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Haley & Aldrich, Inc.
9040 Friars Road
Suite 220
San Diego, CA 92108-5860
Tel: 619.280.9210
Fax: 619.280.9415
www.HaleyAldrich.com

HALEY & ALDRICH

27 November 2002
File No. 28997-003

280

South Coast Air Quality Management District
21865 East Copley Drive
Diamond Bar, CA 91765-4182

Attention: Toxics and Waste Management Unit

Subject: Toxic Risk Assessment for Building 2 SVE Extended Pilot Test System
Permit No. F52649 (A/N 401433), Issued July 2002 to Value Engineering

To whom it may concern:

Pursuant to Permit No. F52649 (A/N 401433), Haley & Aldrich, Inc. is submitting this toxic risk assessment for the granular activated carbon vapor treatment system exhaust sample collected on November 7, 2002 from the soil vapor extraction (SVE) extended pilot test system in the former Building 2 area of the former Boeing C-6 Facility (subject property), Los Angeles, California. Haley & Aldrich received the analytical results for this sample on November 15, 2002.

The compounds 1,1- Dichloroethene (1,1-DCE) and Chloroform were detected in a exhaust sample collected on November 7, 2002 in concentrations of 0.38 parts per million by volume (ppmv) and 0.80 ppmv, respectively. The allowable concentrations for 1,1-DCE and Chloroform as defined by Condition 12 of permit F52649 (A/N 401433) are 0.005 ppmv and 0.04 ppmv, respectively. The SVE system was shut down before the analytical results were received pending system closure. If the system is restarted, fresh activated carbon will be placed in the primary vessel.

A maximum individual cancer risk (MICR) calculation was performed as outlined by Condition 15 of permit F52649 (A/N 401433). The process flow rate used for the calculation was the actual operational flow rate when the vapor sample was collected. The results of this calculation, shown in Table 1, indicate that the total MICR for all compounds detected in the November 7, 2002 exhaust samples is 9.98E-07 (or approximately 1 in one million). This value was calculated for a worker approximately 25 meters away from the system. The calculated MICR for the nearest residential receptor is 6.03E-08 (or approximately 0.06 in one million). This value was calculated for a residential receptor at 500 meters. Both of these numbers are less than the specified toxic risk of ten in a million.

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We appreciate the opportunity to provide environmental consulting services on this project. Please do not hesitate to call if you have any questions.

Sincerely yours,

HALEY & ALDRICH, INC

Richard M. Farson, PE
Senior Engineer

Scott P. Zachary
Project Manager

cc: William Pearce – Boeing
John Scott – Boeing
Stephanie Sibbett - Boeing

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TABLE 1
RULE 1401 MICR ANALYSIS, PERMIT TO OPERATE F52649 (A/N 401433)
BOEING FORMER C-6, BUILDING 2 SVE
LOS ANGELES, CA

MICR, Actual Exhaust, 14-Foot High Stack

565 cfm

Q (tons/yr)	Removal Rate in lbs/day = [ppmV * SCFM * (60 min/hr * 24 hr/day * 365 days/yr) * MW * ton/2000 lb] / (1,000,000 * 379 cu.Ft / lb-mol)
MW	Molecular Weight (lb/ lbmol)
SCFM	Flow Rate (Stantard Cubic Feet per minute)
ppmV	Concentration (parts per million by volume)
379 cu ft/lbmol	Molar volume of air at 60 deg F and 1 atm (ideal gas assumption)
% eff	Percent efficiency of carbon
lbs/day (%eff)	Removal Rate in lbs/day after carbon treatment
C	Effluent concentration in parts per million by volume

