

## **Appendix C**

Human Health Risk Assessment Tables: Groundwater

**TABLE C-1 FORT TOTTEN HUMAN HEALTH RISK ASSESSMENT CALCULATIONS, ESTIMATES OF CANCER AND NONCANCER RISKS FOR ADULT RESIDENTS DUE TO EXPOSURES TO GROUNDWATER INGESTION -- REASONABLE MAXIMUM SCENARIO (RME)**

Site Number:		Groundwater					
<b>* RME- Ingestion of Groundwater</b>							
Ingestion Rate = CR		2 L/day					
Exposure Frequency = EF		350 day/yr					
Exposure Duration = ED		24 yr					
Body Weight = BW		70 kg					
Averaging Time (Noncancer) = AT		8,760 days					
Averaging Time (Cancer) = AT		25,550 days					
Intake (mg/kg-day) = Conc * CR * EF * ED / (BW * AT)							
NCADI = Daily intake - Noncarcinogens							
CADI = Daily Intake - Carcinogens							
HQ = Hazard Quotient - Noncarcinogens = NCADI / RfD							
Risk = Cancer Risk = CADI * SF							
Chemical of Concern	EPC (mg/L)	NCADI (mg/kg-day)	CADI (mg/kg-day)	Chronic RfD (mg/kg-day)	SF per (mg/kg-day)	HQ	Risk
<b>Inorganics</b>							
ALUMINUM	7.97E-01	2.18E-02	7.48E-03	1.00E+00	NA	2.18E-02	--
ANTIMONY	1.34E-03	3.67E-05	1.26E-05	4.00E-04	NA	9.18E-02	--
BARIUM	1.48E-01	4.06E-03	1.39E-03	7.00E-02	NA	5.81E-02	--
CADMIUM	2.09E-04	5.73E-06	1.96E-06	5.00E-04	NA	1.15E-02	--
CHROMIUM	5.10E-02	1.40E-03	4.79E-04	3.00E-03	NA	4.66E-01	--
COBALT	3.00E-03	8.22E-05	2.82E-05	6.00E-02	NA	1.37E-03	--
COPPER	4.63E-03	1.27E-04	4.35E-05	3.70E-02	NA	3.43E-03	--
MANGANESE	6.05E-02	1.66E-03	5.68E-04	2.40E-02	NA	6.91E-02	--
NICKEL	1.91E-01	5.23E-03	1.79E-03	2.00E-02	NA	2.62E-01	--
SELENIUM	1.97E-03	5.40E-05	1.85E-05	5.00E-03	NA	1.08E-02	--
VANADIUM	9.00E-04	2.47E-05	8.45E-06	7.00E-03	NA	3.52E-03	--
ZINC	1.32E-02	3.62E-04	1.24E-04	3.00E-01	NA	1.21E-03	--
<b>PAHs</b>							
ACENAPHTHENE	8.00E-04	2.19E-05	7.51E-06	6.00E-02	NA	3.65E-04	--
ANTHRACENE	2.00E-03	5.48E-05	1.88E-05	3.00E-01	NA	1.83E-04	--
BENZ(A)ANTHRACENE	2.52E-03	6.90E-05	2.37E-05	NA	7.30E-01	--	1.73E-05
BENZO(A)PYRENE	2.78E-03	7.62E-05	2.61E-05	NA	7.30E+00	--	1.91E-04
BENZO(B)FLOURANTHENE	5.00E-03	1.37E-04	4.70E-05	NA	7.30E-01	--	3.43E-05
BENZO(G,H,I)PERYLENE	2.63E-03	7.21E-05	2.47E-05	3.00E-02	NA	2.40E-03	--
BENZO(K)FLOURANTHENE	1.53E-03	4.19E-05	1.44E-05	NA	7.30E-02	--	1.05E-06
CHRYSENE	3.50E-03	9.59E-05	3.29E-05	NA	7.30E-03	--	2.40E-07
DIBENZ[A, H]ANTHRACENE	2.00E-03	5.48E-05	1.88E-05	NA	7.30E+00	--	1.37E-04
