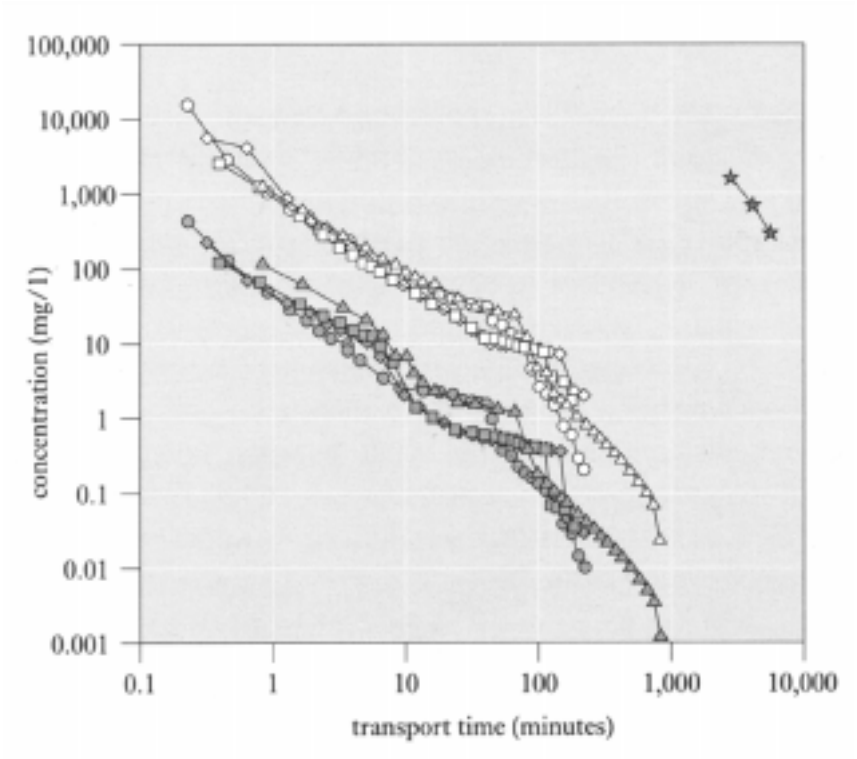
APPENDIX C

BRANDSMA, 1996
FIGURE 2

Exhibit C-1. Figure 2, Brandsma, 1996



▫ Solids
▪ Oil
★ LC50

APPENDIX D

CALCULATION OF SEDIMENT PORE WATER POLLUTANT CONCENTRATIONS FOR WATER QUALITY ANALYSES

Exhibit D-1. Gulf of Mexico Deep Water Development Model Well
Pore Water Pollutant Concentration: Current Technology
Technology = Discharge Assuming 11% (wt) Base Fluid Retention on Discharged Cuttings and 0.2% (vol.) Crude Contamination in SBF
Dry Cuttings Generated per Well: 778,050 lbs
Whole Drilling Fluid Discharged per Well: 588 bbls

