

CHESTER RISK PROJECT
EXTERNAL REVIEW DRAFT VERSION 1.0

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TABLE 3-1

INGESTION OF CHEMICALS IN SOIL, SEDIMENT, AND FISH TISSUE

DOSE EQUATION FOR RESIDENTIAL EXPOSURE

$$\text{DOSE (mg/kg/d)} = \frac{C \times IR \times CF \times EF \times ED}{BW \times AT}$$

Where: C = chemical concentration in soil, sediment, solid leachate, or fish tissue (mg/kg)

IR = ingestion rate
= 200 mg/d soil or sediment for children*
= 100 mg/d soil or sediment for adults (>6 years old)*
= 54 g/d fish tissue*

CF = conversion factor
= 1E-6 kg/mg soil or sediment
= 1E-3 kg/g fish tissue

EF = exposure frequency
= 350 d/yr*

ED = exposure duration
= 6 years for children*
= 24 years for adults*

BW = body weight
= 15 kg for children*
= 70 kg for adults*

AT = averaging time
= ED x 365 d/yr for non-carcinogens
= 70 yr x 365 d/yr for carcinogens

*Standard default exposure factors from USEPA, 1991a

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TABLE 3-2

DERMAL ABSORPTION OF CHEMICALS IN SOIL AND SEDIMENT

DOSE EQUATION FOR RESIDENTIAL EXPOSURE

$$\text{DOSE (mg/kg/d)} = \frac{C \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

- Where:
- C = chemical concentration in soil, sediment, or leachate (mg/kg)
 - CF = conversion factor
= 1E-6 kg/mg for soil and sediment
 - SA = skin surface area available for contact
= 860 cm²/event for children (hands and feet)^{a,d}
= 1800 cm²/event for adults (hands and feet)^{a,d}
 - AF = soil-to-skin adherence factor
= 1 mg/cm²^b
 - ABS = absorption factor
= 6% for PCBs^b
= 1% for cadmium^b
 - EF = exposure frequency
= 350 events/yr for soil^b
= 7 events/yr for sediment^d
 - ED = exposure duration
= 6 years for children^c
= 24 years for adults^c
 - BW = body weight
= 15 kg for children^c
= 70 kg for adults^c
 - AT = averaging time
= ED x 365 d/yr for non-carcinogens
= 70 yr x 365 d/yr for carcinogens

^aUSEPA, 1989b

^bUSEPA, 1992a

^cUSEPA, 1991a

^dUSEPA, 1989a

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TABLE 3-3

INGESTION OF DRINKING WATER AND SURFACE WATER

DOSE EQUATION FOR RESIDENTIAL EXPOSURE

$$\text{DOSE (mg/kg/d)} = \frac{C \times \text{IR} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

Where: C = chemical concentration in water (mg/L)

IR = ingestion rate of water
= 2 L/day for adults, drinking water^a
= 1 L/day for children, drinking water^b
= 0.05 L/hour x 2.6 hrs/d for surface water, recreational use^c

EF = exposure frequency
= 350 d/yr for drinking water^a
= 7 events/yr for surface water^c

ED = exposure duration
= 6 years for children^a
= 24 years for adults^a

BW = body weight
= 15 kg for children^a
= 70 kg for adults^a

AT = averaging time
= ED x 365 d/yr for non-carcinogens
= 70 yr x 365 d/yr for carcinogens

^aUSEPA, 1991a

^bUSEPA, 1989b

^cUSEPA, 1989a

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TABLE 3-4

DERMAL EXPOSURE TO DRINKING WATER AND SURFACE WATER

DOSE EQUATION FOR RESIDENTIAL EXPOSURE

$$\text{DOSE (mg/kg/d)} = \frac{\text{Kp} \times \text{C} \times \text{t} \times \text{CF} \times \text{A} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

- Where:
- C = chemical concentration in water (mg/L)
 - Kp = permeability coefficient from water (cm/hr) (chemical-specific)^a
 - t = duration of exposure event
 - = 0.33 hrs/d for child bath^b
 - = 2.6 hrs/d for surface water recreation^c
 - CF = Conversion factor (L/cm³: 1E-3)
 - A = Skin surface area available for contact
 - = 18000 cm² for adult^c
 - = 7200 cm² for child^c
 - EF = exposure frequency
 - = 350 d/yr for drinking water^d
 - = 7 events/yr for surface water^c
 - ED = exposure duration
 - = 6 years for children^d
 - = 24 years for adults^d
 - BW = body weight
 - = 15 kg for children^d
 - = 70 kg for adults^d
 - AT = averaging time
 - = ED x 365 d/yr for non-carcinogens
 - = 70 yr x 365 d/yr for carcinogens

^aUSEPA, 1992a

^bProfessional judgment

^cUSEPA, 1989a

^dUSEPA, 1991a

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TABLE 3-5

INHALATION EXPOSURE TO DRINKING WATER
DOSE EQUATION FOR RESIDENTIAL EXPOSURE

$$\text{DOSE (mg/kg/d)} = \frac{D \times EF \times ED}{BW \times AT}$$

$$D = \left[\frac{(VR \times S)}{(BW \times Ra \times CF1)} \right] \times \left[\frac{Ds - 1/Ra + \exp(-Ra \times Ds)}{Ra} \right]$$

$$S = Cwd \times FR/SV$$

$$Cwd = C \times CF2 \times (1 - \exp[(-KaL \times ts)/60d])$$

$$KaL = KL/SQRT [(T1 \times uS)/(Ts \times u1)]$$

$$KL = 1/[(1/kl) + ((R \times T)/(H \times kg))]$$

$$kg = kH \times SQRT(MWH/MW)$$

$$kl = kC \times SQRT(MWC/MW)$$

Where: D = Inhalation dose (mg/kg/shower)

VR = Inhalation rate
= 14 L/min (20 m³/d)^a

S = Indoor VOC generation rate (ug/m³/min)
(calculated)

Ra = Rate of air exchange
= 0.01667/min^b

CF1 = Conversion factor
= 1E+6 ug L /mg/m^c

Cwd = Concentration leaving water droplet
(ug/L) (calculated)

FR = Shower flow rate
= 20 L/min^c

SV = Shower stall air volume
= 2.9 m³ ^c

C = Concentration in water (mg/L)

TABLE 3-5
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CF2	= Conversion factor = 1000 ug/mg
KaL	= Adjusted overall mass transfer coefficient (cm/hr) (calculated)
ts	= Shower droplet time = 2 sec ^b
d	= Shower droplet diameter = 1 mm ^b
KL	= Mass transfer coefficient (cm/hr) (calculated)
T1	= Calibration water temperature of KL = 293 K ^b
Ts	= Shower water temperature = 318 K ^b
u1	= Water viscosity at T1 = 1.002 centipoise ^b
uS	= Water viscosity at Ts = 0.596 centipoise ^b
R	= Gas constant = 8.2E-5 atm m ³ /mol/K
T	= Absolute temperature = 293 K
H	= Henry's Law constant (atm m ³ /mol) (chemical-specific)
kg	= Gas-film mass transfer coefficient (cm/hr) (calculated)
kl	= Liquid-film mass transfer coefficient (cm/hr) (calculated)
kH	= kg for water = 3000 cm/hr
kC	= kl for carbon dioxide = 20 cm/hr
MWH	= Molecular weight of water = 18 g/mol

MWC = Molecular weight of carbon dioxide
= 44 g/mol

MW = Molecular weight of contaminant (g/mol)
(chemical-specific)

Ds = duration of shower
= 12 min^c

EF = exposure frequency
= 350 showers/yr^a

ED = exposure duration
= 24 years for adults^a

BW = body weight
= 70 kg for adults^a

AT = averaging time
= ED x 365 d/yr for non-carcinogens
= 70 yr x 365 d/yr for carcinogens

^aUSEPA, 1991a

^bFoster and Chrostowski, 1987

^cProfessional judgment

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TABLE 3-6

INHALATION OF CHEMICALS IN AIR

DOSE EQUATION FOR RESIDENTIAL EXPOSURE

$$\text{DOSE (mg/kg/d)} = \frac{C \times \text{IR} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

- Where:
- C = chemical concentration in air (mg/m³)
(modeled)
 - IR = inhalation rate
 - = 20 m³/day for adults^a
 - = 12 m³/day for children^b
 - EF = exposure frequency
 - = 350 d/yr^a
 - ED = exposure duration
 - = 6 years for children (carcinogenic)^a
 - = 24 years for adults (carcinogenic)^a
 - = 30 years for adults (noncarcinogenic)^a
 - BW = body weight
 - = 15 kg for children^a
 - = 70 kg for adults^a
 - AT = averaging time
 - = ED x 365 d/yr for non-carcinogens
 - = 70 yr x 365 d/yr for carcinogens

^aUSEPA, 1991a

^bProfessional judgment

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TABLE 3-7

ORAL DOSE-RESPONSE PARAMETERS FOR CHEMICALS OF POTENTIAL CONCERN

CHEMICAL	ORAL RFD (mg/kg/day)	ORAL CSF (1/mg/kg/day)
MANGANESE	5E-3 (WATER) 1.4E-1 (FOOD)	N/A
CHLORDANE COMPOUNDS	6E-5	1.3
p,p'-DDE	N/A	3.4E-1
DIELDRIN	5E-5	16
PCBs	N/A	7.7
CADMIUM	5E-4 (WATER) 1E-3 (FOOD)	N/A
p,p'-DDD	N/A	2.4E-1
MERCURY	3E-4 (HEAST)	N/A
BENZO[B]FLUORANTHENE	N/A	7.3E-1 (ECAO)
ARSENIC	3E-4	1.75
BERYLLIUM	5E-3	4.3
VANADIUM	7E-3 (HEAST)	N/A
ANTIMONY	4E-4	N/A
CHROMIUM VI	5E-3	N/A
NICKEL	2E-2	N/A
SILVER	5E-3	N/A
BENZO[K]FLUORANTHENE	N/A	7.3E-2 (ECAO)
CHRYSENE	N/A	7.3E-3 (ECAO)
BENZ[A]ANTHRACENE	N/A	7.3E-1 (ECAO)
BENZO[A]PYRENE	N/A	7.3
DIBENZ[A,H]ANTHRACENE	N/A	7.3 (ECAO)
INDENO[1,2,3-C,D]PYRENE	N/A	7.3E-1 (ECAO)
p,p'-DDT	5E-4	3.4E-1
t-NONACHLOR	5E-4 (heptachlor)	4.5 (heptachlor)
COPPER	3.71E-2 (HEAST)	N/A

CHEMICAL	ORAL RFD (mg/kg/day)	ORAL CSF (1/mg/kg/day)
ZINC	3E-1	N/A
SELENIUM	5E-3	N/A
ALUMINUM	2.9 (RBCo)	N/A
BARIUM	7E-2	N/A
MIREX	2E-4	1.8 (W)
PENTACHLOROANISOLE	3E-2 (HEAST 1989)	1.2E-1 (HEAST 1990)
TETRACHLOROETHENE	1E-2	5.2E-2 (ECAO)
TOTAL THMs	1E-2 (CHLOROFORM)	6.1E-3 (CHLOROFORM)
CARBON TETRACHLORIDE	7E-4	1.3E-1
FLUORIDE	6E-2	N/A
NITRITE	1E-1	N/A
DIOXINS	N/A	1.5E5

The following hierarchy was used in selecting these numbers: parameters from USEPA's Integrated Risk Information System (IRIS), parameters from Health Effects Assessment Summary Tables (HEAST), numbers withdrawn from IRIS or HEAST but not yet substituted (W), numbers from USEPA's Environmental Criteria and Assessment Office (ECAO), numbers from other sources (RBCo).

USEPA, 1989c
 USEPA, 1990a
 USEPA, 1994a
 USEPA, 1994b
 USEPA, 1994c

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TABLE 3-8

INHALATION DOSE-RESPONSE PARAMETERS FOR CHEMICALS OF POTENTIAL CONCERN

CHEMICAL	INHALATION RFD (mg/kg/day)	INHALATION CSF (1/mg/kg/day)
BENZENE	1.7E-3 (ECAO)	2.9E-2
FORMALDEHYDE	N/A	4.5E-2
2-METHOXYETHANOL	5.7E-3	N/A
ACROLEIN	5.7E-6	N/A
VINYL CHLORIDE	N/A	3E-1 (HEAST)
CADMIUM	N/A	6.3
ACRYLONITRILE	5.7E-4	2.4E-1 (HEAST)
MERCURY	8.6E-5 (HEAST)	N/A
ETHYLENE GLYCOL	5.7E-3 (HEAST)	N/A
ARSENIC	N/A	15.1
1,3-BUTADIENE	N/A	9.8E-1
CROTONALDEHYDE	N/A	1.9 (W)
HYDROGEN CHLORIDE	2E-3	N/A
TETRACHLOROETHENE	N/A	2.03E-3 (ECAO)
TOTAL THMs	N/A	8.05E-2 (CHLOROFORM)
CARBON TETRACHLORIDE	N/A	5.3E-2
DIESEL	N/A	1.7E-5/ug/m ³ *
GASOLINE	N/A	5.1E-5/ug/m ³ *
CHROMIUM VI	N/A	4.2E1 (HEAST)

The following hierarchy was used in selecting these numbers: parameters from USEPA's Integrated Risk Information System (IRIS), parameters from Health Effects Assessment Summary Tables (HEAST), numbers withdrawn from IRIS or HEAST but not yet substituted (W), numbers from USEPA's Environmental Criteria and Assessment Office (ECAO), numbers from other sources (RBCo).

*unit risk USEPA, 1994a USEPA, 1994c

CHESTER RISK PROJECT
 TABLE 4-1
 U.S. CENSUS OF POPULATION AND HOUSING - STF- 3A SAMPLE COUNT DATA (1990)*
 SUMMARY

Area	Total Housing Units	Occupied Housing Units	Vacant Housing Units	Public	Drilled Well	Dug Well	Other
Marcus Hook Borough	1055	990	65	1055	0	0	0
Trainer Borough	912	871	41	902	7	3	0
Chester City	16,512	14,538	1,975	16,445	18	22	26
Chester Township CDP	1,879	1,778	101	1,868	5	6	0
Linwood	1,190	1,123	67	1,190	0	0	0
Upland Borough	1,224	1,187	37	1,224	0	0	0
Eddystone Borough	1,071	993	78	1,065	0	0	6

* Data obtained from STF 3A, File 29, Tables H22-H33

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TABLE 4-2
CERCLIS SITES GROUND WATER MONITORING DATA*
SUMMARY

Site Name	GW Contamination Organics*	GW Contamination Inorganics*	No GW Contamination*	Comments
Air Products	Benzene (16) Carbon Tetrachloride (1400) Chloroform (57) Tetrachloroethene (720) 1,1,1-Trichloroethane (1) Trichloroethene (1700) Vinyl Chloride (4)	Barium (700) Zinc (230)		Residents (547) -2 miles NW known to rely on homewells
Delaware Co Incinerator Landfill	Chlorobenzene (1)	Manganese (932)		
ABM Wade	Acetone (11) Benzene (110%) Carbon Disulfide (5) Chlorobenzene (113%) Chloroethane (17) 1,1-Dichloroethane (15) 1,2-Dichloroethane (93) 1,1-Dichloroethene (107%) 1,2-Dichloroethene (690) 1,2-Dichloropropane (49) Ethylbenzene (3) Methylene Chloride (5) Toluene (111%) Xylene (1) Vinyl Chloride (270)			CERCLIS Data: Data units appear to be incorrect; no filter metal data presented for metals Data presented are from 5-Year Review in 1993. No metals data were provided.