FLUORANTHENE	8.21E-03	2.25E-04	7.71E-05	4.00E-02	NA	5.62E-03	--
FLUORENE	9.00E-04	2.47E-05	8.45E-06	4.00E-02	NA	6.16E-04	--
INDENO(1,2,3-CD)PYRENE	2.51E-03	6.88E-05	2.36E-05	NA	7.30E-01	--	1.72E-05
2-METHYLNAPHTHALENE	0.00E+00	0.00E+00	0.00E+00	2.00E-02	NA	0.00E+00	--
NAPHTHALENE	9.00E-04	2.47E-05	8.45E-06	2.00E-02	NA	1.23E-03	--
PHENANTHRENE	4.70E-03	1.29E-04	4.41E-05	2.00E-02	NA	6.44E-03	--
PYRENE	6.75E-03	1.85E-04	6.34E-05	3.00E-02	NA	6.16E-03	--
<b>Pesticides/PCBs</b>							
DIELDRIN	4.00E-04	1.10E-05	3.76E-06	5.00E-05	1.60E+01	2.19E-01	6.01E-05
<b>Semivolatiles</b>							
BIS(2-ETHYLHEXYL)PHTHALATE	1.40E-02	3.84E-04	1.32E-04	2.00E-02	1.40E-02	1.92E-02	1.84E-06
BUTYLBENZYLPHTHALATE	5.00E-04	1.37E-05	4.70E-06	2.00E-01	NA	6.85E-05	--
DI(2-ETHYLHEXYL)ADIPATE	1.00E-04	2.74E-06	9.39E-07	6.00E-01	1.20E-03	4.57E-06	1.13E-09
DIBENZOFURAN	9.00E-04	2.47E-05	8.45E-06	4.00E-03	NA	6.16E-03	--
DIBUTYLPHTHALATE	4.00E-03	1.10E-04	3.76E-05	1.00E-01	NA	1.10E-03	--
DIETHYLPHTHALATE	3.00E-03	8.22E-05	2.82E-05	8.00E-01	NA	1.03E-04	--
DIMETHYLPHTHALATE	1.00E-04	2.74E-06	9.39E-07	1.00E+01	NA	2.74E-07	--
<b>Volatiles</b>							
ACETONE	5.05E-03	1.38E-04	4.74E-05	1.00E-01	NA	1.38E-03	--
BROMOFORM	3.00E-03	8.22E-05	2.82E-05	2.00E-02	7.90E-03	4.11E-03	2.23E-07
CHLOROETHANE	6.00E-04	1.64E-05	5.64E-06	4.00E-01	2.90E-03	4.11E-05	1.63E-08
CHLOROFORM	2.30E-02	6.30E-04	2.16E-04	1.00E-02	6.10E-03	6.30E-02	1.32E-06
CHLOROMETHANE	2.42E-03	6.62E-05	2.27E-05	NA	1.30E-02	--	2.95E-07
DIBROMOCHLOROMETHANE	5.00E-04	1.37E-05	4.70E-06	2.00E-02	8.40E-02	6.85E-04	3.95E-07
M&P XYLENES	3.00E-04	8.22E-06	2.82E-06	2.00E+00	NA	4.11E-06	--
METHYL-T-BUTYL ETHER	1.03E-03	2.81E-05	9.65E-06	NA	4.00E-03	--	3.86E-08
METHYLENE CHLORIDE	2.00E-04	5.48E-06	1.88E-06	6.00E-02	7.50E-03	9.13E-05	1.41E-08
N-BUTYLBENZENE	1.00E-04	2.74E-06	9.39E-07	4.00E-02	NA	6.85E-05	--
P-ISOPROPYLTOLUENE	2.00E-04	5.48E-06	1.88E-06	NA	NA	--	--
TERT-BUTYLALCOHOL	5.10E-03	1.40E-04	4.79E-05	NA	NA	--	--
XYLENES	3.00E-04	8.22E-06	2.82E-06	2.00E+00	NA	4.11E-06	--
<b>Cumulative Risk</b>						1.34E+00	0.0004621

**TABLE C-2 FORT TOTTEN HUMAN HEALTH RISK ASSESSMENT CALCULATIONS, ESTIMATES OF CANCER AND NONCANCER RISKS FOR ADULT RESIDENTS DUE TO EXPOSURE TO DERMAL CONTACT WITH GROUNDWATER -- REASONABLE MAXIMUM SCENARIO (RME)**

Site Number:		Groundwater					
