Tables

Table 6.4-1: Chemical and Bacterial Composition of Poultry Waste and Cattle Manure (Solids)

Parameter	Units ID	Poultry Waste												Cattle Manure										
														Fresh			Dry							
		Number of Samples	CDM Average	CDM Median	Literature Average (1)	Literature Average (3)	Literature Median (3)	Literature Average (4)	Literature (2)	Literature Average (5)	Literature Average (7)	Literature Average (9)	Literature Average (10)	Number of Samples	CDM Average	CDM Median	Number of Samples	CDM Average	CDM Median	Literature (2)	Literature Average (4)	Literature Average (5)	Literature Average (6)	Literature Average (8)
Estriol	ng/g	15	5.87	3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17a-estradiol	ng/g	15	3.18	3.75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Estrone	ng/g	15	13.2	8.82	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17b-estradiol	ng/g	15	3.01	3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Campylobacter species	MPN*/gram	2	0.126	0.126	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E. coli	MPN*/gram	16	40400	3860	-	-	-	-	-	-	0 (non-compost)	-	-	4	806000	795000	4	171000	111000	-	-	-	-	>300,000
Enterococcus Group	MPN*/gram	16	107000	137000	-	-	-	-	-	-	-	-	-	4	201000	56100	4	152000	72600	-	-	-	-	>300,000
Total Coliform	MPN*/gram	16	47500	11800	-	-	-	-	-	-	0 (non-compost)	646000	-	4	806000	795000	4	202000	169000	-	-	-	-	-
Staphylococcus aureus	MPN*/gram	16	0.11	0.111	-	-	-	-	-	-	0 (non-compost)	7.94E+12	-	4	0.604	0.596	4	0.29	0.293	-	-	-	-	-
Salmonella species	MPN*/gram	16	0.232	0.112	-	-	-	-	-	-	0 (non-compost)	10	-	4	0.604	0.596	4	0.29	0.293	-	-	-	-	-
Fecal Coliform	MPN*/gram	16	46900	7610	-	-	-	-	-	-	-	-	-	4	806000	795000	4	171000	111000	-	-	-	-	>300,000
Organic Matter	%	16	73.2	74.3	-	-	-	-	-	-	-	-	-	5	86.3	86.4	5	86.6	88.7	-	-	-	-	-
Solids Total	%	16	81.6	81.1	-	-	-	-	-	-	-	-	-	5	24.8	15.9	5	31.6	28	-	-	-	-	-
Moisture	%	16	18.4	19	-	-	-	-	-	-	-	-	-	5	75.2	84.2	5	68.4	72	-	14.7	-	-	-
Total Molybdenum	mg/Kg	10	3.56	3.48	6	-		-	-	-	-	-	4.03	5	3	2.82	5	1.49	0.977	-	-	-	-	-
Total Barium	mg/Kg	16	48.8	45.5	-	21.6	21	-	-	-	-	-	19.1	5	82.2	97.4	5	91.9	90.2	-	-	-	-	-
Total Cadmium	mg/Kg	16	0.307	0.308	3	0.252	0.232	-	-	-	-	4.9	-	5	1.42	1.59	5	0.822	0.893	-	-	-	-	-
Total P (6020)	mg/Kg	16	20100	19600	22400	17100	17900	13600	12800	16000	21000	6000	15700	5	5920	5940	5	2690	2630	16000	10800	4940	9000	-
Nitrogen Total (Inorganic + Organic)	mg/Kg	16	30000	37700	34500	-	-	-	-	-	-	34000	37200	5	30600	37400	5	30000	26100	-	-	-	-	-
Ammonium (Water Soluble)	mg/Kg	16	1700	1400	-	-	-	-	-	-	-	-	-	5	808	938	5	215	161	-	-	-	-	-
Total Mercury	mg/Kg	16	0.00561	0.00396	-	-	-	-	-	-	-	-	-	5	0.0826	0.0231	5	0.0153	0.0105	-	-	-	-	-
Phosphorus (Mehlich 3)	mg/Kg	16	5410	4320	-	-	-	-	-	-	-	-	-	5	3280	3230	5	1610	1380	-	-	-	-	-
Total Beryllium	mg/Kg	16	0.307	0.308	-	-	-	-	-	-	-	-	-	5	1.42	1.59	5	0.822	0.893	-	-	-	-	-
Total Chromium	mg/Kg	16	7.33	6.67	-	-	-	-	-	-	-	-	22.5	5	1.42	1.59	5	0.822	0.893	-	-	-	-	-
Phosphorus (Water Soluble)	mg/Kg	16	1440	796	-	-	-	-	-	-	-	-	-	5	3020	2350	5	950	754	-	-	-	-	-
Sulfate (Water Soluble)	mg/Kg	16	4410	4310	-	-	-	-	-	-	-	-	-	5	569	361	5	69.9	39.1	-	-	-	-	-
Total Aluminum	mg/Kg	16	1930	1350	1180	3170	2370	-	-	473	3960	-	727	5	493	562	5	562	514	-	-	1530	1440	-
Total Antimony	mg/Kg	16	0.307	0.308	-	-	-	-	-	-	-	-	-	5	1.42	1.59	5	0.822	0.893	-	-	-	-	-
Total Arsenic	mg/Kg	16	18.7	21	43	15.7	14.8	-	-	-	-	-	-	5	1.42	1.59	5	0.822	0.893	-	-	-	-	-
Chloride (Water Soluble)	mg/Kg	16	3880	4130	-	-	-	-	-	-	-	-	-	5	3190	3080	5	305	113	-	-	-	-	-
Total Iron	mg/Kg	16	1100	732	1100	2190	1910	-	-	860	3860	-	-	5	525	584	5	509	493	-	918	1150	2030	-
Total Calcium	mg/Kg	16	34400	35100	-	22400	22200	18600	-	20600	30000	-	21200	5	9010	8420	5	6960	6560	-	16500	15900	19600	-
Total Nickel	mg/Kg	16	14	13.3	15	11.1	10.8	-	-	-	-	-	-	5	1.86	1.86	5	0.822	0.893	-	-	-	-	-
Total Cobalt	mg/Kg	16	1.81	1.69	6	-	-	-	-	-	-	-	2.47	5	1.42	1.59	5	0.822	0.893	-	-	-	-	-
Total Copper	mg/Kg	16	417	430	748	479	414	-	-	-	557	-	565	5	14	14.2	5	10.5	9.45	-	-	-	40	-
Nitrate-N (Water Soluble)	mg/Kg	16	248	11.8	-	-	-	-	-	-	-	-	-	5	28.4	31.9	5	16.4	17.9	-	-	-	-	-
Total Manganese	mg/Kg	16	1490	754	956	449	460	-	-	-	6300	-	688	5	342	350	5	348	346	-	224	-	154	-