Site Name	GW Contamination Organics*	GW Contamination Inorganics*	No GW Contamination*	Comments
Monroe Chemical			No recent monitoring data PADER results in 1984 showed no contamination	Mn and methaclor were detected above or at EPA regulatory levels in 1981 only; Locals residents are served by the Chester Water Authority
Scott Paper	Benzene (26) 1,1-Dichloroethane (5) Ethylbenzene (6) Fluorotrichloromethane (7) Methylene Chloride (280) Phenanthrene (149) Pyrene (23)			
Metro Container Corporation	Cresols (30) Carbon Disulfide (unknown) Carbon Tetrachloride (9) Methylene Chloride (14) Phenols (9670)	Nitrate (1200000) Arsenic (8) Cadmium (70) Total Chromium (500) Lead (140) Total Cyanide (2700) Sulfate (1250000000)		Detection limits are quite high for volatiles; Local residents supplied by a municipal water source

Site Name	GW Contamination Organics*	GW Contamination Inorganics*	No GW Contamination*	Comments
East 10th St	Carbon Disulfide (2) Chlorobenzene (2) Chloroform (6) 1,2-Dichloroethane (3) 1,2-Dichloroethene (37) 1,1-Dichloroethene (57) 1,1-Dichloroethane (42) 1,1,2,2-Tetrachloroethane (2) Toluene (2) Trichloroethane (140) Trichloroethene (230) Tetrachloroethene (67) Xylene (5) Acenaphthene (1) Di-n-butylphthlate (2) 2-Butanone (640) Fluoranthene (2) Bis-2-ethylhexylphthlate (1) 4-methyl-2-petonone (1) Phenol (14) Carbazole (1) Gamma-BHC (Lindane) (.0040) Endrin (.017) 4,4-DDT-(.015) PCBs (.26) Beta-BHC (.032) Petroleum Hydrocarbon (380)	Antimony (32.3) Arsenic (8.7) Beryllium (17.8) Cadmium (8.8) Chromium (304) Copper (235) Lead (11.7) Manganese (25000) Mercury (0.61) Nickel (492) Selenium (5.8) Zinc (2470)		

Site Name	GW Contamination Organics*	GW Contamination Inorganics*	No GW Contamination*	Comments
PECO Swedeland				no wells; unknown if ground water is contaminated
Vermiculite Dump Site				no wells; unknown if ground water is contaminated

*The numbers in parenthesis represent the highest concentration reported for each contaminant in $\mu\text{g/L}$. GW- Groundwater

CHESTER RISK PROJECT
TABLE 4-3
RISK SUMMARY
CHESTER WATER AUTHORITY

DRINKING WATER ADULT		CANCER RISK	NON-CANCER RISK
TOTAL RISK FROM ALL SOURCES (1989-ED- 1 YEAR)		1.34E-07	3.95E-01
TOTAL RISK FROM ALL SOURCES (1990-ED- 1 YEAR)		2.13E-07	2.29E-01
TOTAL RISK WITHOUT FLUORIDE (1991-ED- 1 YEAR)		1.86E-07	2.14E-01
TOTAL RISK FROM ALL SOURCES (1992-ED- 1 YEAR)		1.98E-07	2.27E-01
TOTAL RISK WITHOUT FLUORIDE (1993-ED- 1 YEAR)		1.78E-07	2.39E-01
TOTAL RISK WITHOUT FLUORIDE (1993-ED- 30 YEARS)		4.27E-06	2.39E-01
DRINKING WATER CHILD			
TOTAL RISK FROM ALL SOURCES (1989-ED- 1 YEAR)		3.12E-07	9.21E-01
TOTAL RISK FROM ALL SOURCES (1990-ED- 1 YEAR)		4.96E-07	5.33E-01
TOTAL RISK WITHOUT FLUORIDE (1991-ED- 1 YEAR)		4.35E-07	4.99E-01
TOTAL RISK FROM ALL SOURCES (1992-ED- 1 YEAR)		4.62E-07	5.31E-01
TOTAL RISK WITHOUT FLUORIDE (1993-ED- 1 YEAR)		4.15E-07	5.57E-01
TOTAL RISK WITHOUT FLUORIDE (1993-ED- 30 YEARS)		2.49E-06	5.57E-01
INHALATION ADULT			
TOTAL RISK FROM ALL SOURCES (1989-ED- 1 YEAR)		2.24E-06	0.00E+00
TOTAL RISK FROM ALL SOURCES (1990-ED- 1 YEAR)		2.90E-06	4.47E-02
TOTAL RISK FROM ALL SOURCES (1991-ED- 1 YEAR)		3.12E-06	0.00E+00
TOTAL RISK FROM ALL SOURCES (1992-ED- 1 YEAR)		3.32E-06	0.00E+00
TOTAL RISK FROM ALL SOURCES (1993-ED- 1 YEAR)		2.64E-06	0.00E+00
TOTAL RISK FROM ALL SOURCES (1993-ED- 30 YEARS)		6.33E-05	0.00E+00
DERMAL CHILD			
TOTAL RISK FROM ALL SOURCES (1989-ED- 1 YEAR)		7.41E-08	8.51E-02
TOTAL RISK FROM ALL SOURCES (1990-ED- 1 YEAR)		1.00E-07	1.13E-01
TOTAL RISK FROM ALL SOURCES (1991-ED- 1 YEAR)		1.03E-07	1.18E-01
TOTAL RISK FROM ALL SOURCES (1992-ED- 1 YEAR)		1.10E-07	1.26E-01
TOTAL RISK FROM ALL SOURCES (1993-ED- 1 YEAR)		1.32E-07	1.06E-01
TOTAL RISK FROM ALL SOURCES (1993-ED- 30 YEARS)		7.95E-07	1.06E-01
TOTAL RISK*			
1989 (1 YEAR)	ADULT	2.37E-06	3.95E-01
1990 (1 YEAR)	ADULT	3.11E-06	2.74E-01
1991 (1 YEAR)	ADULT	3.30E-06	2.14E-01
1992 (1 YEAR)	ADULT	3.51E-06	2.27E-01
1993 (1 YEAR)	ADULT	2.82E-06	2.39E-01
1989 (1 YEAR)	CHILD	3.86E-07	1.01E+00
1990 (1 YEAR)	CHILD	5.96E-07	6.46E-01
1991 (1 YEAR)	CHILD	5.38E-07	6.17E-01
1992 (1 YEAR)	CHILD	5.72E-07	6.57E-01
1993 (1 YEAR)	CHILD	5.48E-07	6.63E-01
1993 (30 YEARS)		7.09E-05	9.02E-01

*Total Risk without Fluoride

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TABLE 4-4
RISK SUMMARY
PHILADELPHIA SUBURBAN WATER COMPANY

DRINKING WATER ADULT		CANCER RISK	NON-CANCER RISK
TOTAL RISK FROM ALL SOURCES (1989-ED- 1 YEAR)		1.13E-07	1.30E-01
TOTAL RISK FROM ALL SOURCES (1990-ED- 1 YEAR)		1.51E-07	1.73E-01
TOTAL RISK FROM ALL SOURCES (1991-ED- 1 YEAR)		9.72E-08	1.12E-01
TOTAL RISK FROM ALL SOURCES (1992-ED- 1 YEAR)		8.69E-08	9.97E-02
TOTAL RISK FROM ALL SOURCES (1993-ED- 1 YEAR)		2.34E-07	2.68E-01
TOTAL RISK FROM ALL SOURCES (1993-ED- 30 YEARS)		5.62E-06	2.68E-01
DRINKING WATER CHILD			
TOTAL RISK FROM ALL SOURCES (1989-ED- 1 YEAR)		2.65E-07	3.04E-01
TOTAL RISK FROM ALL SOURCES (1990-ED- 1 YEAR)		3.52E-07	4.03E-01
TOTAL RISK FROM ALL SOURCES (1991-ED- 1 YEAR)		2.27E-07	2.60E-01
TOTAL RISK FROM ALL SOURCES (1992-ED- 1 YEAR)		2.03E-07	2.33E-01
TOTAL RISK FROM ALL SOURCES (1993-ED- 1 YEAR)		5.46E-07	6.26E-01
TOTAL RISK FROM ALL SOURCES (1993-ED- 30 YEARS)		3.28E-06	6.26E-01
INHALATION ADULT			
TOTAL RISK FROM ALL SOURCES (1989-ED- 1 YEAR)		1.90E-06	0.00E+00
TOTAL RISK FROM ALL SOURCES (1990-ED- 1 YEAR)		2.52E-06	0.00E+00
TOTAL RISK FROM ALL SOURCES (1991-ED- 1 YEAR)		1.63E-06	0.00E+00
TOTAL RISK FROM ALL SOURCES (1992-ED- 1 YEAR)		1.46E-06	0.00E+00
TOTAL RISK FROM ALL SOURCES (1993-ED- 1 YEAR)		3.92E-06	0.00E+00
TOTAL RISK FROM ALL SOURCES (1993-ED- 30 YEARS)		9.41E-05	0.00E+00
DERMAL CHILD			
TOTAL RISK FROM ALL SOURCES (1989-ED- 1 YEAR)		6.29E-08	7.21E-02
TOTAL RISK FROM ALL SOURCES (1990-ED- 1 YEAR)		8.35E-08	9.58E-02
TOTAL RISK FROM ALL SOURCES (1991-ED- 1 YEAR)		5.39E-08	6.18E-02
TOTAL RISK FROM ALL SOURCES (1992-ED- 1 YEAR)		4.82E-08	5.53E-02
TOTAL RISK FROM ALL SOURCES (1993-ED- 1 YEAR)		1.30E-07	1.49E-01
TOTAL RISK FROM ALL SOURCES (1993-ED- 30 YEARS)		7.78E-07	1.49E-01
TOTAL RISK*			
1989 (1 YEAR)	ADULT	2.01E-06	1.30E-01
1990 (1 YEAR)	ADULT	2.67E-06	1.73E-01
1991 (1 YEAR)	ADULT	1.73E-06	1.12E-01
1992 (1 YEAR)	ADULT	1.54E-06	9.97E-02
1993 (1 YEAR)	ADULT	4.15E-06	2.68E-01
1989 (1 YEAR)	CHILD	3.28E-07	3.76E-01
1990 (1 YEAR)	CHILD	4.35E-07	4.99E-01
1991 (1 YEAR)	CHILD	2.81E-07	3.22E-01
1992 (1 YEAR)	CHILD	2.51E-07	2.88E-01
1993 (1 YEAR)	CHILD	6.76E-07	7.75E-01
1993 (30 YEARS)		1.04E-04	1.04E+00

*Note fluoride is not added to the finished water

CHESTER RISK PROJECT
TABLE 4-5
RISK SUMMARY
PHILADELPHIA WATER DEPARTMENT

DRINKING WATER ADULT		CANCER RISK	NON-CANCER RISK
Total Risk without Fluoride (1989-ED- 1 YEAR)		1.63E-07	1.87E-01
Total Risk without Fluoride (1990-ED- 1 YEAR)		1.96E-07	2.15E-01
Total Risk without Fluoride (1991-ED- 1 YEAR)		1.97E-07	2.20E-01
Total Risk without Fluoride (1992-ED- 1 YEAR)		1.41E-07	1.61E-01
Total Risk without Fluoride (1993-ED- 1 YEAR)		2.14E-07	2.40E-01
Total Risk without Fluoride (1993-ED- 30 YEARS)		5.14E-06	2.40E-01
DRINKING WATER CHILD			
Total Risk without Fluoride (1989-ED- 1 YEAR)		3.80E-07	4.37E-01
Total Risk without Fluoride (1990-ED- 1 YEAR)		4.58E-07	5.03E-01
Total Risk without Fluoride (1991-ED- 1 YEAR)		4.60E-07	5.14E-01
Total Risk without Fluoride (1992-ED- 1 YEAR)		3.28E-07	3.77E-01
Total Risk without Fluoride (1993-ED- 1 YEAR)		5.00E-07	5.60E-01
Total Risk without Fluoride (1993-ED- 30 YEARS)		3.00E-06	5.60E-01
INHALATION ADULT			
Total Risk from All Sources (1989-ED- 1 Year)		2.73E-06	0.00E+00
Total Risk from All Sources (1990-ED- 1 Year)		2.87E-06	2.92E-02
Total Risk from All Sources (1991-ED- 1 Year)		3.05E-06	1.75E-02
Total Risk from All Sources (1992-ED- 1 Year)		2.35E-06	0.00E+00
Total Risk from All Sources (1993-ED- 1 Year)		3.34E-06	1.75E-02
Total Risk from All Sources (1993-ED- 30 Year)		8.00E-05	1.75E-02
DERMAL CHILD			
Total Risk from All Sources (1989-ED- 1 Year)		9.04E-08	1.04E-01
Total Risk from All Sources (1990-ED- 1 Year)		9.77E-08	1.11E-01
Total Risk from All Sources (1991-ED- 1 Year)		1.03E-07	1.17E-01
Total Risk from All Sources (1992-ED- 1 Year)		7.80E-08	8.95E-02
Total Risk from All Sources (1993-ED- 1 Year)		1.12E-07	1.28E-01
Total Risk from All Sources (1993-ED- 30 Year)		6.73E-07	1.28E-01
TOTAL RISK*			
1989 (1 YEAR)	ADULT	2.89E-06	1.87E-01
1990 (1 YEAR)	ADULT	3.06E-06	2.45E-01
1991 (1 YEAR)	ADULT	3.24E-06	2.38E-01
1992 (1 YEAR)	ADULT	2.49E-06	1.61E-01
1993 (1 YEAR)	ADULT	3.55E-06	2.57E-01
1989 (1 YEAR)	CHILD	4.71E-07	5.40E-01
1990 (1 YEAR)	CHILD	5.55E-07	6.14E-01
1991 (1 YEAR)	CHILD	5.62E-07	6.31E-01
1992 (1 YEAR)	CHILD	4.06E-07	4.66E-01
1993 (1 YEAR)	CHILD	6.12E-07	6.88E-01
1993 (30 YEARS)		8.89E-05	9.45E-01

*Total Risk without Fluoride

CHESTER RISK PROJECT
TABLE 4-6
CHESTER WATER AUTHORITY
CHEMICALS OF POTENTIAL CONCERN (COPC)

RBC* PPM	CHEMICALS-ORGANICS	1989		1990		1991		COPC
		HIGH-PPM	LOW-PPM	HIGH-PPM	LOW-PPM	HIGH-PPM	LOW-PPM	
0.00017	bromochloromethane	0.005	yes	0.008	0.003 yes	0.01	0.004 yes	COPC
0.00015	chloroform	0.033	0.019 yes	0.044	0.017 yes	0.046	0.021 yes	
0.0001	dibromomethane	0.008	yes					
0.00015	total trihalomethane**	0.056	0.022 yes	0.072	0.024 yes	0.076	0.023 yes	
0.00013	dibromochloromethane					0.0011	0.0009 yes	
0.00011	endrin							
0.00052	lindane							
0.00018	methoxychlor							
0.00029	alvax (2,4,5-TP S)			0.0008	yes			
0.000001	toxaphene							
0.0001	2,4-D							
0.00016	carbon tetrachloride							
0.0011	tetrachloroethene							
	INORGANICS							
		1989		1990		1991		
0.0015	antimony							
0.00038	arsenic							
0.000016	beryllium							
0.0018	cadmium							
0.00029	thallium							
0.00022	fluoride							
10	nitrate	5.9	no	0.8	no	0.92	yes	
0.00037	nitrite	0.88	yes			5.1	no	
0.015	lead							
15	gross alpha (pCi/L)			2	no			

11/84 Data obtained from PADEF - June 1994

*RBCs - Risk Based Concentrations from the Screening Guidance, EPA 600/R-83-001

**Average concentrations for the system are reported; minimum and maximum average are reported for each year.

Note: Some contaminants such as cis-1,3-dichloropropene reported during 1993 at 2 ppb by the Chester Water Authority in November, 1994 were not included. Note Contd. - because they are not regulated. See 'Uncertainty Section' in the risk assessment.

CHESTER RISK PROJECT
TABLE 4-7
PHILADELPHIA SUBURBAN WATER COMPANY
CHEMICALS OF POTENTIAL CONCERN (COPC)

RBC* PPM	CONTAMINANTS - ORGANICS	1989		1990		1991	
		HIGH-PPM	LOW-PPM COPC	HIGH-PPM	LOW-PPM COPC	HIGH-PPM	LOW-PPM COPC
0.00044	1,1-dichloroethene						
0.00012	1,2-dichloroethene						
0.00087	benzene						
0.00017	bromochloromethane					0.0129	0.014 yes
0.00016	carbon tetrachloride					0.0417	0.0096 yes
0.00015	chloroform					0.0017	0.0014 yes
0.00013	dibromochloromethane						
0.0061	dibromomethane						
0.00044	1,4-dichlorobenzene						
0.0016	trichloroethene						
0.000019	vinyl chloride	0.0475	0.0127 yes	0.0631	0.0154 yes		
0.00015	total trihalomethanes**						
	INORGANICS:	1989		1990		1991	
0.000038	arsenic						
0.015	lead	0.0031	no			0.002	no
15	gross alpha						

11/94 Data obtained from PADER-June 1994

*RBCs - Risk Based Concentrations from the Screening Guidance, EPA/903/R-93-001

**Average concentrations for the system are reported; minimum and maximum average are reported for each year.

CHESTER RISK PROJECT
TABLE 4-7 (CONTINUED)
CHESTER WATER AUTHORITY
CHEMICALS OF POTENTIAL CONCERN (COPC)

RBC* PPM	CONTAMINANTS-ORGANICS	1992		1993		1994	
		HIGH-PPM	LOW-PPM COPC	HIGH-PPM	LOW-PPM COPC	HIGH-PPM	LOW-PPM COPC
0.000044	1,1-dichloroethene						
0.00012	1,2-dichloroethane						
0.000087	benzene			0.0125	0.005 yes		
0.00017	bromochloromethane	0.0152	0.0046 ym				
0.00016	carbon tetrachloride	0.0414	0.0086 yes	0.0259	0.0092 yes		
0.00015	chloroform	0.0023	0.0007 yes	0.0033	0.0012 yes		
0.00013	dibromochloromethane			0.0007	no		
0.00044	dibromomethane						
0.0016	1,4-dichlorobenzene						
0.00019	trichloroethene						
0.000019	vinyl chloride					0.022	0.0151 yes
0.00015	total trihalomethanes**	0.0291	0.0035 ym	0.098	0.0173 ym		
	INORGANICS						
0.000038	arsenite						
0.015	lead						
15	gross alpha						
						1993	1994

11/94 Date obtained from PADER-June 1994

*RBCs - Risk Based Concentrations from the Screening Guidance, EPA/903/R-93-001

**Average concentrations for this system are reported; minimum and maximum average are reported for each year.

CHESTER RISK PROJECT
PHILADELPHIA WATER DEPARTMENT
CHEMICALS OF POTENTIAL CONCERN (COPC)

RCC PPM	CONTAMINANTS-ORGANICS	1990		1991		1991	
		HIGH-PPM	LOW-PPM COPC	HIGH-PPM	LOW-PPM COPC	HIGH-PPM	LOW-PPM COPC
0.000044	1,1-dichloroethane						
0.00012	1,2-dichloroethane						
0.000097	benzene						
0.00017	bromochloromethane						
0.00018	carbon tetrachloride**			0.0005	yes	0.0003	yes
0.00015	chloroform						
0.00013	dibromochloromethane						
0.0001	dibromomethane						
0.00044	1,4-dichlorobenzene						
0.0018	trichloroethane						
0.00019	vinyl chloride			0.0715	yes	0.0761	yes
0.00015	total trihalomethanes**	0.0683	yes				
	INORGANICS	1990	1990	1990	1991	1991	1991
0.000038	arsenic						
0.015	lead						
0.22	fluoride**						
15	gross alpha			1.01	yes	1.01	yes

11/94 Data obtained from PWD - November 1994 - (Annual Report Fiscal 1993)
 *RCCs - Risk Based Concentrations from the Screening Guidance, EPA800/A-83-001
 **Highest average concentrations for the system are reported
 ***The 1994 data were not available for analysis
 Note: Some contaminants such as ethylene dibromide detected up to 0.14 ppb during 1990 were not included because they are not regulated. See "Uncertainty Section" in the risk assessment.