<b>* RME- Dermal Contact with Groundwater</b>							
Surface Area Available for Contact = SA	18,000	cm2					
Event Time = ET	0.58	hr/day					
Permeability Constant = PC	chemical-specific	cm/hr					
Exposure Frequency = EF	350	day/yr					
Exposure Duration = ED	24	yr					
Body Weight = BW	70	kg					
Averaging Time (Noncancer) = AT	8,760	days					
Averaging Time (Cancer) = AT	25,550	days					
Conversion Factor = CF	0.001	L/cm3					
Intake (mg/kg-day) = Conc * SA * PC * ET * EF * ED * CF / (BW * AT)							
NCADI = Daily intake - Noncarcinogens							
CADI = Daily Intake - Carcinogens							
HQ = Hazard Quotient - Noncarcinogens = NCADI / RfD							
Risk = Cancer Risk = CADI * SF							
Chemical of Concern	EPC (mg/L)	NCADI (mg/kg-day)	CADI (mg/kg-day)	Chronic RfD (mg/kg-day)	SF per (mg/kg-day)	HQ	Risk
<b>Inorganics</b>							
ALUMINUM	7.97E-01	1.14E-04	3.91E-05	1.00E+00	NA	1.14E-04	--
ANTIMONY	1.34E-03	1.92E-07	6.57E-08	6.00E-05	NA	3.19E-03	--
BARIUM	1.48E-01	2.12E-05	7.27E-06	4.90E-03	NA	4.33E-03	--
CADMIUM	2.09E-04	3.29E-08	1.13E-08	1.25E-05	NA	2.63E-03	--
CHROMIUM	5.10E-02	7.29E-06	2.50E-06	7.50E-05	NA	9.72E-02	--
COBALT	3.00E-03	4.29E-07	1.47E-07	6.00E-02	NA	7.15E-06	--
COPPER	4.63E-03	6.62E-07	2.27E-07	3.70E-02	NA	1.79E-05	--
MANGANESE	6.05E-02	8.65E-06	2.97E-06	9.60E-04	NA	9.01E-03	--
NICKEL	1.91E-01	7.38E-06	2.53E-06	8.00E-04	NA	9.22E-03	--
SELENIUM	1.97E-03	2.82E-07	9.66E-08	5.00E-03	NA	5.63E-05	--
VANADIUM	9.00E-04	1.29E-07	4.41E-08	1.82E-04	NA	7.07E-04	--
ZINC	1.32E-02	1.89E-06	6.47E-07	3.00E-01	NA	6.29E-06	--
<b>PAHs</b>							
ACENAPHTHENE	8.00E-04	2.86E-05	9.81E-06	NA	NA	--	--
ANTHRACENE	2.00E-03	6.29E-05	2.16E-05	NA	NA	--	--
BENZ(A)ANTHRACENE	2.52E-03	1.87E-04	6.43E-05	NA	NA	--	--
BENZO(A)PYRENE	2.78E-03	3.06E-04	1.05E-04	NA	NA	--	--
BENZO(B)FLOURANTHENE	5.00E-03	5.58E-04	1.91E-04	NA	NA	--	--
BENZO(G,H,I)PERYLENE	2.63E-03	6.77E-04	2.32E-04	NA	NA	--	--
BENZO(K)FLOURANTHENE	1.53E-03	1.31E-04	4.50E-05	NA	NA	--	--
CHRYSENE	3.50E-03	2.60E-04	8.92E-05	NA	NA	--	--
DIBENZ(A, H)ANTHRACENE	2.00E-03	4.86E-04	1.67E-04	NA	NA	--	--
FLUORANTHENE	8.21E-03	2.82E-04	9.66E-05	NA	NA	--	--
FLUORENE	9.00E-04	3.22E-05	1.10E-05	NA	NA	--	--
INDENO(1,2,3-CD)PYRENE	2.51E-03	4.31E-04	1.48E-04	NA	NA	--	--
2-METHYLNAPHTHALENE	0.00E+00	0.00E+00	0.00E+00	2.00E-02	NA	0.00E+00	--