Pollutant Name	Avg. Conc. of Pollutants in Drilling Waste	Pollutant Loadings per Well (lbs) Current Technology (11%)	Percent Pollutant/Synthetic (%)	Pollutant Sediment Conc. at 100 m (mg/kg)	Partition Coefficient[-1] or Leach Factors	Pore Water Conc. at 100 m (mg/l) (a)
Conventional Pollutants	**lbs/lb disch. cuttings**					
TSS (associated with adhering SBF)		78,414				
TSS (associated with dry cuttings)		778,050				
TSS (total)		856,464				
Total Oil (synthetic plus crude)		112,075		1.00e+04		
Priority Pollutant Organics	**lbs/bbl drilling fluid**					
Naphthalene	1.01e-03	0.5911	5.27e-04	5.29e-02	0.0795	4.59e-03
Fluorene	5.48e-04	0.3224	2.88e-04	2.89e-02	0.0407	1.28e-03
Phenanthrene	1.30e-03	0.7647	6.82e-04	6.84e-02	0.0113	8.45e-04
Phenol	7.22e-08	0.0000	3.79e-08	3.80e-06	11.3380	4.71e-05
Total Priority Pollutant Organics		1.6782				
Priority Pollutants, Metals	**lbs/lb dry SBF**					
Cadmium	1.10e-06	0.0863	7.70e-05	7.72e-03	0.1100	9.28e-04
Mercury	1.00e-07	0.0078	7.00e-06	7.02e-04	0.0180	1.38e-05
Antimony	5.70e-06	0.4470	3.99e-04	4.00e-02		
Arsenic	7.10e-06	0.5567	4.97e-04	4.98e-02	0.0050	2.72e-04
Beryllium	7.00e-07	0.0549	4.90e-05	4.91e-03		
Chromium	2.40e-04	18.8194	1.68e-02	1.68e+00	0.0340	6.26e-02
Copper	1.87e-05	1.4663	1.31e-03	1.31e-01	0.0063	9.03e-04
Lead	3.51e-05	2.7523	2.46e-03	2.46e-01	0.0200	5.38e-03
Nickel	1.35e-05	1.0586	9.45e-04	9.47e-02	0.0430	4.45e-03
Selenium	1.10e-06	0.0863	7.70e-05	7.72e-03		
Silver	7.00e-07	0.0549	4.90e-05	4.91e-03		
Thallium	1.20e-06	0.0941	8.40e-05	8.42e-03		
Zinc	2.00e-04	15.7220	1.40e-02	1.41e+00	0.0041	6.30e-03
Total Priority Pollutant Metals		41.21				
Non-Conventional Pollutants	**lbs/lb dry SBF or bbl SBF**					
Aluminum	9.07e-03	711.2071	6.35e-01	6.37e+01		
Barium	1.20e-01	9,409.6800	8.40e+00	8.42e+02	0.0021	1.93e+00
Iron	1.53e-02	1,203.2079	1.07e+00	1.08e+02	0.1300	1.53e+01
Tin	1.46e-05	1.1448	1.02e-03	1.02e-01		
Titanium	8.75e-05	6.8612	6.12e-03	6.14e-01		
Alkylated benzenes	5.66e-03	3.3273	2.97e-03	2.98e-01		
Alkylated naphthalenes	5.32e-02	31.2808	2.79e-02	2.80e+00		
Alkylated fluorenes	6.40e-03	3.7654	3.36e-03	3.37e-01		
Alkylated phenanthrenes	8.09e-03	4.7574	4.24e-03	4.26e-01		
Alkylated phenols	6.37e-07	0.0004	3.34e-07	3.35e-05		
Total biphenyls	1.05e-02	6.1834	5.52e-03	5.53e-01		
Total dibenzothiophenes	9.15e-06	0.0054	4.80e-06	4.82e-04		
Total Non-Conventional Pollutants		11,381.42				
Total Loadings and Reductions (lbs)		**979,963**				

(a) Pore water conc. = (Pollutant Sed. Conc. * Partition Coeff or Leach Factor) * 35.5 kg sediment / 32.5 liter pore water unit volume

Exhibit D-2. Gulf of Mexico Deep Water Development Model Well
Pore Water Pollutant Concentrations: Discharge Option
Technology = Discharge Assuming 7% (wt) Base Fluid Retention on Discharged Cuttings and 0.2% (vol) Crude Contamination in SBF
Dry Cuttings Generated per Well: 778,050 lbs
Whole Drilling Fluid Discharged Per Well: 337

Pollutant Name	Avg. Conc. of Pollutants in Drilling Waste	Pollutant Loadings per Well (lbs) Discharge Option (7%)	Percent Pollutant/Synthetic (%)	Pollutant Sediment Conc. at 100 m (mg/kg)	Partition Coefficient^{-1} or Leach Factors	Pore Water Conc. at 100 m (mg/l) (a)
Conventional Pollutants	**lbs/lb disch. cuttings**					
TSS (associated with adhering SBF)		44,886				
TSS (associated with dry cuttings)		778,050				
TSS (total)		822,936				
Total Oil (synthetic plus crude)		64,190		5.74e+03		
Priority Pollutants, Organics	**lbs/bbl drilling fluid**					
Naphthalene	1.01e-03	0.3388	5.28e-04	3.03e-02	0.0795	2.63e-03
Fluorene	5.48e-04	0.1848	2.88e-04	1.65e-02	0.0407	7.35e-04
Phenanthrene	1.30e-03	0.4382	6.83e-04	3.92e-02	0.0113	4.84e-04
Phenol	7.22e-08	2.43e-05	3.79e-08	2.18e-06	11.34	2.70e-05
Total Priority Pollutants, Organics		0.9618				
Priority Pollutants, Metals	**lbs/lb dry SBF**					
Cadmium	1.10e-06	0.0494	7.69e-05	4.42e-03	0.1100	5.31e-04
Mercury	1.00e-07	0.0045	6.99e-06	4.02e-04	0.0180	7.90e-06
Antimony	5.70e-06	0.2559	3.99e-04	2.29e-02		
Arsenic	7.10e-06	0.3187	4.96e-04	2.85e-02	0.0050	1.56e-04
Beryllium	7.00e-07	0.0314	4.89e-05	2.81e-03		
Chromium	2.40e-04	10.7726	1.68e-02	9.64e-01	0.0340	3.58e-02
Copper	1.87e-05	0.8394	1.31e-03	7.51e-02	0.0063	5.17e-04
Lead	3.51e-05	1.5755	2.45e-03	1.41e-01	0.0200	3.08e-03
Nickel	1.35e-05	0.6060	9.44e-04	5.42e-02	0.0430	2.55e-03
Selenium	1.10e-06	0.0494	7.69e-05	4.42e-03		
Silver	7.00e-07	0.0314	4.89e-05	2.81e-03		
Thallium	1.20e-06	0.0539	8.39e-05	4.82e-03		
Zinc	2.00e-04	8.9996	1.40e-02	8.05e-01	0.0041	3.61e-03
Total Priority Pollutant Metals		23.59				
Non-Conventional Pollutants	**lbs/lb dry SBF or bbl SBF**					
Aluminum	9.07e-03	407.1115	6.34e-01	3.64e+01		
Barium	1.20e-01	5,386.3200	8.39e+00	4.82e+02	0.0021	1.11e+00
Iron	1.53e-02	688.7442	1.07e+00	6.16e+01	0.1300	8.75e+00
Tin	1.46e-05	0.6553	1.02e-03	5.87e-02		
Titanium	8.75e-05	3.9275	6.12e-03	3.52e-01		
Alkylated benzenes	5.66e-03	1.9070	2.97e-03	1.71e-01		
Alkylated naphthalenes	5.32e-02	17.9280	2.79e-02	1.60e+00		
Alkylated fluorenes	6.40e-03	2.1581	3.36e-03	1.93e-01		
Alkylated phenanthrenes	8.09e-03	2.7266	4.25e-03	2.44e-01		
Alkylated phenols	6.37e-07	0.0002	3.34e-07	1.92e-05		
Total biphenyls	1.05e-02	3.5439	5.52e-03	3.17e-01		
Total dibenzothiophenes	9.15e-06	0.0031	4.80e-06	2.76e-04		
Total Non-Conventional Pollutants		6,515.03				
Total Loadings and Reductions (lbs)		**893,666**				