CHESTER RISK PROJECT
TABLE 4-B (CONTINUED)
PHILADELPHIA WATER DEPARTMENT
CHEMICALS OF POTENTIAL CONCERN (COPC)

REC'S PPM	CONTAMINANTS-ORGANICS	1992 HIGH-PPM	LOW-PPM COPC	1993 HIGH-PPM	LOW-PPM COPC	1994** HIGH-PPM	LOW-PPM COPC
0.00044	1,1-dichloroethane						
0.00012	1,2-dichloroethane						
0.00087	benzene						
0.00017	bromodichloromethane						
0.00016	carbon tetrachloride**			0.0003	yes		
0.00015	chloroform						
0.00013	dibromochloromethane						
0.0001	dibromomethane						
0.00044	1,4-dichlorobenzene						
0.0016	trichloroethane						
0.00019	vinyl chloride	0.0599	yes	0.0633	yes		
0.00015	total trihalomethanes**						
	INORGANICS	1992		1993		1994	
0.00038	arsenic						
0.015	lead						
0.22	fluoride**	1	yes	0.98	yes		
15	Gross alpha						

11/94 Data obtained from PWD - November 1994 - (Annual Report Fiscal 1993)
*PRCs - Risk Based Concentrations from the Screening Guidance, EPA/600/R-93-001
**Highest average concentrations for the system are reported
***The 1994 data were not available for analysis
Note: Some contaminants such as ethylene dichloride detected up to 0.14 ppb during 1999 were not included because they are not regulated.
See "Uncertainty Section" in the risk assessment.

CHESTER RISK PROJECT
TABLE 4-9
CHESTER WATER AUTHORITY
VIOLATION SUMMARY

Date	Violation	Parameter	Compliance Achieved
January 1994	Treatment Technique	Not meeting Treatment Performance requirement*	January 1994
June 1993	Treatment Technique	Not meeting Treatment Performance requirement*	June 1993
June, July , October 1992	Treatment Technique	Not meeting Treatment Performance requirement*	November 1992
January 1992	Late submitting monitoring results	Required samples under the Lead Rule	January 1992
December 1991	Treatment Technique	Not meeting Treatment Performance requirement*	January 1992

* Under the Surface Water Treatment Rule (SWTR)
Data from the Federal Reporting Data System (FRDS)

CHESTER RISK PROJECT
TABLE 4-10
PHILADELPHIA SUBURBAN WATER COMPANY
VIOLATION SUMMARY

Date	Violation	Parameter	Compliance Achieved
May 1994	Late submitting monitoring results	Volatile Organics under Phase II	May 1994
March 1992	Treatment Technique	Not meeting Treatment Performance requirement*	March 1992

* Under the Surface Water Treatment Rule (SWTR)
Data from the Federal Reporting Data System (FRDS)

CHESTER RISK PROJECT
TABLE 4-11
PHILADELPHIA WATER DEPARTMENT
VIOLATION SUMMARY

Date	Violation	Parameter	Compliance Achieved
March 1992	Treatment Technique	Not meeting Treatment Performance requirement*	March 1992
February 1992	Treatment Technique	Not meeting Treatment Performance requirement*	March 1992
January 1992	Late submitting initial monitoring results for lead	Required samples under the Lead Rule	September 1992
December 1991	Treatment Technique	Not meeting Treatment Performance requirement*	December 1991
December 1991	Late submitting monitoring results	Required samples under the SWTR	January 1992
November 1991	Treatment Technique	Not meeting Treatment Performance requirement*	November 1991

* Under Surface Water Treatment Rule (SWTR)
Data from the Federal Reporting Data System (FRDS)

CHESTER RISK PROJECT

TABLE 4-12

COMPARISON OF CHILDREN'S BLOOD LEAD IN CHESTER, PA
WITH RESULTS OF USEPA'S THREE-CITY STUDY

City	Geometric Mean (ug/dL)	Children Above 10 ug/dL
Chester (all years combined)	14.2	68%
Baltimore	12.5	59%
Boston	12.6	71%
Cincinnati	11.7	52%

CHESTER RISK PROJECT

TABLE 4-13

TEMPORAL TRENDS IN CHILDREN'S BLOOD LEAD
CHESTER, PA

Year	Geometric Mean (ug/dL)	Children Above 10 ug/dL	Children Above 50 ug/dL
1989	16.6	72%	6.2%
1990	18.0	79%	3.8%
1991	17.1	78%	2.8%
1992	12.1	61%	0.27%
1993	11.9	62%	0.22%

CHESTER RISK PROJECT

TABLE 4-14

SITE-SPECIFIC INFORMATION

SITE	OPERATIONAL HISTORY	LOCATION	SIZE
DE County Incinerator Landfill No. 1	incinerator ash disposal, municipal waste disposal	Chester Township	30 acres
Vermiculite Dump	rayon production disposal	Marcus Hook	4 acres
ABM Wade	rubber recycling debris disposal	Chester City	3 acres
Monroe Chemicals	production of benzaldehydes and benzyl alcohol	Eddystone	2.3 acres
Scott Paper	paper mill waste discharge	Chester City	?
Air Products & Chemicals, Inc.	catalyst and petroleum cracking waste disposal	Marcus Hook	?
Metro Container	RCRA drum recycling, sludge and incinerator ash production	Trainer	?
East Tenth Street Site, a.k.a. FMC Site	rayon production	Marcus Hook	35 acres

CHESTER RISK PROJECT

TABLE 4-15

SUMMARY OF FINDINGS AT CERCLIS SITES¹

SITE	COMMENTS
DE County Incinerator Landfill No. 1	Exceedances of risk-based screening levels for soil, under a residential exposure scenario, for arsenic and beryllium.
Vermiculite Dump	Exceedances of risk-based screening levels for soil, under a residential exposure scenario, for copper, mercury, benz[a]anthracene and benzo[a]pyrene.
ABM Wade	Exceedances of risk-based screening levels for soil, under a residential exposure scenario, for antimony, arsenic, beryllium and manganese.
Monroe Chemicals	Exceedances of risk-based screening levels for soil, under a residential exposure scenario, for arsenic, beryllium and silver.
Scott Paper	Exceedances of risk-based screening levels for soil, under a residential exposure scenario, for benz[a]pyrene.
Air Products & Chemicals, Inc.	Exceedances of risk-based screening levels for soil, under a residential exposure scenario, for arsenic and mercury.
Metro Container	Based on usable data, no exceedances of risk-based screening levels for soil, under a residential exposure scenario.
East Tenth Street Site, a.k.a. FMC Site	Exceedances of risk-based screening levels for soil, under a residential exposure scenario, for antimony, arsenic, beryllium, copper, mercury, vanadium, benz[a]anthracene, benzo[b]-fluoranthene, benzo[k]fluoranthene, benzo[a]pyrene, chrysene, dibenz[a,h]-anthracene, indeno[1,2,3-c,d]pyrene, Aroclor-1254 and Aroclor-1260.

¹Based on available historical data

SOIL INGESTION DOSE CALCULATIONS

SITE	SOURCE	CHEMICAL	MAXIMUM CONCENTRATION (mg/kg)	CHILD DOSE (mg/kg/day)		ADULT DOSE (mg/kg/day)	
				NONCARCINOGENIC	CARCINOGENIC	NONCARCINOGENIC	CARCINOGENIC
DE CO. INC. NO. 1	B10	As	15	1.5E-04	1.5E-05	2.0E-05	7.0E-06
		As	3.5	2.7E-05	2.7E-06	3.1E-06	1.0E-06
VERMICULITE DUMP	NW SOIL	Cd	8410	8.4E-09			
		Hg	81.3	8.7E-04		7.4E-03	
		BENZOAANTHRACENE	3.5		3.9E-08		1.7E-08
		BENZO(A)PYRENE	2.4		2.4E-08		1.1E-08
ARM WADE@	WELL #10	Bb	5	5.9E-05		6.8E-06	
		As	20	2.4E-04		2.7E-05	
		Mn	20000	2.5E-01		2.8E-02	
		Ba	1.5	1.8E-05		2.0E-06	
MONROE CHEMICAL	WAREHOUSE	As	0.7	8.3E-06		9.5E-07	
		Ba	0.4	4.7E-06		5.4E-07	
		As	100	1.2E-03		1.3E-04	
		BENZO(A)PYRENE	0.8		8.1E-07		2.8E-07
SCOTT PAPER	SOIL PILES	As	10.1	1.2E-04		1.3E-05	
		Hg*	201	2.4E-03		2.7E-04	
AIR FOOD & CHEM.	B6-1 FH-30 SOIL	Bb	29	3.4E-04		3.9E-05	
		As	86.4	7.0E-04		8.0E-05	
EAST TENTH STREET	B-5	Ba	7.4	8.9E-05		1.0E-05	
		Cd	9770	3.0E-02		3.7E-03	
		Hg	3.2	3.8E-05		4.3E-06	
		BENZO(A)ANTHRACENE	318		3.8E-05		4.3E-06
		BENZO(B)FLUORANTHENE	81		8.2E-06		9.4E-07
		BENZO(K)FLUORANTHENE	66		8.4E-06		9.6E-07
B-4A	B-3	Ba	3.3	3.9E-06		4.4E-07	
		As	42	4.3E-05		4.9E-06	
B-3	B-3	CHRYSENE	52	5.3E-05		6.0E-06	
		DIBENZO(A,H)ANTHRACENE	0.57	5.9E-07		6.7E-08	
		INDENOL(1,2,3-C,D)PYRENE	18	1.8E-05		2.1E-06	
		AROCLOL 1254	8.2	8.4E-06		9.6E-07	
B-4A	B-4A	AROCLOL 1260	8.2	8.4E-06		9.6E-07	

Based on available historical data.
 *Because the maximum concentration of Hg reported at this site was suspect (screening method of analysis with results that could not be verified), the highest level of Hg detected by a lead laboratory was used.
 (If remedial action, including soil removal, has occurred at this site.)

CHESTER RISK PROJECT

TABLE 4-17

DERMAL ABSORPTION DOSE CALCULATIONS

SITE	SOURCE	CHEMICAL	MAXIMUM CONCENTRATION (mg/kg)	CHILD		ADULT	
				NONCARCINOGENIC DOSE (mg/kg/day)	CARCINOGENIC DOSE (mg/kg/day)	NONCARCINOGENIC DOSE (mg/kg/day)	CARCINOGENIC DOSE (mg/kg/day)
EAST TENTH STREET	S-3	AROCOLOR 1254	8.2		2.17E-06		4.19E-06
	S-4A	AROCOLOR 1250	8.2		2.17E-06		4.19E-06

Based on available historical data.

SOIL INGESTION RISK CALCULATIONS

SITE	SOURCE	CHEMICAL	MAXIMUM CONCENTRATION (mg/kg)	CHILD		ADULT	
				HO*	CARCINOGENIC RISK	HO*	CARCINOGENIC RISK
DECO. INC. NO. 1	S10	As	15	0.8	2.7E-05	0.1	1.3E-05
		Pa	2.3	0.0	1.0E-05	0.0	4.9E-05
VERMICULITE DUMP	NW SOIL	Cd	5410	1.7		0.2	
		Hg	81.3	3.2		0.4	
		BE SOIL	9.8		2.9E-05		1.3E-05
		BENZO(A)PYRENE	2.4		1.9E-05		8.9E-05
ARM WAREH	WELL #10	Sb	5	0.1		0.0	
		As	20	0.8	3.9E-05		1.9E-05
		Mn	21000	50.3		5.8	
		Pa	1.5	0.0	0.0E-05		3.0E-05
MONROE CHEMICAL	WAREHOUSE	As	0.7	0.0	1.3E-05	0.0	5.9E-07
		Pa	0.4	0.0	1.9E-05	0.0	8.1E-07
		Ag	100	0.2		0.0	
		BENZO(A)PYRENE	0.8		4.5E-05		2.1E-05
SCOTT PAPER	SOIL PILE	As	10.1	0.4	1.9E-05	0.0	8.3E-05
		Hg**	201	6.0		0.9	
AIR PROD & CHEM	S1-1 PH-NP/ROIL	Sb	29	0.9		0.1	
		As	56.4	2.3	1.0E-04	0.3	4.9E-05
EAST TENTH STREET	S-5	As	7.4	0.0	3.3E-05	0.0	1.5E-05
		Cd	2770	0.9		0.1	
		Hg	3.2	0.1		0.0	
		V	318	0.5		0.1	
		BENZO(A)ANTHRACENE	81		4.9E-05		2.1E-05
		BENZO(B)FLUORANTHENE	86		6.4E-05		2.9E-05
		BENZO(K)FLUORANTHENE	3.3		2.5E-07		1.1E-07
		BENZO(A)PYRENE	49		3.7E-04		1.4E-04
		CHRYSENE	52		3.9E-07		1.9E-07
		DIBENZO(A,H)ANTHRACENE	0.57		4.3E-06		2.0E-06
INDENO(1,2,3-C,D)PYRENE	16		1.3E-05		6.3E-06		
AROCLOH 1254	8.2		6.5E-05		3.0E-05		
AROCLOH 1260	8.2		6.5E-05		3.0E-05		

Based on available historical data.

*A value of zero in the column indicates an HQ of < 0.1.

**Remedial action, including soil removal, has occurred at this site.

***Because the maximum concentration of Hg reported at this site was suspect (screening method of analysis with results that could not be verified), the highest level of Hg detected by a field laboratory was used.

CHESTER RISK PROJECT

TABLE 4-10

DERMAL ABSORPTION RISK CALCULATIONS

SITE	SOURCE	CHEMICAL	MAXIMUM CONCENTRATION (mg/g)		CHILD HQ	CHILD CARCINOGENIC RISK	ADULT HQ	ADULT CARCINOGENIC RISK
			8-3	8-2				
EAST TENTH STREET	8-3 8-4A	AROCOLOR 1254 AROCOLOR 1260	8.2	8.2		1.87E-05 1.87E-05		3.32E-05 3.32E-05

Based on available historical data.

HAZARD INDEX* AND CUMULATIVE CARCINOGENIC RISK, PER SITE

SITE	CHILD HI**	CARCINOGENIC RISK	ADULT HI**	CARCINOGENIC RISK
DE CO. INC. NO.1	0.6	3.7E-05	0.1	1.7E-05
VERMICULITE DUMP	5.0	2.1E-05	0.6	9.5E-06
ABM WADE@	51.3	4.3E-05	5.9	1.9E-05
MONROE CHEMICAL	0.3	3.0E-06	0.0	1.4E-06
SCOTT PAPER		4.5E-06		2.1E-06
AIR PROD & CHEM	8.4	1.8E-05	1.0	8.3E-06
EAST TENTH STREET	4.8	7.4E-04	0.5	3.9E-04

Based on available historical data.

*In summing Hazard Quotients to calculate Hazard Indices, target organs were not considered.

@Remedial action, including soil removal, has occurred at this site.

