

Appendix I

Borehole Decommissioning Documentation

CONTRACT 907BRI



Contract Name: Crooked Bridge Road, Stafford
SUBCONTRACT ORDER

No. 907BRI/8944

12. Law

12.1 This Agreement shall be governed by the laws of the United Kingdom

Signed for and on
behalf of the
Contractor

Signed for and on
behalf of the Sub-
Contractor

Print Name: AUDY JACKSON

Print Name: STEVE RULE

Date: 04/11/2011

Date: 07/11/2011

TOR DRILLING LTD

Ash View Farm, Southwood, Nr Glastonbury, Somerset, BA6 8PG
Office: 01458 851 515 Fax: 01458 851 181 Mobile: 07976 547 417

The South West's Premier
Drilling Company
for Geotechnical, Environmental
& Remediation Works



Client: Vertase FLI

Daily Report Sheet

Location: Former Bayer Cropscience site, Cambridge Road, Hauxton CB22 5HT Grid ref: TL 43265244 Installed in Autumn 1942 by G Lack of Cottenham, Cambridge.	Job No:
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Date: 13-12-11	Rig: none	Sheet: 1 of 1
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Position No	
Borehole (a)	Diameter: 4 ½ inch Depth: 180 foot Installed in Autumn 1942 by G Lack of Cottenham, Cambridge. Decommission Method: Due to the well being artesian and also having damage at surface level, it was decided with the client the best way to seal the well was to seal with Bentonite pellets. Hole backfilled 48.8 m with bentonite 3m concrete cap placed in borehole

Consumables Used (For The Above Positions) Li = Cones (H) = / (SH) = Re Mix = Be =
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Drillers Names: Steve Sutton	Logs Typed By: Chris Edmunds
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Appendix J

Degradation Curves and Mass Degradation Calculations

Figure 136. Contaminant concentration reduction curves for 12 selected Hauxton COCs in selected treatment beds

