/m3	ug/m3 to ug/ft3	ug/ft3 to lbs/ft3	cfm	lb/min	min/hr	lb/hr
		0.0282868	2.20E-09	250		60	
1,1,1 Trichloroethane	14.8	0.4186451	9.221E-10		2.305E-07		1.383E-05
1,1 Dichloroethane	1.1	0.0311155	6.85E-11		1.71E-08		0.0000
1,1 Dichloroethylene	12.3	0.347928	7.66E-10		1.92E-07		0.0000
1,2,4 Trimethylbenzene	0	0	0.00E+00		0.00E+00		0.0000
1,2 Dichloroethane	0	0	0.00E+00		0.00E+00		0.0000
Benzene	3.8	0.10749	2.37E-10		5.92E-08		0.0000
Chloroethane	0	0	0		0		0
Chloroform	0	0	0		0		0
cis 1,2 Dichloroethylene	1.2	0.0339442	7.477E-11		1.869E-08		1.122E-06
Ethylbenzene	0	0	0		0		0
m,p Xylenes	0	0	0.00E+00		0		0
o Xylene	0	0	0		0		0
Tetrachloroethylene	11	0.3111551	6.854E-10		1.713E-07		1.028E-05
Toluene	2.8	0.0792031	1.745E-10		4.361E-08		2.617E-06
trans 1,2 Dichloroethylene	0	0	0		0		0
Trichloroethylene	103.1	2.9163721	6.424E-09		1.606E-06		9.636E-05
Vinyl Chloride	0	0	0		0		0
1,1,2 Trichloroethane	0	0	0		0		0
2 Butanone	0	0	0		0		0
4 Methyl 2 Pentanone	3.2	0.0905179	1.994E-10		4.984E-08		2.991E-06
Acetone	0	0	0		0		0
Methylene Chloride	0	0	0		0		0

Note: Value of 0 is equivelant to a 'none detect'

Section III - Point Source Method - Conservative Approach

Use this method only if the stack height to building height ratio is less than 1.5 (no credit given for plume rise rise due to buoyancy or momentum).

Emission Point SP-04
h_e - stack height (ft) 33.29167

Contaminant	CAS Number	Q (lb/hr)	Q_a (lb/yr)	C_a (µg/m^3)	C_p (µg/m^3)	C_{st} (µg/m^3)	AGC (µg/m^3)	SGC (µg/m^3)
1,1,1 Trichloroethane	00071-55-6	0.0000	0.12	0.000	0.00	0.02	1000	68000
1,1 Dichloroethane	00075-34-3	0.0000	0.01	0.000	0.00	0.00	0.63	--
1,1 Dichloroethylene	00156-59-2	0.0000	0.10	0.000	0.00	0.01	63	
,2,4 Trimethylbenzene	00095-63-6	0.0000	0.00	0.000	0.00	0.00	290	--
1,2 Dichloroethane	00107-06-2	0.0000	0.00	0.000	0.00	0.00	0.038	--
Benzene	00071-43-2	0.0000	0.03	0.000	0.00	0.00	0.13	1300
Chloroethane	00075-00-3	0.0000	0.00	0.000	0.00	0.00	10000	--
Chloroform	00067-66-3	0.0000	0.00	0.000	0.00	0.00	0.043	150
s 1,2 Dichloroethylene	00156-59-2	0.0000	0.01	0.000	0.00	0.00	63	--
Ethylbenzene	00100-41-4	0.0000	0.00	0.000	0.00	0.00	1000	54000
m,p Xylenes	08-38-3/106-42-	0.0000	0.00	0.000	0.00	0.00	100	4300
o Xylene	00095-47-6	0.0000	0.00	0.000	0.00	0.00	100	4300
Tetrachloroethylene	00127-18-4	0.0000	0.09	0.000	0.00	0.01	1	1000
Toluene	00108-88-3	0.0000	0.02	0.000	0.00	0.00	5000	37000
s 1,2 Dichloroethylene	00156-60-5	0.0000	0.00	0.000	0.00	0.00	63	--
Trichloroethylene	00079-01-6	0.0001	0.84	0.002	0.00	0.12	0.5	14000
Vinyl Chloride	00075-01-4	0.0000	0.00	0.000	0.00	0.00	0.11	180000
1,1,2 Trichloroethane	00079-00-5	0.0000	0.00	0.000	0.00	0.00	1.4	--
2 Butanone	00078-93-3	0.0000	0.00	0.000	0.00	0.00	5000	13000
4 Methyl 2 Pentanone	00107-83-5	0.0000	0.03	0.000	0.00	0.00	4200	350000
Acetone	00067-64-1	0.0000	0.00	0.000	0.00	0.00	28000	180000
Methylene Chloride	00075-09-2	0.0000	0.00	0.000	0.00	0.00	2.1	14000