**A value of zero in this column indicates an HI of < 0.1.

CHESTER RISK PROJECT

TABLE 4-21

PERCENT CONTRIBUTION TO HAZARD INDEX AND CUMULATIVE CARCINOGENIC RISK, PER SITE

SITE	CHEMICAL	PERCENT CONTRIBUTION			
		CHILD HI	CHILD CARCINOGENIC RISK	ADULT HI	ADULT CARCINOGENIC RISK
DE CO. INC. NO.1	As	99	73	99	73
	Ba	1	27	1	27
VERMICULITE DUMP	Cu	35		35	
	Hg	65		65	
ABM WADE@	BENZ[A]ANTHRACENE		14		14
	BENZO[A]PYRENE		86		86
MONROE CHEMICAL	3b	<1		<1	
	As	2	84	2	84
	Mn	98		98	
	Ba	<1	16	<1	16
SCOTT PAPER	As	10	42	10	42
	Ba	<1	58	<1	58
	Ag	89		89	
AIR PROD & CHEM	BENZO[A]PYRENE		100		100
	As	5		5	
EAST TENTH STREET	Hg	95		95	
	Gb	18		18	
@Remedial action, including soil removal, has occurred at this site.	As	49	14	49	12
	Ba	<1	4	<1	4
	Cu	18		18	
	Hg	3		3	
	V	11		11	
	BENZ[A]ANTHRACENE		6		5
	BENZO[B]FLUORANTHENE		9		6
	BENZO[K]FLUORANTHENE		<1		<1
	BENZO[A]PYRENE		42		37
	CHRYSENE		<1		<1
DIBENZ[A,H]ANTHRACENE		1		1	
INDENO[1,2,3-c,d]PYRENE		2		2	
AROCLOR 1254		11		16	
AROCLOR 1260		11		16	

Based on available historical data.
 @Remedial action, including soil removal, has occurred at this site.

CHESTER RISK PROJECT

TABLE 4-22

SURFACE WATER, SEDIMENT, AND FISH TISSUE CHEMICALS OF CONCERN

LOCATION	MEDIUM	CHEMICAL OF CONCERN	MAXIMUM CONCENTRATION	
WQF00511-000.6	FISH	Technical chlordane	0.09 mg/kg	
		Dieldrin	0.03 mg/kg	
VERMICULITE DUMP	SW (DS)	Aluminum	2290 ug/l	
		Chromium	9.1 ug/l	
		Barium	99.7 ug/l	
		Cadmium	0.4 ug/l	
		Nickel	15.9 ug/l	
		Manganese	391 ug/l	
		Zinc	260 ug/l	
		Arsenic	4 ug/l	
		Selenium	20 ug/l	
		Mercury	5.7 ug/l	
	SW (US)	Aluminum	2130 ug/l	
		Chromium	10.4 ug/l	
		Barium	93.6 ug/l	
		Cadmium	0.35 ug/l	
		Copper	17.8 ug/l	
		Nickel	15.5 ug/l	
		Manganese	373 ug/l	
		Zinc	175 ug/l	
		Vanadium	12.9 ug/l	
		Arsenic	9 ug/l	
Selenium	19 ug/l			
Mercury	13 ug/l			
WQN0182	SW	Manganese	17700 ug/l	
	FISH	Technical chlordane	0.33 mg/kg	
p,p'-DDE		0.28 mg/kg		
Dieldrin		0.01 mg/kg		
PCBs		0.43 mg/kg		
Cadmium		0.003 mg/kg		
PROE CHEMICAL	POND SW	Arsenic	22 ug/l	
		Antimony	36.8 mg/kg	
	POND SED	Arsenic	1.5 mg/kg	
		Beryllium	0.3 mg/kg	
		Cadmium	12.6 mg/kg	
		Chromium	44 mg/kg	
		Silver	73 mg/kg	
	SED (US)	Benzo[b]fluoranthene	200 ug/kg	
		Arsenic	21.7 mg/kg	
		Beryllium	0.9 mg/kg	
	SED (DS)	Vanadium	142 mg/kg	
		Arsenic	8 mg/kg	
		Antimony	21.4 mg/kg	
		Beryllium	0.7 mg/kg	
		Chromium	243 mg/kg	
	EAST 10TH STREET	SED	Manganese	6076 mg/kg
			Nickel	201 mg/kg
			Vanadium	89 mg/kg
			Benzo[a]anthracene	5800 ug/kg
			Benzo[b]fluoranthene	8700 ug/kg
WQF00002-084.9	FISH	Benzo[a]pyrene	3400 ug/kg	
		Indeno[1,2,3-c,d]pyrene	3500 ug/kg	
		Dibenzo[a,h]anthracene	1100 ug/kg	
		Technical chlordane	0.14 mg/kg	
		cis-Chlordane	0.027 mg/kg	
		t-Nonachlor	0.033 mg/kg	
		p,p'-DDT	0.26 mg/kg	
		p,p'-DDD	0.23 mg/kg	
		p,p'-DDE	0.52 mg/kg	
		PCBs	2 mg/kg	
Arsenic (converted from dry)	0.45 mg/kg			
Copper	18.4 mg/kg			
Cadmium	0.22 mg/kg			
Cadmium (converted from dry)	0.78 mg/kg			
Copper (converted from dry)	41.4 mg/kg			
Oxychlordane	0.034 mg/kg			

CHESTER RISK PROJECT

TABLE 4-22

SURFACE WATER, SEDIMENT, AND FISH TISSUE CHEMICALS OF CONCERN

STATION	MEDIUM	CHEMICAL OF CONCERN	MAXIMUM CONCENTRATION
WQF00002-081.8	FISH	Technical chlordane	1.6 mg/kg
		c-Chlordane	0.024 mg/kg
		l-Nonachlor	0.033 mg/kg
		p,p'-DDT	0.24 mg/kg
		p,p'-DDD	0.5 mg/kg
		p,p'-DDE	2.1 mg/kg
		PCBs	1.9 mg/kg
DELFISH-07	FISH	Oxychlordane	0.027 mg/kg
		PCB 1260	1.54 mg/kg
		PCB 1254	1.46 mg/kg
		p,p'-DDD	0.58 mg/kg
		p,p'-DDE	2.77 mg/kg
		Mercury	0.19 mg/kg
DELAWARE COUNTY INCINERATOR LAND- FILL #1	SW	Arsenic	69 ug/l
		Beryllium	12 ug/l
		Manganese	7260 ug/l
	SED	Arsenic	12 mg/kg
		Beryllium	1.8 mg/kg
		Cadmium	9.4 mg/kg
		Chromium	110 mg/kg
		Vanadium	67 mg/kg
		Benz[a]anthracene	1700 ug/kg
		Benzo[b]fluoranthene	2200 ug/kg
Benzo[a]pyrene	2700 ug/kg		
Dibenz[a,h]anthracene	230 ug/kg		
ABM WADE 422120	SED	Arsenic	164 mg/kg
422120	SW	Free cyanide	42 ug/l
		Total cyanide	0.046 mg/l
		Cadmium	39 ug/l
		Chromium	88 ug/l
		Copper	65 ug/l
3096	FISH	Zinc	96 ug/l
		Chlordane	0.01711 mg/kg
		p,p'-DDE	0.03438 mg/kg
		Dieldrin	0.00689 mg/kg
		Mirex	0.00301 mg/kg
		Pentachloroanisole	0.00215 mg/kg
		Dioxins	0.000001 mg/kg
		PCBs	0.15309 mg/kg
Mercury	0.06 mg/kg		
422088	SW	Cadmium	55 ug/l
		Chromium	130 ug/l
		Copper	82 ug/l
		Zinc	888 ug/l
		Mercury	2 ug/l
422115	SED	Antimony	10 mg/kg
WQ0172	SW	Chromium	5 ug/l
		Copper	80 ug/l
		Manganese	130 ug/l
		Nickel	50 ug/l
		Zinc	60 ug/l
		Aluminum	1090 ug/l
WQ0158	SW	Chromium	5 ug/l
		Manganese	60 ug/l
		Nickel	50 ug/l
		Zinc	50 ug/l
		Aluminum	1000 ug/l

CHESTER RISK PROJECT
TABLE 4-23
SURFACE WATER RISKS

LOCATION	CHEMICAL OF CONCERN	CHILD HAZARD INDEX	ADULT HAZARD INDEX	CANCER RISK	
VERMICULITE DUMP (DS)	Aluminum	0.00015	0.000038	N/A	
	Chromium	0.00038	0.00011	N/A	
	Barium	0.00027	0.000068	N/A	
	Cadmium	0.00051	0.00023	N/A	
	Nickel	0.00013	0.00003	N/A	
	Manganese	0.015	0.0038	N/A	
	Zinc	0.00019	0.000056	N/A	
	Arsenic	0.0025	0.00065	2.3E-07	
	Selenium	0.00075	0.00019	N/A	
	Mercury	0.0061	0.0023	N/A	
	TOTAL	0.026	0.0075	2.3E-07	
VERMICULITE DUMP (US)	Aluminum	0.00014	0.000035	N/A	
	Chromium	0.00044	0.00012	N/A	
	Barium	0.00025	0.000064	N/A	
	Cadmium	0.00045	0.0002	N/A	
	Copper	0.000098	0.000027	N/A	
	Nickel	0.00013	0.000029	N/A	
	Manganese	0.014	0.0036	N/A	
	Zinc	0.00013	0.000037	N/A	
	Vanadium	0.00035	0.000088	N/A	
	Arsenic	0.0057	0.0015	5.2E-07	
	Selenium	0.00072	0.00017	N/A	
	Mercury	0.014	0.0052	N/A	
		TOTAL	0.036	0.011	5.2E-07
	WQN0182	Manganese	0.6727	0.17	N/A
	TOTAL	0.67	0.17	N/A	
PROE CHEMICAL	Arsenic	0.014	0.0036	1.3E-06	
	TOTAL	0.014	0.0036	1.3E-06	
DELAWARE COUNTY INCINERATOR LAND-FILL #1	Arsenic	0.044	0.011	4.0E-06	
	Beryllium	0.0061	0.0032	3.5E-05	
	Manganese	0.28	0.0703	N/A	
	TOTAL	0.33	0.085	3.9E-05	
422120	Free cyanide	0.0004	0.0001	N/A	
	Total cyanide	0.00044	0.00011	N/A	
	Cadmium	0.05	0.023	N/A	
	Chromium	0.0038	0.0011	N/A	
	Copper	0.00036	0.0001	N/A	
	Zinc	0.000071	0.00002	N/A	
	TOTAL*	0.055	0.024	N/A	
422088	Cadmium	0.07	0.032	N/A	
	Chromium	0.0055	0.0016	N/A	
	Copper	0.00044	0.00012	N/A	
	Zinc	0.00066	0.00019	N/A	
	Mercury	0.0022	0.00079	N/A	
	TOTAL	0.079	0.035	N/A	
WQN0172	Chromium	0.0002	0.00006	N/A	
	Copper	0.00043	0.00012	N/A	
	Manganese	0.0049	0.0012	N/A	
	Nickel	0.00042	0.000095	N/A	
	Zinc	0.000044	0.000013	N/A	
	Aluminum	0.00007	0.000017	N/A	
	TOTAL	0.0061	0.0015	N/A	
WQN0158	Chromium	0.00021	0.00006	N/A	
	Manganese	0.0023	0.00058	N/A	
	Nickel	0.00043	0.000095	N/A	
	Zinc	0.0028	0.0006	N/A	
	Aluminum	0.000065	0.000016	N/A	
	TOTAL	0.0058	0.0014	N/A	

*INCLUDES TOTAL NOT FREE, CYANIDE

CHESTER RISK PROJECT
 TABLE 4-24
 SEDIMENT RISKS

STATION	CHEMICAL OF CONCERN	CHILD HAZARD INDEX	ADULT HAZARD INDEX	CANCER RISK
MONROE CHEMICAL-POND SED	Antimony	0.024	0.0025	N/A
	Arsenic	0.0013	0.00014	8.2E-08
	Beryllium	0.000015	0.000001	4.0E-08
	Cadmium	0.0087	0.0028	N/A
	Chromium	0.0022	0.00024	N/A
	Silver	0.0037	0.0004	N/A
	TOTAL	0.040	0.0061	1.2E-07
MONROE CHEMICAL-US SED	Benzo[b]fluoranthene	N/A	N/A	4.6E-09
	Arsenic	0.0185	0.002	1.2E-06
	Beryllium	0.000046	0.000004	1.2E-07
	Vanadium	0.0052	0.00056	N/A
	TOTAL	0.024	0.0026	1.3E-06
MONROE CHEMICAL-DS SED	Arsenic	0.0068	0.00073	4.4E-07
	Antimony	0.014	0.0015	N/A
	Beryllium	0.000035	0.000003	9.4E-08
	Chromium	0.012	0.0013	N/A
	Manganese	0.011	0.0012	N/A
	Nickel	0.0026	0.00028	N/A
	Vanadium	0.0032	0.00035	N/A
	TOTAL	0.050	0.0054	5.3E-07
EAST 10TH STREET	Benz[a]anthracene	N/A	N/A	1.3E-07
	Benzo[b]fluoranthene	N/A	N/A	2.0E-07
	Benzo[a]pyrene	N/A	N/A	7.8E-07
	Indeno[1,2,3-c,d]pyrene	N/A	N/A	8.0E-08
	Dibenz[a,h]anthracene	N/A	N/A	2.5E-07
	TOTAL	N/A	N/A	1.4E-06
DELAWARE COUNTY INCINERATOR LAND-FILL #1	Arsenic	0.01	0.0011	6.6E-07
	Beryllium	0.00009	0.000009	2.4E-07
	Cadmium	0.0065	0.0021	N/A
	Chromium	0.0056	0.0006	N/A
	Vanadium	0.0024	0.00026	N/A
	Benzo[a]anthracene	N/A	N/A	3.9E-08
	Benzo[b]fluoranthene	N/A	N/A	5.0E-08
	Benzo[a]pyrene	N/A	N/A	6.2E-07
	Dibenz[a,h]anthracene	N/A	N/A	5.3E-08
TOTAL	0.025	0.0041	1.7E-06	
ABM WADE	Arsenic	0.14	0.015	9.0E-06
	TOTAL	0.14	0.015	9.0E-06
422115	Antimony	0.0064	0.00068	N/A
	TOTAL	0.0064	0.00068	N/A

CHESTER RISK PROJECT

TABLE 4-25

FISH TISSUE RISKS

STATION	CHEMICAL OF CONCERN	CHILD HAZARD INDEX	ADULT HAZARD INDEX	CANCER RISK.
WQF00511-000.6	Technical chlordane	5.2	1.1	6.4E-05
	Dieldrin	2.1	0.44	2.6E-04
	TOTAL	7.3	1.5	3.3E-04
WQN0182	Technical chlordane	19	4.07	2.4E-04
	p,p'-DDE	N/A	N/A	5.2E-05
	Dieldrin	0.69	0.15	8.8E-05
	PCBs	N/A	N/A	1.8E-03
	Cadmium	0.01	0.002	N/A
	TOTAL	20	4.2	2.2E-03
WQF00002-084.9	Technical chlordane	8	1.7	1.0E-04
	cis-Chlordane	1.6	0.33	1.9E-05
	t-Nonachlor	0.23	0.05	8.2E-05
	p,p'-DDT	1.8	0.38	4.9E-05
	p,p'-DDD	N/A	N/A	3.0E-05
	p,p'-DDE	N/A	N/A	9.7E-05
	PCBs	N/A	N/A	8.5E-03
	Arsenic (converted from dry)	5.2	1.1	4.3E-04
	Copper	1.7	0.37	N/A
	Cadmium	0.76	0.16	N/A
	Cadmium (converted from dry)	2.7	0.58	N/A
	Copper (converted from dry)	3.8	0.83	N/A
	Oxychlordane	2	0.42	2.4E-05
		TOTAL 1*	16	3.4
	TOTAL 2*	12	2.5	4.3E-04
WQF00002-081.8	Technical chlordane	92	19.7	1.1E-03
	c-Chlordane	1.38	0.3	1.7E-05
	t-Nonachlor	0.23	0.05	8.2E-05
	p,p'-DDT	1.7	0.36	4.5E-05
	p,p'-DDD	N/A	N/A	6.6E-05
	p,p'-DDE	N/A	N/A	3.9E-04
	PCBs	N/A	N/A	8.0E-03
	Oxychlordane	1.6	0.33	1.9E-05
	TOTAL	97	21	9.8E-03
DELFIH-07	PCB 1260	N/A	N/A	6.5E-03
	PCB 1254	N/A	N/A	6.2E-03
	p,p'-DDD	N/A	N/A	7.7E-05
	p,p'-DDE	N/A	N/A	5.2E-04
	Mercury	2.2	0.47	N/A
	alpha-Chlordane	8.6	1.8	1.1E-04
	TOTAL	11	2.3	1.3E-02
3096	Chlordane	0.98	0.21	1.2E-05
	p,p'-DDE	N/A	N/A	6.4E-06
	Dieldrin	0.48	0.1	6.1E-05
	Mirex	0.05	0.01	3.0E-06
	Pentachloroanisole	0.00025	0.000053	1.4E-07
	Dioxins	N/A	N/A	9.8E-05
	PCBs	N/A	N/A	6.5E-04
	Mercury	0.69	0.15	N/A
	TOTAL	2.2	0.47	8.3E-04