(b) Pore water conc. = (Pollutant Sed. Conc. * Partition Coeff or Leach Factor) * 35.5 kg sediment / 32.5 liter pore water unit volume

Exhibit D-3. Gulf of Mexico Deep Water Exploratory Model Well
Pore Water Pollutant Concentrations: Current Technology
Technology = Discharge Assuming 11% (wt) Base Fluid Retention on Discharged Cuttings and 0.2% (vol.) Crude Contamination in SBF
Dry Cuttings Generated per Well: 1,729,910 lbs
Whole Drilling Fluid Discharged per Well: 1308 bbls

Pollutant Name	Avg. Conc. of Pollutants in Drilling Waste	Pollutant Loadings per Well (lbs) Current Technology (11%)	Percent Pollutant/Synthetic (%)	Pollutant Sediment Conc. at 100 m (mg/kg)	Partition Coefficient^{-1} or Leach Factors	Pore Water Conc. at 100 m (mg/l) (a)
Conventional Pollutants	**lbs/lb disch. cuttings**					
TSS (associated with adhering SBF)		174,346				
TSS (associated with dry cuttings)		1,729,910				
TSS (total)		1,904,256				
Total Oil (synthetic plus crude)		249,187		2.23e+04		
Priority Pollutant Organics	**lbs/bbl drilling fluid**					
Naphthalene	1.01e-03	1.3148	5.28e-04	1.18e-01	0.0796	1.02e-02
Fluorene	5.48e-04	0.7172	2.88e-04	6.42e-02	0.0407	2.85e-03
Phenanthrene	1.30e-03	1.7010	6.83e-04	1.52e-01	0.0113	1.88e-03
Phenol	7.22e-08	0.0001	3.79e-08	8.46e-06	11.34	1.05e-04
Total Priority Pollutant Organics		3.7331				
Priority Pollutants, Metals	**lbs/lb dry SBF**					
Cadmium	1.10e-06	0.1918	7.70e-05	1.72e-02	0.1100	2.06e-03
Mercury	1.00e-07	0.0174	7.00e-06	1.56e-03	0.0180	3.07e-05
Antimony	5.70e-06	0.9938	3.99e-04	8.90e-02		
Arsenic	7.10e-06	1.2379	4.97e-04	1.11e-01	0.0050	6.05e-04
Beryllium	7.00e-07	0.1220	4.90e-05	1.09e-02		
Chromium	2.40e-04	41.8430	1.68e-02	3.75e+00	0.0340	1.39e-01
Copper	1.87e-05	3.2603	1.31e-03	2.92e-01	0.0063	2.01e-03
Lead	3.51e-05	6.1195	2.46e-03	5.48e-01	0.0200	1.20e-02
Nickel	1.35e-05	2.3537	9.45e-04	2.11e-01	0.0430	9.90e-03
Selenium	1.10e-06	0.1918	7.70e-05	1.72e-02		
Silver	7.00e-07	0.1220	4.90e-05	1.09e-02		
Thallium	1.20e-06	0.2092	8.40e-05	1.87e-02		
Zinc	2.00e-04	34.9564	1.40e-02	3.13e+00	0.0041	1.40e-02
Total Priority Pollutant Metals		91.62				
Non-Conventional Pollutants	**lbs/lb dry SBF or bbl SBF**					
Aluminum	9.07e-03	1,581.3008	6.35e-01	1.42e+02		
Barium	1.20e-01	20,921.5200	8.40e+00	1.87e+03	0.0021	4.30e+00
Iron	1.53e-02	2,675.2173	1.07e+00	2.39e+02	0.1300	3.40e+01
Tin	1.46e-05	2.5455	1.02e-03	2.28e-01		
Titanium	8.75e-05	15.2553	6.12e-03	1.37e+00		
Alkylated benzenes	5.66e-03	7.4016	2.97e-03	6.63e-01		
Alkylated naphthalenes	5.32e-02	69.5839	2.79e-02	6.23e+00		
Alkylated fluorenes	6.40e-03	8.3762	3.36e-03	7.50e-01		
Alkylated phenanthrenes	8.09e-03	10.5829	4.25e-03	9.47e-01		
Alkylated phenols	6.37e-07	0.0008	3.34e-07	7.46e-05		
Total biphenyls	1.05e-02	13.7550	5.52e-03	1.23e+00		
Total dibenzothiophenes	9.15e-06	0.0120	4.80e-06	1.07e-03		
Total Non-Conventional Pollutants		25,305.55				
Total Loadings and Reductions (lbs)		**2,178,844**				