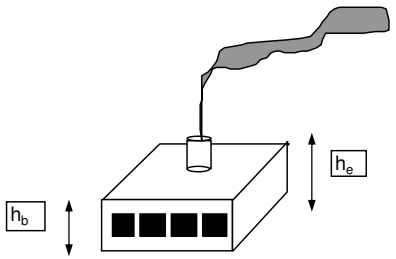
Note: Input values only into gray cells.

Equations Used For Airguide-1 Calculations

Maximum Actual Annual Impact
C_a (µg/m^3) = $(6.0*Q_a)/(h_e^{2.25})$
where Q_a is in lbs/yr and h_e is in feet

Maximum Potential Annual Impact
C_p (µg/m^3) = $(52500*Q)/(h_e^{2.25})$
where Q is lbs/hr and h_e is in feet

Maximum Short Term Impact
C_{st} (µg/m^3) = C_p * 65



Section II - Basic Cavity Impact Analysis

Use this method only if the shortest distance from the building to the property line is less than 3 times the building height (h_b). Cavity impacts would then occur to offsite receptors.

Emission Point: SP-503 (carbon inlet)

h_b - building height (ft): 24.167 If the physical stack height is greater than 1.5 h_b, no annual or short term cavity impacts occur from this source.

Contaminant	CAS Number	Q (lb/hr)	Q_a (lb/yr)	C_c (µg/m³)	C_{st} (µg/m³)	AGC (µg/m³)	SGC (µg/m³)
1,1,1 Trichloroethane	00071-55-6	2.45E-02	214.41	0.6314	37.89	1000	68000
1,1 Dichloroethane	00075-34-3	8.57E-04	7.50	0.0221	1.33	0.63	--
1,1 Dichloroethylene	00156-59-2	8.86E-03	77.58	0.2285	13.71	63	--
1,2,4 Trimethylbenzene	00095-63-6	1.49E-05	0.13	0.0004	0.02	290	--
1,2 Dichloroethane	00107-06-2	1.46E-05	0.13	0.0004	0.02	0.038	--
Benzene	00071-43-2	1.81E-05	0.16	0.0005	0.03	0.13	1300
Chloroethane	00075-00-3	9.21E-06	0.08	0.0002	0.01	10000	--
Chloroform	00067-66-3	3.89E-05	0.34	0.0010	0.06	0.043	150
cis 1,2 Dichloroethylene	00156-59-2	5.67E-04	4.97	0.0146	0.88	63	--
Ethylbenzene	00100-41-4	7.43E-06	0.07	0.0002	0.01	1000	54000
m,p Xylenes	108-38-3/106-42-3	1.16E-05	0.10	0.0003	0.02	100	4300
o Xylene	00095-47-6	1.07E-05	0.09	0.0003	0.02	100	4300
Tetrachloroethylene	00127-18-4	2.67E-05	0.23	0.0007	0.04	1	1000
Toluene	00108-88-3	9.87E-05	0.86	0.0025	0.15	5000	37000
trans 1,2 Dichloroethylene	00156-60-5	5.23E-05	0.46	0.0013	0.08	63	--
Trichloroethylene	00079-01-6	1.23E-02	108.05	0.3182	19.09	0.5	14000
Vinyl Chloride	00075-01-4	0.00E+00	0.00	0.0000	0.00	0.11	180000
1,1,2 Trichloroethane	00079-00-5	0.00E+00	0.00	0.0000	0.00	1.4	--
2 Butanone	00078-93-3	2.39E-04	2.09	0.0062	0.37	5000	13000
4 Methyl 2 Pentanone	00107-83-5	1.87E-05	0.16	0.0005	0.03	4200	350000
Acetone	00067-64-1	4.81E-04	4.22	0.0124	0.74	28000	180000
Methylene Chloride	00075-09-2	3.95E-04	3.46	0.0102	0.61	2.1	14000

Note: Input values only into gray cells.