*TOTAL 1 includes wet weight metals, TOTAL 2 includes dry weight metals only

CHESTER RISK PROJECT
 TABLE 4-26
 SURFACE WATER, SEDIMENT, AND FISH TISSUE RISKS

STATION ID	SOURCE	CHILD HI	ADULT - 24 HI	DRIVER	CANCER RISK	DRIVER
WQ0182	SW	0.673	0.171	Mn	N/A	
	FISH	19.687	4.219	chlordan	2.20E-03	PCBs
DELFI07	FISH	10.816	2.318	chlordan,Hg	1.30E-02	PCBs
WQF00002-081.8	FISH	96.874	20.759	chlordan	9.80E-03	PCBs
WQF00002-084.9	DRY FISH	11.698	2.507	As	4.30E-04	As
	WET FISH	16.036	3.441	chlordan	8.90E-03	PCBs
WQF00511-000.6	FISH	7.249	1.553	chlordan	3.30E-04	dieldrin
422088	SW	0.080	0.035	Cd	N/A	
422115	SED	0.006	0.001	Sb	N/A	
422120	SW	0.055	0.024	Cd	N/A	
3096	FISH	2.203	0.472	chlordan	8.30E-04	PCBs
WQ0158	SW	0.006	0.001	Zn,Mn	N/A	
WQ0172	SW	0.006	0.002	Mn	N/A	
ABM WADE	SED	0.140	0.015	As	9.00E-06	As
MONROE	POND SW	0.014	0.004	As	1.30E-06	As
	POND SED	0.040	0.006	Sb	1.20E-07	As
	US SED	0.024	0.003	As	1.30E-06	As
	DS SED	0.050	0.006	Cr,Sb,Mn	5.30E-07	As
DELCO INCINERATOR LF-1	SW	0.326	0.085	Mn	3.90E-05	Be
	SED	0.025	0.004	As	1.70E-06	As, benzo[a]pyrene
EAST 10TH STREET	SED	N/A	N/A		1.40E-06	benzo[a]pyrene
VERMICULITE DUMP	SW US	0.037	0.011	Mn	5.20E-07	As
	SW DS	0.026	0.007	Mn	2.30E-07	As

CHESTER RISK PROJECT
TABLE 4-27
Delaware County, PA TRI Facilities
Chronic Index and Residual Mass Ranking

<i>Rank</i>	<i>Company Name</i>	<i>City</i>	<i>TRI Category</i>	<i>Chemical and Issue of Concern</i>
6	<i>Epsilon Prods.</i>	<i>Marcus Hook</i>	<i>Air fugitive, Air stack</i>	<i>Ethylene, Propylene: volume</i>
5	<i>Boeing Defense & Space Group</i>	<i>Ridley Park</i>	<i>Air stack</i>	<i>Volatiles mixture: volume</i>
4	<i>Foamex L.P.</i>	<i>Eddystone</i>	<i>Air fugitive</i>	<i>Dichloromethane: toxicity</i>
3	<i>Scott Paper</i>	<i>Chester</i>	<i>Air fugitive, Air stack</i>	<i>Chloroform: toxicity</i> <i>Acids: volume, acute toxicity</i>
2	<i>Witco Corp.</i>	<i>Trainer</i>	<i>Air fugitive, Air stack</i>	<i>2-Methoxyethanol: volume and toxicity</i>
1	<i>Sun Refining & Marketing</i>	<i>Marcus Hook</i>	<i>Air fugitive, Air stack</i>	<i>Ethylene Oxide: volume, toxicity</i> <i>Benzene and MTBE: volume, toxicity</i>

This analysis does not represent relative risk. The rank provides a rough estimate of potential hazard for screening purposes and must be evaluated with the qualitative information contained in this report.

CHESTER RISK PROJECT

TABLE 4-28

1992 TRI FOR REGION III
DELAWARE CO., PA

Chemical Name	Facility ID#	Facility Name	Street Address	Zip Code	City	County	Latitude	Longitude	SIC Code
CHROMIUM	19013PNSV1008E	PENNSYLVANIA MACHINE WORKS	100 BETHEL RD.	190133485	ASTON	DELAWARE	762500	-395000	3408
NICKEL	19013PNSV1008E	PENNSYLVANIA MACHINE WORKS	100 BETHEL RD.	190133485	ASTON	DELAWARE	762500	-395000	3408
SULFURIC ACID	19013MRTM1200W	NORTH AMERICA SILICA	1200 W. FRONT ST.	19013	CHESTER	DELAWARE	395005	-752221	2819
AMMONIA	19013MRTM1200W	NORTH AMERICA SILICA	1200 W. FRONT ST.	19013	CHESTER	DELAWARE	395005	-752221	2819
PHOSPHORIC ACID	19331CNCRDCCNCI	CONCORD BEVERAGE CO.	CONCHESTER RD. & ALDAN AVE.	19331	CONCORDVILLE	DELAWARE	395328	-763150	2006
AMMONIA	19331CNCRDCCNCI	CONCORD BEVERAGE CO.	CONCHESTER RD. & ALDAN AVE.	19331	CONCORDVILLE	DELAWARE	395328	-763150	2006
ETHYLENE	19081PRLNPBLUB	EPBILON PRODS. CO.	BLUE BALL AVE. & POST RD.	19081	MARCUS HOOK	DELAWARE	394856	-752548	2821
PROPYLENE	19081PRLNPBLUB	EPBILON PRODS. CO.	BLUE BALL AVE. & POST RD.	19081	MARCUS HOOK	DELAWARE	394856	-752548	2821
CHROMIUM COMPOUNDS	19013THPOCFRONT	PO CORP.	1201 W. FRONT ST.	19013	CHESTER	DELAWARE	395008	-752230	2819
FORMALDEHYDE	19058HYDR1420CO	HYDROL CHEMICAL CO.	520 COMMERCE DR.	19050	YEADON	DELAWARE	395930	-751500	2869
NAPHTHALENE	19081CNGLMRIDGE	CONKOLEUM CORP.	RIDGE RD. & YATES AVE.	19081	MARCUS HOOK	DELAWARE	394902	-752405	3906
BUTYL BENZYL PHTHALATE	19081CNGLMRIDGE	CONKOLEUM CORP.	RIDGE RD. & YATES AVE.	19081	MARCUS HOOK	DELAWARE	394902	-752405	3906
FREON 113	19014MCOHDCROZM	COEE INDUSTRIES INC.	9 CROZERVILLE RD.	19014	ASTON	DELAWARE	395244	-752725	2899
1,1,1-TRICHLOROETHANE	19014MCOHDCROZM	COEE INDUSTRIES INC.	9 CROZERVILLE RD.	19014	ASTON	DELAWARE	395244	-752725	2899
COPPER COMPOUNDS	19013HRCST651E9	HARCST CO. INC.	651 E. 9TH ST.	19013	CHESTER	DELAWARE	395118	-762108	3324
1,1,1-TRICHLOROETHANE	19015RBNDS2RACE	ORB IND. INC.	2 RACE ST.	19015	UPLAND	DELAWARE	395104	-752303	2851
ACETONE	19015RBNDS2RACE	ORB IND. INC.	2 RACE ST.	19015	UPLAND	DELAWARE	395104	-752303	2851
XYLENE (MIXED ISOMERS)	19023BENTRY237M1	BENTRY PAINT TECH.	237 MILL ST.	19023	DARBY	DELAWARE	395450	-751538	2851
TOLUENE	19023BENTRY237M1	BENTRY PAINT TECH.	237 MILL ST.	19023	DARBY	DELAWARE	395450	-751538	2851
METHANOL	19014CSTMCRPROZ	CUSTOM COMPOUNDING INC.	6 CROZERVILLE RD.	19014	ASTON	DELAWARE	395244	-752735	2821
DIBUTYL PHTHALATE	19029SSSCHAM48	POWESSCHEM CO.	48 POWHATTAN AVE.	19029	ESSINGTON	DELAWARE	395158	-751806	2821
METHYL METHACRYLATE	19029SSSCHAM48	POWESSCHEM CO.	48 POWHATTAN AVE.	19029	ESSINGTON	DELAWARE	395158	-751806	2821
TOLUENE	19014NTRM11CRO	INTERNATIONAL ENVELOPE CO.	11 CROZERVILLE RD.	19014	ASTON	DELAWARE	395242	-762745	2677
1,1,1-TRICHLOROETHANE	19018TTNSMARPPL	CLIFTON PRECISION - N.	MARPLE AT BROADWAY AVE.	19018	CLIFTON HEIGHTS	DELAWARE	394510	-751713	3621
NICKEL	19018BCHANNPENNJ	BUCHAN IND.	PENN & JEFFERSON ST.	19018	CLIFTON HEIGHTS	DELAWARE	395820	-750104	2782
TOLUENE	19018BCHANNPENNJ	BUCHAN IND.	PENN & JEFFERSON ST.	19018	CLIFTON HEIGHTS	DELAWARE	395820	-750104	2782
1,1,1-TRICHLOROETHANE	19018BCHANNPENNJ	BUCHAN IND.	PENN & JEFFERSON ST.	19018	CLIFTON HEIGHTS	DELAWARE	395820	-750104	2782
N-BUTYL ALCOHOL	19014ZNTHP200CO	ZENITH PRODUCTS CORP.	200 COMMERCE DR.	19014	ASTON	DELAWARE	395215	-750015	

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1992 TRI FOR REGION III
DELAWARE CO., PA

Chemical Name	Facility ID#	Facility Name	Street Address	Zip Code	City	County	Latitude	Longitude	SIC Code
XYLENE (MIXED ISOMERS)	19014ZNIH4P20000	ZENITH PRODUCTS CORP.	200 COMMERCE DR.	19014	ASTON	DELAWARE	395215	-750015 2514	
TOLUENE	19014ZNIH4P20000	ZENITH PRODUCTS CORP.	200 COMMERCE DR.	19014	ASTON	DELAWARE	395215	-750015 2514	
ETHYLENE GLYCOL	19032MZRCH1830C	PPG IND. INC.	1830 COLUMBIA AVE.	19032	FOLCROFT	DELAWARE	395319	-751637 2843	
DIETHANOLAMINE	19032MZRCH1830C	PPG IND. INC.	1830 COLUMBIA AVE.	19032	FOLCROFT	DELAWARE	395319	-751637 2843	
DIETHYL SULFATE	19032MZRCH1830C	PPG IND. INC.	1830 COLUMBIA AVE.	19032	FOLCROFT	DELAWARE	395319	-751637 2843	
GLYCOL ETHERS	19032MZRCH1830C	PPG IND. INC.	1830 COLUMBIA AVE.	19032	FOLCROFT	DELAWARE	395319	-751637 2843	
CHLOROMETHANE	19032MZRCH1830C	PPG IND. INC.	1830 COLUMBIA AVE.	19032	FOLCROFT	DELAWARE	395319	-751637 2843	
BENZYL CHLORIDE	19032MZRCH1830C	PPG IND. INC.	1830 COLUMBIA AVE.	19032	FOLCROFT	DELAWARE	395319	-751637 2843	
DECABROMODIPHENYL OXIDE	19013TR65C06000WF	TRB ACQUISITION CORP.	800 W. FRONT ST.	19013	CHESTER	DELAWARE	395000	-752230 2952	
XYLENE (MIXED ISOMERS)	19050JLHRS3001EB	JULIAN B. SLEVIN CO. INC.	300 E. BALTIMORE AVE.	19050	LANSDOWNE	DELAWARE	395600	-751900 2699	
TOLUENE	19050JLHRS3001EB	JULIAN B. SLEVIN CO. INC.	300 E. BALTIMORE AVE.	19050	LANSDOWNE	DELAWARE	395600	-751900 2699	
HYDROCHLORIC ACID	19032THRL116400	BULLEN COMPANIES	1640 DELMAR DR.	19032	FOLCROFT	DELAWARE	395343	-751640 2842	
HYDROGEN FLUORIDE	19032THRL116400	BULLEN COMPANIES	1640 DELMAR DR.	19032	FOLCROFT	DELAWARE	395343	-751640 2842	
PHOSPHORIC ACID	19032THRL116400	BULLEN COMPANIES	1640 DELMAR DR.	19032	FOLCROFT	DELAWARE	395343	-751640 2842	
GLYCOL ETHERS	19032THRL116400	BULLEN COMPANIES	1640 DELMAR DR.	19032	FOLCROFT	DELAWARE	395343	-751640 2842	
1,1,1-TRICHLOROETHANE	19016TLDYH4THTO	TELEDYNE PACKAGING	4TH & TOWNSEND STS.	19016	CHESTER	DELAWARE	395030	-752150 3499	
DIETHANOLAMINE	19061BPLCMPOSTRBP	EXPLORATION & OIL INC.	POST RD.	19061	TRAINER	DELAWARE	394900	-752400 2911	
NICKEL	19061BPLCMPOSTRBP	EXPLORATION & OIL INC.	POST RD.	19061	TRAINER	DELAWARE	394900	-752400 2911	
PHOSPHORIC ACID	19061BPLCMPOSTRBP	EXPLORATION & OIL INC.	POST RD.	19061	TRAINER	DELAWARE	394900	-752400 2911	
SULFURIC ACID	19061BPLCMPOSTRBP	EXPLORATION & OIL INC.	POST RD.	19061	TRAINER	DELAWARE	394900	-752400 2911	
1,2,4-TRIMETHYLBENZENE	19061BPLCMPOSTRBP	EXPLORATION & OIL INC.	POST RD.	19061	TRAINER	DELAWARE	394900	-752400 2911	
CYCLOHEXANE	19061BPLCMPOSTRBP	EXPLORATION & OIL INC.	POST RD.	19061	TRAINER	DELAWARE	394900	-752400 2911	
HYDROGEN FLUORIDE	19061BPLCMPOSTRBP	EXPLORATION & OIL INC.	POST RD.	19061	TRAINER	DELAWARE	394900	-752400 2911	
ETHYLENE	19061BPLCMPOSTRBP	EXPLORATION & OIL INC.	POST RD.	19061	TRAINER	DELAWARE	394900	-752400 2911	
PROPYLENE	19061BPLCMPOSTRBP	EXPLORATION & OIL INC.	POST RD.	19061	TRAINER	DELAWARE	394900	-752400 2911	
AMMONIA	19061BPLCMPOSTRBP	EXPLORATION & OIL INC.	POST RD.	19061	TRAINER	DELAWARE	394900	-752400 2911	
METHANOL	19061BPLCMPOSTRBP	EXPLORATION & OIL INC.	POST RD.	19061	TRAINER	DELAWARE	394900	-752400 2911	
XYLENE (MIXED ISOMERS)	19061BPLCMPOSTRBP	EXPLORATION & OIL INC.	POST RD.	19061	TRAINER	DELAWARE	394900	-752400 2911	
ETHYLBENZENE	19061BPLCMPOSTRBP	EXPLORATION & OIL INC.	POST RD.	19061	TRAINER	DELAWARE	394900	-752400 2911	
TETRACHLOROETHYLENE	19061BPLCMPOSTRBP	EXPLORATION & OIL INC.	POST RD.	19061	TRAINER	DELAWARE	394900	-752400 2911	
TOLUENE	19061BPLCMPOSTRBP	EXPLORATION & OIL INC.	POST RD.	19061	TRAINER	DELAWARE	394900	-752400 2911	
1,2-DICHLOROETHANE	19061BPLCMPOSTRBP	EXPLORATION & OIL INC.	POST RD.	19061	TRAINER	DELAWARE	394900	-752400 2911	
NAPHTHALENE	19061BPLCMPOSTRBP	EXPLORATION & OIL INC.	POST RD.	19061	TRAINER	DELAWARE	394900	-752400 2911	
METHYL TERT-BUTYL ETHER	19061BPLCMPOSTRBP	EXPLORATION & OIL INC.	POST RD.	19061	TRAINER	DELAWARE	394900	-752400 2911	
BENZENE	19061BPLCMPOSTRBP	EXPLORATION & OIL INC.	POST RD.	19061	TRAINER	DELAWARE	394900	-752400 2911	
SULFURIC ACID	19013RNO4LINDUS	BOEING DEFENSE & SPACE GROUP	STEWART AVE. A INDUSTRIAL HWY.	19103	RIDLEY PARK	DELAWARE	395251	-751932 3721	
METHYL ETHYL KETONE	19013RNO4LINDUS	BOEING DEFENSE & SPACE GROUP	STEWART AVE. A INDUSTRIAL HWY.	19103	RIDLEY PARK	DELAWARE	395251	-751932 3721	
TOLUENE	19013RNO4LINDUS	BOEING DEFENSE & SPACE GROUP	STEWART AVE. A INDUSTRIAL HWY.	19103	RIDLEY PARK	DELAWARE	395251	-751932 3721	

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1992 TRI FOR REGION III
DELAWARE CO., PA