(a) Pore water conc. = (Pollutant Sed. Conc. * Partition Coeff or Leach Factor) * 35.5 kg sediment / 32.5 liter pore water unit volume

Exhibit D-4. Gulf of Mexico Deep Water Exploratory Model Well
Pore Water Pollutant Concentrations: Discharge Option
Technology = Discharge Assuming 7% (wt) Base Fluid Retention on Discharged Cuttings and 0.2% (vol) Crude Contamination in SBF
Dry Cuttings Generated per Well: 1,729,910 lbs
Whole Drilling Fluid Discharged Per Well: 749 bbls

Pollutant Name	Avg. Conc. of Pollutants in Drilling Waste	Pollutant Loadings (lbs) Discharge Option (7%)	Percent Pollutant/Synthetic (%)	Pollutant Sediment Conc. at 100 m (mg/kg)	Partition Coefficient^{-1} or Leach Factors	Pore Water Conc. at 100 m (mg/l) (a)
Conventional Pollutants	**lbs/lb disch. cuttings**					
TSS (associated with adhering SBF)		99,799				
TSS (associated with dry cuttings)		1,729,910				
TSS (total)		1,829,709				
Total Oil (synthetic plus crude)		142,719		1.28e+04		
Priority Pollutants, Organics	**lbs/bbl drilling fluid**					
Naphthalene	1.01e-03	0.7529	5.28e-04	6.74e-02	0.0795	5.85e-03
Fluorene	5.48e-04	0.4107	2.88e-04	3.68e-02	0.0407	1.63e-03
Phenanthrene	1.30e-03	0.9740	6.82e-04	8.72e-02	0.0113	1.08e-03
Phenol	7.22e-08	5.41e-05	3.79e-08	4.84e-06	11.34	6.00e-05
Total Priority Pollutants, Organics		2.1377				
Priority Pollutants, Metals	**lbs/lb dry SBF**					
Cadmium	1.10e-06	0.1098	7.69e-05	9.83e-03	0.1100	1.18e-03
Mercury	1.00e-07	0.0100	6.99e-06	8.93e-04	0.0180	1.76e-05
Antimony	5.70e-06	0.5689	3.99e-04	5.09e-02		
Arsenic	7.10e-06	0.7086	4.96e-04	6.34e-02	0.0050	3.46e-04
Beryllium	7.00e-07	0.0699	4.89e-05	6.25e-03		
Chromium	2.40e-04	23.9518	1.68e-02	2.14e+00	0.0340	7.96e-02
Copper	1.87e-05	1.8662	1.31e-03	1.67e-01	0.0063	1.15e-03
Lead	3.51e-05	3.5029	2.45e-03	3.14e-01	0.0200	6.85e-03
Nickel	1.35e-05	1.3473	9.44e-04	1.21e-01	0.0430	5.66e-03
Selenium	1.10e-06	0.1098	7.69e-05	9.83e-03		
Silver	7.00e-07	0.0699	4.89e-05	6.25e-03		
Thallium	1.20e-06	0.1198	8.39e-05	1.07e-02		
Zinc	2.00e-04	20.0097	1.40e-02	1.79e+00	0.0041	8.02e-03
Total Priority Pollutant Metals		52.44				
Non-Conventional Pollutants	**lbs/lb dry SBF or bbl SBF**					
Aluminum	9.07e-03	905.1670	6.34e-01	8.10e+01		
Barium	1.20e-01	11,975.8800	8.39e+00	1.07e+03	0.0021	2.46e+00
Iron	1.53e-02	1,531.3458	1.07e+00	1.37e+02	0.1300	1.95e+01
Tin	1.46e-05	1.4571	1.02e-03	1.30e-01		
Titanium	8.75e-05	8.7324	6.12e-03	7.82e-01		
Alkylated benzenes	5.66e-03	4.2384	2.97e-03	3.79e-01		
Alkylated naphthalenes	5.32e-02	39.8458	2.79e-02	3.57e+00		
Alkylated fluorenes	6.40e-03	4.7965	3.36e-03	4.29e-01		
Alkylated phenanthrenes	8.09e-03	6.0601	4.25e-03	5.42e-01		
Alkylated phenols	6.37e-07	0.0005	3.34e-07	4.27e-05		
Total biphenyls	1.05e-02	7.8765	5.52e-03	7.05e-01		
Total dibenzothiophenes	9.15e-06	0.0069	4.80e-06	6.13e-04		
Total Non-Conventional Pollutants		14,485.41				
Total Loadings and Reductions (lbs)		**1,986,968**				