				Emmission Rates		
Compound	**MW (lb/lbmol)**	**Flow Rate (SCFM)**	**C ppmV (by volume)**	**lbs/day**	**lbs/ yr**	**ton / yr**
Methylene Chloride	85.0	565	0.0023	0.000	0.2	0.000
Methyl Ethyl Ketone	72.1	565	0.00	0.000	0.0	0.000
Toluene	92.1	565	0.0025	0.000	0.2	0.000
Tetrachloroethylene	166.0	565	0.0009	0.000	0.1	0.000
Trichloroethylene	131.4	565	0.0071	0.002	0.7	0.000
1,2-Dichloroethylene	97.0	565	0.0082	0.002	0.6	0.000
Xylene	106.1	565	0.0029	0.001	0.2	0.000
Methyl Chloroform (1,1,1-TCA)	133.5	565	0.029	0.008	3.0	0.002
1,1 - Dichloroethane	99.0	565	0.015	0.003	1.2	0.001
Chloroform	119.4	565	0.80	0.205	74.8	0.037
Ethylbenzene	106.1	565	0.0005	0.000	0.0	0.000
Methyl tert butyl ether	88.2	565	0.00	0.000	0.0	0.000
Bromomethane (Methyl bromide)	95.0	565	0.00	0.000	0.0	0.000
Vinyl Chloride	62.5	565	0.00	0.000	0.0	0.000
Carbon tetrachloride	153.2	565	0.0042	0.001	0.5	0.000
4-methyl-2-pentanone (MIBK)	100.2	565	0.00	0.000	0.0	0.000
1,1-Dichloroethylene	97.0	565	0.38	0.079	28.9	0.014
1,1,2-Trichloro-1,2,2-Trifluoroethane	187.5	565	0.0021	0.001	0.3	0.000
Acetone	58.0	565	0.0039	0.000	0.2	0.000
Trichloroethane, 1, 1, 2-	133.5	565	0.00	0.000	0.0	0.000
1,2,4-Trimethylbenzene	120.1	565	0.0021	0.001	0.2	0.000
TPH	99.3	565	0	0.000	0.0	0.000

Maximum Individual Cancer Risk (MICR)

HIA =	(Q hr x (X/Q) hr) / REL
MICR	MICR = Q_{tons} * X/Q * MET * U * MP * LEA
Qtons	Maximum Emission Rate (tons / yr)
X / Q	Dispersion Factor in [(ug / m^3) / (tons / yr)]. Use reference table 3A, SCAQMD, Risk Assessment Procedures for Rule 1401.
MET	Meteorological Correction Factor. Use reference table 3B, SCAQMD, Risk Assessment Procedures for Rule 1401.
U	Unit Risk Factors in (ug / m^3)$^{-1}$. Use reference table 8A, SCAQMD, Risk Assessment Procedures for Rule 1401.
MP	Multi-pathway factor (if applicable). Use reference table 8A, SCAQMD, Risk Assessment Procedures for Rule 1401.
LEA	Lifetime Exposure adjustment factor. Use reference table 9, SCAQMD, Risk Assessment Procedures for Rule 1401.