Chemical Name	Facility ID#	Facility Name	Street Address	Zip Code	City	County	Latitude	Longitude	SIC
TRICHLOROETHYLENE	19015NR04	INDUS BOEING DEFENSE & SPACE GROUP STEWART AVE & INDUSTRIAL HWY.	19103	RIDLEY PARK	DELAWARE	398251	-751932	3721	
ACETONE	19015NR04	INDUS BOEING DEFENSE & SPACE GROUP STEWART AVE & INDUSTRIAL HWY.	19103	RIDLEY PARK	DELAWARE	398251	-751932	3721	
METHYL ISOBUTYL KETONE	19015NR04	INDUS BOEING DEFENSE & SPACE GROUP STEWART AVE & INDUSTRIAL HWY.	19103	RIDLEY PARK	DELAWARE	398251	-751932	3721	
SULFURIC ACID	19013SC11	FOAMEX L.P.	19022	EDDYSTONE	DELAWARE	395119	-717006	3086	
TOLENE/DISOCYANATE (MIXED ISC)	19013SC11	FOAMEX L.P.	19022	EDDYSTONE	DELAWARE	395119	-717006	3086	
DICHLOROMETHANE	19013SC11	FOAMEX L.P.	19022	EDDYSTONE	DELAWARE	395119	-717006	3086	
HYDROCHLORIC ACID	19013SC11	FRONT SCOTT PAPER CO.	FRONT A AVE. OF THE STATES	19013	CHESTER	DELAWARE	395042	-752124	2621
SULFURIC ACID	19013SC11	FRONT SCOTT PAPER CO.	FRONT A AVE. OF THE STATES	19013	CHESTER	DELAWARE	395042	-752124	2621
BUTYL BENZYL PHTHALATE	19013SC11	FRONT SCOTT PAPER CO.	FRONT A AVE. OF THE STATES	19013	CHESTER	DELAWARE	395042	-752124	2621
CHLOROFORM	19013SC11	FRONT SCOTT PAPER CO.	FRONT A AVE. OF THE STATES	19013	CHESTER	DELAWARE	395042	-752124	2621
SULFURIC ACID	19013WT	CORX/XXXW WITCO CORP.	3300 W. 4TH ST.	19061	TRAINER	DELAWARE	394948	-752400	2843
METHANOL	19013WT	CORX/XXXW WITCO CORP.	3300 W. 4TH ST.	19061	TRAINER	DELAWARE	394948	-752400	2843
2-METHOXYETHANOL	19013WT	CORX/XXXW WITCO CORP.	3300 W. 4TH ST.	19061	TRAINER	DELAWARE	394948	-752400	2843
CHLORINE	19061SR04	RENSUL REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
CHLOROX (MIXED ISOMERS)	19061SR04	RENSUL REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
ETHYLENE GLYCOL	19061SR04	RENSUL REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
PHENOL	19061SR04	RENSUL REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
SULFURIC ACID	19061SR04	RENSUL REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
1,3-BUTADIENE	19061SR04	RENSUL REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
CYCLOHEXANE	19061SR04	RENSUL REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
1,2,4-TRIMETHYLBENZENE	19061SR04	RENSUL REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
AMMONIA	19061SR04	RENSUL REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
PROPYLENE	19061SR04	RENSUL REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
ETHYLENE	19061SR04	RENSUL REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
ZINC COMPOUNDS	19061SR04	RENSUL REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
METHANOL	19061SR04	RENSUL REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
XYLENE (MIXED ISOMERS)	19061SR04	RENSUL REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
ETHYLBENZENE	19061SR04	RENSUL REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
TOLUENE	19061SR04	RENSUL REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
CHROMIUM COMPOUNDS	19061SR04	RENSUL REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
ANTHRACENE COMPOUNDS	19061SR04	RENSUL REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
METHYL TERT-BUTYL ETHER	19061SR04	RENSUL REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
BENZENE	19061SR04	RENSUL REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
ETHYLENE OXIDE	19061SR04	RENSUL REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911

CHESTER RISK PROJECT

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1992 TRI FOR REGION III
DELAWARE CO., PA

TOXICITY DATA:

Chemical Name	Facility ID#	Reference Dose (RID)	Confidence Statement	Reference Dose Status	Cancer Potency (CPF)	Weight of Evidence	RID Index Dose	CPF Index Dose
CHROMIUM	19013PNNNSV1001BE	0			0	0	0	0
NICKEL	19013PNNNSV1001BE	0.02 medium	IRIS		0	0	1.4	0
SULFURIC ACID	19013NRTHM1200W	0			0	0	0	0
AMMONIA	19013NRTHM1200W	0			0	0	0	0
PHOSPHORIC ACID	19331CNCRCOONCH	0			0	0	0	0
AMMONIA	19331CNCRCOONCH	0			0	0	0	0
ETHYLENE PROPYLENE	19061PSLNPRLUEB	0			0	0	0	0
	19061PSLNPRLUEB	0			0	0	0	0
CHROMIUM COMPOUNDS	19013THPOCFRONT	0.005 low	IRIS		0	0	0.35	0
FORMALDEHYDE	19050HYDRLE62000	0.2 medium	IRIS		0	0	14	0
NAPHTHALENE	19061CNGLMREXOE	0.004 na		ECAO; Risk Assessment 2002	0	0	0.26	0
BUTYL BENZYL PHTHALATE	19061CNGLMREXOE	0.2 low	IRIS		0	0	14	0
FREON 113	19014MCOHDCRO	30 low	IRIS		0	0	2100	0
1,1,1-TRICHLOROETHANE	19014MCOHDCRO	0.09 na		wid from IRIS and HEAST	0	0	6.3	0
COPPER COMPOUNDS	19013HRCST651E9	0.005 medium	IRIS		0	0	0.35	0
1,1,1-TRICHLOROETHANE	19015RBND52RACE	0.09 na		wid from IRIS and HEAST	0	0	6.3	0
ACETONE	19015RBND52RACE	0.1 low	IRIS		0	0	7	0
XYLENE (MIXED ISOMERS)	19023SNTRY237M1	2 medium	IRIS		0	0	140	0
TOLUENE	19023SNTRY237M1	0.2 medium	IRIS		0	0	14	0
METHANOL	19014CSTMCRCROZ	0.5 medium	IRIS		0	0	35	0
DIBUTYL PHTHALATE	19025SSCHM48POW	0.1 low	IRIS		0	0	7	0
METHYL METHACRYLATE	19025SSCHM48POW	0.08 na	HEAST		0	0	5.6	0
TOLUENE	19014NTRNT11CRO	0.2 medium	IRIS		0	0	14	0
1,1,1-TRICHLOROETHANE	19018TTNSMARIPL	0.09 na		wid from IRIS and HEAST	0	0	6.3	0
NICKEL	19018ECH48NPENJU	0.02 medium	IRIS		0	0	1.4	0
TOLUENE	19018ECH48NPENJU	0.2 medium	IRIS		0	0	14	0
1,1,1-TRICHLOROETHANE	19018ECH48NPENJU	0.09 na		wid from IRIS and HEAST	0	0	6.3	0
N-BUTYL ALCOHOL	19014ZNT4HP20000	0.1 low	IRIS		0	0	7	0

CHESTER RISK PROJECT

TABLE 4-28

1992 TRI FOR REGION III
DELAWARE CO., PA

TOXICITY DATA:

Chemical Name	Facility ID#	Reference Dose (RID)	Confidence Statement	Reference Dose Status	Cancer Potency (CPF)	Weight of Evidence	RID Index Dose	CPF Index Dose
XYLENE (MIXED ISOMERS)	19014ZNTHP200CO	2 medium	Iris		0		140	0
TOLUENE	19014ZNTHP200CO	0.2 medium	Iris		0		14	0
ETHYLENE GLYCOL	19032MZCH1830C	2 High	Iris		0		140	0
DIETHANOLAMINE	19032MZCH1830C	0			0		0	0
DIETHYL SULFATE	19032MZCH1830C	0			0		0	0
GLYCOL ETHERS	19032MZCH1830C	0.001 na	HEAST		0	0.07	0.07	0
CHLOROMETHANE	19032MZCH1830C	0			0.013 C		0	1.5837112
BENZYL CHLORIDE	19032MZCH1830C	0			0.17 B2		0	0.0614574
DECABROMODIPHENYL OXIDE	19013TRSC0600WF	0.01 low	Iris		0		0.7	0
XYLENE (MIXED ISOMERS)	19050JUNBS300EB	2 medium	Iris		0		140	0
TOLUENE	19050JUNBS300EB	0.2 medium	Iris		0		14	0
HYDROCHLORIC ACID	19032THBL16400	0			0		0	0
HYDROGEN FLUORIDE	19032THBL16400	0			0		0	0
PHOSPHORIC ACID	19032THBL16400	0			0		0	0
GLYCOL ETHERS	19032THBL16400	0.001 na	HEAST		0	0.07	0.07	0
1,1,1-TRICHLOROETHANE	19016TLDYN4HTO	0.06 na	w/d from Iris and Heast		0		6.3	0
DIETHANOLAMINE	19061BPLCMPOSTR	0			0		0	0
NICKEL	19061BPLCMPOSTR	0.02 medium	Iris		0		1.4	0
PHOSPHORIC ACID	19061BPLCMPOSTR	0			0		0	0
SULFURIC ACID	19061BPLCMPOSTR	0			0		0	0
1,2,4-TRIMETHYLBENZENE	19061BPLCMPOSTR	0			0		0	0
CYCLOHEXANE	19061BPLCMPOSTR	0			0		0	0
HYDROGEN FLUORIDE	19061BPLCMPOSTR	0			0		0	0
ETHYLENE	19061BPLCMPOSTR	0			0		0	0
PROPYLENE	19061BPLCMPOSTR	0			0		0	0
AMMONIA	19061BPLCMPOSTR	0			0		0	0
METHANOL	19061BPLCMPOSTR	0.5 medium	Iris		0		35	0
XYLENE (MIXED ISOMERS)	19061BPLCMPOSTR	2 medium	Iris		0		140	0
ETHYLBENZENE	19061BPLCMPOSTR	0.1 low	Iris		0		7	0
TETRACHLOROETHYLENE	19061BPLCMPOSTR	0.01 medium	Iris		0.052 c-b2		0.7	0.2639510
TOLUENE	19061BPLCMPOSTR	0.2 medium	Iris		0		14	0
1,2-DICHLOROETHANE	19061BPLCMPOSTR	0			0.001 B2		0	0.1148106
NAPHTHALENE	19061BPLCMPOSTR	0.004 na	ECAO: Risk Assessment 202		0		0.28	0
METHYL TERT-BUTYL ETHER	19061BPLCMPOSTR	0.005 na			0		0.35	0
BENZENE	19061BPLCMPOSTR	0			0.029 A		0	0.2413764
SULFURIC ACID	19013BNQHLINDUS	0			0		0	0
METHYL ETHYL KETONE	19013BNQHLINDUS	0.6 low	Iris		0		42	0
TOLUENE	19013BNQHLINDUS	0.2 medium	Iris		0		14	0

CHESTER RISK PROJECT

TABLE 4-28

1992 TRI FOR REGION III
DELAWARE CO., PA

TOXICITY DATA:

Chemical Name	Facility ID#	Reference Dose (RID)	Confidence Statement	Reference Dose Status	Cancer Potency (CPF)	Weight of Evidence	RfD Index Dose	CPF Index Dose
TRICHLOROETHYLENE	10013BNH4LINDUS	0			0.011 e-b2	0	1.247725	
ACETONE	10013BNH4LINDUS	0.1 low	Iris		0	7	0	
METHYL ISOBUTYL KETONE	10013BNH4LINDUS	0.05	HEAST		0	3.5	0	
SULFURIC ACID	10013SCTFM1500E	0			0	0	0	
TOLUENEDIISOCYANATE (MIXED IS)	10013SCTFM1500E	0			0	0	0	
DICHLOROMETHANE	10013SCTFM1500E	0.06 medium	Iris		0.0076 B2	4.2	1.3930355	
HYDROCHLORIC ACID	10013SCTTFFRCNT	0			0	0	0	
SULFURIC ACID	10013SCTTFFRCNT	0			0	0	0	
BUTYL BENZYL PHTHALATE	10013SCTTFFRCNT	0.2 low	Iris		0 C	14	0	
CHLOROFORM	10013SCTTFFRCNT	0.01 medium	Iris		0.0061 B2	0.7	1.7127468	
SULFURIC ACID	10013WTCR33000W	0			0	0	0	
METHANOL	10013WTCR33000W	0.5 medium	Iris		0	35	0	
2-METHOXYETHANOL	10013WTCR33000W	0.001 na *	HEAST		0	0.07	0	
CHLORINE	10061SNRFRNGREEN	0			0	0	0	
CREOSOL (MIXED ISOMERS)	10061SNRFRNGREEN	0			0	0	0	
ETHYLENE GLYCOL	10061SNRFRNGREEN	2 high	Iris		0	140	0	
PHENOL	10061SNRFRNGREEN	0.6 low	Iris		0	42	0	
SULFURIC ACID	10061SNRFRNGREEN	0			0	0	0	
1,3-BUTADIENE	10061SNRFRNGREEN	0			0	0	0	
CYCLOHEXANE	10061SNRFRNGREEN	0			0	0	0	
1,2,4-TRIMETHYLBENZENE	10061SNRFRNGREEN	0			0	0	0	
AMMONIA	10061SNRFRNGREEN	0			0	0	0	
PROPYLENE	10061SNRFRNGREEN	0			0	0	0	
ETHYLENE	10061SNRFRNGREEN	0			0	0	0	
ZINC COMPOUNDS	10061SNRFRNGREEN	0.3 medium	Iris		0	21	0	
METHANOL	10061SNRFRNGREEN	0.5 medium	Iris		0	35	0	
XYLENE (MIXED ISOMERS)	10061SNRFRNGREEN	2 medium	Iris		0	140	0	
ETHYLBENZENE	10061SNRFRNGREEN	0.1 low	Iris		0	7	0	
TOLUENE	10061SNRFRNGREEN	0.2 medium	Iris		0	14	0	
CHROMIUM COMPOUNDS	10061SNRFRNGREEN	0.005 low	Iris		0	0.35	0	
ANTIMONY COMPOUNDS	10061SNRFRNGREEN	0.0004 low	Iris		0	0.028	0	
METHYL TERT-BUTYL ETHER	10061SNRFRNGREEN	0.005 na	Iris		0	0.35	0	
BENZENE	10061SNRFRNGREEN	0			0.020 A	0	0.2413794	
ETHYLENE OXIDE	10061SNRFRNGREEN	0			1.02 B1	0	0.0081699	

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1902 TRI FOR REGION III
DELAWARE CO., PA

TRI RELEASES:

Chemical Name	Facility ID#	Air Nonpoint Release (lb/yr)	Air Nonpoint Chronic Index	Air Point Release (lb/yr)	Air Point Chronic Index	Water Release (lb/yr)	Water Chronic Index	Land Release (lb/yr)	Land Chronic Index	Onsite Total Releases (lb/yr)	Onsite Total Chronic Index	Onsite Total Releases (lb/yr)	Onsite Total Chronic Index
CHROMIUM	19013PNNSY100BE	0	0	0	0	0	0	0	0	0	0	0	0
NICKEL	19013PNNSY100BE	0	0	0	0	0	0	0	0	0	0	0	0
SULFURIC ACID	19013NRTM1200W	0	0	0	0	0	0	0	0	0	0	0	0
AMMONIA	19013NRTM1200W	0	0	1700	0	0	0	0	0	1700	0	1700	0
PHOSPHORIC ACID	19331CNCRDCCNCH	0	0	0	0	0	0	0	0	0	0	0	0
AMMONIA	19331CNCRDCCNCH	5045	0	0	0	0	0	0	0	5045	0	5045	0
ETHYLENE	19061PSLNPBLUEB	6700	0	2400	0	0	0	0	0	9100	0	9100	0
PROPYLENE	19061PSLNPBLUEB	53000	0	8100	0	0	0	0	0	61100	0	70200	0
CHROMIUM COMPOUNDS	19013THPOCFRONT	0	0	5	17730	0	0	0	0	5	17730	5	17730
FORMALDEHYDE	19050HYDRLE2000	70	6815	541	47059	0	0	0	0	610	54874	610	54874
NAPHTHALENE	19061CNGLMRIDXE	5	22162	5	22162	0	0	0	0	10	44325	10	44325
BUTYL BENZYL PHTHALATE	19061CNGLMRIDXE	250	22162	250	22162	5	443	0	0	505	44768	515	89093
FREON 113	19014MCGND0CROZ	750	443	0	0	0	0	0	0	750	443	750	443
1,1,1-TRICHLOROETHANE	19014MCGND0CROZ	750	147750	250	40250	0	0	0	0	1000	190099	1750	107443
COPPER COMPOUNDS	190134RCSTB51E0	0	0	103	365237	0	0	0	0	103	365237	103	365237
1,1,1-TRICHLOROETHANE	19016RBNDS2RACE	1100	216490	0	0	0	0	0	0	1100	216490	1100	216490
ACETONE	19016RBNDS2RACE	1700	301409	0	0	0	0	0	0	1700	301409	2800	518108
XYLENE (MIXED ISOMERS)	19023ENTRY237MI	0	0	4100	35345	0	0	0	0	4100	36346	10200	577110
TOLUENE	19023ENTRY237MI	0	0	6100	540763	0	0	0	0	6100	540763	2065	657116
METHANOL	19014CSTWC8CROZ	834	29574	15494	556507	0	0	0	0	16528	594081	16528	594081
DIBUTYL PHTHALATE	19029SSCHM4BPOW	0	0	0	0	0	0	0	0	0	0	0	0
METHYL METHACRYLATE	19029SSCHM4BPOW	2960	656008	5	1104	0	0	0	0	2965	657116	2965	657116
TOLUENE	19014NTRNT11CRO	11578	1026386	0	0	0	0	0	0	11578	1026386	11578	1026386
1,1,1-TRICHLOROETHANE	19018TTNSMARPPL	2350	482548	3500	699496	0	0	0	0	5850	1152446	5850	1152446
NICKEL	19018BCHNPNNU	0	0	0	0	0	0	0	0	0	0	0	0
TOLUENE	19018BCHNPNNU	0	0	1002	8827	0	0	0	0	1002	8827	1002	8827
1,1,1-TRICHLOROETHANE	19018BCHNPNNU	0	0	8264	1628003	0	0	0	0	8264	1628003	8264	1628003
N-BUTYL ALCOHOL	19014ZNTHP20000	0	0	0	0	0	0	0	0	0	0	0	0