(a) Pore water conc. = (Pollutant Sed. Conc. * Partition Coeff or Leach Factor) * 35.5 kg sediment / 32.5 liter pore water unit volume

Exhibit D-5. Gulf of Mexico Shallow Water Exploratory Model Well
Pore Water Pollutant Concentrations: Current Technology
Technology = Discharge Assuming 11% (wt) Base Fluid Retention on Discharged Cuttings and 0.2% (vol.) Crude Contamination in SBF
Dry Cuttings Generated per Well: 1,077,440 lbs
Whole Drilling Fluid Discharged per Well: 814 bbls

Pollutant Name	Avg. Conc. of Pollutants in Drilling Waste	Pollutant Loadings per Well (lbs) Current Technology (11%)	Percent Pollutant/Synthetic (%)	Pollutant Sediment Conc. at 100 m (mg/kg)	Partition Coefficient^{-1} or Leach Factors	Pore Water Conc. at 100 m (mg/l) (a)
Conventional Pollutants	**lbs/lb disch. cuttings**					
TSS (associated with adhering SBF)		108,588				
TSS (associated with dry cuttings)		1,077,440				
TSS (total)		1,186,028				
Total Oil (synthetic plus crude)		155,202		1.39e+04		
Priority Pollutant Organics	**lbs/bbl drilling fluid**					
Naphthalene	1.01e-03	0.8182	5.27e-04	7.32e-02	0.0796	6.37e-03
Fluorene	5.48e-04	0.4463	2.88e-04	3.99e-02	0.0407	1.78e-03
Phenanthrene	1.30e-03	1.0586	6.82e-04	9.47e-02	0.0113	1.17e-03
Phenol	7.22e-08	0.0001	3.79e-08	5.26e-06	11.34	6.52e-05
Total Priority Pollutant Organics		2.3232				
Priority Pollutants, Metals	**lbs/lb dry SBF**					
Cadmium	1.10e-06	0.1194	7.70e-05	1.07e-02	0.1100	1.28e-03
Mercury	1.00e-07	0.0109	7.00e-06	9.72e-04	0.0180	1.91e-05
Antimony	5.70e-06	0.6190	3.99e-04	5.54e-02		
Arsenic	7.10e-06	0.7710	4.97e-04	6.90e-02	0.0050	3.77e-04
Beryllium	7.00e-07	0.0760	4.90e-05	6.80e-03		
Chromium	2.40e-04	26.0611	1.68e-02	2.33e+00	0.0340	8.66e-02
Copper	1.87e-05	2.0306	1.31e-03	1.82e-01	0.0063	1.25e-03
Lead	3.51e-05	3.8114	2.46e-03	3.41e-01	0.0200	7.45e-03
Nickel	1.35e-05	1.4659	9.45e-04	1.31e-01	0.0430	6.16e-03
Selenium	1.10e-06	0.1194	7.70e-05	1.07e-02		
Silver	7.00e-07	0.0760	4.90e-05	6.80e-03		
Thallium	1.20e-06	0.1303	8.40e-05	1.17e-02		
Zinc	2.00e-04	21.7719	1.40e-02	1.95e+00	0.0041	8.73e-03
Total Priority Pollutant Metals		57.06				
Non-Conventional Pollutants	**lbs/lb dry SBF or bbl SBF**					
Aluminum	9.07e-03	984.8823	6.35e-01	8.82e+01		
Barium	1.20e-01	13,030.5600	8.40e+00	1.17e+03	0.0021	2.68e+00
Iron	1.53e-02	1,666.2068	1.07e+00	1.49e+02	0.1300	2.12e+01
Tin	1.46e-05	1.5854	1.02e-03	1.42e-01		
Titanium	8.75e-05	9.5014	6.12e-03	8.50e-01		
Alkylated benzenes	5.66e-03	4.6062	2.97e-03	4.12e-01		
Alkylated naphthalenes	5.32e-02	43.3038	2.79e-02	3.88e+00		
Alkylated fluorenes	6.40e-03	5.2127	3.36e-03	4.67e-01		
Alkylated phenanthrenes	8.09e-03	6.5860	4.24e-03	5.89e-01		
Alkylated phenols	6.37e-07	0.0005	3.34e-07	4.64e-05		
Total biphenyls	1.05e-02	8.5600	5.52e-03	7.66e-01		
Total dibenzothiophenes	9.15e-06	0.0074	4.80e-06	6.67e-04		
Total Non-Conventional Pollutants		15,761.01				
Total Loadings and Reductions (lbs)		**1,357,050**				