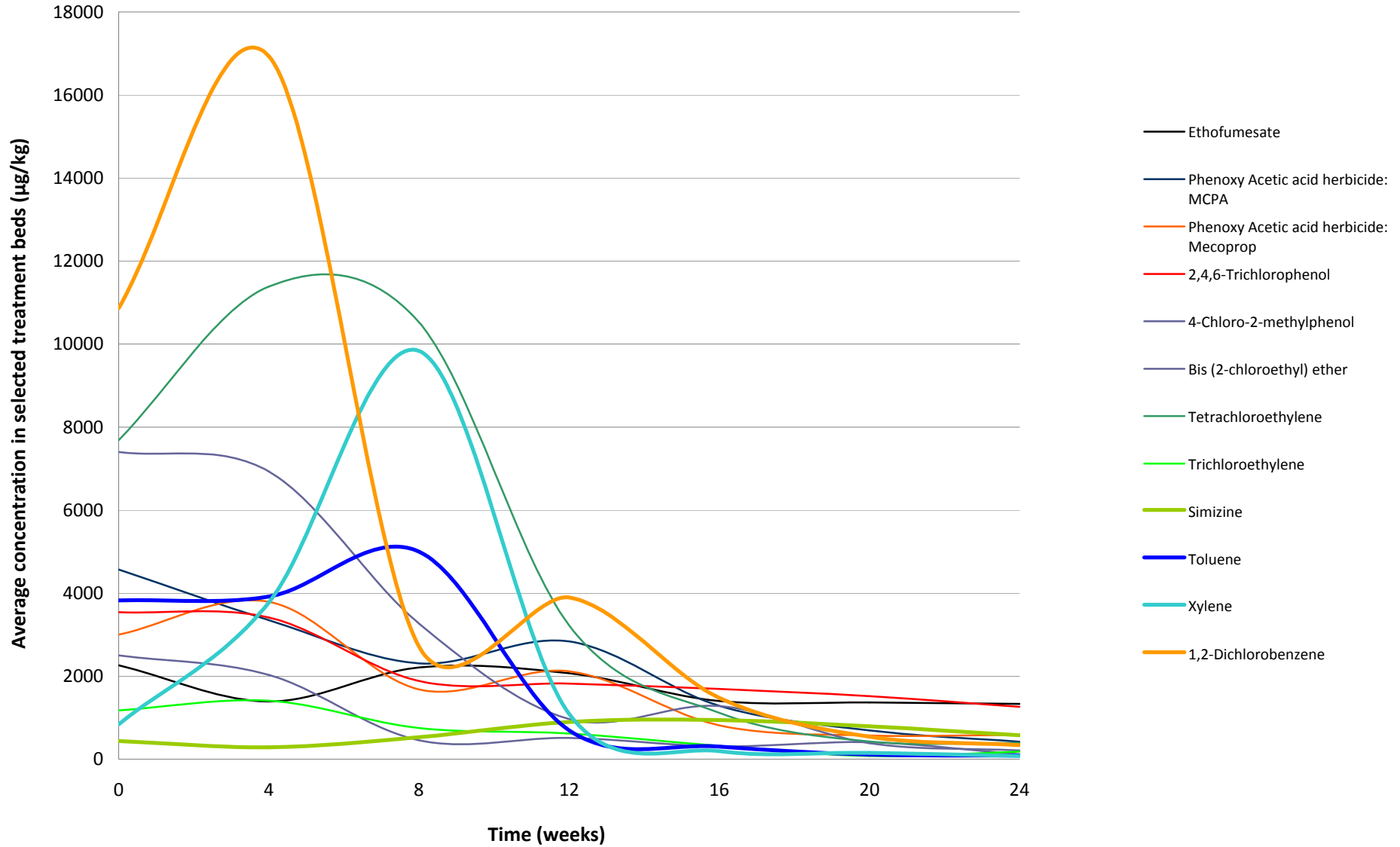


Figure 136.a . Contaminant concentration reduction curves for Chlorinated Solvents in selected treatment beds

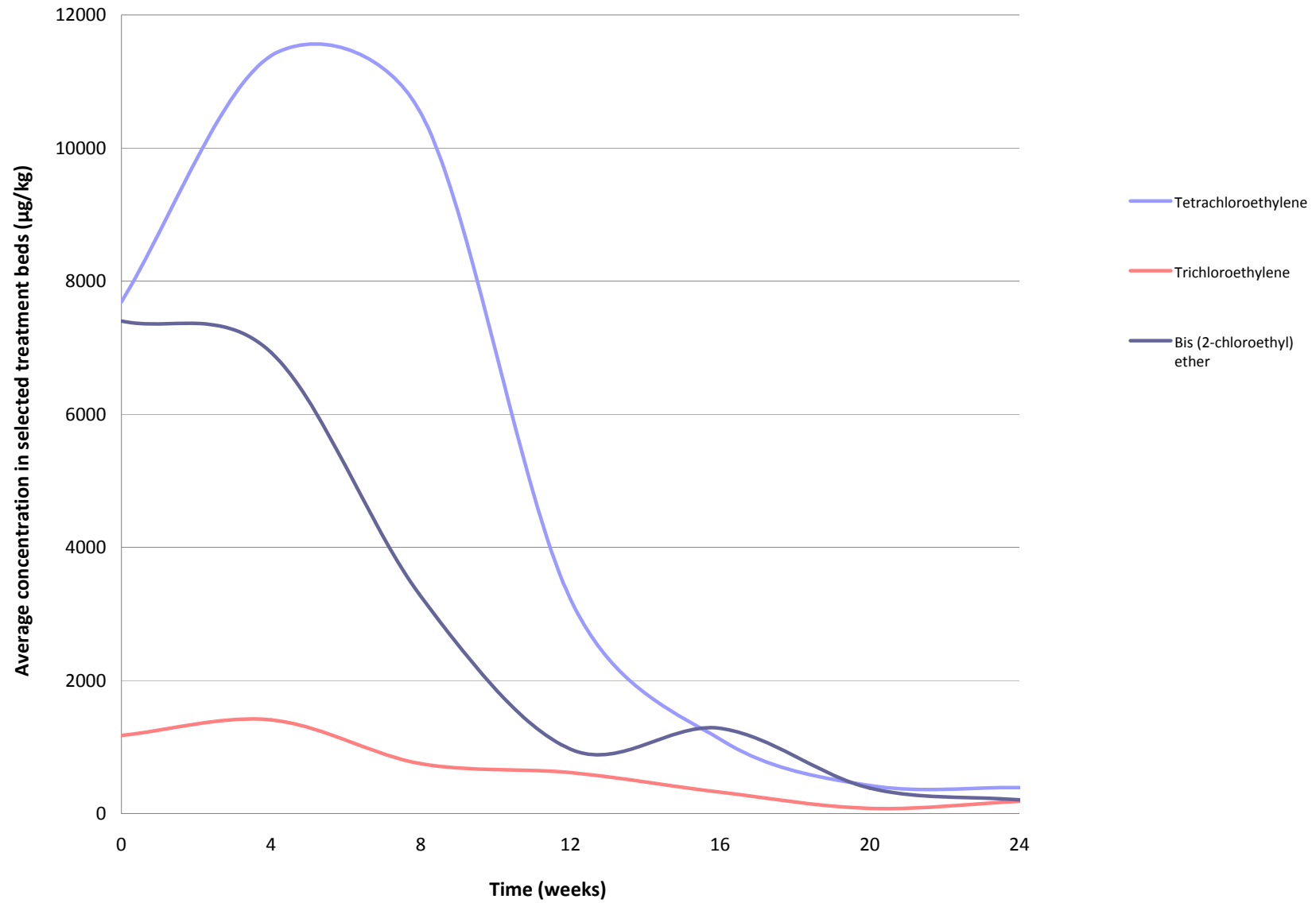


Figure 136.b . Contaminant concentration reduction curves for BTEX compounds in selected treatment beds