CHESTER RISK PROJECT

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1992 TRI FOR REGION III
DELAWARE CO., PA

Chemical Name	Facility ID#	Air Nonpoint		Air Point		Water		Land		Onsite Total		Onsite Total	
		Releases (lb/yr)	Chronic Index	Releases (lb/yr)	Chronic Index	Releases (lb/yr)	Chronic Index	Releases (lb/yr)	Chronic Index	Releases (lb/yr)	Chronic Index	Releases (lb/yr)	Chronic Index
XYLENE (MIXED ISOMERS)	190142N1H20000	250	2218	25508	224057	0	0	0	0	25750	22873	46000	2023430
	190142N1H20000	250	22182	20000	1772904	0	0	0	0	20250	1795157	0	0
ETHYLENE GLYCOL	19030M2RCH1830C	0	0	0	0	0	0	0	0	0	0	0	0
DIETHANOLAMINE	19030M2RCH1830C	57	0	0	0	0	0	0	0	57	0	0	0
DIETHYL SULFATE	19030M2RCH1830C	234	0	0	0	0	0	0	0	234	0	0	0
GLYCOL ETHERS	19030M2RCH1830C	22	390059	0	0	0	0	0	0	22	390059	0	0
CHLOROMETHANE	19030M2RCH1830C	0	3818	878	482957	0	0	0	0	163	456876	0	0
BENZYL CHLORIDE	19030M2RCH1830C	211	4261020	0	0	0	0	0	0	211	4261020	0	0
DECABROMODIPHENYL OXIDE	19013TRC0000WF	3000	5318982	0	0	0	0	0	0	3000	5318982	0	0
XYLENE (MIXED ISOMERS)	19050JLH8S300EB	18778	166475	3487	30912	0	0	0	0	22268	197397	108808	7869310
	19050JLH8S300EB	72987	8470278	13555	1201847	0	0	0	0	98542	7671923	0	0
HYDROFLUORIC ACID	19032THBL16400	250	0	250	0	0	0	250	0	750	0	0	0
HYDROGEN FLUORIDE	19032THBL16400	250	0	250	0	0	0	250	0	750	0	0	0
PHOSPHORIC ACID	19032THBL16400	250	0	250	0	0	0	250	0	750	0	0	0
GLYCOL ETHERS	19032THBL16400	250	4432495	250	4432495	0	0	250	4432495	750	13297456	3000	13297456
1,1,1-TRICHLOROETHANE	19016TDYN41410	22251	4353432	88004	17633750	0	0	0	0	111255	21917162	111255	21917162
DIETHANOLAMINE	19061BPLCMPOSTR	0	0	0	0	0	0	0	0	0	0	0	0
NICKEL	19061BPLCMPOSTR	0	0	0	0	0	0	0	0	0	0	0	0
PHOSPHORIC ACID	19061BPLCMPOSTR	0	0	0	0	0	0	0	0	0	0	0	0
SULFURIC ACID	19061BPLCMPOSTR	0	0	0	0	0	0	0	0	0	0	0	0
1,2,4-TRIMETHYLBENZENE	19061BPLCMPOSTR	0	0	0	0	0	0	0	0	0	0	0	0
CYCLOHEXANE	19061BPLCMPOSTR	392	0	33	0	0	0	0	0	415	0	0	0
HYDROGEN FLUORIDE	19061BPLCMPOSTR	645	0	0	0	0	0	0	0	645	0	0	0
ETHYLENE	19061BPLCMPOSTR	114	0	1183	0	0	0	0	0	1297	0	0	0
PROPYLENE	19061BPLCMPOSTR	1187	0	3298	0	0	0	0	0	4483	0	0	0
AMMONIA	19061BPLCMPOSTR	79	0	17480	0	0	0	0	0	84031	0	0	0
METHANOL	19061BPLCMPOSTR	0	0	290	16283	0	0	0	0	290	16283	0	0
XYLENE (MIXED ISOMERS)	19061BPLCMPOSTR	4406	39059	483	4282	0	0	0	0	4889	43341	0	0
ETHYLBENZENE	19061BPLCMPOSTR	581	103011	12	2128	0	0	0	0	593	105139	0	0
TETRACHLOROETHYLENE	19061BPLCMPOSTR	45	291374	0	0	0	0	0	0	45	291374	0	0
TOLUENE	19061BPLCMPOSTR	4406	390591	483	42818	0	0	0	0	4889	433408	0	0
1,2-DICHLOROETHANE	19061BPLCMPOSTR	133	143772	0	0	0	0	0	0	133	143772	0	0
NAPHTHALENE	19061BPLCMPOSTR	889	2960900	0	0	0	0	0	0	888	2960900	0	0
METHYL TERT-BUTYL ETHER	19061BPLCMPOSTR	34	127654	2848	10446481	0	0	0	0	2982	10374137	0	0
BENZENE	19061BPLCMPOSTR	2644	13564805	414	2129656	0	0	0	0	3058	1523261	108893	31579565
SULFURIC ACID	190139HGHINDUS	0	0	250	0	0	0	0	0	250	0	0	0
METHYL ETHYL KETONE	190139HGHINDUS	250	7387	24000	709198	0	0	0	0	24250	716585	0	0
TOLUENE	190139HGHINDUS	1800	89950	87000	6033033	0	0	0	0	88000	616883	0	0

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1992 TRI FOR REGION III
DELAWARE CO., PA

TRI RELEASES:

Chemical Name	Facility ID#	Air Nonpoint Releases (lb/yr)	Air Nonpoint Chronic Index	Air Point Releases (lb/yr)	Air Point Chronic Index	Water Releases (lb/yr)	Water Chronic Index	Land Releases (lb/yr)	Land Chronic Index	Onsite Total Releases (lb/yr)	Onsite Total Chronic Index	Onsite Total Releases Sums	Onsite Total Chronic Index Sums
TRICHLOROETHYLENE	190135R9HJLINDJUS	250	246662	8400	835053	0	0	0	0	8400	8603715	0	0
ACETONE	190135R9HJLINDJUS	12000	2127593	40000	7091977	0	0	0	0	52000	9219549	184400	36308755
METHYL ISOBUTYL KETONE	190135R9HJLINDJUS	250	88650	41000	14538552	0	0	0	0	41250	14827202	0	0
SULFURIC ACID	190135CTFM1500E	0	0	0	0	0	0	0	0	0	0	0	0
TOLUENEDIISOCYANATE (MIXED ISOMERS)	190135CTFM1500E	0	0	151	0	0	0	0	0	151	0	0	0
DICHLOROMETHANE	190135CTFM1500E	33532	39793308	18	11864	0	0	0	0	33542	39795173	33688	39795173
HYDROCHLORIC ACID	190135CTTFPFRONT	0	0	53000	0	0	0	0	0	53000	0	0	0
SULFURIC ACID	190135CTTFPFRONT	0	0	110000	0	0	0	0	0	110000	0	0	0
BUTYL BENZYL PHTHALATE	190135CTTFPFRONT	7900	847143	80000	8209333	0	0	0	0	88000	8877478	243600	41593391
CHLOROFORM	190135CTTFPFRONT	8000	18003792	7500	1873323	0	0	0	0	14500	35715915	0	0
SULFURIC ACID	190135WTCCR3300W	0	0	0	0	0	0	0	0	0	0	0	0
METHANOL	190135WTCCR3300W	207500	7361434	48787	1729881	0	0	0	0	256387	9091417	747045	8708446882
2-METHOXYETHANOL	190135WTCCR3300W	362004	8242608945	138568	2458749318	0	0	0	0	480638	849035264	0	0
CHLORINE	190018NRFNGREEN	0	0	0	0	0	0	0	0	0	0	0	0
CRESOL (MIXED ISOMERS)	190018NRFNGREEN	0	0	0	0	0	0	0	0	0	0	0	0
ETHYLENE GLYCOL	190018NRFNGREEN	0	0	0	0	0	0	0	0	0	0	0	0
PHENOL	190018NRFNGREEN	0	0	0	0	0	0	0	0	0	0	0	0
SULFURIC ACID	190018NRFNGREEN	0	0	0	0	0	0	0	0	0	0	0	0
1,3-BUTADIENE	190018NRFNGREEN	120	0	0	0	0	0	0	0	120	0	0	0
CYCLOHEXANE	190018NRFNGREEN	1800	0	900	0	0	0	0	0	2150	0	0	0
1,2,4-TRIMETHYLBENZENE	190018NRFNGREEN	4800	0	94	0	0	0	0	0	4908	0	0	0
AMMONIA	190018NRFNGREEN	9300	0	0	0	0	0	0	0	9300	0	0	0
PROPYLENE	190018NRFNGREEN	33000	0	12000	0	0	0	0	0	45000	0	0	0
ETHYLENE	190018NRFNGREEN	46000	0	0	0	0	0	0	0	46000	0	0	0
ZINC COMPOUNDS	190018NRFNGREEN	0	0	270	15067	0	0	0	0	270	15957	0	0
METHANOL	190018NRFNGREEN	8700	202121	1100	39008	0	0	0	0	8800	241127	0	0
XYLENE (MIXED ISOMERS)	190018NRFNGREEN	29000	267084	1700	15070	0	0	0	0	30700	272165	0	0
ETHYL BENZENE	190018NRFNGREEN	3000	531890	220	30008	0	0	0	0	3220	570904	0	0
TOLUENE	190018NRFNGREEN	31000	2748141	7000	681488	0	0	0	0	38000	3430409	0	0
CHROMIUM COMPOUNDS	190018NRFNGREEN	0	0	1300	4609785	0	0	0	0	1300	4609785	0	0
ANTIMONY COMPOUNDS	190018NRFNGREEN	0	0	400	17720941	0	0	0	0	400	17720941	0	0
METHYL TERT-BUTYL ETHER	190018NRFNGREEN	4800	17020744	8400	3332290	0	0	0	0	14200	50353033	0	0
BENZENE	190018NRFNGREEN	81000	262225734	3600	20052556	0	0	0	0	84600	282228290	0	0
ETHYLENE OXIDE	190018NRFNGREEN	118000	18710186620	400	80784312	0	0	0	0	118400	18770950222	368958	17130481033

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1992 TRI FOR REGION III
DELAWARE CO., PA

Chemical Name	Facility ID#	TRI TRANSFERS:			TRI TOTALS:			
		POTW Transfers (lb/yr)	POTW Chronic Index	Offsite Transfers (lb/yr)	Offsite Chronic Index	Total Releases and Transfers (lb/yr)	Total Chronic Index	Total Chronic Index Sums
CHROMIUM NICKEL	10013PNNSY100BE 10013PNNSY100BE	0	0	18150	0	18150	0	10239041
SULFURIC ACID AMMONIA	10013NRTM1200W 10013NRTM1200W	0	0	0	0	1700	0	1700
PHOSPHORIC ACID AMMONIA	10331CNCRDCCNCH 10331CNCRDCCNCH	0	0	0	0	5045	0	5045
ETHYLENE PROPYLENE	10061PSLNPBLUEB 10061PSLNPBLUEB	0	0	0	0	8100	0	70200
CHROMIUM COMPOUNDS	10013THPOCFCKKIT	0	0	147535	523130646	147535	523157378	147535
FORMALDEHYDE	10050HYDRLE200CO	0	0	0	0	819	54674	619
NAPHTHALENE BUTYL BENZYL PHTHALATE	10061CNGLMRIDGE 10061CNGLMRIDGE	0	0	7410	32900391	7410	32844716	60020
FREON 113	10014MCGND0CROZ	0	0	0	0	760	443	760
1,1,1-TRICHLOROETHANE	10014MCGND0CROZ	0	0	8188	1201694	7100	1306595	7850
COPPER COMPOUNDS	100134RCST651E9	0	0	0	0	103	365237	103
1,1,1-TRICHLOROETHANE ACETONE	10016RND52RACE 10016RND52RACE	0	0	0	0	1100	216609	22488
XYLENE (MIXED ISOMERS)	100235NTRY237MI	0	0	19435	136831	19435	173177	34232
TOLUENE	100235NTRY237MI	0	0	8587	782122	14887	1302885	1476062
METHANOL	10014CSTMC6CROZ	0	0	0	0	18528	586081	16528
DIBUTYL PHTHALATE METHYL METHACRYLATE	100205SCHM48PCW 100205SCHM48PCW	0	0	800	106390	800	106390	6765
TOLUENE	10014NTRNT11CRO	0	0	4201	372417	18778	1308804	15778
1,1,1-TRICHLOROETHANE	10018LTTNSM4RPL	0	0	8050	1585845	13900	2738291	13900
NICKEL	10018ECHNPNENNJ	5	4432	0	0	8	4432	0
TOLUENE	10018ECHNPNENNJ	0	0	0	0	1002	88927	12407
1,1,1-TRICHLOROETHANE	10018ECHNPNENNJ	0	0	3158	817790	11400	2245793	2330052
N-BUTYL ALCOHOL	10014ZNTHP200CO	0	0	0	0	0	0	0

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1992 TRI FOR REGION III
DELAWARE CO., PA

Chemical Name	Facility ID#	TRI TRANSFERS:			TRI TOTALS:				
		POTW Transfers (lb/yr)	POTW Chronic Index	Offsite Transfers (lb/yr)	Offsite Chronic Index	Total Releases and Transfers (lb/yr)	Total Chronic Index	Total Releases and Transfers Sum	
XYLENE (MIXED ISOMERS)	19014ZNTHP200CO	0	0	500	4432	26250	232705	47000	2072187
TOLUENE	19014ZNTHP200CO	0	0	500	44326	20750	1839491		
ETHYLENE GLYCOL	19032MZRCH1830C	0	0	3000	17730	2000	17730		
DIETHANOLAMINE	19032MZRCH1830C	7	0	727	0	791	0		
DIETHYL SULFATE	19032MZRCH1830C	0	0	0	0	234	0		
GLYCOL ETHERS	19032MZRCH1830C	6779	120181272	6779	120181272	13580	240772403		
CHLOROMETHANE	19032MZRCH1830C	0	0	0	0	583	454874		
BENZYL CHLORIDE	19032MZRCH1830C	0	0	0	0	211	4261020	17300	245509220
DECABROMODIPHENYL OXIDE	19013TRSC000WF	0	0	3000	8318002	8000	10637865	8000	10637085
XYLENE (MIXED ISOMERS)	19050ULNBS300EB	0	0	4000	35460	26266	232647		
TOLUENE	19050ULNBS300EB	0	0	12322	1092342	86884	8764285	125130	8997112
HYDROCHLORIC ACID	19032THBL1640D	0	0	0	0	760	0		
HYDROGEN FLUORIDE	19032THBL1640D	0	0	0	0	750	0		
PHOSPHORIC ACID	19032THBL1640D	0	0	0	0	780	0		
GLYCOL ETHERS	19032THBL1640D	208	4432488	0	0	1000	17729941	3250	17729941
1,1,1-TRICHLOROETHANE	19016TLDYNA4THO	0	0	0	0	111255	21817182	111255	21817182
DIETHANOLAMINE	19061BPLCMPOSTR	0	0	0	0	0	0		
NICKEL	19061BPLCMPOSTR	0	0	0	0	0	0		
PHOSPHORIC ACID	19061BPLCMPOSTR	0	0	0	0	0	0		
SULFURIC ACID	19061BPLCMPOSTR	0	0	0	0	0	0		
1,2,4-TRIMETHYLBENZENE	19061BPLCMPOSTR	0	0	0	0	5	0		
CYCLOHEXANE	19061BPLCMPOSTR	0	0	0	0	415	0		
HYDROGEN FLUORIDE	19061BPLCMPOSTR	0	0	0	0	645	0		
ETHYLENE	19061BPLCMPOSTR	0	0	0	0	1267	0		
PROPYLENE	19061BPLCMPOSTR	0	0	0	0	4483	0		
AMMONIA	19061BPLCMPOSTR	0	0	0	0	84531	0		
METHANOL	19061BPLCMPOSTR	0	0	0	0	290	10283		
XYLENE (MIXED ISOMERS)	19061BPLCMPOSTR	0	0	0	0	4800	43341		
ETHYLBENZENE	19061BPLCMPOSTR	0	0	0	0	583	105139		
TETRACHLOROETHYLENE	19061BPLCMPOSTR	0	0	0	0	45	291374		
TOLUENE	19061BPLCMPOSTR	0	0	0	0	4889	433408		
1,2-DICHLOROETHANE	19061BPLCMPOSTR	0	0	0	0	133	1437722		
NAPHTHALENE	19061BPLCMPOSTR	0	0	0	0	668	2660900		
METHYL TERT-BUTYL ETHER	19061BPLCMPOSTR	0	0	0	0	2082	10574137		
BENZENE	19061BPLCMPOSTR	0	0	0	0	3089	1573251	108893	31579585
SULFURIC ACID	19013BNQHLINDUS	0	0	750	0	1000	0		
METHYLETHYL KETONE	19013BNQHLINDUS	0	0	18550	489051	40000	1205638		
TOLUENE	19013BNQHLINDUS	0	0	12550	1112584	70030	8254237		