Equations Used For Airguide-1 Calculations

Annual Cavity Impact

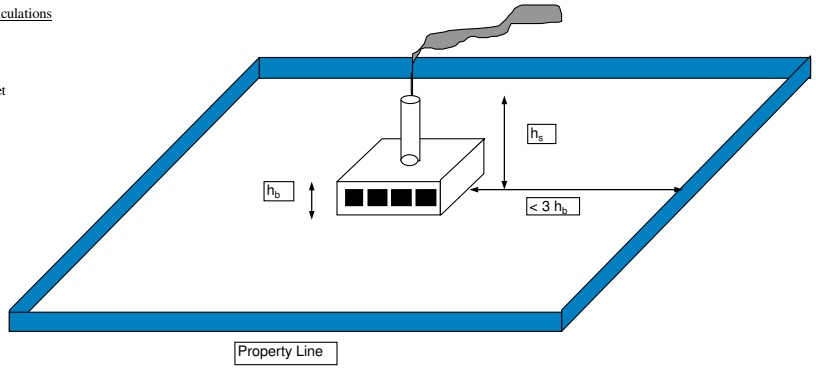
C_c (µg/m³) = $(1.72*Q_a)/(h_b^2)$

where Q_a is in lbs/yr and h_b is in feet

Short Term Cavity Impact

C_{st} (µg/m³) = $(904000*Q)/(h_b^2)$

where Q is lbs/hr and h_b is in feet



	ug/m3	ug/m3 to ug/ft3	ug/ft3 to lbs/ft3	cfm	lb/min	min/hr	lb/hr
		0.0282868	2.20E-09	795		60	
1,1,1 Trichloroethane	8235.7	232.96184	5.131E-07		0.0004079		0.0244764
1,1 Dichloroethane	288.2	8.1522642	1.80E-08		1.43E-05		0.0009
1,1 Dichloroethylene	2980	84.294751	1.86E-07		1.48E-04		0.0089
1,2,4 Trimethylbenzene	5	0.1414341	3.12E-10		2.48E-07		0.0000
1,2 Dichloroethane	4.9	0.1386055	3.05E-10		2.43E-07		0.0000
Benzene	6.1	0.1725497	3.80E-10		3.02E-07		0.0000
Chloroethane	3.1	0.0876892	1.931E-10		1.536E-07		9.213E-06
Chloroform	13.1	0.3705575	8.162E-10		6.489E-07		3.893E-05
cis 1,2 Dichloroethylene	190.8	5.397127	1.189E-08		9.451E-06		0.0005671
Ethylbenzene	2.5	0.0707171	1.558E-10		1.238E-07		7.43E-06
m,p Xylenes	3.9	0.1103186	2.43E-10		1.932E-07		1.159E-05
o Xylene	3.6	0.1018326	2.243E-10		1.783E-07		1.07E-05
Tetrachloroethylene	9	0.2545815	5.608E-10		4.458E-07		2.675E-05
Toluene	33.2	0.9391227	2.069E-09		1.644E-06		9.867E-05
trans 1,2 Dichloroethylene	17.6	0.4978482	1.097E-09		8.718E-07		5.231E-05
Trichloroethylene	4150.3	117.39883	2.586E-07		0.0002056		0.0123346
Vinyl Chloride	0	0	0		0		0
1,1,2 Trichloroethane	0	0	0		0		0
2 Butanone	80.3	2.2714324	5.003E-09		3.978E-06		0.0002387
4 Methyl 2 Pentanone	6.3	0.178207	3.925E-10		3.121E-07		1.872E-05
Acetone	161.9	4.5796377	1.009E-08		8.019E-06		0.0004812
Methylene Chloride	133	3.7621483	8.287E-09		6.588E-06		0.0003953

Note: Value of 0 is equivelant to a 'none detect'

AIRGUIDE-XL™

Section III - Point Source Method - Conservative Approach

Use this method only if the stack height to building height ratio is less than 1.5 (no credit given for plume rise rise due to buoyancy or momentum).