(a) Pore water conc. = (Pollutant Sed. Conc. * Partition Coeff or Leach Factor) * 35.5 kg sediment / 32.5 liter pore water unit volume

Exhibit D-6. Gulf of Mexico Shallow Water Exploratory Model Well
Pore Water Pollutant Concentrations: Discharge Option
Technology = Discharge Assuming 7% (wt) Retention on Discharged Cuttings and 0.2% (vol) Crude Contamination
Dry Cuttings Generated per Well: 1,077,440 lbs
Whole Drilling Fluid Discharged Per Well: 466 bbls

Pollutant Name	Avg. Conc. of Pollutants in Drilling Waste	Pollutant Loadings per Well (lbs) Discharge Option (7%)	Percent Pollutant/Synthetic (%)	Pollutant Sediment Conc. at 100 m (mg/kg)	Partition Coefficient^{-1} or Leach Factors	Pore Water Conc. at 100 m (mg/l) (a)
Conventional Pollutants	**lbs/lb disch. cuttings**					
TSS (associated with adhering SBF)		62,158				
TSS (associated with dry cuttings)		1,077,440				
TSS (total)		1,139,598				
Total Oil (synthetic plus crude)		88,890		7.96e+03		
Priority Pollutants, Organics	**lbs/bbl drilling fluid**					
Naphthalene	1.01e-03	0.4684	5.27e-04	4.19e-02	0.0796	3.65e-03
Fluorene	5.48e-04	0.2555	2.87e-04	2.29e-02	0.0407	1.02e-03
Phenanthrene	1.30e-03	0.6060	6.82e-04	5.42e-02	0.0113	6.69e-04
Phenol	7.22e-08	3.37e-05	3.79e-08	3.01e-06	11.34	3.73e-05
Total Priority Pollutants, Organics		1.3300				
Priority Pollutants, Metals	**lbs/lb dry SBF**					
Cadmium	1.10e-06	0.0684	7.69e-05	6.12e-03	0.1100	7.35e-04
Mercury	1.00e-07	0.0062	6.99e-06	5.56e-04	0.0180	1.09e-05
Antimony	5.70e-06	0.3543	3.99e-04	3.17e-02		
Arsenic	7.10e-06	0.4413	4.96e-04	3.95e-02	0.0050	2.16e-04
Beryllium	7.00e-07	0.0435	4.89e-05	3.89e-03		
Chromium	2.40e-04	14.9179	1.68e-02	1.34e+00	0.0340	4.96e-02
Copper	1.87e-05	1.1624	1.31e-03	1.04e-01	0.0063	7.16e-04
Lead	3.51e-05	2.1817	2.45e-03	1.95e-01	0.0200	4.27e-03
Nickel	1.35e-05	0.8391	9.44e-04	7.51e-02	0.0430	3.53e-03
Selenium	1.10e-06	0.0684	7.69e-05	6.12e-03		
Silver	7.00e-07	0.0435	4.89e-05	3.89e-03		
Thallium	1.20e-06	0.0746	8.39e-05	6.68e-03		
Zinc	2.00e-04	12.4627	1.40e-02	1.12e+00	0.0041	5.00e-03
Total Priority Pollutant Metals		32.66				
Non-Conventional Pollutants	**lbs/lb dry SBF or bbl SBF**					
Aluminum	9.07e-03	563.7668	6.34e-01	5.05e+01		
Barium	1.20e-01	7,458.9600	8.39e+00	6.68e+02	0.0021	1.53e+00
Iron	1.53e-02	953.7710	1.07e+00	8.54e+01	0.1300	1.21e+01
Tin	1.46e-05	0.9075	1.02e-03	8.12e-02		
Titanium	8.75e-05	5.4388	6.12e-03	4.87e-01		
Alkylated benzenes	5.66e-03	2.6369	2.97e-03	2.36e-01		
Alkylated naphthalenes	5.32e-02	24.7906	2.79e-02	2.22e+00		
Alkylated fluorenes	6.40e-03	2.9842	3.36e-03	2.67e-01		
Alkylated phenanthrenes	8.09e-03	3.7703	4.24e-03	3.37e-01		
Alkylated phenols	6.37e-07	0.0003	3.34e-07	2.66e-05		
Total biphenyls	1.05e-02	4.9005	5.51e-03	4.39e-01		
Total dibenzothiophenes	9.15e-06	0.0043	4.80e-06	3.82e-04		
Total Non-Conventional Pollutants		9,021.93				
Total Loadings and Reductions (lbs)		**1,237,544**				