NAPHTHALENE	9.00E-04	6.31E-06	2.16E-06	NA	NA	--	--
PHENANTHRENE	4.70E-03	1.01E-04	3.46E-05	NA	NA	--	--
PYRENE	6.75E-03	3.09E-04	1.06E-04	NA	NA	--	--
<b>Pesticides/PCBs</b>							
DIELDRIN	4.00E-04	7.44E-07	2.55E-07	5.00E-05	1.60E+01	1.49E-02	4.08E-06
<b>Semivolatiles</b>							
BIS(2-ETHYLHEXYL)PHTHALATE	1.40E-02	4.61E-05	1.58E-05	2.00E-02	1.40E-02	2.30E-03	2.21E-07
BUTYLBENZYLPHTHALATE	5.00E-04	5.08E-06	1.74E-06	2.00E-01	NA	2.54E-05	--
DI(2-ETHYLHEXYL)ADIPATE	1.00E-04	5.15E-05	1.77E-05	6.00E-01	1.20E-03	8.58E-05	2.12E-08
DIBENZOFURAN	9.00E-04	1.93E-05	6.62E-06	4.00E-03	NA	4.83E-03	--
DIBUTYLPHTHALATE	4.00E-03	1.49E-05	5.10E-06	1.00E-01	NA	1.49E-04	--
DIETHYLPHTHALATE	3.00E-03	1.76E-06	6.03E-07	8.00E-01	NA	2.20E-06	--
DIMETHYLPHTHALATE	1.00E-04	2.00E-08	6.86E-09	1.00E+01	NA	2.00E-09	--
<b>Volatiles</b>							
ACETONE	5.05E-03	4.12E-07	1.41E-07	1.00E-01	NA	4.12E-06	--
BROMOFORM	3.00E-03	1.03E-06	3.53E-07	2.00E-02	7.90E-03	5.15E-05	2.79E-09
CHLOROETHANE	6.00E-04	5.41E-07	1.85E-07	4.00E-01	2.90E-03	1.35E-06	5.38E-10
CHLOROFORM	2.30E-02	2.34E-05	8.01E-06	1.00E-02	6.10E-03	2.34E-03	4.88E-08
CHLOROMETHANE	2.42E-03	1.18E-06	4.03E-07	NA	1.30E-02	--	5.24E-09
DIBROMOCHLOROMETHANE	5.00E-04	2.79E-07	9.56E-08	2.00E-02	8.40E-02	1.39E-05	8.03E-09
M&P XYLENES	3.00E-04	3.43E-06	1.18E-06	2.00E+00	NA	1.72E-06	--
METHYL-T-BUTYL ETHER	1.03E-03	3.82E-07	1.31E-07	NA	4.00E-03	--	5.24E-10
METHYLENE CHLORIDE	2.00E-04	1.03E-07	3.53E-08	6.00E-02	7.50E-03	1.72E-06	2.65E-10
N-BUTYLBENZENE	1.00E-04	NA	NA	4.00E-02	NA	--	--
P-ISOPROPYLTOLUENE	2.00E-04	NA	NA	NA	NA	--	--
TERT-BUTYLALCOHOL	5.10E-03	NA	NA	NA	NA	--	--
XYLENES	3.00E-04	4.08E-06	1.40E-06	2.00E+00	NA	2.04E-06	--
<b>Cumulative Risk</b>						1.51E-01	4.388E-06

**TABLE C-3 FORT TOTTEN HUMAN HEALTH RISK ASSESSMENT CALCULATIONS, ESTIMATES OF CANCER AND NONCANCER RISKS FOR ADULT RESIDENTS DUE TO INHALATION OF VOLATILES FROM GROUNDWATER -- REASONABLE MAXIMUM SCENARIO (RME)**

Site Number:

Groundwater

<b>* RME- Inhalation of Volatiles from Groundwater</b>							
Air Exchange Rate = AER	1.67E-02 min-1						
Body Weight = BW	70 kg						
Duration in Shower Room = DSR	1 min						
Ventilation Rate = VR	20 L/min						
Exposure Frequency = EF	350 day/yr						
Exposure Duration = ED	30 yr						
Averaging Time (Non-Cancer) = AT	10,950 days						
Averaging Time (Cancer) = AT	25,550 days						