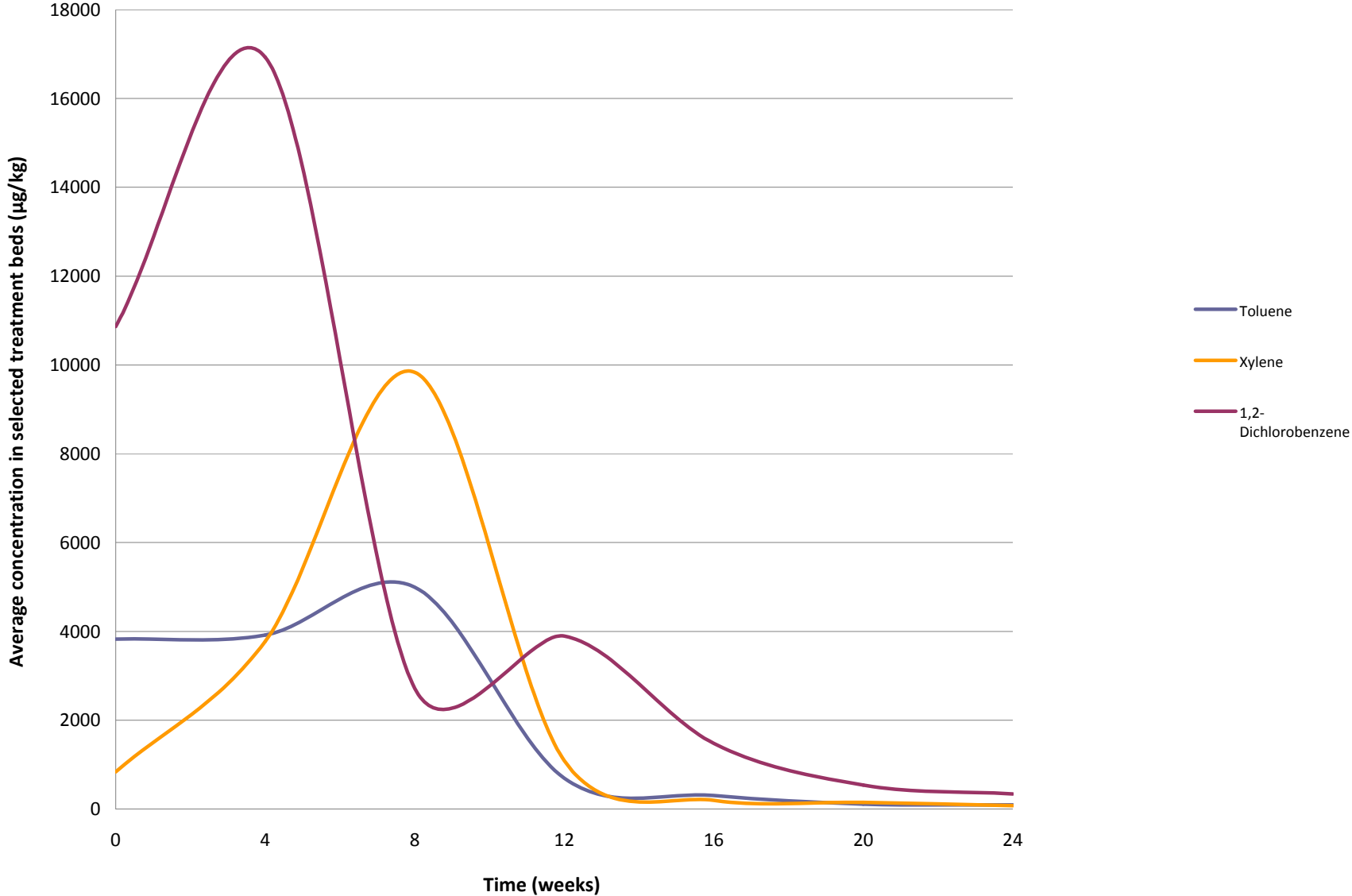


Figure 136.c . Contaminant concentration reduction c urves for Chlorinated Phenols in selected treatment beds