CHESTER RISK PROJECT

TABLE 4-28

1992 TRI FOR REGION III
DELAWARE CO., PA

Chemical Name	Facility ID#	TRI TRANSFERS:			TRI TOTALS:			
		POTW Transfers (lb/yr)	POTW Chronic Index	Offsite Transfers (lb/yr)	Offsite Chronic Index	Total Releases and Transfers (lb/yr)	Total Chronic Index	Total Releases and Transfers Chronic Index Sums
TRICHLOROETHYLENE	10013BNHGLINDUS	0	0	15950	15864654	24600	24468370	
ACETONE	10013BNHGLINDUS	0	0	29000	5141683	81000	14361252	
METHYL ISOBUTYL KETONE	10013BNHGLINDUS	0	0	2650	804227	43800	15331429	281750 81820624
SULFURIC ACID	10013SCTFM1500E	0	0	0	0	0	0	
TOLUENEDIISOCYANATE (MIXED ISOMERS)	10013SCTFM1500E	0	0	750	0	908	0	
DICHLOROMETHANE	10013SCTFM1500E	0	0	0	0	33642	39795173	34448 39795173
HYDROCHLORIC ACID	10013SCTTFFRONT	0	0	0	0	53000	0	
SULFURIC ACID	10013SCTTFFRONT	0	0	770	0	110770	0	
BUTYL BENZYL PHTHALATE	10013SCTTFFRONT	19008	596487	16	896	76318	8764859	
CHLOROFORM	10013SCTTFFRONT	508	1248808	0	0	14800	36844724	254880 43729583
SULFURIC ACID	10013WTCR3300W	4	0	0	0	4	0	
METHANOL	10013WTCR3300W	8798	237581	0	0	283088	8328998	
2-METHOXYETHANOL	10013WTCR3300W	20120	35876419	0	0	510778	8056081883	773860 9065410882
CHLORINE	10061SNRPNGREEN	0	0	0	0	0	0	
CRESOL (MIXED ISOMERS)	10061SNRPNGREEN	0	0	0	0	0	0	
ETHYLENE GLYCOL	10061SNRPNGREEN	0	0	0	0	0	0	
PHENOL	10061SNRPNGREEN	44000	1300196	0	0	44000	1300196	
SULFURIC ACID	10061SNRPNGREEN	0	0	0	0	0	0	
1,3-BUTADIENE	10061SNRPNGREEN	0	0	0	0	120	0	
CYCLOHEXANE	10061SNRPNGREEN	0	0	0	0	2650	0	
1,2,4-TRIMETHYLBENZENE	10061SNRPNGREEN	0	0	0	0	4984	0	
AMMONIA	10061SNRPNGREEN	320000	0	0	0	229300	0	
PROPYLENE	10061SNRPNGREEN	0	0	0	0	45000	0	
ETHYLENE	10061SNRPNGREEN	0	0	0	0	46000	0	
ZINC COMPOUNDS	10061SNRPNGREEN	7300	431429	730	43143	8300	480526	
METHANOL	10061SNRPNGREEN	76000	2684851	0	0	82800	2936078	
XYLENE (MIXED ISOMERS)	10061SNRPNGREEN	26000	237084	0	0	58700	529238	
ETHYLBENZENE	10061SNRPNGREEN	2800	496438	0	0	6020	1087342	
TOLUENE	10061SNRPNGREEN	83000	584932	0	0	181800	9024540	
CHROMIUM COMPOUNDS	10061SNRPNGREEN	8400	33332290	480	1737634	11180	39479609	
ANTIMONY COMPOUNDS	10061SNRPNGREEN	460	20389432	10890	482697852	11760	820817025	
METHYL TERT-BUTYL ETHER	10061SNRPNGREEN	8800	24687318	0	0	21100	74829352	
BENZENE	10061SNRPNGREEN	29000	149108751	0	0	83000	431387041	
ETHYLENE OXIDE	10061SNRPNGREEN	8	0	0	0	110400	18770950232	968928 17853002183

CHESTER COUNTY RISK PROJECT
TABLE 4-29
SUMMARY RANKING FOR
TOTAL ONSITE RELEASES

Facility Name	City	Total Onsite Residual Mass Sum	Total Onsite Chronic Index Relative Hazard	Total Onsite Chronic Index and Residual Mass Relative Hazard
28 PENNSYLVANIA MACHINE WORK	ASTON	0	0	0
27 PG CORP.	CHESTER	5	17730	17730
26 HYDROL CHEMICAL CO.	YEADON	619	54874	54874
25 CONGOLEUM CORP.	MARCUS HOOK	515	89093	89093
24 MCGEE INDUSTRIES INC.	ASTON	1750	197443	197443
23 HARCASST CO. INC.	CHESTER	103	365237	365237
22 ORB IND. INC.	UPLAND	2800	518108	518108
21 SENTRY PAINT TECH.	DARBY	10200	577110	577110
20 CUSTOM COMPOUNDING INC.	ASTON	16528	586081	586081
19 ESSCHEM CO.	ESSINGTON	2965	657116	657116
18 NORTH AMERICA SILICA	CHESTER	1700	0	865414
17 INTERNATIONAL ENVELOPE CO.	ASTON	11578	1026386	1026386
16 CLIFTON PRECISION - N.	CLIFTON HEIGHTS	5850	1152446	1152446
15 BUCHAN IND.	CLIFTON HEIGHTS	9266	1716830	1716830
14 ZENITH PRODUCTS CORP.	ASTON	46000	2023430	2023430
13 CONCORD BEVERAGE CO.	CONCORDVILLE	5045	0	2568245
12 PPG IND. INC.	FOLCROFT	1107	5107955	5107955
11 TRS ACQUISITION CORP.	CHESTER	3000	5318982	5318982
10 JULIAN B. SLEVIN CO. INC.	LANSDOWNE	108808	7869310	7869310
9 BULLEN COMPANIES	FOLCROFT	3000	13297456	13297456
8 TELEDYNE PACKAGING	CHESTER	111255	21917162	21917162
7 BP EXPLORATION & OIL INC.	TRAINER	108893	31579565	31579565
6 EPSILON PRODS. CO.	MARCUS HOOK	70200	0	35738527
5 BOEING DEFENSE & SPACE GRO	BRIDLEY PARK	184400	38308755	38308755
4 FOAMEX L.P.	EDDYSTONE	33698	39795173	39795173
3 SCOTT PAPER CO.	CHESTER	243600	41593391	41593391
2 WITCO CORP.	TRAINER	747045	8708446682	8708446682
1 SUN REFINING & MARKETING CO	MARCUS HOOK	368956	17130461033	17130461033

KEY

	Order statistic	
	percentile	confidence limit
90th percentile-95% confidence	3	6

CHESTER RISK PROJECT

TABLE 4-30

CHEMICALS OF POTENTIAL CONCERN IN AIR

CHEMICAL	VOLATILE	PARTICULATE MATTER	CARCINOGEN ENDPOINT EVALUATED	NON- CANCER ENDPOINT EVALUATED
arsenic		X	X	
cadmium		X	X	
chromium		X	X	
hydrogen chloride		X		X
mercury		X		X
acrolein	X			X
acrylonitrile	X		X	
benzene	X		X	
1,3-butadiene	X		X	
crotonaldehyde	X		X	
diesel		X	X	
formaldehyde	X		X	
gasoline		X	X	
2- methoxyethanol	X			X
vinyl chloride	X		X	

CHESTER RISK PROJECT

TABLE 4-31

CRITERIA POLLUTANTS AND
NATIONAL AMBIENT AIR QUALITY STANDARDS

CHEMICAL	NATIONAL AMBIENT AIR QUALITY STANDARD (ug/m ³)*
carbon monoxide	40,000 (1 hour)**
carbon monoxide	10,000 (8 hours)**
lead	1.5 (quarter)***
nitrogen dioxide	100 (annual)***
ozone	235 (1 hour)****
PM-10	150 (24 hours)****
PM-10	50 (annual)*****
sulfur dioxide	1300 (3 hours)**
sulfur dioxide	365 (24 hours)**
sulfur dioxide	80 (annual)***

*Values represent primary standards -- except for sulfur dioxide (3 hours), which is a secondary standard.

**Standard is not to be exceeded more than once per year.

***Standard is never to be exceeded.

****Standard is attained when the expected number of exceedances is less than or equal to 1.

*****Standard is attained when the expected annual arithmetic mean is less than or equal to 50 ug/m³.

CHESTER RISK PROJECT

TABLE 4-32

MAXIMUM CARCINOGENIC RISKS IN AIR

CHEMICAL	MAXIMUM PREDICTED CONCENTRATION (ug/m ³)	RISK-BASED LEVEL (ug/m ³)	CARCINOGENIC RISK*
chromium VI	0.0047	0.00015	3E-05
benzene	2.8	0.22	1E-05
gasoline	0.19	5.10E-05 (ug/m ³) ^{-1**}	9E-06
1,3-butadiene	0.044	0.0064	7E-06
cadmium	0.0067	0.00099	7E-06
arsenic	0.0022	0.00041	5E-06
diesel	0.24	1.70E-05 (ug/m ³) ^{-1**}	4E-06
crotonaldehyde	0.012	0.0033	3E-06
acrylonitrile	0.042	0.026	2E-06
formaldehyde	0.30	0.14	2E-06
vinyl chloride	0.025	0.021	1E-06

*Value represents the maximum carcinogenic risk posed by an individual chemical at a specific location.

**Value represents the unit risk for this compound.

CHESTER RISK PROJECT

TABLE 4-33

MAXIMUM NON-CANCER THREATS IN AIR

CHEMICAL	MAXIMUM PREDICTED CONCENTRATION (ug/m ³)	RISK-BASED LEVEL (ug/m ³)	HAZARD QUOTIENT*
hydrogen chloride	17	7.3	2.4
acrolein	0.33	0.021	1.6
2-methoxyethanol	19	21	0.9
mercury (inorganic)	0.061	0.31	0.2

*Value represents the maximum non-cancer threat, as predicted by the Hazard Quotient, posed by an individual chemical at a specific location.

CHESTER RISK PROJECT

TABLE 4-34

MAXIMUM RATIO OF PREDICTED CONCENTRATIONS
OF CRITERIA POLLUTANTS TO
NATIONAL AMBIENT AIR QUALITY STANDARDS

CHEMICAL	MAXIMUM PREDICTED CONCENTRATION (ug/m ³)	NATIONAL AMBIENT AIR QUALITY STANDARD (ug/m ³)*	RATIO**
carbon monoxide (1 hour)	1960	40,000	0.05
carbon monoxide (8 hours)	675	10,000	0.07
lead (quarter)	0.11***	1.5	0.08
nitrogen dioxide (annual)	32	100	0.3
ozone (1 hour)	****	235	-
PM-10 (24 hours)	70	150	0.5
PM-10 (annual)	14	50	0.3
sulfur dioxide (3 hours)	372	1300	0.3
sulfur dioxide (24 hours)	170	365	0.5
sulfur dioxide (annual)	41	80	0.5

*Please refer to Table 4-31 for a detailed explanation of each standard.

**Value represents the ratio between the maximum predicted concentration and the National Ambient Air Quality Standard.

***The modeled concentration for lead represents an annual average level, rather than a quarterly concentration. Although the annual average level was compared to the quarterly standard for lead, inaccuracies related to such a comparison are insignificant in the context of this study.

****Ozone was not evaluated in the air modeling exercise.

CHESTER RISK PROJECT

TABLE 4-35

RELATIVE CONTRIBUTIONS OF POINT SOURCES
TO LONG AND SHORT-TERM RISK
FROM ENVIRONMENTAL AIR POLLUTION

Source		Pollutants
Long-term Risk		
PQ	28%	chromium, arsenic
Delcora	26%	metals
Sun	22%	organics
DuPont	10%	organics
Westinghouse	7%	metals
Other	8%	
Short-term Risk (excludes criteria pollutants)		
DuPont	51%	2-Methoxyethanol, Acrolein
Westinghouse	31%	HCl
Crozer-Chester	7%	Mercury, HCl
Other	11%	

TABLE 4-36. CAL3QHC predicted emissions concentrations under the worst-case modeling conditions with and without the DCRRF trucks. The concentration difference indicates the contribution due to the trucks.

Intersection	Pollutant	Concentration ($\mu\text{g}/\text{m}^3$)		Concentration Difference ($\mu\text{g}/\text{m}^3$)
		With Trucks	Without Trucks	
Second and Jeffrey Streets	TOG	326	314	12
	PM-10	9.6	3.6	6.0
Second and Flower Streets	TOG	265	253	12
	PM-10	7.2	3.6	3.6

TABLE 4-37. Ten highest concentrations by receptor location from the CAL3QHC model for the emissions of the existing traffic with the DCRRF trucks.

TOG		PM-10	
Location	Conc. ($\mu\text{g}/\text{m}^3$)	Location	Conc. ($\mu\text{g}/\text{m}^3$)
Second and Flower Streets			
NW block at corner	326	NE block at corner	9.6
SE block at corner	289	NW block at corner	9.6
NE block at corner	241	SW block at corner	8.4
SW block at corner	229	SE block at corner	6.0
NE block 25 m E of corner	205	NE block 25 m E of corner	6.0
SW block 25m W of corner	193	NW block 25 m W of corner	6.0
SE block 25 m E of corner	181	SW block 25 m W of corner	6.0
NW block 25 m W of corner	181	SE block 25 m E of corner	6.0
NW block 50 m W of corner	145	NE block 50 m E of corner	6.0
SE block 50 m E of corner	145	NW block 50 m W of corner	6.0
Second and Jeffrey Streets			
SE block at corner	265	SW block at corner	7.2
NE block at corner	265	NE block at corner	7.2
NW block at corner	265	SE block at corner	6.0
SW block at corner	253	NW block at corner	6.0
NE block 25 m E of corner	253	SW block 25 m W of corner	6.0
SW block 25 m W of corner	253	NE block 25 m E of corner	6.0
SE block 25 m E of corner	217	SE block 25 m E of corner	6.0
NW block 25 m W of corner	217	NW block 25 m W of corner	6.0
NW block 50 m W of corner	145	SW block 50 m W of corner	6.0

TABLE 4-38. ISCST2 predicted annual average hourly emissions concentrations for 1991 with and without DCRRF trucks. The concentration difference indicates the contribution due to the trucks. Concentrations are reported for two cross sections showing the concentration versus distance from Second Street.

Cross Section with Second Street	Meters North of Second Street	TOG Concentration ($\mu\text{g}/\text{m}^3$)			PM-10 Concentration ($\mu\text{g}/\text{m}^3$)		
		With Trucks	Without Trucks	Difference	With Trucks	Without Trucks	Difference
600 m east of Thurlow Street	500	0.084	0.078	0.006	0.0089	0.0038	0.0051
	300	0.171	0.158	0.013	0.0187	0.0077	0.0109
	100	0.560	0.514	0.046	0.0638	0.0252	0.0386
	11.5	1.517	1.386	0.131	0.1783	0.0678	0.1104
	-11.5	1.411	1.286	0.124	0.1678	0.0630	0.1048
	-100	0.473	0.432	0.041	0.0554	0.0212	0.0342
	-300	0.138	0.127	0.011	0.0158	0.0062	0.0096
	-500	0.067	0.062	0.005	0.0076	0.0030	0.0046
1,200 m east of Thurlow Street	500	0.116	0.109	0.007	0.0111	0.0053	0.0058
	300	0.224	0.211	0.013	0.0213	0.0104	0.0109
	100	0.734	0.692	0.042	0.0693	0.0339	0.0354
	11.5	2.476	2.327	0.148	0.2403	0.1140	0.1262
	-11.5	2.236	2.102	0.134	0.2170	0.1030	0.1140
	-100	0.599	0.563	0.037	0.0586	0.0276	0.0311
	-300	0.173	0.162	0.011	0.0175	0.0079	0.0096
	-500	0.090	0.083	0.006	0.0093	0.0041	0.0052

TABLE 4-39. Six highest concentrations by receptor location from the ISCST2 model for the emissions of the existing traffic with the DCRRF trucks.

TOG		PM-10	
Location	Concentration ($\mu\text{g}/\text{m}^3$)	Location	Concentration ($\mu\text{g}/\text{m}^3$)
1,400 m east of Thurlow, 11.5 m north of Second	2.57	1,200 m east of Thurlow, 11.5 m north of Second	0.24
1,200 m east of Thurlow, 11.5 m north of Second	2.48	400 m east of Thurlow, 11.5 m north of Second	0.22
1,400 m east of Thurlow, 11.5 m south of Second	2.30	1,000 m east of Thurlow, 11.5 m north of Second	0.22
1,200 m east of Thurlow, 11.5 m south of Second	2.24	1,200 m east of Thurlow, 11.5 m south of Second	0.22
1,000 m east of Thurlow, 11.5 m north of Second	2.15	400 m east of Thurlow, 11.5 m south of Second	0.20
1,600 m east of Thurlow, 11.5 m north of Second	2.04	1,000 m east of Thurlow, 11.5 m south of Second	0.20