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[a]
= 100 mg/d soil or sediment for adults (>6 years old)[a]
= 54 g/d fish tissue[a]

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

EF = exposure frequency
= 350 d/yr[a]

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

[a]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 cm^2/event for children (hands and feet)[a,d]
= 1800 cm^2/event for adults (hands and feet)[a,d]

AF = soil-to-skin adherence factor
= 1 mg/cm^2 [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

[a]USEPA, 1989b
[b]USEPA, 1992a
[c]USEPA, 1991a
[d]USEPA, 1989a

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TABLE 3-3

INGESTION OF DRINKING WATER AND SURFACE WATER

DOSE EQUATION FOR RESIDENTIAL EXPOSURE

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

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

[a]USEPA, 1991a
[b]USEPA, 1989b
[c]USEPA, 1989a

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TABLE 3-4

DERMAL EXPOSURE TO DRINKING WATER AND SURFACE WATER

DOSE EQUATION FOR RESIDENTIAL EXPOSURE

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

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/cm^3: 1E-3)

A = Skin surface area available for contact
= 18000 cm^2 for adult[c]
= 7200 cm^2 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

[a]USEPA, 1992a
[b]Professional judgment
[c]USEPA, 1989a
[d]USEPA, 1991a

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TABLE 3-5

INHALATION EXPOSURE TO DRINKING WATER

DOSE EQUATION FOR RESIDENTIAL EXPOSURE

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

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

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

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

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

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

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

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

Where:

D = Inhalation dose (mg/kg/shower)

VR = Inhalation rate
= 14 L/min (20 m^3/d)[a]

S = Indoor VOC generation rate (ug/m^3/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 m^3 [c]

C = Concentration in water (mg/L)

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

[a]USEPA, 1991a
[b]Foster and Chrostowski, 1987
[c]Professional judgment

CHESTER RISK PROJECT

TABLE 3-6

INHALATION OF CHEMICALS IN AIR

DOSE EQUATION FOR RESIDENTIAL EXPOSURE

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

Where: C = chemical concentration in air (mg/m^3) (modeled)

IR = inhalation rate
= 20 m^3/day for adults[a]
= 12 m^3/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

[a]USEPA, 1991a
[b]Professional judgment

CHESTER RISK PROJECT

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 µg/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

CHESTER RISK PROJECT
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 HIGH-PPM	1989 LOW-PPM	1989 COPC	1990 HIGH-PPM	1990 LOW-PPM	1990 COPC	1991 HIGH-PPM	1991 LOW-PPM	1991 COPC
0.00017	bromodichloromethane	0.005		yes	0.008	0.003	yes	0.01	0.004	yes
0.00015	chloroform	0.033	0.019	yes	0.044	0.017	yes	0.046	0.021	yes
0.0061	dibromomethane	0.008		yes						
0.00015	total trihalomethane**	0.056	0.022	yes	0.072	0.024	yes	0.078	0.023	yes
0.00013	dibromochloromethane							0.0011	0.0009	yes
0.0011	endrin									
0.000052	lindane									
0.00018	methoxychlor									
0.0029	silvex (2,4,5-TP S)									
0.000061	toxaphene									
0.0061	2,4-D									
0.00016	carbon tetrachloride				0.0008		yes			
0.0011	tetrachloroethene									
	INORGANICS	1989			1990			1991		
0.0015	antimony									
0.000038	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			

11/94 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.
Note: Some contaminants such as cis-1,3-dichloropropene reported during 1993 at 2.2 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 4-6 (CONTINUED)
CHESTER WATER AUTHORITY
CHEMICALS OF POTENTIAL CONCERN (COPC)

RBC* PPM	CHEMICALS-ORGANICS	1992 HIGH-PPM	1992 LOW-PPM	1992 COPC	1993 HIGH-PPM	1993 LOW-PPM	1993 COPC	1994 HIGH-PPM	1994 LOW-PPM	1994 COPC
0.00017	bromodichloromethane	0.0111	0.009	yes	0.012	0.0066	yes			
0.00015	chloroform	0.075	0.0548	yes	0.059	0.026	yes			
0.0061	dibromomethane									
0.00015	total trihalomethane**	0.063	0.055	yes	0.066	0.061	yes	0.0588	0.0546	yes
0.00013	dibromochloromethane	0.0028	0.001	yes	0.0016	0.0005	yes			
0.0011	endrin									
0.000052	lindane									
0.00018	methoxychlor									
0.0029	silvex (2,4,5-TP S)									
0.000061	toxaphene									
0.0061	2,4-D									
0.00016	carbon tetrachloride									
0.0011	tetrachloroethene				0.001		yes			
	INORGANICS	1992			1993			1994		
0.0015	antimony									
0.000038	arsenic									
0.000016	beryllium									
0.0018	cadmium									
0.00029	thallium									
0.00022	fluoride				1		yes			
10	nitrate				7.5	2.3	no	9.1		no
0.00037	nitrite				0.4	0.002	yes	0.002		yes
0.015	lead									
15	gross alpha (pCi/L)									

11/94 Data obtained from PADER- June 1994
*RBCs- Risk Based Concentations 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.
Note: Some contaminants such as cis-1,3-dichloropropene reported during 1993 at 2.2 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 HIGH-PPM	1989 LOW-PPM	COPC	1990 HIGH-PPM	1990 LOW-PPM	COPC	1991 HIGH-PPM	1991 LOW-PPM	COPC
0.000044	1,1-dichloroethane									
0.00012	1,2-dichloroethane									
0.000087	benzene									
0.00017	bromodichloromethane							0.0129	0.014	yes
0.00016	carbon tetrachloride									
0.00015	chloroform							0.0417	0.0096	yes
0.00013	dibromochloromethane							0.0017	0.0014	yes
0.0061	dibromomethane									
0.00044	1,4-dichlorobenzene									
0.0016	trichloroethene									
0.000019	vinyl chloride									
0.00015	total trihalomethanes**	0.0475	0.0127	yes	0.0631	0.0154	yes			
	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 HIGH-PPM	1992 LOW-PPM	1992 COPC	1993 HIGH-PPM	1993 LOW-PPM	1993 COPC	1994 HIGH-PPM	1994 LOW-PPM	1994 COPC
0.000044	1,1-dichloroethene									
0.00012	1,2-dichloroethane									
0.000087	benzene									
0.00017	bromodichloromethane	0.0152	0.0046	yes	0.0125	0.005	yes			
0.00016	carbon tetrachloride									
0.00015	chloroform	0.0414	0.0088	yes	0.0259	0.0092	yes			
0.00013	dibromochloromethane	0.0023	0.0007	yes	0.0033	0.0012	yes			
0.0061	dibromomethane				0.0007		no			
0.00044	1,4-dichlorobenzene									
0.0016	trichloroethene									
0.000019	vinyl chloride									
0.00015	total trihalomethanes**	0.0291	0.0035	yes	0.098	0.0173	yes	0.022	0.0151	yes
	INORGANICS	1992			1993			1994		
0.000038	arsenic									
0.015	lead	0.00245		no						
15	gross alpha	3pCi/l		no						

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 4-8
PHILADELPHIA WATER DEPARTMENT
CHEMICALS OF POTENTIAL CONCERN (COPC)

RBC* PPM	CONTAMINANTS-ORGANICS	1989 HIGH-PPM	1989 LOW-PPM COPC	1990 HIGH-PPM	1990 LOW-PPM COPC	1991 HIGH-PPM	1991 LOW-PPM COPC
0.000044	1,1-dichloroethane						
0.00012	1,2-dichloroethane						
0.000087	benzene						
0.00017	bromodichloromethane						
0.00016	carbon tetrachloride**			0.0005	yes	0.0003	yes
0.00015	chloroform						
0.00013	dibromochloromethane						
0.0061	dibromomethane						
0.00044	1,4-dichlorobenzene						
0.0016	trichloroethene						
0.000019	vinyl chloride						
0.00015	total trihalomethanes**	0.0683	yes	0.0715	yes	0.0761	yes
	INORGANICS	1989		1990		1991	
0.000038	arsenic						
0.015	lead						
0.22	fluoride**	1	yes	1.01	yes	1.01	yes
15	gross alpha						

11/94 Data obtained from PWD-November 1994-(Annual Report Fiscal 1993)
*RBCs-Risk Based Concentrations from the Screening Guidance, EPA/903/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 dibromide detected up to 0.14 ppb during 1989 were not included because they are not regulated. See "Uncertainty Section" in the risk assessment.