Table 6.4-1: Chemical and Bacterial Composition of Poultry Waste and Cattle Manure (Solids)

Parameter	Units ID	Poultry Waste												Cattle Manure										
														Fresh			Dry							
		Number of Samples	CDM Average	CDM Median	Literature Average (1)	Literature Average (3)	Literature Median (3)	Literature Average (4)	Literature (2)	Literature Average (5)	Literature Average (7)	Literature Average (9)	Literature Average (10)	Number of Samples	CDM Average	CDM Median	Number of Samples	CDM Average	CDM Median	Literature (2)	Literature Average (4)	Literature Average (5)	Literature Average (6)	Literature Average (8)
Total Lead	mg/Kg	16	1.82	1.33	11	2.06	1.78	-	-	-	-	-	13	5	1.42	1.59	5	0.822	0.893	-	-	-	-	-
Total Magnesium	mg/Kg	16	5900	6760	6570	7160	7170	6820	-	6470	-	-	4700	5	4820	5010	5	2830	2340	-	5760	6851	6000	-
Total Selenium	mg/Kg	16	1.2	1.31	-	1.18	1.13	-	-	-	-	-	-	5	1.42	1.59	5	0.822	0.893	-	-	-	-	-
Total Potassium	mg/Kg	16	30700	29100	26400	33000	35800	18200	15000	-	30000	13000	23400	5	9270	9060	5	1950	2230	35000	24700	-	7300	-
Total Vanadium	mg/Kg	16	17.6	6.27	-	-	-	-	-	-	-	-	-	5	7.11	7.96	5	4.11	4.46	-	-	-	-	-
Total Thallium	mg/Kg	16	0.307	0.308	-	-	-	-	-	-	-	-	-	5	1.42	1.59	5	0.822	0.893	-	-	-	-	-
Total Sodium	mg/Kg	16	8090	7510	7840	10800	11300	6820	-	-	8200	-	-	5	1210	1380	5	159	97.7	-	3530	-	10	-
Total Silver	mg/Kg	16	8.23	0.308	-	-	-	-	-	-	-	-	-	5	1.42	1.59	5	0.822	0.893	-	-	-	-	-
Total Zinc	mg/Kg	16	506	469	718	373	376	-	-	-	484	154	517	5	74.1	78	5	72.9	68	-	-	-	127	-
Soluble Salts (1:2)	mmhos/cm	16	11.8	12.2	-	-	-	-	-	-	-	-	-	5	3.85	3.28	5	2.18	0.89	-	-	-	-	-
pH (1:1)	s.u.	10	7.93	8.05	-	-	-	-	-	-	-	5.9	-	5	7.44	7.6	5	7.58	7.6	-	7	-	-	-
Brevibacteria 16S rRNA	Copies/g	9	1.1E+09	1.03E+09	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-