(a) Pore water conc. = (Pollutant Sed. Conc. * Partition Coeff or Leach Factor) * 35.5 kg sediment / 32.5 liter pore water unit volume

Exhibit D-7. Gulf of Mexico Shallow Water Development Model Well
Pore Water Pollutant Concentrations: Current Technology
Technology = Discharge Assuming 11% (wt) Base Fluid Retention on Discharged Cuttings and 0.2% (vol.) Crude Contamination in SBF
Dry Cuttings Generated per Well: 514,150 lbs
Whole Drilling Fluid Discharged per Well: 389 bbls

Pollutant Name	Avg. Conc. of Pollutants in Drilling Waste	Pollutant Loadings per Well (lbs) Current Technology (11%)	Percent Pollutant/Synthetic (%)	Pollutant Sediment Conc. at 100 m (mg/kg)	Partition Coefficient[-1] or Leach Factors	Pore Water Conc. at 100 m (mg/l) (a)
Conventional Pollutants	**lbs/lb disch. cuttings**					
TSS (associated with adhering SBF)		51,818				
TSS (associated with dry cuttings)		514,150				
TSS (total)		565,968				
Total Oil (synthetic plus crude)		74,062		6.63e+03		
Priority Pollutant Organics	**lbs/bbl drilling fluid**					
Naphthalene	1.01e-03	0.3910	5.28e-04	3.50e-02	0.0796	3.04e-03
Fluorene	5.48e-04	0.2133	2.88e-04	1.91e-02	0.0407	8.49e-04
Phenanthrene	1.30e-03	0.5059	6.83e-04	4.53e-02	0.0113	5.59e-04
Phenol	7.22e-08	0.0000	3.79e-08	2.52e-06	11.34	3.12e-05
Total Priority Pollutant Organics		1.1102				
Priority Pollutants, Metals	**lbs/lb dry SBF**					
Cadmium	1.10e-06	0.0570	7.70e-05	5.10e-03	0.1100	6.13e-04
Mercury	1.00e-07	0.0052	7.00e-06	4.64e-04	0.0180	9.12e-06
Antimony	5.70e-06	0.2954	3.99e-04	2.64e-02		
Arsenic	7.10e-06	0.3679	4.97e-04	3.29e-02	0.0050	1.80e-04
Beryllium	7.00e-07	0.0363	4.90e-05	3.25e-03		
Chromium	2.40e-04	12.4363	1.68e-02	1.11e+00	0.0340	4.13e-02
Copper	1.87e-05	0.9690	1.31e-03	8.67e-02	0.0063	5.97e-04
Lead	3.51e-05	1.8188	2.46e-03	1.63e-01	0.0200	3.56e-03
Nickel	1.35e-05	0.6995	9.45e-04	6.26e-02	0.0430	2.94e-03
Selenium	1.10e-06	0.0570	7.70e-05	5.10e-03		
Silver	7.00e-07	0.0363	4.90e-05	3.25e-03		
Thallium	1.20e-06	0.0622	8.40e-05	5.57e-03		
Zinc	2.00e-04	10.3895	1.40e-02	9.30e-01	0.0041	4.16e-03
Total Priority Pollutant Metals		27.23				
Non-Conventional Pollutants	**lbs/lb dry SBF or bbl SBF**					
Aluminum	9.07e-03	469.9841	6.35e-01	4.21e+01		
Barium	1.20e-01	6,218.1600	8.40e+00	5.57e+02	0.0021	1.28e+00
Iron	1.53e-02	795.1109	1.07e+00	7.12e+01	0.1300	1.01e+01
Tin	1.46e-05	0.7565	1.02e-03	6.77e-02		
Titanium	8.75e-05	4.5341	6.12e-03	4.06e-01		
Alkylated benzenes	5.66e-03	2.2012	2.97e-03	1.97e-01		
Alkylated naphthalenes	5.32e-02	20.6943	2.79e-02	1.85e+00		
Alkylated fluorenes	6.40e-03	2.4911	3.36e-03	2.23e-01		
Alkylated phenanthrenes	8.09e-03	3.1473	4.25e-03	2.82e-01		
Alkylated phenols	6.37e-07	0.0002	3.35e-07	2.22e-05		
Total biphenyls	1.05e-02	4.0907	5.52e-03	3.66e-01		
Total dibenzothiophenes	9.15e-06	0.0036	4.81e-06	3.19e-04		
Total Non-Conventional Pollutants		7,521.17				
Total Loadings and Reductions (lbs)		**647,580**				