CHESTER RISK PROJECT
TABLE 4-8 (CONTINUED)
PHILADELPHIA WATER DEPARTMENT
CHEMICALS OF POTENTIAL CONCERN (COPC)

RBC* PPM	CONTAMINANTS-ORGANICS	1992 HIGH-PPM	1992 LOW-PPM COPC	1993 HIGH-PPM	1993 LOW-PPM COPC	1994*** HIGH-PPM	1994*** LOW-PPM COPC
0.000044	1,1-dichloroethene						
0.00012	1,2-dichloroethane						
0.000087	benzene						
0.00017	bromodichloromethane						
0.00016	carbon tetrachloride**			0.0003	yes		
0.00015	chloroform						
0.00013	dibromochloromethane						
0.0061	dibromomethane						
0.00044	1,4-dichlorobenzene						
0.0016	trichloroethene						
0.000019	vinyl chloride						
0.00015	total trihalomethanes**	0.0589	yes	0.0833	yes		
	INORGANICS	1992		1993		1994	
0.000038	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)
*RBCs-Risk Based Concentrations from the Screening Guidance, EPA/903/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 dibromide detected up to 0.14 ppb during 1989 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 SITES[1]

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.

[1]Based on available historical data

CHESTER RISK PR

TABLE 4-16

SOIL INGESTION DOSE CALCULATIONS

SITE	SOURCE	CHEMICAL	MAXIMUM CONCENTRATION (mg/kg)	CHILD NONCARCINOGENIC DOSE (mg/kg/day)	CHILD CARCINOGENIC DOSE (mg/kg/day)	ADULT NONCARCINOGENIC DOSE (mg/kg/day)	ADULT CARCINOGENIC DOSE (mg/kg/day)
DE CO. INC. NO.1	S10	As	15	1.60E-04	1.54E-05	2.05E-05	7.05E-06
		Be	2.3	2.76E-05	2.36E-06	3.15E-06	1.08E-06
VERMICULITE DUMP	NW SOIL	Cu	5410	6.48E-02		7.41E-03	
		Hg	81.3	9.74E-04		1.11E-04	
	SE SOIL	BENZ[A]ANTHRACENE	3.8		3.90E-06		1.78E-06
	MIDDLE SOIL	BENZO[A]PYRENE	2.4		2.47E-06		1.13E-06
ABM WADE@	WELL #10	Sb	5	5.99E-05		6.85E-06	
	WELL #6	As	20	2.40E-04	2.05E-05	2.74E-05	9.39E-06
		Mn	21000	2.52E-01		2.88E-02	
	WELL #14	Be	1.5	1.80E-05	1.54E-06	2.05E-06	7.05E-07
MONROE CHEMICAL	WAREHOUSE	As	0.7	8.39E-06	7.19E-07	9.59E-07	3.29E-07
		Be	0.4	4.79E-06	4.11E-07	5.48E-07	1.88E-07
		Ag	100	1.20E-03		1.37E-04	
SCOTT PAPER	SOIL PILES	BENZO[A]PYRENE	0.6		6.18E-07		2.82E-07
AIR PROD & CHEM	SS-1	As	10.1	1.21E-04	1.04E-05	1.38E-05	4.74E-06
	FH-30 SOIL	Hg*	201	2.41E-03		2.75E-04	
EAST TENTH STREET	S-3	Sb	29	3.48E-04		3.97E-05	
	S-5	As	58.4	7.00E-04	6.00E-05	8.00E-05	2.74E-05
		Be	7.4	8.87E-05	7.60E-06	1.01E-05	3.48E-06
	S-3	Cu	2720	3.26E-02		3.73E-03	
	S-1	Hg	3.2	3.84E-05		4.38E-06	
	S-4A	V	318	3.81E-03		4.36E-04	
	S-3	BENZ[A]ANTHRACENE	81		8.27E-05		2.86E-05
		BENZO[B]FLUORANTHENE	86		8.84E-05		4.04E-05
	S-4A	BENZO[K]FLUORANTHENE	3.3		3.38E-06		1.55E-06
	S-3	BENZO[A]PYRENE	42		4.32E-05		1.97E-05
		CHRYSENE	52		5.34E-05		2.44E-05
		DIBENZ[A,H]ANTHRACENE	0.57		5.86E-07		2.68E-07
		INDENO[1,2,3-C,D]PYRENE	18		1.85E-05		8.45E-06
		AROCLOR 1254	8.2		8.42E-06		3.85E-06
	S-4A	AROCLOR 1260	8.2		8.42E-06		3.85E-06

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 fixed laboratory was used.

@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 NONCARCINOGENIC DOSE	CHILD CARCINOGENIC DOSE (mg/kg/day)	ADULT NONCARCINOGENIC DOSE (mg/kg/day)	ADULT CARCINOGENIC DOSE (mg/kg/day)
EAST TENTH STREET	S-3	AROCLOR 1254	8.2		2.17E-06		4.16E-06
	S-4A	AROCLOR 1260	8.2		2.17E-06		4.16E-06

Based on available historical data.

CHESTER RISK F

TABLE 4-16

SOIL INGESTION RISK CALCULATIONS

SITE	SOURCE	CHEMICAL	MAXIMUM CONCENTRATION (mg/kg)	CHILD HQ*	CHILD CARCINOGENIC RISK	ADULT HQ*	ADULT CARCINOGENIC RISK
DE CO. INC. NO.1	S10	As	15	0.6	2.7E-05	0.1	1.2E-05
		Be	2.3	0.0	1.0E-05	0.0	4.6E-06
VERMICULITE DUMP	NW SOIL	Cu	5410	1.7		0.2	
		Hg	81.3	3.2		0.4	
	SE SOIL	BENZ[A]ANTHRACENE	3.6		2.6E-06		1.3E-06
	MIDDLE SOIL	BENZO[A]PYRENE	2.4		1.6E-05		8.2E-06
ABM WADE@	WELL #10	Sb	5	0.1		0.0	
	WELL #8	As	20	0.8	3.6E-05	0.1	1.6E-05
		Mn	21000	50.3		5.8	
	WELL #14	Be	1.5	0.0	6.6E-06	0.0	3.0E-06
MONROE CHEMICAL	WAREHOUSE	As	0.7	0.0	1.3E-06	0.0	5.6E-07
		Be	0.4	0.0	1.6E-06	0.0	8.1E-07
		Ag	100	0.2		0.0	
SCOTT PAPER	SOIL PILES	BENZO[A]PYRENE	0.6		4.5E-06		2.1E-06
AIR PROD & CHEM	SS-1	As	10.1	0.4	1.8E-05	0.0	8.3E-06
	FH-30SOIL	Hg**	201	8.0		0.9	
EAST TENTH STREET	S-3	Sb	29	0.9		0.1	
	S-5	As	58.4	2.3	1.0E-04	0.3	4.8E-05
		Be	7.4	0.0	3.3E-05	0.0	1.5E-05
	S-3	Cu	2720	0.9		0.1	
	S-1	Hg	3.2	0.1		0.0	
	S-4A	V	318	0.5		0.1	
	S-3	BENZ[A]ANTHRACENE	61		4.6E-05		2.1E-05
		BENZO[B]FLUORANTHENE	86		6.4E-05		2.9E-05
	S-4A	BENZO[K]FLUORANTHENE	3.3		2.5E-07		1.1E-07
	S-3	BENZO[A]PYRENE	42		3.2E-04		1.4E-04
		CHRYSENE	52		3.9E-07		1.8E-07
		DIBENZ[A,H]ANTHRACENE	0.57		4.3E-06		2.0E-06
		INDENO[1,2,3-C,D]PYRENE	18		1.3E-05		6.2E-06
		AROCLOR 1254	8.2		6.5E-05		3.0E-05
	S-4A	AROCLOR 1260	8.2		6.5E-05		3.0E-05

Based on available historical data.