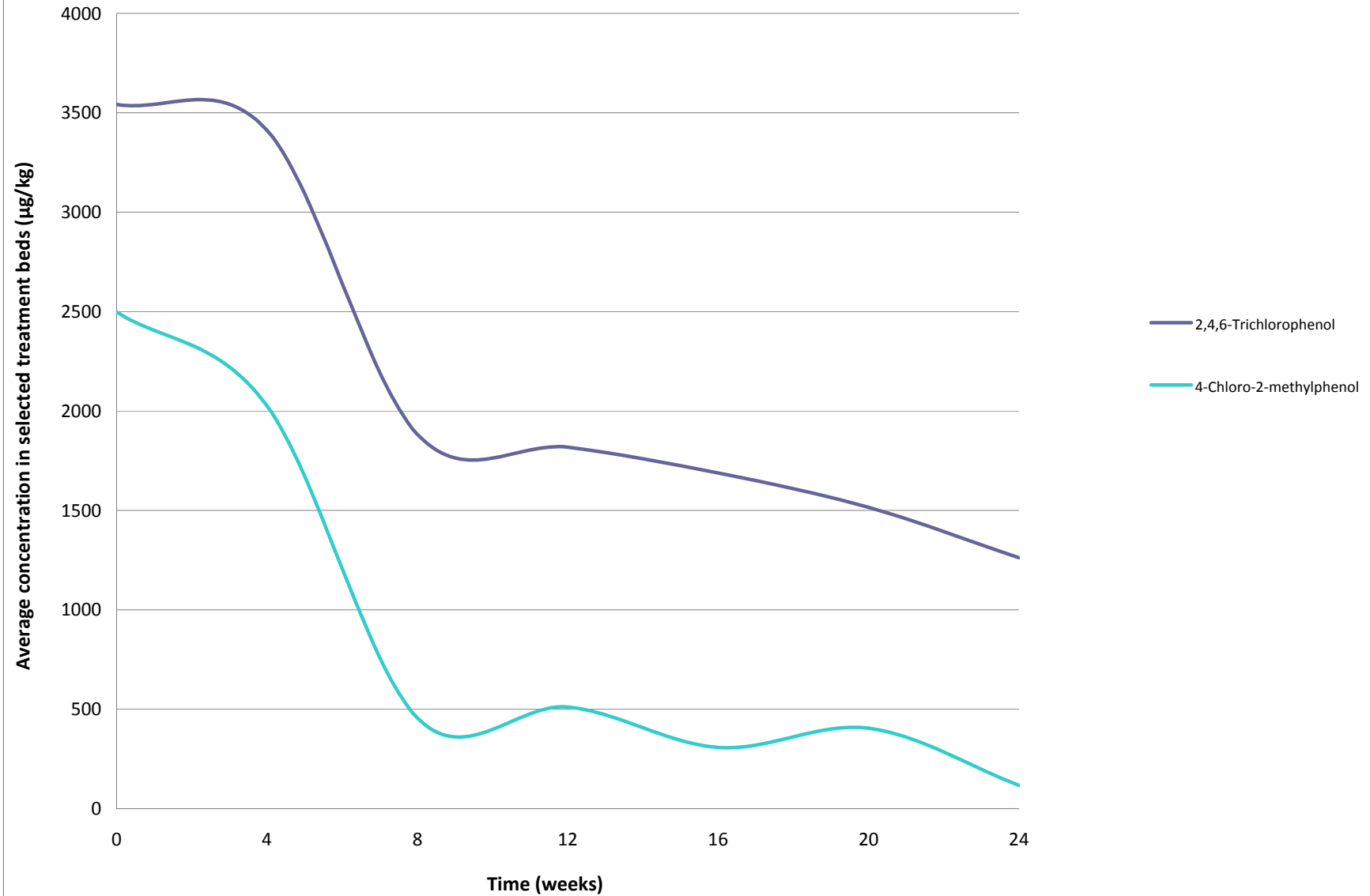


Figure 136.d . Contaminant concentration reduction curves for Acid Herbicides in selected treatment beds