(-) samples were not analyzed for the parameter of interest for the sample of interest
Non-detects treated as 1/2 the detection limit

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Table 6.4-2a: Chemical and Bacterial Compounds of Poultry and Cattle Wastes (Water)

Parameter	Units	POULTRY									CATTLE																	
		Edge of Field			SPLP Leach						Edge of Field			Cattle Impacted Spring			SPLP Leach on Fresh Manure						SPLP Leach on Dry Manure					
					4:1 Ratio			20:1 Ratio									4:1 Ratio			20:1 Ratio			4:1 Ratio			20:1 Ratio		
		Number of Samples	CDM Average	CDM Median	Number of Samples	CDM Average	CDM Median	Number of Samples	CDM Average	CDM Median	Number of Samples	CDM Average	CDM Median	Number of Samples	CDM Average	CDM Median	Number of Samples	CDM Average	CDM Median	Number of Samples	CDM Average	CDM Median	Number of Samples	CDM Average	CDM Median	Number of Samples	CDM Average	CDM Median
17a-estradiol	ng/L	43	2.48	0.5	-	-	-	2	273	273	2	0.05	0.05	1	0.5	0.5	-	-	-	3	113	0.05	-	-	-	1	0.05	0.05
17b-estradiol	ng/L	43	2.49	2.11	-	-	-	2	0.05	0.05	2	0.05	0.05	1	0.5	0.5	-	-	-	3	0.05	0.05	-	-	-	1	0.05	0.05
Alkalinity (as CaCO3)	mg/L	67	110	60	1	3680	3680	2	1610	1610	2	25	25	2	188	188	1	735	735	5	302	291	1	493	493	5	152	145
Ammonia Nitrogen	mg/L	66	4.26	0.369	-	-	-	-	-	-	2	0.145	0.145	2	0.0695	0.0695	-	-	-	-	-	-	-	-	-	-	-	-
Brevibacteria 16S rRNA	Copies/L	38	5310000	73700	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Campylobacter species	MPN*/100ml or cfu/100mL	60	29.6	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride	mg/L	67	22.3	5.08	1	1840	1840	2	402	402	2	3.62	3.62	2	51.9	51.9	1	50	50	5	27.1	31.7	1	50	50	5	10	10
Conductivity	mmhos/cm	43	0.196	0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Aluminum	mg/L	81	0.334	0.159	1	0.5	0.5	2	1.23	1.23	2	0.05	0.05	2	0.05	0.05	1	1.15	1.15	5	0.5	0.5	1	0.5	0.5	5	0.5	0.5
Dissolved Antimony	mg/L	81	0.00362	0.001	1	0.005	0.005	2	0.005	0.005	2	0.0005	0.0005	2	0.0005	0.0005	1	0.005	0.005	5	0.005	0.005	1	0.005	0.005	5	0.005	0.005
Dissolved Arsenic	mg/L	91	0.823	0.005	1	1.44	1.44	2	0.238	0.238	2	0.00175	0.00175	2	0.003	0.003	1	0.012	0.012	5	0.005	0.005	1	0.005	0.005	5	0.005	0.005
Dissolved Barium	mg/L	83	0.0573	0.037	1	0.495	0.495	2	0.202	0.202	2	0.017	0.017	2	0.208	0.208	1	0.481	0.481	5	0.198	0.196	1	0.242	0.242	5	0.145	0.131
Dissolved Beryllium	mg/L	81	0.00119	0.0005	1	0.005	0.005	2	0.005	0.005	2	0.0005	0.0005	2	0.0005	0.0005	1	0.005	0.005	5	0.005	0.005	1	0.005	0.005	5	0.005	0.005
Dissolved Cadmium	mg/L	81	0.00147	0.0005	1	0.005	0.005	2	0.005	0.005	2	0.0005	0.0005	2	0.0005	0.0005	1	0.005	0.005	5	0.005	0.005	1	0.005	0.005	5	0.005	0.005
Dissolved Calcium	mg/L	83	37.2	22	1	106	106	2	45.4	45.4	2	5.75	5.75	2	101	101	1	84.7	84.7	5	46.1	48.5	1	76.9	76.9	5	34.4	34.6