(a) Pore water conc. = (Pollutant Sed. Conc. * Partition Coeff or Leach Factor) * 35.5 kg sediment / 32.5 liter pore water unit volume

Exhibit D-8. Gulf of Mexico Shallow Water Development Model Well
Pore Water Pollutant Concentrations: Discharge Option
Technology = Discharge Assuming 7% (wt) Base Fluid Retention on Discharged Cuttings and 0.2% (vol) Crude Contamination in SBF
Dry Cuttings Generated per Well: 514,150 lbs
Whole Drilling Fluid Discharged Per Well: 223 bbls

Pollutant Name	Avg. Conc. of Pollutants in Drilling Waste	Pollutant Loadings per Well (lbs) Discharge Option (7%)	Percent Pollutant/Synthetic (%)	Pollutant Sediment Conc. at 100 m (mg/kg)	Partition Coefficient[-1] or Leach Factors	Pore Water Conc. at 100 m (mg/l) (a)
Conventional Pollutants	**lbs/lb disch. cuttings**					
TSS (associated with adhering SBF)		29,661				
TSS (associated with dry cuttings)		514,150				
TSS (total)		543,811				
Total Oil (synthetic plus crude)		42,418		3.80e+03		
Priority Pollutants, Organics	**lbs/bbl drilling fluid**					
Naphthalene	1.01e-03	0.2242	5.28e-04	2.01e-02	0.0796	1.74e-03
Fluorene	5.48e-04	0.1223	2.88e-04	1.09e-02	0.0407	4.87e-04
Phenanthrene	1.30e-03	0.2900	6.84e-04	2.60e-02	0.0113	3.20e-04
Phenol	7.22e-08	1.61e-05	3.80e-08	1.44e-06	11.34	1.79e-05
Total Priority Pollutants, Organics		0.6364				
Priority Pollutants, Metals	**lbs/lb dry SBF**					
Cadmium	1.10e-06	0.0326	7.69e-05	2.92e-03	0.1100	3.51e-04
Mercury	1.00e-07	0.0030	6.99e-06	2.65e-04	0.0180	5.22e-06
Antimony	5.70e-06	0.1691	3.99e-04	1.51e-02		
Arsenic	7.10e-06	0.2106	4.96e-04	1.88e-02	0.0050	1.03e-04
Beryllium	7.00e-07	0.0208	4.89e-05	1.86e-03		
Chromium	2.40e-04	7.1186	1.68e-02	6.37e-01	0.0340	2.37e-02
Copper	1.87e-05	0.5547	1.31e-03	4.96e-02	0.0063	3.42e-04
Lead	3.51e-05	1.0411	2.45e-03	9.32e-02	0.0200	2.04e-03
Nickel	1.35e-05	0.4004	9.44e-04	3.58e-02	0.0430	1.68e-03
Selenium	1.10e-06	0.0326	7.69e-05	2.92e-03		
Silver	7.00e-07	0.0208	4.89e-05	1.86e-03		
Thallium	1.20e-06	0.0356	8.39e-05	3.19e-03		
Zinc	2.00e-04	5.9470	1.40e-02	5.32e-01	0.0041	2.38e-03
Total Priority Pollutant Metals		15.59				
Non-Conventional Pollutants	**lbs/lb dry SBF or bbl SBF**					
Aluminum	9.07e-03	269.0223	6.34e-01	2.41e+01		
Barium	1.20e-01	3,559.3200	8.39e+00	3.19e+02	0.0021	7.31e-01
Iron	1.53e-02	455.1273	1.07e+00	4.07e+01	0.1300	5.78e+00
Tin	1.46e-05	0.4331	1.02e-03	3.88e-02		
Titanium	8.75e-05	2.5953	6.12e-03	2.32e-01		
Alkylated benzenes	5.66e-03	1.2619	2.97e-03	1.13e-01		
Alkylated naphthalenes	5.32e-02	11.8633	2.80e-02	1.06e+00		
Alkylated fluorenes	6.40e-03	1.4280	3.37e-03	1.28e-01		
Alkylated phenanthrenes	8.09e-03	1.8043	4.25e-03	1.61e-01		
Alkylated phenols	6.37e-07	0.0001	3.35e-07	1.27e-05		
Total biphenyls	1.05e-02	2.3451	5.53e-03	2.10e-01		
Total dibenzothiophenes	9.15e-06	0.0020	4.81e-06	1.83e-04		
Total Non-Conventional Pollutants		4,305.20				
Total Loadings and Reductions (lbs)		**590,550**				

(a) Pore water conc. = (Pollutant Sed. Conc. * Partition Coeff or Leach Factor) * 35.5 kg sediment / 32.5 liter pore water unit volume