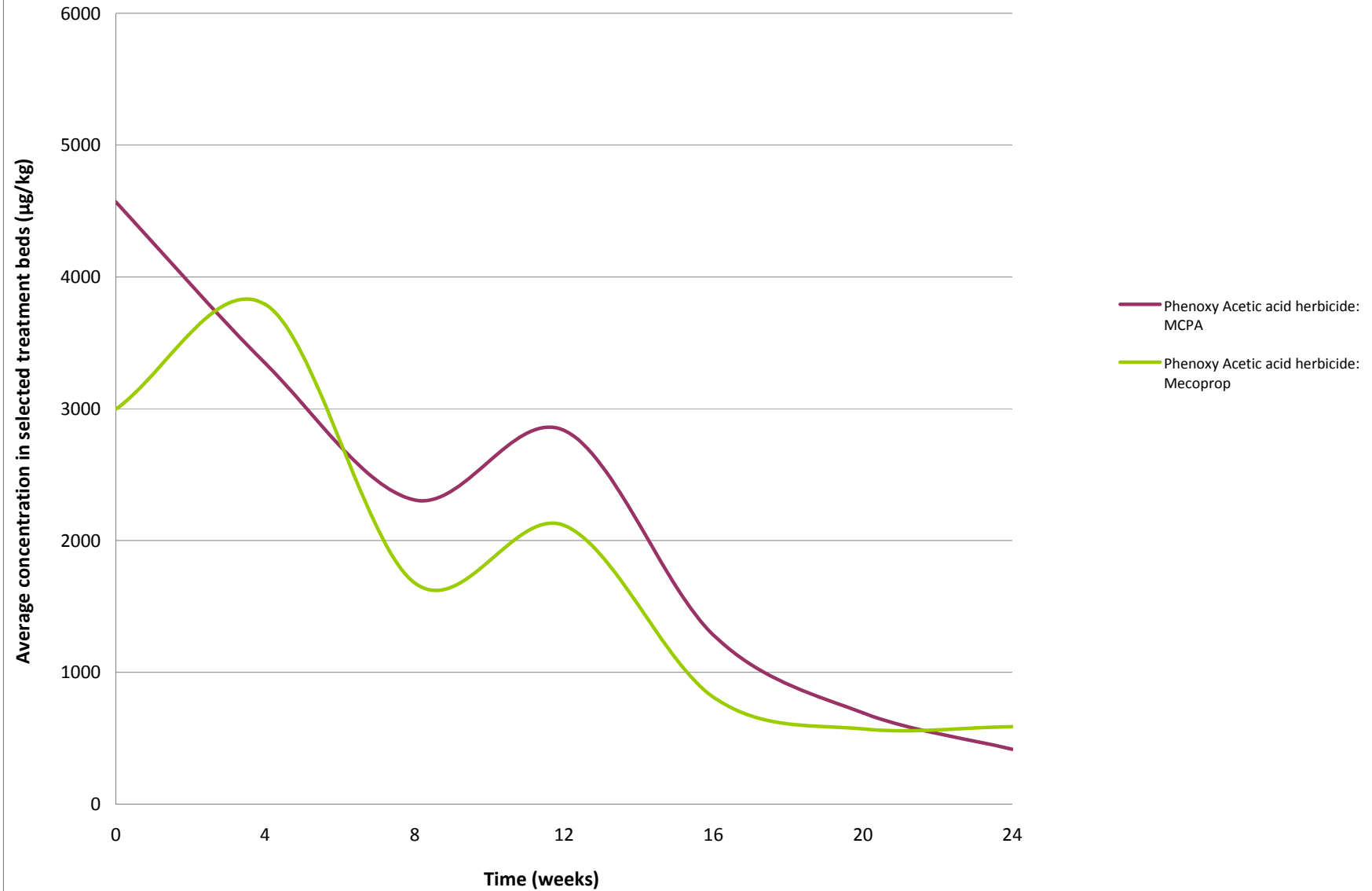


Figure 136.e. Contaminant concentration reduction curves for Organo-phosphates/organo-nitrates in selected treatment beds

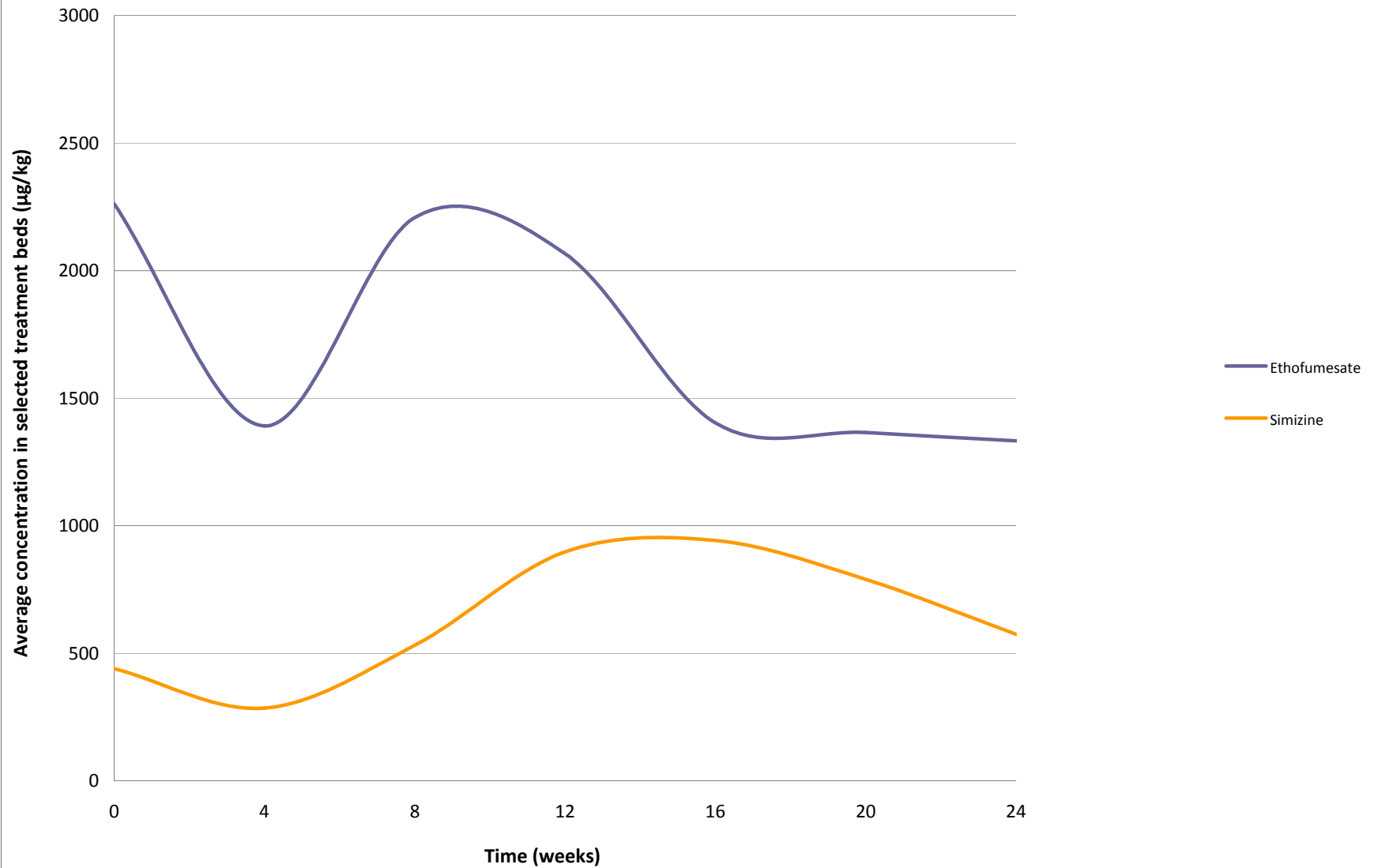


Table 17. Mass degradation parameters for Type A (Non-cohesive) treatment beds.