Intake (mg/kg-day) = Conc * EF * ED * SD / AT							
NCADI = Daily intake - Noncarcinogens							
CADI = Daily Intake - Carcinogens							
HQ = Hazard Quotient - Noncarcinogens = NCADI / RfD							
Risk = Cancer Risk = CADI * SF							
Chemical of Concern	EPC (mg/kg/shower)	NCADI (mg/kg-day)	CADI (mg/kg-day)	Chronic RfD (mg/kg-day)	SF per (mg/kg-day)	HQ	Risk
Volatiles							
ACETONE	2.22E-05	2.13E-05	9.13E-06	1.00E-01	NA	2.13E-04	--
BROMOFORM	3.12E-05	3.00E-05	1.28E-05	NA	3.90E-03	--	5.01E-08
CHLOROETHANE	1.36E-05	1.30E-05	5.57E-06	2.90E+00	NA	4.48E-06	--
CHLOROFORM	4.04E-04	3.88E-04	1.66E-04	8.60E-05	8.05E-02	4.51E+00	1.34E-05
CHLOROMETHANE	5.96E-05	5.72E-05	2.45E-05	2.60E-02	3.50E-03	2.20E-03	8.58E-08
DIBROMOCHLOROMETHANE	5.98E-06	5.73E-06	2.46E-06	NA	NA	--	--
M&P XYLENES	5.71E-06	5.47E-06	2.35E-06	2.00E-01	NA	2.74E-05	--
METHYL-T-BUTYL ETHER	1.65E-05	1.58E-05	6.76E-06	8.57E-01	NA	1.84E-05	--
METHYLENE CHLORIDE	3.87E-06	3.71E-06	1.59E-06	8.60E-01	1.65E-03	4.31E-06	2.62E-09
N-BUTYLBENZENE	1.76E-06	1.69E-06	7.24E-07	NA	NA	--	--
P-ISOPROPYLTOLUENE	0.00E+00	0.00E+00	0.00E+00	NA	NA	--	--
TERT-BUTYLALCOHOL	0.00E+00	0.00E+00	0.00E+00	NA	NA	--	--
XYLENES	5.71E-06	5.47E-06	2.35E-06	NA	NA	--	--
Cumulative Risk						4.51E+00	1.35E-05

**TABLE C-4 FORT TOTTEN HUMAN HEALTH RISK ASSESSMENT CALCULATIONS, ESTIMATES OF CANCER AND NONCANCER RISKS FOR CHILD RESIDENTS DUE TO EXPOSURES TO GROUNDWATER INGESTION -- REASONABLE MAXIMUM SCENARIO (RME)**

Chemical of Concern	EPC (mg/L)	NCADI (mg/kg-day)	CADI (mg/kg-day)	Chronic RfD (mg/kg-day)	SF per (mg/kg-day)	HQ	Risk
<b>Inorganics</b>							
ALUMINUM	7.97E-01	5.09E-02	4.36E-03	1.00E+00	NA	5.09E-02	--
ANTIMONY	1.34E-03	8.57E-05	7.34E-06	4.00E-04	NA	2.14E-01	--
BARIUM	1.48E-01	9.48E-03	8.13E-04	7.00E-02	NA	1.35E-01	--
CADMIUM	2.09E-04	1.34E-05	1.15E-06	5.00E-04	NA	2.67E-02	--
CHROMIUM	5.10E-02	3.26E-03	2.79E-04	3.00E-03	NA	1.09E+00	--
COBALT	3.00E-03	1.92E-04	1.64E-05	6.00E-02	NA	3.20E-03	--
COPPER	4.63E-03	2.96E-04	2.54E-05	3.70E-02	NA	8.00E-03	--
MANGANESE	6.05E-02	3.87E-03	3.32E-04	2.40E-02	NA	1.61E-01	--
NICKEL	1.91E-01	1.22E-02	1.05E-03	2.00E-02	NA	6.11E-01	--
SELENIUM	1.97E-03	1.26E-04	1.08E-05	5.00E-03	NA	2.52E-02	--
VANADIUM	9.00E-04	5.75E-05	4.93E-06	7.00E-03	NA	8.22E-03	--
ZINC	1.32E-02	8.44E-04	7.23E-05	3.00E-01	NA	2.81E-03	--