*A value of zero in this 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 fixed laboratory was used.

CHESTER RISK PROJECT

TABLE 4-10

DERMAL ABSORPTION RISK CALCULATIONS

SITE	SOURCE	CHEMICAL	MAXIMUM CONCENTRATION (mg/kg)	CHILD HQ	CHILD CARCINOGENIC RISK	ADULT HQ	ADULT CARCINOGENIC RISK
EAST TENTH STREET	S-3	AROCLOR 1254	6.2		1.67E-05		3.20E-05
	S-4A	AROCLOR 1260	6.2		1.67E-05		3.20E-05

Based on available historical data.

CHESTER PROJECT

TABLE 4-20

HAZARD INDEX* AND CUMULATIVE CARCINOGENIC RISK, PER SITE

SITE	CHILD HI**	CHILD CARCINOGENIC RISK	ADULT HI**	ADULT 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

		PERCENT CONTRIBUTION			
SITE	CHEMICAL	CHILD HI	CHILD CARCINOGENIC RISK	ADULT HI	ADULT CARCINOGENIC RISK
DE CO. INC. NO.1	As	99	73	99	73
	Be	1	27	1	27
VERMICULITE DUMP	Cu	35		35	
	Hg	65		65	
	BENZ[A]ANTHRACENE		14		14
	BENZO[A]PYRENE		86		86
ABM WADE@	Sb	<1		<1	
	As	2	84	2	84
	Mn	98		98	
	Be	<1	16	<1	16
MONROE CHEMICAL	As	10	42	10	42
	Be	<1	58	<1	58
	Ag	89		89	
SCOTT PAPER	BENZO[A]PYRENE		100		100
AIR PROD & CHEM	As	5	100	5	100
	Hg	95		95	
EAST TENTH STREET	Sb	18		18	
	As	49	14	49	12
	Be	<1	4	<1	4
	Cu	18		18	
	Hg	3		3	
	V	11		11	
	BENZ[A]ANTHRACENE		6		5
	BENZO[B]FLUORANTHENE		9		8
	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

TION	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
NROE CHEMICAL	POND SW	Arsenic	22 ug/l
	POND SED	Antimony	36.8 mg/kg
		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
		Vanadium	142 mg/kg
	SED(DS)	Arsenic	8 mg/kg
		Antimony	21.4 mg/kg
		Beryllium	0.7 mg/kg
		Chromium	243 mg/kg
		Manganese	6076 mg/kg
		Nickel	201 mg/kg
		Vanadium	89 mg/kg
EAST 10TH STREET	SED	Benz[a]anthracene	5800 ug/kg
		Benzo[b]fluoranthene	8700 ug/kg
		Benzo[a]pyrene	3400 ug/kg
		Indeno[1,2,3-c,d]pyrene	3500 ug/kg
		Dibenz[a,h]anthracene	1100 ug/kg
WQF00002-084.9	FISH	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
		t-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
		Oxychlordane	0.027 mg/kg
DELFISH-07	FISH	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
		alpha-Chlordane	150 ug/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	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
		Zinc	96 ug/l
3096	FISH	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
WQN0172	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
WQN0158	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

ION	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
NROE 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
	Benz[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	8.9E-03
	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
DELFISH-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
WQN0182	SW	0.673	0.171	Mn	N/A	
	FISH	19.687	4.219	chlordane	2.20E-03	PCBs
DELFISH07	FISH	10.816	2.318	chlordane,Hg	1.30E-02	PCBs
WQF00002-081.8	FISH	96.874	20.759	chlordane	9.80E-03	PCBs
WQF00002-084.9	DRY FISH	11.698	2.507	As	4.30E-04	As
	WET FISH	16.036	3.441	chlordane	8.90E-03	PCBs
WQF00511-000.6	FISH	7.249	1.553	chlordane	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	chlordane	8.30E-04	PCBs
WQN0158	SW	0.006	0.001	Zn,Mn	N/A	
WQN0172	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	0.005	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

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

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	19013PNNSY100BE	PENNSYLVANIA MACHINE WORKS	100 BETHEL RD.	190133485	ASTON	DELAWARE	752500	-395000	3498
NICKEL	19013PNNSY100BE	PENNSYLVANIA MACHINE WORKS	100 BETHEL RD.	190133485	ASTON	DELAWARE	752500	-395000	3498
SULFURIC ACID	19013NRTHM1200W	NORTH AMERICA SILICA	1200 W. FRONT ST.	19013	CHESTER	DELAWARE	395005	-752221	2819
AMMONIA	19013NRTHM1200W	NORTH AMERICA SILICA	1200 W. FRONT ST.	19013	CHESTER	DELAWARE	395005	-752221	2819
PHOSPHORIC ACID	19331CNCRDCONCI	CONCORD BEVERAGE CO.	CONCHESTER RD. & ALDAN AVE.	19331	CONCORDVILLE	DELAWARE	395328	-753150	2086
AMMONIA	19331CNCRDCONCI	CONCORD BEVERAGE CO.	CONCHESTER RD. & ALDAN AVE.	19331	CONCORDVILLE	DELAWARE	395328	-753150	2086
ETHYLENE	19061PSLNPBLUEB	EPSILON PRODS. CO.	BLUE BALL AVE. & POST RD.	19061	MARCUS HOOK	DELAWARE	394856	-752548	2821
PROPYLENE	19061PSLNPBLUEB	EPSILON PRODS. CO.	BLUE BALL AVE. & POST RD.	19061	MARCUS HOOK	DELAWARE	394856	-752548	2821
CHROMIUM COMPOUNDS	19013THPQCFRONT	PQ CORP.	1201 W. FRONT ST.	19013	CHESTER	DELAWARE	395008	-752230	2819
FORMALDEHYDE	19050HYDRL520CO	HYDROL CHEMICAL CO.	520 COMMERCE DR.	19050	YEADON	DELAWARE	395930	-751500	2869
NAPHTHALENE	19061CNGLMRIDGE	CONGOLEUM CORP.	RIDGE RD. & YATES AVE.	19061	MARCUS HOOK	DELAWARE	394902	-752405	3996
BUTYL BENZYL PHTHALATE	19061CNGLMRIDGE	CONGOLEUM CORP.	RIDGE RD. & YATES AVE.	19061	MARCUS HOOK	DELAWARE	394902	-752405	3996
FREON 113	19014MCGND9CROZ	MCGEE INDUSTRIES INC.	9 CROZERVILLE RD.	19014	ASTON	DELAWARE	395244	-752725	2899
1,1,1-TRICHLOROETHANE	19014MCGND9CROZ	MCGEE INDUSTRIES INC.	9 CROZERVILLE RD.	19014	ASTON	DELAWARE	395244	-752725	2899
COPPER COMPOUNDS	19013HRCST651E9	HARCAST CO. INC.	651 E. 9TH ST.	19013	CHESTER	DELAWARE	395118	-752108	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)	19023SNTRY237MI	SENTRY PAINT TECH.	237 MILL ST.	19023	DARBY	DELAWARE	395450	-751538	2851
TOLUENE	19023SNTRY237MI	SENTRY PAINT TECH.	237 MILL ST.	19023	DARBY	DELAWARE	395450	-751538	2851
METHANOL	19014CSTMC8CROZ	CUSTOM COMPOUNDING INC.	8 CROZERVILLE RD.	19014	ASTON	DELAWARE	395244	-752735	2821
DIBUTYL PHTHALATE	190290SCHM48POWE	SSCHEM CO.	48 POWHATTAN AVE.	190290056	ESSINGTON	DELAWARE	395158	-751806	2821
METHYL METHACRYLATE	190290SCHM48POWE	SSCHEM CO.	48 POWHATTAN AVE.	190290056	ESSINGTON	DELAWARE	395158	-751806	2821
TOLUENE	19014NTRNT11CRO	INTERNATIONAL ENVELOPE CO.	11 CROZERVILLE RD.	19014	ASTON	DELAWARE	395242	-752745	2677
1,1,1-TRICHLOROETHANE	19018LTTNSMARPL	CLIFTON PRECIBION - N.	MARPLE AT BROADWAY AVE.	190182495	CLIFTON HEIGHTS	DELAWARE	394510	-751713	3621
NICKEL	19018BCHNNPENNJ	BUCHAN IND.	PENN & JEFFERSON ST.	190182694	CLIFTON HEIGHTS	DELAWARE	395820	-750104	2782
TOLUENE	19018BCHNNPENNJ	BUCHAN IND.	PENN & JEFFERSON ST.	190182694	CLIFTON HEIGHTS	DELAWARE	395820	-750104	2782
1,1,1-TRICHLOROETHANE	19018BCHNNPENNJ	BUCHAN IND.	PENN & JEFFERSON ST.	190182694	CLIFTON HEIGHTS	DELAWARE	395820	-750104	2782
N-BUTYL ALCOHOL	19014ZNTHP200CO	ZENITH PRODUCTS CORP.	200 COMMERCE DR.	19014	ASTON	DELAWARE	395215	-750015	