TB	Volume m ³	Density mg/m ³	Contamination m ^{max} kg	Contamination m ^{min} kg	Contamination Degraded kg	Contamination Degraded %
1	487	1.88	2.24	1.85	0.39	17.54
3	379	1.88	0.58	0.50	0.08	13.93
6	195	1.88	2.98	0.70	2.28	76.56
17	247	2.05	0.49	0.04	0.46	92.63
21	176	1.88	0.17	0.01	0.15	92.02
107	170	1.88	0.21	0.11	0.10	47.68
120	1230	2.06	23.72	5.23	18.49	77.95
121	596	1.88	44.25	0.98	43.27	97.79
124	484	1.88	0.02	0.02	0.00	0.00
125	745	1.75	7.54	1.42	6.12	81.17
126	159	1.88	2.81	0.20	2.61	92.96
127	1133	1.88	3.76	0.49	3.27	86.98
128	1144	1.84	10.04	5.57	4.47	44.53
129	811	1.88	5.21	0.97	4.23	81.31
130	620	1.95	1.84	1.00	0.84	45.50
131	1237	1.97	17.12	6.91	10.22	59.67
132	866	2.02	0.08	0.00	0.08	100.00
143	631	1.78	47.71	0.98	46.73	97.95
147	296	1.66	1.80	1.80	0.00	0.00
148	198	1.88	0.91	0.05	0.86	94.30
166	350	1.76	2.36	0.51	1.85	78.28
167	312	1.88	1.32	0.63	0.69	52.04
174	161	1.88	1.29	1.29	0.00	0.17
176	319	1.88	0.61	0.61	0.00	0.00
178	330	1.88	29.48	29.48	0.00	0.00
Totals (All beds)			208.54	61.35	147.20	70.58
Average (per bed)			8.34	2.45	5.89	

Table 18. Mass degradation parameters for Type B (Semi Cohesive) treatment beds.

TB	Volume m ³	Density mg/m ³	Contamination m ^{max} kg	Contamination m ^{min} kg	Contamination Degraded kg	Contamination Degraded %
2	152	1.84	0.43	0.01	0.42	98.69
4	595	1.99	2.70	0.60	2.10	77.64
5	290	1.9	4.49	0.02	4.47	99.57
9	336	1.78	2.73	0.11	2.62	95.93
10	281	1.71	6.796	0.139	6.657	97.95
11	377	1.73	17.55	0.37	17.18	97.91
12	382	1.76	15.69	0.03	15.65	99.79
13	613	1.7	35.12	0.71	34.41	97.98
15	260	1.76	4.50	0.24	4.25	94.60
16	414	1.71	16.13	1.87	14.26	88.42
18	134	1.76	4.95	0.60	4.35	87.89
19	580	1.76	245.02	1.70	243.32	99.31
20	229	1.71	20.99	0.25	20.74	98.80
22	263	1.79	14.59	0.81	13.78	94.44
23	308	1.98	12.99	0.41	12.57	96.81
24	547	1.85	8.59	1.67	8.18	95.31
25	509	1.76	179.56	3.44	176.12	98.08
26	805	1.685	3.76	0.26	3.49	92.99
27	298	1.76	66.56	7.69	58.87	88.45
28	515	1.63	9.40	5.25	4.15	44.13
29	501	1.71	32.38	0.28	32.10	99.12
31	352	1.78	35.19	0.30	34.89	99.14
32	304	1.63	60.85	0.13	60.72	99.79
33	271	1.76	69.43	3.64	65.80	94.76
34	222	1.76	12.13	2.83	9.30	76.70
35	523	1.76	21.21	0.75	20.46	96.46
38	132	1.72	2.12	0.24	1.88	88.75
40	405	1.76	66.03	4.23	61.79	93.59
42	327	1.74	36.82	3.48	33.35	90.56
43	333	1.76	9.64	0.08	9.56	99.21