<b>PAHs</b>							
ACENAPHTHENE	8.00E-04	5.11E-05	4.38E-06	6.00E-02	NA	8.52E-04	--
ANTHRACENE	2.00E-03	1.28E-04	1.10E-05	3.00E-01	NA	4.26E-04	--
BENZ(A)ANTHRACENE	2.52E-03	1.61E-04	1.38E-05	NA	7.30E-01	--	1.01E-05
BENZO(A)PYRENE	2.78E-03	1.78E-04	1.52E-05	NA	7.30E+00	--	1.11E-04
BENZO(B)FLOURANTHENE	5.00E-03	3.20E-04	2.74E-05	NA	7.30E-01	--	2.00E-05
BENZO(G,H,I)PERYLENE	2.63E-03	1.68E-04	1.44E-05	3.00E-02	NA	5.60E-03	--
BENZO(K)FLOURANTHENE	1.53E-03	9.78E-05	8.38E-06	NA	7.30E-02	--	6.12E-07
CHRYSENE	3.50E-03	2.24E-04	1.92E-05	NA	7.30E-03	--	1.40E-07
DIBENZ[A, H]ANTHRACENE	2.00E-03	1.28E-04	1.10E-05	NA	7.30E+00	--	8.00E-05
FLUORANTHENE	8.21E-03	5.25E-04	4.50E-05	4.00E-02	NA	1.31E-02	--
FLUORENE	9.00E-04	5.75E-05	4.93E-06	4.00E-02	NA	1.44E-03	--
INDENO(1,2,3-CD)PYRENE	2.51E-03	1.60E-04	1.38E-05	NA	7.30E-01	--	1.00E-05
2-METHYLNAPHTHALENE	0.00E+00	0.00E+00	0.00E+00	2.00E-02	NA	0.00E+00	--
NAPHTHALENE	9.00E-04	5.75E-05	4.93E-06	2.00E-02	NA	2.88E-03	--
PHENANTHRENE	4.70E-03	3.00E-04	2.58E-05	2.00E-02	NA	1.50E-02	--
PYRENE	6.75E-03	4.32E-04	3.70E-05	3.00E-02	NA	1.44E-02	--
<b>Pesticides/PCBs</b>							
DIELDRIN	4.00E-04	2.56E-05	2.19E-06	5.00E-05	1.60E+01	5.11E-01	3.51E-05
<b>Semivolatiles</b>							
BIS(2-ETHYLHEXYL)PHTHALATE	1.40E-02	8.95E-04	7.67E-05	2.00E-02	1.40E-02	4.47E-02	1.07E-06
BUTYLBENZYLPHTHALATE	5.00E-04	3.20E-05	2.74E-06	2.00E-01	NA	1.60E-04	--
DI(2-ETHYLHEXYL)ADIPATE	1.00E-04	6.39E-06	5.48E-07	6.00E-01	1.20E-03	1.07E-05	6.58E-10
DIBENZOFURAN	9.00E-04	5.75E-05	4.93E-06	4.00E-03	NA	1.44E-02	--
DIBUTYLPHTHALATE	4.00E-03	2.56E-04	2.19E-05	1.00E-01	NA	2.56E-03	--
DIETHYLPHTHALATE	3.00E-03	1.92E-04	1.64E-05	8.00E-01	NA	2.40E-04	--
DIMETHYLPHTHALATE	1.00E-04	6.39E-06	5.48E-07	1.00E+01	NA	6.39E-07	--
<b>Volatiles</b>							
ACETONE	5.05E-03	3.23E-04	2.77E-05	1.00E-01	NA	3.23E-03	--
BROMOFORM	3.00E-03	1.92E-04	1.64E-05	2.00E-02	7.90E-03	9.59E-03	1.30E-07
CHLOROETHANE	6.00E-04	3.84E-05	3.29E-06	4.00E-01	2.90E-03	9.59E-05	9.53E-09
CHLOROFORM	2.30E-02	1.47E-03	1.26E-04	1.00E-02	6.10E-03	1.47E-01	7.69E-07
CHLOROMETHANE	2.42E-03	1.55E-04	1.32E-05	NA	1.30E-02	--	1.72E-07
DIBROMOCHLOROMETHANE	5.00E-04	3.20E-05	2.74E-06	2.00E-02	8.40E-02	1.60E-03	2.30E-07
M&P XYLENES	3.00E-04	1.92E-05	1.64E-06	2.00E+00	NA	9.59E-06	--
METHYL-T-BUTYL ETHER	1.03E-03	6.57E-05	5.63E-06	NA	4.00E-03	--	2.25E-08