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
XYLENE (MIXED ISOMERS)	19014ZNTHP200CO	ZENITH PRODUCTS CORP.	200 COMMERCE DR.	19014	ASTON	DELAWARE	395215	-750015	2514
TOLUENE	19014ZNTHP200CO	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	19013TRSCO800WF	TRS ACQUISITION CORP.	800 W. FRONT ST.	19013	CHESTER	DELAWARE	395000	-752230	2952
XYLENE (MIXED ISOMERS)	19050JLNBS300EB	JULIAN B. SLEVIN CO. INC.	300 E. BALTIMORE AVE.	19050	LANSDOWNE	DELAWARE	395600	-751900	2699
TOLUENE	19050JLNBS300EB	JULIAN B. SLEVIN CO. INC.	300 E. BALTIMORE AVE.	19050	LANSDOWNE	DELAWARE	395600	-751900	2699
HYDROCHLORIC ACID	19032THBLL1640D	BULLEN COMPANIES	1640 DELMAR DR.	19032	FOLCROFT	DELAWARE	395343	-751640	2842
HYDROGEN FLUORIDE	19032THBLL1640D	BULLEN COMPANIES	1640 DELMAR DR.	19032	FOLCROFT	DELAWARE	395343	-751640	2842
PHOSPHORIC ACID	19032THBLL1640D	BULLEN COMPANIES	1640 DELMAR DR.	19032	FOLCROFT	DELAWARE	395343	-751640	2842
GLYCOL ETHERS	19032THBLL1640D	BULLEN COMPANIES	1640 DELMAR DR.	19032	FOLCROFT	DELAWARE	395343	-751640	2842
1,1,1-TRICHLOROETHANE	19016TLDYN4THTO	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	19013BNGHLINDUS	BOEING DEFENSE & SPACE GROUP	STEWART AVE. & INDUSTRIAL HWY.	19103	RIDLEY PARK	DELAWARE	395251	-751932	3721
METHYL ETHYL KETONE	19013BNGHLINDUS	BOEING DEFENSE & SPACE GROUP	STEWART AVE. & INDUSTRIAL HWY.	19103	RIDLEY PARK	DELAWARE	395251	-751932	3721
TOLUENE	19013BNGHLINDUS	BOEING DEFENSE & SPACE GROUP	STEWART AVE. & INDUSTRIAL HWY.	19103	RIDLEY PARK	DELAWARE	395251	-751932	3721

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
TRICHLOROETHYLENE	19013BNGHLINDUS	BOEING DEFENSE & SPACE GROUP	STEWART AVE. & INDUSTRIAL HWY.	19103	RIDLEY PARK	DELAWARE	395251	-751932	3721
ACETONE	19013BNGHLINDUS	BOEING DEFENSE & SPACE GROUP	STEWART AVE. & INDUSTRIAL HWY.	19103	RIDLEY PARK	DELAWARE	395251	-751932	3721
METHYL ISOBUTYL KETONE	19013BNGHLINDUS	BOEING DEFENSE & SPACE GROUP	STEWART AVE. & INDUSTRIAL HWY.	19103	RIDLEY PARK	DELAWARE	395251	-751932	3721
SULFURIC ACID	19013SCTFM1500E	FOAMEX L.P.	1500 E. 2ND ST.	19022	EDDYSTONE	DELAWARE	395119	-717006	3086
TOLUENEDIISOCYANATE (MIXED ISC	19013SCTFM1500E	FOAMEX L.P.	1500 E. 2ND ST.	19022	EDDYSTONE	DELAWARE	395119	-717006	3086
DICHLOROMETHANE	19013SCTFM1500E	FOAMEX L.P.	1500 E. 2ND ST.	19022	EDDYSTONE	DELAWARE	395119	-717006	3086
HYDROCHLORIC ACID	19013SCTTPFRONT	SCOTT PAPER CO.	FRONT & AVE. OF THE STATES	19013	CHESTER	DELAWARE	395042	-752124	2621
SULFURIC ACID	19013SCTTPFRONT	SCOTT PAPER CO.	FRONT & AVE. OF THE STATES	19013	CHESTER	DELAWARE	395042	-752124	2621
BUTYL BENZYL PHTHALATE	19013SCTTPFRONT	SCOTT PAPER CO.	FRONT & AVE. OF THE STATES	19013	CHESTER	DELAWARE	395042	-752124	2621
CHLOROFORM	19013SCTTPFRONT	SCOTT PAPER CO.	FRONT & AVE. OF THE STATES	19013	CHESTER	DELAWARE	395042	-752124	2621
SULFURIC ACID	19013WTCCR3300W	WITCO CORP.	3300 W. 4TH ST.	19061	TRAINER	DELAWARE	394948	-752400	2843
METHANOL	19013WTCCR3300W	WITCO CORP.	3300 W. 4TH ST.	19061	TRAINER	DELAWARE	394948	-752400	2843
2-METHOXYETHANOL	19013WTCCR3300W	WITCO CORP.	3300 W. 4TH ST.	19061	TRAINER	DELAWARE	394948	-752400	2843
CHLORINE	19061SNRFNGREENSUN	REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
CRESOL (MIXED ISOMERS)	19061SNRFNGREENSUN	REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
ETHYLENE GLYCOL	19061SNRFNGREENSUN	REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
PHENOL	19061SNRFNGREENSUN	REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
SULFURIC ACID	19061SNRFNGREENSUN	REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
1,3-BUTADIENE	19061SNRFNGREENSUN	REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
CYCLOHEXANE	19061SNRFNGREENSUN	REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
1,2,4-TRIMETHYLBENZENE	19061SNRFNGREENSUN	REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
AMMONIA	19061SNRFNGREENSUN	REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
PROPYLENE	19061SNRFNGREENSUN	REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
ETHYLENE	19061SNRFNGREENSUN	REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
ZINC COMPOUNDS	19061SNRFNGREENSUN	REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
METHANOL	19061SNRFNGREENSUN	REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
XYLENE (MIXED ISOMERS)	19061SNRFNGREENSUN	REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
ETHYLBENZENE	19061SNRFNGREENSUN	REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
TOLUENE	19061SNRFNGREENSUN	REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
CHROMIUM COMPOUNDS	19061SNRFNGREENSUN	REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
ANTIMONY COMPOUNDS	19061SNRFNGREENSUN	REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
METHYL TERT-BUTYL ETHER	19061SNRFNGREENSUN	REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
BENZENE	19061SNRFNGREENSUN	REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911
ETHYLENE OXIDE	19061SNRFNGREENSUN	REFINING & MARKETING CO.	GREEN ST. & DELAWARE AVE.	190610426	MARCUS HOOK	DELAWARE	394800	-752600	2911