44	297	1.76	35.20	1.46	33.73	95.84
46	483	1.69	391.06	0.39	390.67	99.90
47	253	1.58	9.30	0.31	8.99	96.64
48	511	1.9	82.88	1.28	81.60	98.45
49	524	1.76	93.30	1.17	92.14	98.75
50	354	1.76	34.05	4.17	29.88	87.76
51	417	1.79	23.63	0.74	22.89	96.85
52	326	1.75	28.02	0.83	27.19	97.03
53	197	1.76	17.92	4.05	13.87	77.41
54	356	1.76	129.74	1.57	128.17	98.79
55BC	398	1.76	94.66	0.25	94.42	99.74
56	604	1.76	161.10	11.10	150.00	93.11
5755A	570	1.76	43.75	15.68	28.07	64.16
58	436	1.66	27.34	0.35	26.99	98.73
59	428	1.76	41.76	0.94	40.82	97.75
60	346	1.83	78.77	3.48	75.29	95.58
61	318	1.73	16.28	1.61	14.67	90.12
62	315	1.73	14.07	1.59	12.47	88.68
63	532	1.76	148.80	4.32	144.48	97.10
64	892	1.82	74.51	6.85	67.66	90.81
65	906	1.76	258.15	13.16	244.99	94.90
69A	500	1.76	152.67	18.53	134.14	87.86
69B	500	1.75	32.67	4.12	28.55	87.40
69C	500	1.76	458.14	22.94	435.20	94.99
69D	500	1.76	254.96	17.16	237.79	93.27
69E	500	1.76	155.50	23.50	132.00	84.89
69F	500	1.76	93.21	27.28	65.93	70.73
73	313	1.98	6.01	0.01	6.01	99.90
74	672	1.52	32.440	9.453	22.986	70.86
75	455	1.76	109.34	24.06	85.28	77.99
76	886	1.76	584.31	105.15	479.15	82.00
83	2189	1.77	1531.64	68.98	1462.66	95.50
85	713	1.94	75.96	3.81	72.15	94.98

86	801	1.76	17.91	2.07	15.84	88.45
87	859	1.76	489.473	141.951	347.522	71.00
88	966	1.76	821.08	123.06	698.03	85.01
93	709	1.76	4428.63	99.59	4329.05	97.75
94	495	1.88	190.69	2.29	188.39	98.80
95	760	1.76	167.24	3.04	164.20	98.18
96	481	1.81	8.45	0.22	8.23	97.38
97	492	1.75	8.53	0.34	8.19	95.99
98	352	1.57	42.77	1.82	40.95	95.75
99	903	1.76	553.86	43.87	509.99	92.08
101	815	1.76	49.91	11.73	38.18	76.49
102	597	1.76	55.398	2.790	52.608	94.96
103	1069	1.76	86.14	57.09	29.05	33.72
104	807	1.69	32.37	5.73	26.64	82.29
105	260	1.76	0.60	0.31	0.28	47.51
106	315	1.76	89.80	2.34	87.46	97.40
108	498	1.83	8.03	2.15	5.88	73.26
109	727	1.87	336.41	11.18	325.23	96.68
110	553	1.76	41.46	12.09	29.36	70.83
111	711	1.76	109.45	7.04	102.41	93.57
112	1168	1.76	164.98	14.67	150.31	91.11
113	1430	1.8	483.80	26.80	457.00	94.46
114	762	1.76	136.54	52.03	84.51	61.89
115A	188	1.86	129.03	4.86	124.17	96.24
155B	188	1.86	7.61	2.62	4.99	65.62
115C	905	1.86	25.494	21.428	4.065	15.95
116	878	1.76	575.66	16.67	558.99	97.10
117	696	1.76	212.05	8.52	203.53	95.98
118	1231	1.81	956.32	49.82	906.49	94.79
119	956	1.68	1199.019	68.814	1130.205	94.26
122	903	2.04	119.50	2.65	116.85	97.78
123	487	1.98	8.37	3.07	5.30	63.34
133	1845	1.86	83.41	62.63	20.78	24.91

134	1099	1.76	20.68	9.99	10.69	51.69
135	923	1.74	13.42	1.79	11.63	86.65
136	1411	1.76	56.27	21.58	34.69	61.65
137	1581	1.87	58.789	33.692	25.097	42.69
138	907	1.68	19.63	16.40	3.22	16.42
139	1183	1.76	37.07	15.33	21.75	58.66
144	979	1.65	14.39	7.27	7.12	49.46
150	352	1.92	7.45	0.22	7.23	97.05
152	639	1.8	4.86	0.33	4.53	93.14
160	1593	1.76	207.44	42.86	164.58	79.34
161	2025	1.61	33.97	8.80	25.16	74.08
162	1619	1.73	74.64	19.55	55.09	73.81
165	509	1.76	123.15	11.60	111.55	90.58
169	180	1.8	0.08	0.08	0.00	0.00
170	1341	1.76	231.58	170.79	60.78	26.25
173	1566	1.76	29.11	12.38	16.73	57.46
175	202	1.76	0.24	0.23	0.01	2.33
177	230	1.76	4.91	4.91	0.00	0.00
Totals (All beds)			18887.16	1685.57	17202.86	91.08
Average (per bed)			165.68	14.79	150.90	

Table 19. Mass degradation parameters for Type C (Gault Clay) treatment beds.