Emission Point	SP-503 (carbon inlet)
h_e - stack height (ft)	24.167

Contaminant	CAS Number	Q (lb/hr)	Q_a (lb/yr)	C_a (µg/m^3)	C_p (µg/m^3)	C_{st} (µg/m^3)	AGC (µg/m^3)	SGC (µg/m^3)
1,1,1 Trichloroethane	00071-55-6	2.45E-02	214.41	0.993	0.99	64.50	1000	68000
1,1 Dichloroethane	00075-34-3	8.57E-04	7.50	0.035	0.03	2.26	0.63	--
1,1 Dichloroethylene	00156-59-2	8.86E-03	77.58	0.359	0.36	23.34	63	--
,2,4 Trimethylbenzene	00095-63-6	1.49E-05	0.13	0.001	0.00	0.04	290	--
1,2 Dichloroethane	00107-06-2	1.46E-05	0.13	0.001	0.00	0.04	0.038	--
Benzene	00071-43-2	1.81E-05	0.16	0.001	0.00	0.05	0.13	1300
Chloroethane	00075-00-3	9.21E-06	0.08	0.000	0.00	0.02	10000	--
Chloroform	00067-66-3	3.89E-05	0.34	0.002	0.00	0.10	0.043	150
s 1,2 Dichloroethylene	00156-59-2	5.67E-04	4.97	0.023	0.02	1.49	63	--
Ethylbenzene	00100-41-4	7.43E-06	0.07	0.000	0.00	0.02	1000	54000
m,p Xylenes	108-38-3/106-42-3	1.16E-05	0.10	0.000	0.00	0.03	100	4300
o Xylene	00095-47-6	1.07E-05	0.09	0.000	0.00	0.03	100	4300
Tetrachloroethylene	00127-18-4	2.67E-05	0.23	0.001	0.00	0.07	1	1000
Toluene	00108-88-3	9.87E-05	0.86	0.004	0.00	0.26	5000	37000
s 1,2 Dichloroethylene	00156-60-5	5.23E-05	0.46	0.002	0.00	0.14	63	--
Trichloroethylene	00079-01-6	1.23E-02	108.05	0.501	0.50	32.50	0.5	14000
Vinyl Chloride	00075-01-4	0.00E+00	0.00	0.000	0.00	0.00	0.11	180000
1,1,2 Trichloroethane	00079-00-5	0.00E+00	0.00	0.000	0.00	0.00	1.4	--
2 Butanone	00078-93-3	2.39E-04	2.09	0.010	0.01	0.63	5000	13000
4 Methyl 2 Pentanone	00107-83-5	1.87E-05	0.16	0.001	0.00	0.05	4200	350000
Acetone	00067-64-1	4.81E-04	4.22	0.020	0.02	1.27	28000	180000
Methylene Chloride	00075-09-2	3.95E-04	3.46	0.016	0.02	1.04	2.1	14000

Note: Input values only into gray cells.

Equations Used For Airguide-1 Calculations

Maximum Actual Annual Impact

C_a (µg/m^3) = $(6.0*Q_a)/(h_e^{2.25})$

where Q_a is in lbs/yr and h_e is in feet

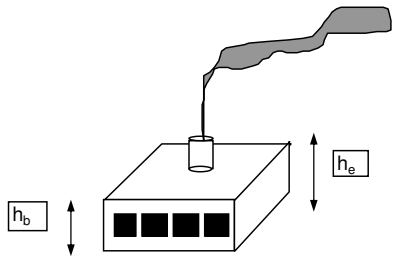
Maximum Potential Annual Impact

C_p (µg/m^3) = $(52500*Q)/(h_e^{2.25})$

where Q is lbs/hr and h_e is in feet

Maximum Short Term Impact

C_{st} (µg/m^3) = C_p * 65



Section II - Basic Cavity Impact Analysis

Use this method only if the shortest distance from the building to the property line is less than 3 times the building height (h_b). Cavity impacts would then occur to offsite receptors.

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h_b - building height (ft): Mixed — If the physical stack height is greater than 1.5 h_b, no annual or short term cavity impacts occur from this source.