CHESTER RISK PROJECT

TABLE 4-28

1992 TRI FOR REGION III
DELAWARE CO., PA

TOXICITY DATA:

Chemical Name	Facility ID#	Reference Dose (RfD)	Confidence Statement	Reference Dose Status	Cancer Potency (CPF)	Weight of Evidence	RfD Index Dose	CPF Index Dose
CHROMIUM	19013PNNSY100BE	0			0		0	0
NICKEL	19013PNNSY100BE	0.02	medium	Iris	0		1.4	0
SULFURIC ACID	19013NRTHM1200W	0			0		0	0
AMMONIA	19013NRTHM1200W	0			0		0	0
PHOSPHORIC ACID	19331CNCRDCONCH	0			0		0	0
AMMONIA	19331CNCRDCONCH	0			0		0	0
ETHYLENE	19061PSLNPBLUEB	0			0		0	0
PROPYLENE	19061PSLNPBLUEB	0			0		0	0
CHROMIUM COMPOUNDS	19013THPQCFRONT	0.005	low	Iris	0		0.35	0
FORMALDEHYDE	19050HYDRL520CO	0.2	medium	Iris	0		14	0
NAPHTHALENE	19061CNGLMRIDGE	0.004	na	ECAO: Risk Assessment 2/92	0		0.28	0
BUTYL BENZYL PHTHALATE	19061CNGLMRIDGE	0.2	low	Iris	0	C	14	0
FREON 113	19014MCGND9CROZ	30	low	Iris	0		2100	0
1,1,1-TRICHLOROETHANE	19014MCGND9CROZ	0.09	na	w/d from Iris and heast	0		6.3	0
COPPER COMPOUNDS	19013HRCST651E9	0.005	medium	Iris	0		0.35	0
1,1,1-TRICHLOROETHANE	19015RBNDS2RACE	0.09	na	w/d from Iris and heast	0		6.3	0
ACETONE	19015RBNDS2RACE	0.1	low	Iris	0		7	0
XYLENE (MIXED ISOMERS)	19023SNTRY237MI	2	medium	Iris	0		140	0
TOLUENE	19023SNTRY237MI	0.2	medium	Iris	0		14	0
METHANOL	19014CSTMC8CROZ	0.5	medium	Iris	0		35	0
DIBUTYL PHTHALATE	19029SSCHM48POW	0.1	low	Iris	0		7	0
METHYL METHACRYLATE	19029SSCHM48POW	0.08	na	HEAST	0		5.6	0
TOLUENE	19014NTRNT11CRO	0.2	medium	Iris	0		14	0
1,1,1-TRICHLOROETHANE	19018LTTNSMARPL	0.09	na	w/d from Iris and heast	0		6.3	0
NICKEL	19018BCHNNPENNJ	0.02	medium	Iris	0		1.4	0
TOLUENE	19018BCHNNPENNJ	0.2	medium	Iris	0		14	0
1,1,1-TRICHLOROETHANE	19018BCHNNPENNJ	0.09	na	w/d from Iris and heast	0		6.3	0
N-BUTYL ALCOHOL	19014ZNTHP200CO	0.1	low	Iris	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 (RfD)	Confidence Statement	Reference Dose Status	Cancer Potency (CPF)	Weight of Evidence	RfD 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	19032MZRCH1830C	2	high	Iris	0		140	0
DIETHANOLAMINE	19032MZRCH1830C	0			0		0	0
DIETHYL SULFATE	19032MZRCH1830C	0			0		0	0
GLYCOL ETHERS	19032MZRCH1830C	0.001	na	HEAST	0		0.07	0
CHLOROMETHANE	19032MZRCH1830C	0			0.013	C	0	1.5837112
BENZYL CHLORIDE	19032MZRCH1830C	0			0.17	B2	0	0.0614574
DECABROMODIPHENYL OXIDE	19013TRSCO800WF	0.01	low	Iris	0		0.7	0
XYLENE (MIXED ISOMERS)	19050JLNBS300EB	2	medium	Iris	0		140	0
TOLUENE	19050JLNBS300EB	0.2	medium	Iris	0		14	0
HYDROCHLORIC ACID	19032THBLL1640D	0			0		0	0
HYDROGEN FLUORIDE	19032THBLL1640D	0			0		0	0
PHOSPHORIC ACID	19032THBLL1640D	0			0		0	0
GLYCOL ETHERS	19032THBLL1640D	0.001	na	HEAST	0		0.07	0
1,1,1-TRICHLOROETHANE	19016TLDYN4THTO	0.09	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	0.2639519
TOLUENE	19061BPLCMPOSTR	0.2	medium	Iris	0		14	0
1,2-DICHLOROETHANE	19061BPLCMPOSTR	0			0.091	B2	0	0.1148106
NAPHTHALENE	19061BPLCMPOSTR	0.004	na	ECAO: Risk Assessment 2/92	0		0.28	0
METHYL TERT-BUTYL ETHER	19061BPLCMPOSTR	0.005	na		0		0.35	0
BENZENE	19061BPLCMPOSTR	0			0.029	A	0	0.2413794
SULFURIC ACID	19013BNGHLINDUS	0			0		0	0
METHYL ETHYL KETONE	19013BNGHLINDUS	0.6	low	Iris	0		42	0
TOLUENE	19013BNGHLINDUS	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 (RfD)	Confidence Statement	Reference Dose Status	Cancer Potency (CPF)	Weight of Evidence	RfD Index Dose	CPF Index Dose
TRICHLOROETHYLENE	19013BNGHLINDUS	0			0.011	c-b2	0	1.2477725
ACETONE	19013BNGHLINDUS	0.1	low	Iris	0		7	0
METHYL ISOBUTYL KETONE	19013BNGHLINDUS	0.05		HEAST	0		3.5	0
SULFURIC ACID	19013SCTFM1500E	0			0		0	0
TOLUENEDIISOCYANATE (MIXED ISC	19013SCTFM1500E	0			0		0	0
DICHLOROMETHANE	19013SCTFM1500E	0.06	medium	Iris	0.0075	B2	4.2	1.3930355
HYDROCHLORIC ACID	19013SCTTPFRONT	0			0		0	0
SULFURIC ACID	19013SCTTPFRONT	0			0		0	0
BUTYL BENZYL PHTHALATE	19013SCTTPFRONT	0.2	low	Iris	0	C	14	0
CHLOROFORM	19013SCTTPFRONT	0.01	medium	Iris	0.0061	B2	0.7	1.7127486
SULFURIC ACID	19013WTCCR3300W	0			0		0	0
METHANOL	19013WTCCR3300W	0.5	medium	Iris	0		35	0
2-METHOXYETHANOL	19013WTCCR3300W	0.001	na	HEAST	0		0.07	0
CHLORINE	19061SNRFNGREEN	0			0		0	0
CRESOL (MIXED ISOMERS)	19061SNRFNGREEN	0			0		0	0
ETHYLENE GLYCOL	19061SNRFNGREEN	2	high	Iris	0		140	0
PHENOL	19061SNRFNGREEN	0.6	low	Iris	0		42	0
SULFURIC ACID	19061SNRFNGREEN	0			0		0	0
1,3-BUTADIENE	19061SNRFNGREEN	0			0		0	0
CYCLOHEXANE	19061SNRFNGREEN	0			0		0	0
1,2,4-TRIMETHYLBENZENE	19061SNRFNGREEN	0			0		0	0
AMMONIA	19061SNRFNGREEN	0			0		0	0
PROPYLENE	19061SNRFNGREEN	0			0		0	0
ETHYLENE	19061SNRFNGREEN	0			0		0	0
ZINC COMPOUNDS	19061SNRFNGREEN	0.3	medium	Iris	0		21	0
METHANOL	19061SNRFNGREEN	0.5	medium	Iris	0		35	0
XYLENE (MIXED ISOMERS)	19061SNRFNGREEN	2	medium	Iris	0		140	0
ETHYLBENZENE	19061SNRFNGREEN	0.1	low	Iris	0		7	0
TOLUENE	19061SNRFNGREEN	0.2	medium	Iris	0		14	0
CHROMIUM COMPOUNDS	19061SNRFNGREEN	0.005	low	Iris	0		0.35	0
ANTIMONY COMPOUNDS	19061SNRFNGREEN	0.0004	low	Iris	0		0.028	0
METHYL TERT-BUTYL ETHER	19061SNRFNGREEN	0.005	na		0		0.35	0
BENZENE	19061SNRFNGREEN	0			0.029	A	0	0.2413794
ETHYLENE OXIDE	19061SNRFNGREEN	0			1.02	B1	0	0.0081699