Dissolved Chromium	mg/L	83	0.00809	0.0025	1	0.059	0.059	2	0.037	0.037	2	0.00118	0.00118	2	0.00125	0.00125	1	0.005	0.005	5	0.005	0.005	1	0.033	0.033	5	0.005	0.005
Dissolved Cobalt	mg/L	81	0.153	0.001	1	0.118	0.118	2	0.0265	0.0265	2	0.0005	0.0005	2	0.00175	0.00175	1	0.005	0.005	5	0.005	0.005	1	0.005	0.005	5	0.005	0.005
Dissolved Copper	mg/L	91	0.123	0.0125	1	10.4	10.4	2	4.54	4.54	2	0.0378	0.0378	2	0.0065	0.0065	1	0.082	0.082	5	0.0242	0.025	1	0.039	0.039	5	0.0172	0.018
Dissolved Iron	mg/L	82	0.607	0.175	1	16.6	16.6	2	7.47	7.47	2	0.097	0.097	2	0.05	0.05	1	1.32	1.32	5	0.5	0.5	1	0.5	0.5	5	0.5	0.5
Dissolved Lead	mg/L	81	0.00259	0.003	1	0.016	0.016	2	0.005	0.005	2	0.0005	0.0005	2	0.00675	0.00675	1	0.005	0.005	5	0.005	0.005	1	0.005	0.005	5	0.005	0.005
Dissolved Magnesium	mg/L	83	6.17	2.46	1	141	141	2	59.7	59.7	2	1.96	1.96	2	14.8	14.8	1	64	64	5	28.1	28.3	1	63.6	63.6	5	20	20.2
Dissolved Manganese	mg/L	83	0.254	0.03	1	5.04	5.04	2	1.54	1.54	2	0.00401	0.00401	2	0.0605	0.0605	1	1.52	1.52	5	0.773	0.886	1	0.815	0.815	5	0.304	0.297
Dissolved Molybdenum	mg/L	69	0.0159	0.0025	1	0.186	0.186	2	0.115	0.115	2	0.0005	0.0005	2	0.0025	0.0025	1	0.012	0.012	5	0.005	0.005	1	0.005	0.005	5	0.005	0.005
Dissolved Nickel	mg/L	82	0.0123	0.005	1	0.785	0.785	2	0.235	0.235	2	0.00084	0.00084	2	0.0065	0.0065	1	0.025	0.025	5	0.0076	0.005	1	0.038	0.038	5	0.005	0.005
Dissolved Ortho P (365.2)	mg/L	35	0.304	0.043	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Potassium	mg/L	83	41.8	7.13	1	3070	3070	2	976	976	2	7.59	7.59	2	51.1	51.1	1	415	415	5	73.1	64	1	105	105	5	19	9.23
Dissolved Selenium	mg/L	81	0.0035	0.001	1	0.07	0.07	2	0.0165	0.0165	2	0.0005	0.0005	2	0.0005	0.0005	1	0.005	0.005	5	0.005	0.005	1	0.005	0.005	5	0.005	0.005
Dissolved Silver	mg/L	81	0.00223	0.0005	1	0.005	0.005	2	0.005	0.005	2	0.0005	0.0005	2	0.0005	0.0005	1	0.005	0.005	5	0.005	0.005	1	0.005	0.005	5	0.005	0.005
Dissolved Sodium	mg/L	83	19.3	3.75	1	802	802	2	295	295	2	1.91	1.91	2	36.8	36.8	1	37	37	5	42	37.8	1	64	64	5	8.86	4.62
Dissolved Titanium	mg/L	1	0.0005	0.0005	-	-	-	-	-	-	-	-	-	2	0.0005	0.0005	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Vanadium	mg/L	81	0.0118	0.005	1	0.42	0.42	2	0.34	0.34	2	0.0025	0.0025	2	0.005	0.005	1	0.367	0.367	5	0.308	0.308	1	0.348	0.348	5	0.344	0.357
Dissolved Zinc	mg/L	91	0.0811	0.023	1	13.8	13.8	2	2.57	2.57	2	0.0312	0.0312	2	0.00675	0.00675	1	0.316	0.316	5	0.119	0.089	1	0.129	0.129	5	0.0994	0.073
`E. coli	MPN*/100ml or cfu/100mL	67	88300	5950	1	>12000	>12000	2	>12000	>12000	2	>12000	>12000	2	820	820	1	>12000	>12000	5	>12000	>12000	1	>12000	>12000	5	7350	>12000
Enterococcus Group	ng/L	67	122000	11000	1	5400	5400	2	8000	8000	2	>12000	>12000	2	6020	6020	1	>12000	>12000	5	8320	7600	1	>12000	>12000	5	5440	2400
Estriol	ng/L	43	32.6	0.5	-	-	-	2	0.05	0.05	2	0.05	0.05	1	0.5	0.5	-	-	-	3	0.05	0.05	-	-	-	1	0.05	0.05

