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Environmental Chemistry

Supplementary Material

Kaolinitic clays as a potential source of dioxins in the Noosa River catchment, Queensland, Australia

Suzanne Vardy[A,*], *Jacob Gruythuysen*[B] and *Brenda Baddiley*[A]

[A]Water Quality and Investigations, Science and Technology Division, Department of Environment and Science, Yuggera, Ecosciences Precinct, GPO Box 2454, Brisbane, Qld 4001, Australia

[B]Aquatic Ecosystem Health, Science and Technology Division, Department of Environment and Science, Yuggera, Ecosciences Precinct, GPO Box 2454, Brisbane, Qld 4001, Australia

*Correspondence to: Email: suzanne.vardy@des.qld.gov.au

Supplementary data

Table 1. Quality control data 2020 – blind laboratory duplicates

Lab	Site ID	Sample type	2,3,7,8-TCDD	1,2,3,7,8-PeCDD	1,2,3,4,7,8-HxCDD	1,2,3,6,7,8-HxCDD	1,2,3,7,8,9-HxCDD	1,2,3,4,6,7,8-HpCDD	OCDD	2,3,7,8-TCDF	1,2,3,7,8-PeCDF	2,3,4,7,8-PeCDF	1,2,3,4,7,8-HxCDF	1,2,3,6,7,8-HxCDF	2,3,4,6,7,8-HxCDF	1,2,3,7,8,9-HxCDF	1,2,3,4,6,7,8-HpCDF	1,2,3,4,7,8,9-HpCDF	OCDF
			pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
ALS	Cootharaba S	Primary	<0.5	7.7	7.2	13.4	34.2	286	4,230	<0.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<5.0
	Cootharaba S	Duplicate	<0.5	6.4	5.9	11.4	28.2	285	3,640	<0.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<4.9
		RPD	0	18	20	16	19	0	15	0	0	0	0	0	0	0	0	0	0
ALS	Cootharaba S	Primary	<0.5	7.7	7.2	13.4	34.2	286	4,230	<0.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<5.0
NMI	Cootharaba S	Interlab duplicate	<0.4	2.6	4.9	12	26	330	4,870	0.16	0.11	0.07	<0.08	<0.08	<0.1	<0.07	<0.2	<0.04	0.24
		RPD	0	99	38	11	27	14	14	0	0	0	0	0	0	0	0	0	0
ALS	Cootharaba N	Primary	<0.5	<2.5	<2.5	4.4	11.7	142	4,530	<0.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<5.0
	Cootharaba N	Duplicate	0.7	3.6	3.9	5.5	14.6	188	6,080	0.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<5.0
		RPD	33	36	44	22	22	28	29	0	0	0	0	0	0	0	0	0	0
ALS	Cootharaba N	Primary	<0.5	<2.5	<2.5	4.4	11.7	142	4,530	<0.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<5.0
NMI	Cootharaba N	Interlab duplicate	<0.3	0.77	1.6	3.7	9.2	160	5,540	<0.06	<0.05	<0.03	<0.06	<0.06	<0.06	<0.08	0.21	<0.04	0.39
		RPD	0	0	0	17	24	12	20	0	0	0	0	0	0	0	0	0	0
ALS	Weyba	Primary	2.70	19	20.4	29	66.9	321	4,410	<0.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<5.0
	Weyba	Duplicate	4.4	44.6	34.7	44.2	114	589	6,410	<0.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<4.9
		RPD	48	81	52	42	52	59	37	0	0	0	0	0	0	0	0	0	0
ALS	Weyba	Primary	2.7	19	20.4	29	66.9	321	4,410	<0.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<5.0
NMI	Weyba	Interlab duplicate	4	27	27	44	110	730	9,070	0.15	0.13	0.07	<0.09	<0.08	<0.08	<0.08	0.3	0.06	0.31
		RPD	39	35	28	41	49	78	69	0	0	0	0	0	0	0	0	0	0