CHESTER RISK PROJECT

TABLE 4-28

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
CHROMIUM	19013PNNSY100BE	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	19013NRTHM1200W	0	0	0	0	0	0	0	0	0	0		
AMMONIA	19013NRTHM1200W	0	0	1700	0	0	0	0	0	1700	0	1700	0
PHOSPHORIC ACID	19331CNCRDCONCH	0	0	0	0	0	0	0	0	0	0		
AMMONIA	19331CNCRDCONCH	5045	0	0	0	0	0	0	0	5045	0	5045	0
ETHYLENE	19061PSLNPBLUEB	6700	0	2400	0	0	0	0	0	9100	0		
PROPYLENE	19061PSLNPBLUEB	52000	0	8100	0	0	0	0	0	61100	0	70200	0
CHROMIUM COMPOUNDS	19013THPQCFRONT	0	0	5	17730	0	0	0	0	5	17730	5	17730
FORMALDEHYDE	19050HYDRL520CO	78	6915	541	47959	0	0	0	0	619	54874	619	54874
NAPHTHALENE	19061CNGLMRIDGE	5	22162	5	22162	0	0	0	0	10	44325		
BUTYL BENZYL PHTHALATE	19061CNGLMRIDGE	250	22162	250	22162	5	443	0	0	505	44768	515	89093
FREON 113	19014MCGND9CROZ	750	443	0	0	0	0	0	0	750	443		
1,1,1-TRICHLOROETHANE	19014MCGND9CROZ	750	147750	250	49250	0	0	0	0	1000	196999	1750	197443
COPPER COMPOUNDS	19013HRCST851E9	0	0	103	365237	0	0	0	0	103	365237	103	365237
1,1,1-TRICHLOROETHANE	19015RBNDS2RACE	1100	216699	0	0	0	0	0	0	1100	216699		
ACETONE	19015RBNDS2RACE	1700	301409	0	0	0	0	0	0	1700	301409	2800	518108
XYLENE (MIXED ISOMERS)	19023SNTRY237MI	0	0	4100	36346	0	0	0	0	4100	36346		
TOLUENE	19023SNTRY237MI	0	0	6100	540763	0	0	0	0	6100	540763	10200	577110
METHANOL	19014CSTMC8CROZ	934	29574	15594	556507	0	0	0	0	16528	586081	16528	586081
DIBUTYL PHTHALATE	19029SSCHM48POW	0	0	0	0	0	0	0	0	0	0		
METHYL METHACRYLATE	19029SSCHM48POW	2960	656008	5	1108	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	19018LTTNSMARPL	2350	462948	3500	689498	0	0	0	0	5850	1152446	5850	1152446
NICKEL	19018BCHNNPENNJ	0	0	0	0	0	0	0	0	0	0		
TOLUENE	19018BCHNNPENNJ	0	0	1002	88827	0	0	0	0	1002	88827		
1,1,1-TRICHLOROETHANE	19018BCHNNPENNJ	0	0	9264	1628003	0	0	0	0	9264	1628003	9266	1716830
N-BUTYL ALCOHOL	19014ZNTHP200CO	0	0	0	0	0	0	0	0	0	0		

CHESTER RISK PROJECT

TABLE 4-28

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
XYLENE (MIXED ISOMERS)	19014ZNTHP200CO	250	2216	25500	226057	0	0	0	0	25750	228273		
TOLUENE	19014ZNTHP200CO	250	22182	20000	1772994	0	0	0	0	20250	1795157	46000	2023430
ETHYLENE GLYCOL	19032MZRCH1830C	0	0	0	0	0	0	0	0	0	0		
DIETHANOLAMINE	19032MZRCH1830C	57	0	0	0	0	0	0	0	57	0		
DIETHYL SULFATE	19032MZRCH1830C	234	0	0	0	0	0	0	0	234	0		
GLYCOL ETHERS	19032MZRCH1830C	22	390059	0	0	0	0	0	0	22	390059		
CHLOROMETHANE	19032MZRCH1830C	5	3916	578	452957	0	0	0	0	583	456876		
BENZYL CHLORIDE	19032MZRCH1830C	211	4261020	0	0	0	0	0	0	211	4261020	1107	5107955
DECABROMODIPHENYL OXIDE	19013TRSCO800WF	3000	5318982	0	0	0	0	0	0	3000	5318982	3000	5318982
XYLENE (MIXED ISOMERS)	19050JLNBS300EB	19779	164475	3487	30912	0	0	0	0	22266	197387		
TOLUENE	19050JLNBS300EB	72987	6470278	13555	1201647	0	0	0	0	86542	7671923	108808	7869310
HYDROCHLORIC ACID	19032THBLL1640D	250	0	250	0	0	0	250	0	750	0		
HYDROGEN FLUORIDE	19032THBLL1640D	250	0	250	0	0	0	250	0	750	0		
PHOSPHORIC ACID	19032THBLL1640D	250	0	250	0	0	0	250	0	750	0		
GLYCOL ETHERS	19032THBLL1640D	250	4432485	250	4432485	0	0	250	4432485	750	13297456	3000	13297456
1,1,1-TRICHLOROETHANE	19016TLDYN4THTO	22251	4383432	88004	17533730	0	0	0	0	111255	21917162	111255	21917162
DIETHANOLAMINE	19061BPLCMPOSTR	0	0	0	0	0	0	0	0	0	0		
NICKEL	19061BPLCMPOSTR	0	0	0	0	0	0	0	0	0	0		
PHOSPHORIC ACID	19061BPLCMPOSTR	0	0	0	0	0	0	0	0	0	0		
SULFURIC ACID	19061BPLCMPOSTR	0	0	0	0	0	0	0	0	0	0		
1,2,4-TRIMETHYLBENZENE	19061BPLCMPOSTR	0	0	5	0	0	0	0	0	5	0		
CYCLOHEXANE	19061BPLCMPOSTR	392	0	23	0	0	0	0	0	415	0		
HYDROGEN FLUORIDE	19061BPLCMPOSTR	645	0	0	0	0	0	0	0	645	0		
ETHYLENE	19061BPLCMPOSTR	114	0	1153	0	0	0	0	0	1267	0		
PROPYLENE	19061BPLCMPOSTR	1187	0	3296	0	0	0	0	0	4483	0		
AMMONIA	19061BPLCMPOSTR	79	0	17400	0	66972	0	0	0	84531	0		
METHANOL	19061BPLCMPOSTR	0	0	290	10293	0	0	0	0	290	10293		
XYLENE (MIXED ISOMERS)	19061BPLCMPOSTR	4406	39059	483	4282	0	0	0	0	4889	43341		
ETHYLBENZENE	19061BPLCMPOSTR	581	103011	12	2128	0	0	0	0	593	105139		
TETRACHLOROETHYLENE	19061BPLCMPOSTR	45	291374	0	0	0	0	0	0	45	291374		
TOLUENE	19061BPLCMPOSTR	4406	390591	483	42818	0	0	0	0	4889	433408		
1,2-DICHLOROETHANE	19061BPLCMPOSTR	133	1437722	0	0	0	0	0	0	133	1437722		
NAPHTHALENE	19061BPLCMPOSTR	668	2960900	0	0	0	0	0	0	668	2960900		
METHYL TERT-BUTYL ETHER	19061BPLCMPOSTR	36	127658	2946	10446481	0	0	0	0	2982	10574137		
BENZENE	19061BPLCMPOSTR	2644	13594605	414	2128656	0	0	0	0	3058	15723261	108893	31579565
SULFURIC ACID	19013BNGHLINDUS	0	0	250	0	0	0	0	0	250	0		
METHYL ETHYL KETONE	19013BNGHLINDUS	250	7397	24000	709188	0	0	0	0	24250	716585		
TOLUENE	19013BNGHLINDUS	1000	88650	57000	5053033	0	0	0	0	58000	5141683		