Contaminant	CAS Number	Q (lb/hr)	Q_a (lb/yr)	C_c (µg/m^3)	C_{st} (µg/m^3)	AGC (µg/m^3)	SGC (µg/m^3)
1,1,1 Trichloroethane	00071-55-6	2.45E-02	214.53	0.6316	37.90	1000	68000
1,1 Dichloroethane	00075-34-3	8.58E-04	7.51	0.0221	1.33	0.63	--
1,1 Dichloroethylene	00156-59-2	8.87E-03	77.69	0.2286	13.72	63	--
1,2,4 Trimethylbenzene	00095-63-6	1.49E-05	0.13	0.0004	0.02	290	--
1,2 Dichloroethane	00107-06-2	1.46E-05	0.13	0.0004	0.02	0.038	--
Benzene	00071-43-2	2.37E-05	0.21	0.0005	0.03	0.13	1300
Chloroethane	00075-00-3	9.21E-06	0.08	0.0002	0.01	10000	--
Chloroform	00067-66-3	3.89E-05	0.34	0.0010	0.06	0.043	150
cis 1,2 Dichloroethylene	00156-59-2	5.68E-04	4.98	0.0146	0.88	63	--
Ethylbenzene	00100-41-4	7.43E-06	0.07	0.0002	0.01	1000	54000
m,p Xylenes	108-38-3/106-42-3	1.16E-05	0.10	0.0003	0.02	100	4300
o Xylene	00095-47-6	1.07E-05	0.09	0.0003	0.02	100	4300
Tetrachloroethylene	00127-18-4	3.89E-05	0.34	0.0009	0.05	1	1000
Toluene	00108-88-3	1.02E-04	0.89	0.0026	0.16	5000	37000
trans 1,2 Dichloroethylene	00156-60-5	5.23E-05	0.46	0.0013	0.08	63	--
Trichloroethylene	00079-01-6	1.24E-02	108.91	0.3195	19.17	0.5	14000
Vinyl Chloride	00075-01-4	0.00E+00	0.00	0.0000	0.00	0.11	180000
1,1,2 Trichloroethane	00079-00-5	0.00E+00	0.00	0.0000	0.00	1.4	--
2 Butanone	00078-93-3	2.40E-04	2.10	0.0062	0.37	5000	13000
4 Methyl 2 Pentanone	00107-83-5	2.25E-05	0.20	0.0005	0.03	4200	350000
Acetone	00067-64-1	5.26E-04	4.61	0.0130	0.78	28000	180000
Methylene Chloride	00075-09-2	4.48E-04	3.92	0.0109	0.65	2.1	14000

Note: Input values only into gray cells.

Equations Used For Airguide-1 Calculations

Annual Cavity Impact

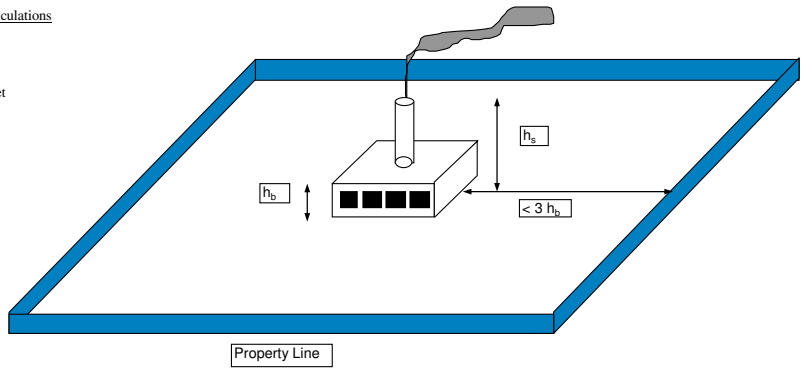
C_c (µg/m^3) = $(1.72*Q_a)/(h_b^2)$

where Q_a is in lbs/yr and h_b is in feet

Short Term Cavity Impact

C_{st} (µg/m^3) = $(904000*Q)/(h_b^2)$

where Q is lbs/hr and h_b is in feet



	ug/m3	ug/m3 to ug/ft3	ug/ft3 to lbs/ft3	cfm	lb/min	min/hr	lb/hr
		0.0282868	2.20E-09	Varies		60	
1,1,1 Trichloroethane	8250.5	233.38049	5.141E-07		0.0004082		0.0244902
1,1 Dichloroethane	289.3	8.1833797	1.80E-08		1.429E-05		0.0009
1,1 Dichloroethylene	2994.1	84.693596	1.87E-07		0.0001478		0.0089
1,2,4 Trimethylbenzene	5	0.1414341	3.12E-10		2.477E-07		0.0000
1,2 Dichloroethane	4.9	0.1386055	3.05E-10		2.427E-07		0.0000
Benzene	15.5	0.4384459	9.66E-10		3.945E-07		0.0000
Chloroethane	3.1	0.0876892	1.931E-10		1.536E-07		9.213E-06
Chloroform	13.1	0.3705575	8.162E-10		6.489E-07		3.893E-05
cis 1,2 Dichloroethylene	192	5.4310712	1.196E-08		9.47E-06		0.0005682
Ethylbenzene	2.5	0.0707171	1.558E-10		1.238E-07		7.43E-06
m,p Xylenes	3.9	0.1103186	2.43E-10		1.932E-07		1.159E-05
o Xylene	3.6	0.1018326	2.243E-10		1.783E-07		1.07E-05
Tetrachloroethylene	25.2	0.7128281	1.57E-09		6.479E-07		3.888E-05
Toluene	38.2	1.0805569	2.38E-09		1.701E-06		0.0001021
trans 1,2 Dichloroethylene	17.6	0.4978482	1.097E-09		8.718E-07		5.231E-05
Trichloroethylene	4258.1	120.44815	2.653E-07		0.0002072		0.0124327
Vinyl Chloride	0	0	0		0		0
1,1,2 Trichloroethane	0	0	0		0		0
2 Butanone	83.8	2.3704363	5.221E-09		3.998E-06		0.0002399
4 Methyl 2 Pentanone	11.7	0.3309559	7.29E-10		3.749E-07		2.25E-05
Acetone	288.6	8.1635789	1.798E-08		8.769E-06		0.0005262
Methylene Chloride	280.3	7.9287983	1.746E-08		7.46E-06		0.0004476