Table 2. Quality control data 2021 – blind laboratory duplicates

Lab	Site ID	Sample type	2,3,7,8-TCDD	1,2,3,7,8-PeCDD	1,2,3,4,7,8-HxCDD	1,2,3,6,7,8-HxCDD	1,2,3,7,8,9-HxCDD	1,2,3,4,6,7,8-HpCDD	OCDD	2,3,7,8-TCDF	1,2,3,7,8-PeCDF	2,3,4,7,8-PeCDF	1,2,3,4,7,8-HxCDF	1,2,3,6,7,8-HxCDF	2,3,4,6,7,8-HxCDF	1,2,3,7,8,9-HxCDF	1,2,3,4,6,7,8-HpCDF	1,2,3,4,7,8,9-HpCDF	OCDF
			pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
ALS	**Cootharaba N**	**Primary**	<0.5	<2.5	<2.5	5.3	11.6	235	8,570	<0.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<5.0
	Cootharaba N	**Duplicate**	<0.5	<2.5	<2.5	<2.5	5.5	106	4,580	<0.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<5.0
		RPD	0	0	0	72	71	76	61	0	0	0	0	0	0	0	0	0	0
ALS	**Cootharaba N**	**Primary**	<0.5	<2.5	<2.5	5.3	11.6	235	8,570	<0.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<5.0
NMI	**Cootharaba N**	**Interlab duplicate**	<0.2	0.63	1.6	3.3	8	150	5,430	<0.1	<0.1	<0.03	<0.03	<0.04	<0.05	<0.07	0.26	<0.04	0.41
		RPD	0	0	0	47	37	44	45	0	0	0	0	0	0	0	0	0	0
ALS	**Weyba**	**Primary**	4.3	52.1	36.6	58.5	125	923	11,300	<0.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<4.9
	Weyba	**Duplicate**	3	34.3	38.8	26.6	89.9	670	8,490	<0.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<4.9
		RPD	36	41	6	75	33	32	28	0	0	0	0	0	0	0	0	0	0
ALS	**Weyba**	**Primary**	4.3	52.1	36.6	58.5	125	923	11,300	<0.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<4.9
NMI	**Weyba**	**Interlab duplicate**	3.4	24	26	43	100	760	10,300	<0.2	<0.1	<0.08	<0.05	<0.1	<0.1	<0.05	0.45	<0.06	<0.2
		RPD	23	74	34	31	22	19	9	0	0	0	0	0	0	0	0	0	0

Table 3. Complete dioxin congener and homologue results

Lake	Poona	Coolamera	Cootharaba N		Cootharaba S		Cooroibah		Doonella		Weyba	
Year sampled	**2020**	**2020**	**2020**	**2021**	**2020**	**2021**	**2020**	**2021**	**2020**	**2021**	**2020***	**2021***
2,3,7,8-TCDD	<0.5	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	3.6	3.7
1,2,3,7,8-PeCDD	<2.4	<2.4	3.6	<2.5	7.1	5.5	5.7	<2.5	<2.5	<2.5	31.8	43.2
1,2,3,4,7,8-HxCDD	<2.4	<2.4	3.9	<2.5	6.6	5.4	5.6	3.3	<2.5	<2.5	27.6	37.7
1,2,3,6,7,8-HxCDD	<2.4	<2.4	5.0	5.3	12.4	11.9	11.4	7.6	2.6	3.7	36.6	42.6
1,2,3,7,8,9-HxCDD	2.5	4.7	13.2	8.6	31.2	25.0	27.6	16.6	5.5	7.6	90.5	107
1,2,3,4,6,7,8-HpCDD	83.4	62.7	165	170	286	346	270	244	60.3	113	455	796
OCDD	2,210	3,050	5,305	6,575	3,935	5,740	4,930	4,640	1,210	2,780	5,410	9,895
2,3,7,8-TCDF	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2,3,7,8-PeCDF	<2.4	<2.4	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
2,3,4,7,8-PeCDF	<2.4	<2.4	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
1,2,3,4,7,8-HxCDF	<2.4	<2.4	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
1,2,3,6,7,8-HxCDF	<2.4	<2.4	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
2,3,4,6,7,8-HxCDF	<2.4	<2.4	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
1,2,3,7,8,9-HxCDF	<2.4	<2.4	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
1,2,3,4,6,7,8-HpCDF	<2.4	<2.4	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
1,2,3,4,7,8,9-HpCDF	<2.4	<2.4	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
OCDF	<4.9	<4.9	<5.0	<5.0	<5.0	<5.0	<4.9	<4.9	<4.9	<4.9	<5.0	<4.9
Tetra-Dioxins	40.0	34.7	56.7	34.2	220	142	177	137	33.2	33.4	417	374
Penta-Dioxins	26.6	26.3	102	66.6	362	242	289	169	58	56.4	794	754
Hexa-Dioxins	123	98.2	670	412	1,805	1,260	1,440	816	302	320	3,090	2,645
Hepta-Dioxins	216	182	602	668	1,280	1,500	1,160	1,050	245	439	1,770	2,860
Octa-Dioxin	2,210	3,050	4,530	6,575	3,935	5,740	4,930	4,640	1,210	2,780	5,410	9,895
Tetra-Furans	<7.8	14.6	<0.5	4.1	<6.4	<8.9	<6.9	<0.5	<0.5	<0.5	10.2	8.5
Penta-Furans	<2.4	<2.4	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
Hexa-Furans	<2.4	<2.4	<2.5	<2.5	<2.5	<24.9	<2.5	<2.5	<2.5	<2.5	<2.5	<22.2
Hepta-Furans	<2.4	<2.4	<2.5	<5.0	<2.5	<7.5	<2.5	<7.4	<2.5	<7.4	<2.5	<7.4
Octa-Furan	<4.9	<4.9	<5.0	<5.0	<5.0	<5.0	<4.9	<4.9	<4.9	<4.9	<5.0	<4.9
Total 2,3,7,8- substituted dioxins	2,296	3,117	5,496	6,759	4,278	6,134	5,250	4,912	1,278	2,904	6,055	10,926
Total 2,3,7,8- substituted furans	<LOR	<LOR	0.5	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
∑PCDD/PCDF homologues	2,616	3,406	6,797	7,757	7,602	8,884	7,996	6,812	1,848	3,629	11,491	16,536