CHESTER RISK PROJECT

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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	19013BNGHLINDUS	250	248662	8400	8355053	0	0	0	0	8650	8603715		
ACETONE	19013BNGHLINDUS	12000	2127593	40000	7091977	0	0	0	0	52000	9219569		
METHYL ISOBUTYL KETONE	19013BNGHLINDUS	250	88650	41000	14538552	0	0	0	0	41250	14627202	184400	38308755
SULFURIC ACID	19013SCTFM1500E	0	0	0	0	0	0	0	0	0	0		
TOLUENEDIISOCYANATE (MIXED ISC	19013SCTFM1500E	5	0	151	0	0	0	0	0	156	0		
DICHLOROMETHANE	19013SCTFM1500E	33532	39793300	10	11964	0	0	0	0	33542	39795173	33698	39795173
HYDROCHLORIC ACID	19013SCTTPFRONT	0	0	53000	0	0	0	0	0	53000	0		
SULFURIC ACID	19013SCTTPFRONT	0	0	110000	0	0	0	0	0	110000	0		
BUTYL BENZYL PHTHALATE	19013SCTTPFRONT	7300	647143	59000	5230333	0	0	0	0	66300	5877476		
CHLOROFORM	19013SCTTPFRONT	6800	18983792	7500	16732123	0	0	0	0	14300	35715915	243600	41593391
SULFURIC ACID	19013WTCCR3300W	0	0	0	0	0	0	0	0	0	0		
METHANOL	19013WTCCR3300W	207500	7361436	48797	1729981	0	0	0	0	256300	9091417		
2-METHOXYETHANOL	19013WTCCR3300W	362094	8242605949	136565	2456749315	0	0	0	0	498659	8699355264	747045	8708446682
CHLORINE	19061SNRFNGREEN	0	0	0	0	0	0	0	0	0	0		
CRESOL (MIXED ISOMERS)	19061SNRFNGREEN	0	0	0	0	0	0	0	0	0	0		
ETHYLENE GLYCOL	19061SNRFNGREEN	0	0	0	0	0	0	0	0	0	0		
PHENOL	19061SNRFNGREEN	0	0	0	0	0	0	0	0	0	0		
SULFURIC ACID	19061SNRFNGREEN	0	0	0	0	0	0	0	0	0	0		
1,3-BUTADIENE	19061SNRFNGREEN	120	0	0	0	0	0	0	0	120	0		
CYCLOHEXANE	19061SNRFNGREEN	1600	0	950	0	0	0	0	0	2550	0		
1,2,4-TRIMETHYLBENZENE	19061SNRFNGREEN	4900	0	06	0	0	0	0	0	4906	0		
AMMONIA	19061SNRFNGREEN	9300	0	0	0	0	0	0	0	9300	0		
PROPYLENE	19061SNRFNGREEN	33000	0	12000	0	0	0	0	0	45000	0		
ETHYLENE	19061SNRFNGREEN	46000	0	0	0	0	0	0	0	46000	0		
ZINC COMPOUNDS	19061SNRFNGREEN	0	0	270	15957	0	0	0	0	270	15957		
METHANOL	19061SNRFNGREEN	5700	202121	1100	39006	0	0	0	0	6800	241127		
XYLENE (MIXED ISOMERS)	19061SNRFNGREEN	29000	257084	1700	15070	0	0	0	0	30700	272155		
ETHYLBENZENE	19061SNRFNGREEN	3000	531899	220	39006	0	0	0	0	3220	570904		
TOLUENE	19061SNRFNGREEN	31000	2748141	7800	691468	0	0	0	0	38800	3439609		
CHROMIUM COMPOUNDS	19061SNRFNGREEN	0	0	1300	4609785	0	0	0	0	1300	4609785		
ANTIMONY COMPOUNDS	19061SNRFNGREEN	0	0	400	17729941	0	0	0	0	400	17729941		
METHYL TERT-BUTYL ETHER	19061SNRFNGREEN	4800	17020744	9400	33332290	0	0	0	0	14200	50353033		
BENZENE	19061SNRFNGREEN	51000	262225734	3900	20052556	0	0	0	0	54900	282278290		
ETHYLENE OXIDE	19061SNRFNGREEN	110000	16710185920	400	60764312	0	0	0	0	110400	16770950232	368956	17130461033

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TABLE 4-28

1992 TRI FOR REGION III
DELAWARE CO., PA

Chemical Name	Facility ID#	TRI TRANSFERS: POTW Transfers (lb/yr)	POTW Chronic Index	Offsite Transfers (lb/yr)	Offsite Chronic Index	TRI TOTALS: Total Releases and Transfers (lb/yr)	Total Chronic Index	Total Releases and Transfers Sums	Total Chronic Index Sums
CHROMIUM	19013PNNSY100BE	0	0	18150	0	18150	0		
NICKEL	19013PNNSY100BE	0	0	11550	10239041	11550	10239041	29700	10239041
SULFURIC ACID	19013NRTHM1200W	0	0	0	0	0	0		
AMMONIA	19013NRTHM1200W	0	0	0	0	1700	0	1700	0
PHOSPHORIC ACID	19331CNCRDCONCH	0	0	0	0	0	0		
AMMONIA	19331CNCRDCONCH	0	0	0	0	5045	0	5045	0
ETHYLENE	19061PSLNPBLUEB	0	0	0	0	9100	0		
PROPYLENE	19061PSLNPBLUEB	0	0	0	0	61100	0	70200	0
CHROMIUM COMPOUNDS	19013THPQCFRONT	0	0	147535	523139848	147535	523157378	147535	523157378
FORMALDEHYDE	19050HYDRL520CO	0	0	0	0	619	54674	619	54674
NAPHTHALENE	19061CNGLMRIDGE	0	0	7400	32900391	7410	32944716		
BUTYL BENZYL PHTHALATE	19061CNGLMRIDGE	5	443	52100	4618650	52610	4663881	60020	37508577
FREON 113	19014MCGND9CROZ	0	0	0	0	750	443		
1,1,1-TRICHLOROETHANE	19014MCGND9CROZ	0	0	6100	1201696	7100	1398695	7850	1399139
COPPER COMPOUNDS	19013HRCST651E9	0	0	0	0	103	365237	103	365237
1,1,1-TRICHLOROETHANE	19015RBNDS2RACE	0	0	0	0	1100	216699		
ACETONE	19015RBNDS2RACE	0	0	19600	3490671	21300	3792080	22488	4008779
XYLENE (MIXED ISOMERS)	19023SNTRY237MI	0	0	15435	136831	19535	173177		
TOLUENE	19023SNTRY237MI	0	0	8597	762122	14697	1302985	34232	1476062
METHANOL	19014CSTMC8CROZ	0	0	0	0	16528	586081	16528	586081
DIBUTYL PHTHALATE	19029SSCHM48POW	0	0	600	106380	600	106380		
METHYL METHACRYLATE	19029SSCHM48POW	0	0	3200	709108	6165	1366314	6765	1472693
TOLUENE	19014NTRNT11CRO	0	0	4201	372417	15779	1398804	15779	1398804
1,1,1-TRICHLOROETHANE	19018LTTNSMARPL	0	0	9050	1595845	13900	2738291	13900	2738291
NICKEL	19018BCHNNPENNJ	5	4432	0	0	5	4432		
TOLUENE	19018BCHNNPENNJ	0	0	0	0	1002	89827		
1,1,1-TRICHLOROETHANE	19018BCHNNPENNJ	0	0	3130	617790	11400	2245793	12407	2339052
N-BUTYL ALCOHOL	19014ZNTHP200CO	0	0	0	0	0	0		