TB	Volume m ³	Density mg/m ³	Contamination m ^{max} kg	Contamination m ^{min} kg	Contamination Degraded kg	Contamination Degraded %
7	381	1.57	0.42	0.10	0.32	76.64
8	398	1.57	1.66	0.84	0.82	49.48
30	295	1.513	49.09	39.24	9.85	20.06
37	300	1.513	3.81	0.15	3.67	96.13
39	363	1.66	18.58	0.07	18.51	99.62
41	435	1.57	24.56	1.95	22.62	92.07
45	328	1.87	50.09	0.22	49.87	99.56
66	1725	1.46	11.41	0.08	11.33	99.34
67	1875	1.47	95.40	0.25	95.15	99.73
68	352	1.513	73.24	3.36	69.88	95.41
70	905	1.47	145.93	0.52	145.41	99.64
71	346	1.66	20.74	0.29	20.45	98.62
77	670	1.48	154.37	0.23	154.14	99.85
78	333	1.5	157.96	0.23	157.74	99.86
79	664	1.44	7.48	0.14	7.34	98.10
80	1453	1.49	71.97	1.97	70.00	97.26
89	499	1.47	42.34	8.01	34.33	81.08
90	450	1.47	46.11	0.50	45.60	98.91
91	330	1.47	24.57	0.79	23.78	96.77
92	312	1.47	8.76	0.25	8.51	97.12
140	831	1.45	5.40	0.65	4.75	88.01
141	792	1.8	17.04	15.56	1.48	8.70
142	983	1.513	198.64	11.15	187.49	94.39
145	427	1.513	3.44	0.26	3.18	92.42
146	699	1.44	13.38	1.22	12.16	90.86
149	231	1.51	1.52	0.21	1.32	86.30
153	1919	1.41	16.98	16.53	0.45	2.64
154	1456	1.46	118.55	49.30	69.25	58.41
155	1456	1.42	99.76	13.88	85.89	86.09
156	426	1.8	18.72	4.46	14.26	76.17

157	1162	1.44	120.83	38.67	82.16	67.99
158	1185	1.43	83.08	17.13	65.96	79.39
159	1234	1.43	9.22	8.43	0.79	8.52
163	452	1.513	6.25	1.52	4.73	75.69
164	496	1.513	5.85	1.41	4.44	75.96
171	325	1.513	12.89	12.55	0.35	2.70
172	261	1.513	2.77	0.48	2.29	82.62
Totals (All beds)			1742.83	252.60	1490.23	85.51
Average (per bed)			47.10	6.83	40.28	

Table 20. Mass Degradation calculation for all remediated site materials (treatment beds)

TB material type	Contamination m ^{max} kg	Contamination m ^{min} kg	Contamination Degraded kg	Contamination Degraded %
Type A	208.54	61.35	147.20	70.58
Type B	18887.16	1685.57	17202.86	91.08
Type C	1742.83	252.60	1490.23	85.51
TOTALS	20838.53	1999.51	18840.29	90.41

Table 16. Example of figures used in mass degradation calculation for TB83

TB Volume	TB Density	TB mass	TB mass	Contaminant of Concern (COC)	Maximum concentration of contamination recorded (tmax)	Final concentration of contamination recorded (tmin)	Maximum mass of contamination recorded (mmax)	Final mass of contamination recorded (mmin)	Total contaminant mass degraded during treatment
m ³	mg/m ³	tonnes	kg		µg/kg	µg/kg	kg	kg	kg
2189	1.77	3874.53	3874530	Dimefox	0	0	0.000	0.000	0.000
				Ethofumesate	10000	7900	38.745	30.609	8.137
				Hempa	630	0	2.441	0.000	2.441
				Schradan	770	770	2.983	2.983	0.000
				Simazine	3800	2600	14.723	10.074	4.649
				Dicamba	140	80	0.542	0.310	0.232
				Phenoxy Acetic acid herbicide: Dichlorprop	270	10	1.046	0.039	1.007
				Phenoxy Acetic acid herbicide: MCPA	2300	10	8.911	0.039	8.873
				Phenoxy Acetic acid herbicide: Mecoprop	500	50	1.937	0.194	1.744
				2,4,6-Trichlorophenol	8600	3300	33.321	12.786	20.535
				2-Methyl-4,6-dinitrophenol	0	0	0.000	0.000	0.000
				4-Chloro-2-methylphenol	3200	810	12.398	3.138	9.260
				Bis (2-chloroethyl) ether	6100	1700	23.635	6.587	17.048
				Phenol	0	0	0.000	0.000	0.000
				1,2-Dichlorobenzene	23000	25	89.114	0.097	89.017
				1,2-Dichloroethane	4300	33	16.660	0.128	16.533
				Cis-1,2-Dichloroethylene	1200	0	4.649	0.000	4.649
				Cyclohexanone	0	0	0.000	0.000	0.000
				Tetrachloroethylene	180000	420	697.415	1.627	695.788
				Toluene	110000	71	426.198	0.275	425.923
Trichloroethylene	4500	14	17.435	0.054	17.381				
Vinyl chloride monomer	0	0	0.000	0.000	0.000				
Xylene (Total)	36000	10	139.483	0.039	139.444				
TOTAL							1531.640	68.978	1462.662
% Degraded							95.49644583		