METHYLENE CHLORIDE	2.00E-04	1.28E-05	1.10E-06	6.00E-02	7.50E-03	2.13E-04	8.22E-09
N-BUTYLBENZENE	1.00E-04	6.39E-06	5.48E-07	4.00E-02	NA	1.60E-04	--
P-ISOPROPYLTOLUENE	2.00E-04	1.28E-05	1.10E-06	NA	NA	--	--
TERT-BUTYLALCOHOL	5.10E-03	3.26E-04	2.79E-05	NA	NA	--	--
XYLENES	3.00E-04	1.92E-05	1.64E-06	2.00E+00	NA	9.59E-06	--
<b>Cumulative Risk</b>						3.12E+00	0.00026956

**TABLE C-5 FORT TOTTEN HUMAN HEALTH RISK ASSESSMENT CALCULATIONS, ESTIMATES OF CANCER AND NONCANCER RISKS FOR CHILD RESIDENTS DUE TO EXPOSURE TO DERMAL CONTACT WITH GROUNDWATER -- REASONABLE MAXIMUM SCENARIO (RME)**

Site Number:		Groundwater					
* RME- Dermal Contact with Groundwater							
Surface Area Available for Contact = SA	6,600 cm <sup>2</sup>						
Event Time = ET	1 hr/day						
Permeability Constant = PC	chemical-specific cm/hr						
Exposure Frequency = EF	350 day/yr						
Exposure Duration = ED	6 yr						
Body Weight = BW	15 kg						
Averaging Time (Noncancer) = AT	2,190 days						
Averaging Time (Cancer) = AT	25,550 days						
Conversion Factor = CF	0.001 L/cm <sup>3</sup>						
Intake (mg/kg-day) = Conc * SA * PC * ET * EF * ED * CF / (BW * AT)							
NCADI = Daily intake - Noncarcinogens							
CADI = Daily Intake - Carcinogens							
HQ = Hazard Quotient - Noncarcinogens = NCADI / RfD							
Risk = Cancer Risk = CADI * SF							
Chemical of Concern	EPC (mg/L)	NCADI (mg/kg-day)	CADI (mg/kg-day)	Chronic RfD (mg/kg-day)	SF per (mg/kg-day)	HQ	Risk
Inorganics							
ALUMINUM	7.97E-01	3.36E-04	2.88E-05	1.00E+00	NA	3.36E-04	--
ANTIMONY	1.34E-03	5.65E-07	4.85E-08	6.00E-05	NA	9.42E-03	--
BARIUM	1.48E-01	6.26E-05	5.36E-06	4.90E-03	NA	1.28E-02	--
CADMIUM	2.09E-04	9.70E-08	8.31E-09	1.25E-05	NA	7.76E-03	--
CHROMIUM	5.10E-02	2.15E-05	1.84E-06	7.50E-05	NA	2.87E-01	--
COBALT	3.00E-03	1.27E-06	1.08E-07	6.00E-02	NA	2.11E-05	--
COPPER	4.63E-03	1.95E-06	1.67E-07	3.70E-02	NA	5.28E-05	--
MANGANESE	6.05E-02	2.55E-05	2.19E-06	9.60E-04	NA	2.66E-02	--
NICKEL	1.91E-01	2.18E-05	1.87E-06	8.00E-04	NA	2.72E-02	--
SELENIUM	1.97E-03	8.31E-07	7.12E-08	5.00E-03	NA	1.66E-04	--
VANADIUM	9.00E-04	3.80E-07	3.25E-08	1.82E-04	NA	2.09E-03	--
ZINC	1.32E-02	5.57E-06	4.77E-07	3.00E-01	NA	1.86E-05	--
PAHs							
ACENAPHTHENE	8.00E-04	8.44E-05	7.23E-06	NA	NA	--	--
ANTHRACENE	2.00E-03	1.86E-04	1.59E-05	NA	NA	--	--