CHESTER RISK PROJECT

TABLE 4-28

1992 TRI FOR REGION III
DELAWARE CO., PA

Chemical Name	Facility ID#	TRI TRANSFERS: POTW Transfers (lb/yr)	POTW Chronic Index	Offsite Transfers (lb/yr)	Offsite Chronic Index	TRI TOTALS: Total Releases and Transfers (lb/yr)	Total Chronic Index	Total Releases and Transfers Sums	Total Chronic Index Sums
XYLENE (MIXED ISOMERS)	19014ZNTHP200CO	0	0	500	4432	26250	232705		
TOLUENE	19014ZNTHP200CO	0	0	500	44325	20750	1839491	47000	2072187
ETHYLENE GLYCOL	19032MZRCH1830C	0	0	2000	17730	2000	17730		
DIETHANOLAMINE	19032MZRCH1830C	7	0	727	0	791	0		
DIETHYL SULFATE	19032MZRCH1830C	0	0	0	0	234	0		
GLYCOL ETHERS	19032MZRCH1830C	6779	120191272	6779	120191272	13580	240772603		
CHLOROMETHANE	19032MZRCH1830C	0	0	0	0	583	456876		
BENZYL CHLORIDE	19032MZRCH1830C	0	0	0	0	211	4261020	17399	245508229
DECABROMODIPHENYL OXIDE	19013TRSCO800WF	0	0	3000	5318982	6000	10637965	6000	10637965
XYLENE (MIXED ISOMERS)	19050JLNBS300EB	0	0	4000	35460	26266	232847		
TOLUENE	19050JLNBS300EB	0	0	12322	1092342	99864	8764265	125130	8997112
HYDROCHLORIC ACID	19032THBLL1640D	0	0	0	0	750	0		
HYDROGEN FLUORIDE	19032THBLL1640D	0	0	0	0	750	0		
PHOSPHORIC ACID	19032THBLL1640D	0	0	0	0	750	0		
GLYCOL ETHERS	19032THBLL1640D	250	4432485	0	0	1000	17729941	3250	17729941
1,1,1-TRICHLOROETHANE	19016TLDYN4THTO	0	0	0	0	111255	21917162	111255	21917162
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	4899	43341		
ETHYLBENZENE	19061BPLCMPOSTR	0	0	0	0	593	105139		
TETRACHLOROETHYLENE	19061BPLCMPOSTR	0	0	0	0	45	291374		
TOLUENE	19061BPLCMPOSTR	0	0	0	0	4899	433408		
1,2-DICHLOROETHANE	19061BPLCMPOSTR	0	0	0	0	133	1437722		
NAPHTHALENE	19061BPLCMPOSTR	0	0	0	0	668	2960900		
METHYL TERT-BUTYL ETHER	19061BPLCMPOSTR	0	0	0	0	2992	10574137		
BENZENE	19061BPLCMPOSTR	0	0	0	0	3068	15723261	108893	31579585
SULFURIC ACID	19013BNGHLINDUS	0	0	750	0	1000	0		
METHYL ETHYL KETONE	19013BNGHLINDUS	0	0	16550	489051	40000	1205636		
TOLUENE	19013BNGHLINDUS	0	0	12550	1112584	70650	6254237		

CHESTER RISK PROJECT

TABLE 4-28

1992 TRI FOR REGION III
DELAWARE CO., PA

Chemical Name	Facility ID#	TRI TRANSFERS: POTW Transfers (lb/yr)	POTW Chronic Index	Offsite Transfers (lb/yr)	Offsite Chronic Index	TRI TOTALS: Total Releases and Transfers (lb/yr)	Total Chronic Index	Total Releases and Transfers Sums	Total Chronic Index Sums
TRICHLOROETHYLENE	19013BNGHLINDUS	0	0	15950	15864654	24600	24468370		
ACETONE	19013BNGHLINDUS	0	0	29000	5141683	91000	14361252		
METHYL ISOBUTYL KETONE	19013BNGHLINDUS	0	0	2550	904227	43800	15531429	261750	61820924
SULFURIC ACID	19013SCTFM1500E	0	0	0	0	0	0		
TOLUENEDIISOCYANATE (MIXED ISC	19013SCTFM1500E	0	0	750	0	906	0		
DICHLOROMETHANE	19013SCTFM1500E	0	0	0	0	33542	39795173	34448	39795173
HYDROCHLORIC ACID	19013SCTTPFRONT	0	0	0	0	53000	0		
SULFURIC ACID	19013SCTTPFRONT	0	0	770	0	110770	0		
BUTYL BENZYL PHTHALATE	19013SCTTPFRONT	10000	996497	16	996	76316	6764859		
CHLOROFORM	19013SCTTPFRONT	500	1248808	0	0	14800	36964724	254880	43729583
SULFURIC ACID	19013WTCCR3300W	4	0	0	0	4	0		
METHANOL	19013WTCCR3300W	6700	237581	0	0	263006	9328999		
2-METHOXYETHANOL	19013WTCCR3300W	20120	356726419	0	0	510779	9056081683	773869	9065410682
CHLORINE	19061SNRFNGREEN	0	0	0	0	0	0		
CRESOL (MIXED ISOMERS)	19061SNRFNGREEN	0	0	0	0	0	0		
ETHYLENE GLYCOL	19061SNRFNGREEN	0	0	0	0	0	0		
PHENOL	19061SNRFNGREEN	44000	1300196	0	0	44000	1300196		
SULFURIC ACID	19061SNRFNGREEN	0	0	0	0	0	0		
1,3-BUTADIENE	19061SNRFNGREEN	0	0	0	0	120	0		
CYCLOHEXANE	19061SNRFNGREEN	0	0	0	0	2550	0		
1,2,4-TRIMETHYLBENZENE	19061SNRFNGREEN	0	0	0	0	4996	0		
AMMONIA	19061SNRFNGREEN	320000	0	0	0	329300	0		
PROPYLENE	19061SNRFNGREEN	0	0	0	0	45000	0		
ETHYLENE	19061SNRFNGREEN	0	0	0	0	46000	0		
ZINC COMPOUNDS	19061SNRFNGREEN	7300	431429	730	43143	8300	490528		
METHANOL	19061SNRFNGREEN	76000	2694951	0	0	82800	2936078		
XYLENE (MIXED ISOMERS)	19061SNRFNGREEN	29000	257084	0	0	58700	529239		
ETHYLBENZENE	19061SNRFNGREEN	2908	496438	0	0	6020	1067342		
TOLUENE	19061SNRFNGREEN	63000	5584932	0	0	101900	9024540		
CHROMIUM COMPOUNDS	19061SNRFNGREEN	9400	33332290	490	1737534	11190	39679609		
ANTIMONY COMPOUNDS	19061SNRFNGREEN	460	20389432	10890	482697852	11750	520817025		
METHYL TERT-BUTYL ETHER	19061SNRFNGREEN	6900	24467319	0	0	21100	74920352		
BENZENE	19061SNRFNGREEN	29000	149108751	0	0	93900	431387041		
ETHYLENE OXIDE	19061SNRFNGREEN	0	0	0	0	110400	16770950232	968926	17853002183

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

	Facility Name	City	Total Onsite Residual Mass Sums	Total Onsite Chronic Index Relative Hazard	Total Onsite Chronic Index and Residual Mass Relative Hazard
28	PENNSYLVANIA MACHINE WORK	ASTON	0	0	0
27	PQ 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	HARCAST 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	35736527
5	BOEING DEFENSE & SPACE GRO	RIDLEY 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/m^3.

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 ($\mu g/m^3$)		Concentration Difference ($\mu g/m^3$)
		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. ($\mu g/m^3$)	Location	Conc. ($\mu g/m^3$)
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

SE block 50 m E of corner	145	NE block 50 m E 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 ($\mu g/m^3$)			PM-10 Concentration ($\mu g/m^3$)		
		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 ($\mu g/m^3$)	Location	Concentration ($\mu g/m^3$)
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