TABLE 1
RULE 1401 MICR ANALYSIS, PERMIT TO OPERATE F52649 (A/N 401433)
BOEING FORMER C-6, BUILDING 2 SVE
LOS ANGELES, CA

WORKER
nearest receptor
25 m

Compound	Qtons (tons / yr)	X / Q [1] [(ug/m^3)/(tons/yr)]	MET [2] (unitless)	U (ug / m^3)	MP (unitless)	LEA [3] (unitless)	MICR
Methylene Chloride	0.000	49.68	0.68	1.00E-06	1.00	0.14	3.62E-10
Methyl Ethyl Ketone	0.000	49.68	0.68			0.14	0.00E+00
Toluene	0.000	49.68	0.68			0.14	0.00E+00
Tetrachloroethylene	0.000	49.68	0.68	5.90E-06	1.00	0.14	1.54E-09
Trichloroethylene	0.000	49.68	0.68	2.00E-06	1.00	0.14	3.46E-09
1,2-Dichloroethylene	0.000	49.68	0.68			0.14	0.00E+00
Xylene	0.000	49.68	0.68		1.00	0.14	0.00E+00
Methyl Chloroform (1,1,1	0.002	49.68	0.68		1.00	0.14	0.00E+00
1,1 - Dichloroethane	0.001	49.68	0.68	1.60E-06	1.00	0.14	4.40E-09
Chloroform	0.037	49.68	0.68	5.30E-06	1.00	0.14	9.38E-07
Ethylbenzene	0.000	49.68	0.68		1.00	0.14	0.00E+00
Methyl tert butyl ether	0.000	49.68	0.68		1.00	0.14	0.00E+00
Bromomethane (Methyl b	0.000	49.68	0.68		1.00	0.14	0.00E+00
Vinyl Chloride	0.000	49.68	0.68	7.80E-05	1.00	0.14	0.00E+00
Carbon tetrachloride	0.000	49.68	0.68	4.20E-05	1.00	0.14	5.01E-08
4-methyl-2-pentanone (M	0.000	49.68	0.68			0.14	0.00E+00
1,1-Dichloroethylene	0.014	49.68	0.68		1.00	0.14	0.00E+00
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.000	49.68	0.68			0.14	0.00E+00
Acetone	0.000	49.68	0.68			0.14	0.00E+00
Trichloroethane, 1, 1, 2-	0.000	49.68	0.68	1.60E-05	1.00	0.14	0.00E+00
1,2,4-Trimethylbenzene	0.000	49.68	0.68			0.14	0.00E+00
TPH	0.000	49.68	0.68			0.14	0.00E+00

Total MICR for all pollutants: 9.98E-07

[1] Dispersion Factor based on 14 foot stack height and downward distance of 25 meters.
[2] Meteorological Correction Factor based on Lennox Station.
[3] LEA based on off-site worker conditions.

RESIDENTIAL
nearest receptor
500 m

Compound	Qtons (tons / yr)	X / Q [4] [(ug/m^3)/(tons/yr)]	MET [2] (unitless)	U (ug / m^3)	MP (unitless)	LEA [5] (unitless)	MICR
Methylene Chloride	0.000	0.42	0.68	1.00E-06	1.00	1.0	2.19E-11
Methyl Ethyl Ketone	0.000	0.42	0.68			1.0	0.00E+00
Toluene	0.000	0.42	0.68			1.0	0.00E+00
Tetrachloroethylene	0.000	0.42	0.68	5.90E-06	1.00	1.0	9.31E-11
Trichloroethylene	0.000	0.42	0.68	2.00E-06	1.00	1.0	2.09E-10
1,2-Dichloroethylene	0.000	0.42	0.68			1.0	0.00E+00
Xylene	0.000	0.42	0.68		1.00	1.0	0.00E+00
Methyl Chloroform (1,1,1	0.002	0.42	0.68		1.00	1.0	0.00E+00
1,1 - Dichloroethane	0.001	0.42	0.68	1.60E-06	1.00	1.0	2.66E-10
Chloroform	0.037	0.42	0.68	5.30E-06	1.00	1.0	5.66E-08
Ethylbenzene	0.000	0.42	0.68			1.0	0.00E+00
Methyl tert butyl ether	0.000	0.42	0.68			1.0	0.00E+00
Bromomethane (Methyl b	0.000	0.42	0.68			1.0	0.00E+00
Vinyl Chloride	0.000	0.42	0.68	7.80E-05	1.00	1.0	0.00E+00
Carbon tetrachloride	0.000	0.42	0.68	4.20E-05	1.00	1.0	3.02E-09
4-methyl-2-pentanone (M	0.000	0.42	0.68			1.0	0.00E+00
1,1-Dichloroethylene	0.014	0.42	0.68		1.00	1.0	0.00E+00
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.000	0.42	0.68			1.0	0.00E+00
Acetone	0.000	0.42	0.68			1.0	0.00E+00
Trichloroethane, 1, 1, 2-	0.000	0.42	0.68	1.60E-05	1.00	1.0	0.00E+00
1,2,4-Trimethylbenzene	0.000	0.42	0.68			1.0	0.00E+00
TPH	0.000	0.42	0.68			1.0	0.00E+00

Total MICR for all pollutants: 6.03E-08

[4] Dispersion Factor based on 14 foot stack height and downward distance of 500 meters.
[5] LEA based on residentail conditions.