Note: Value of 0 is equivelant to a 'none detect'

Section III - Point Source Method - Conservative Approach

Use this method only if the stack height to building height ratio is less than 1.5 (no credit given for plume rise rise due to buoyancy or momentum).

Emission Point SP-03, 04, 503
h_e - stack height (ft) Mixed

Contaminant	CAS Number	Q (lb/hr)	Q_a (lb/yr)	C_a (µg/m^3)	C_p (µg/m^3)	C_{st} (µg/m^3)	AGC (µg/m^3)	SGC (µg/m^3)
1,1,1 Trichloroethane	00071-55-6	0.0245	214.53	0.994	0.99	64.52	1000	68000
1,1 Dichloroethane	00075-34-3	0.0009	7.51	0.035	0.03	2.26	0.63	--
1,1 Dichloroethylene	00156-59-2	0.0089	77.69	0.360	0.36	23.35	63	--
,2,4 Trimethylbenzene	00095-63-6	0.0000	0.13	0.001	0.00	0.04	290	--
1,2 Dichloroethane	00107-06-2	0.0000	0.13	0.001	0.00	0.04	0.038	--
Benzene	00071-43-2	0.0000	0.21	0.001	0.00	0.05	0.13	1300
Chloroethane	00075-00-3	0.0000	0.08	0.000	0.00	0.02	10000	--
Chloroform	00067-66-3	0.0000	0.34	0.002	0.00	0.10	0.043	150
s 1,2 Dichloroethylene	00156-59-2	0.0006	4.98	0.023	0.02	1.50	63	--
Ethylbenzene	00100-41-4	0.0000	0.07	0.000	0.00	0.02	1000	54000
m,p Xylenes	08-38-3/106-42-	0.0000	0.10	0.000	0.00	0.03	100	4300
o Xylene	00095-47-6	0.0000	0.09	0.000	0.00	0.03	100	4300
Tetrachloroethylene	00127-18-4	0.0000	0.34	0.001	0.00	0.09	1	1000
Toluene	00108-88-3	0.0001	0.89	0.004	0.00	0.26	5000	37000
s 1,2 Dichloroethylene	00156-60-5	0.0001	0.46	0.002	0.00	0.14	63	--
Trichloroethylene	00079-01-6	0.0124	108.91	0.503	0.50	32.63	0.5	14000
Vinyl Chloride	00075-01-4	0.0000	0.00	0.000	0.00	0.00	0.11	180000
1,1,2 Trichloroethane	00079-00-5	0.0000	0.00	0.000	0.00	0.00	1.4	--
2 Butanone	00078-93-3	0.0002	2.10	0.010	0.01	0.63	5000	13000
4 Methyl 2 Pentanone	00107-83-5	0.0000	0.20	0.001	0.00	0.05	4200	350000
Acetone	00067-64-1	0.0005	4.61	0.020	0.02	1.33	28000	180000
Methylene Chloride	00075-09-2	0.0004	3.92	0.017	0.02	1.11	2.1	14000

Note: Input values only into gray cells.

Equations Used For Airguide-1 Calculations

Maximum Actual Annual Impact
C_a (µg/m^3) = $(6.0*Q_a)/(h_e^{2.25})$
where Q_a is in lbs/yr and h_e is in feet

Maximum Potential Annual Impact
C_p (µg/m^3) = $(52500*Q)/(h_e^{2.25})$
where Q is lbs/hr and h_e is in feet

Maximum Short Term Impact
C_{st} (µg/m^3) = C_p * 65