BENZ(A)ANTHRACENE	2.52E-03	5.53E-04	4.74E-05	NA	NA	--	--
BENZO(A)PYRENE	2.78E-03	9.03E-04	7.74E-05	NA	NA	--	--
BENZO(B)FLOURANTHENE	5.00E-03	1.65E-03	1.41E-04	NA	NA	--	--
BENZO(G,H,I)PERYLENE	2.63E-03	2.00E-03	1.71E-04	NA	NA	--	--
BENZO(K)FLOURANTHENE	1.53E-03	3.87E-04	3.32E-05	NA	NA	--	--
CHRYSENE	3.50E-03	7.68E-04	6.58E-05	NA	NA	--	--
DIBENZ[A, H]ANTHRACENE	2.00E-03	1.43E-03	1.23E-04	NA	NA	--	--
FLUORANTHENE	8.21E-03	8.31E-04	7.13E-05	NA	NA	--	--
FLUORENE	9.00E-04	9.49E-05	8.14E-06	NA	NA	--	--
INDENO(1,2,3-CD)PYRENE	2.51E-03	1.27E-03	1.09E-04	NA	NA	--	--
2-METHYLNAPHTHALENE	0.00E+00	0.00E+00	0.00E+00	2.00E-02	NA	0.00E+00	--
NAPHTHALENE	9.00E-04	1.86E-05	1.59E-06	NA	NA	--	--
PHENANTHRENE	4.70E-03	2.97E-04	2.55E-05	NA	NA	--	--
PYRENE	6.75E-03	9.11E-04	7.81E-05	NA	NA	--	--
Pesticides/PCBs							
DIELDRIN	4.00E-04	2.19E-06	1.88E-07	5.00E-05	1.60E+01	4.39E-02	3.01E-06
Semivolatiles							
BIS(2-ETHYLHEXYL)PHTHALATE	1.40E-02	1.36E-04	1.16E-05	2.00E-02	1.40E-02	6.79E-03	1.63E-07
BUTYLBENZYLPHthalATE	5.00E-04	1.50E-05	1.28E-06	2.00E-01	NA	7.49E-05	--
DI(2-ETHYLHEXYL)ADIPATE	1.00E-04	1.52E-04	1.30E-05	6.00E-01	1.20E-03	2.53E-04	1.56E-08
DIBENZOFURAN	9.00E-04	5.70E-05	4.88E-06	4.00E-03	NA	1.42E-02	--
DIBUTYLPHthalATE	4.00E-03	4.39E-05	3.76E-06	1.00E-01	NA	4.39E-04	--
DIETHYLPHthalATE	3.00E-03	5.19E-06	4.45E-07	8.00E-01	NA	6.49E-06	--
DIMETHYLPHthalATE	1.00E-04	5.91E-08	5.06E-09	1.00E+01	NA	5.91E-09	--
Volatiles							
ACETONE	5.05E-03	1.21E-06	1.04E-07	1.00E-01	NA	1.21E-05	--
BROMOFORM	3.00E-03	3.04E-06	2.60E-07	2.00E-02	7.90E-03	1.52E-04	2.06E-09
CHLOROETHANE	6.00E-04	1.59E-06	1.37E-07	4.00E-01	2.90E-03	3.99E-06	3.96E-10
CHLOROFORM	2.30E-02	6.89E-05	5.91E-06	1.00E-02	6.10E-03	6.89E-03	3.60E-08
CHLOROMETHANE	2.42E-03	3.47E-06	2.97E-07	NA	1.30E-02	--	3.86E-09
DIBROMOCHLOROMETHANE	5.00E-04	8.23E-07	7.05E-08	2.00E-02	8.40E-02	4.11E-05	5.92E-09
M&P XYLENES	3.00E-04	1.01E-05	8.68E-07	2.00E+00	NA	5.06E-06	--
METHYL-T-BUTYL ETHER	1.03E-03	1.13E-06	9.66E-08	NA	4.00E-03	--	3.86E-10
METHYLENE CHLORIDE	2.00E-04	3.04E-07	2.60E-08	6.00E-02	7.50E-03	5.06E-06	1.95E-10
N-BUTYLBENZENE	1.00E-04	NA	NA	4.00E-02	NA	--	--
P-ISOPROPYLTOLUENE	2.00E-04	NA	NA	NA	NA	--	--
TERT-BUTYLALCOHOL	5.10E-03	NA	NA	NA	NA	--	--
XYLENES	3.00E-04	1.20E-05	1.03E-06	2.00E+00	NA	6.01E-06	--
<b>Cumulative Risk</b>						4.46E-01	3.2364E-06