Table 6.4-2a: Chemical and Bacterial Compounds of Poultry and Cattle Wastes (Water)

Parameter	Units	POULTRY									CATTLE																	
		Edge of Field			SPLP Leach						Edge of Field			Cattle Impacted Spring			SPLP Leach on Fresh Manure						SPLP Leach on Dry Manure					
					4:1 Ratio			20:1 Ratio									4:1 Ratio			20:1 Ratio			4:1 Ratio			20:1 Ratio		
		Number of Samples	CDM Average	CDM Median	Number of Samples	CDM Average	CDM Median	Number of Samples	CDM Average	CDM Median	Number of Samples	CDM Average	CDM Median	Number of Samples	CDM Average	CDM Median	Number of Samples	CDM Average	CDM Median	Number of Samples	CDM Average	CDM Median	Number of Samples	CDM Average	CDM Median	Number of Samples	CDM Average	CDM Median
Estrone	ng/L	43	5.26	0.5	-	-	-	2	0.05	0.05	2	0.05	0.05	1	0.5	0.5	-	-	-	3	64.7	0.05	-	-	-	1	0.05	0.05
Fecal Coliform	MPN*/100ml or cfu/100mL	68	89900	5000	1	>12000	>12000	2	>12000	>12000	2	>12000	>12000	2	670	670	1	>12000	>12000	5	>12000	>12000	1	>12000	>12000	5	7350	>12000
Nitrite + Nitrate (as N)	mg/L	69	1.63	1.21	-	-	-	2	1	1	2	0.197	0.197	2	33.4	33.4	-	-	-	5	1	1	-	-	-	5	1	1
pH (1:1)	s.u.	67	6.82	6.7	1	7.3	7.3	2	7.45	7.45	2	6.5	6.5	2	6.35	6.35	1	7.7	7.7	5	7.34	7.4	1	7.8	7.8	5	7.28	7.2
Salmonella species	MPN*/100ml or cfu/100mL	68	2.3	1	-	-	-	2	1	1	2	1	1	2	1	1	1	1	1	5	1	1	1	1	1	5	1	1
Soluble Reactive P (4500PF)	mg/L	46	3.66	0.529	1	487	487	2	131	131	2	0.553	0.553	2	2.94	2.94	2	132	65.9	4	30.5	32.8	2	33.7	33.7	4	26.2	25.2
Staphylococcus aureus	MPN*/100ml or cfu/100mL	67	11	1	-	-	-	2	1.5	1.5	2	0.825	0.825	2	0.55	0.55	1	1.5	1.5	4	1.76	1.25	-	-	-	6	10.3	1
TOC	mg/L	71	57.8	10	1	13.5	13.5	2	10.2	10.2	2	11.7	11.7	2	11.4	11.4	1	12.6	12.6	5	50.7	3.34	1	4.62	4.62	5	13.8	6.95
Total Aluminum	mg/L	83	9.14	4.09	-	-	-	-	-	-	2	2.76	2.76	2	0.05	0.05	-	-	-	-	-	-	-	-	-	-	-	-
Total Antimony	mg/L	81	0.00354	0.002	-	-	-	-	-	-	2	0.0005	0.0005	2	0.0005	0.0005	-	-	-	-	-	-	-	-	-	-	-	-
Total Arsenic	mg/L	91	0.0171	0.005	-	-	-	-	-	-	2	0.00282	0.00282	2	0.0035	0.0035	-	-	-	-	-	-	-	-	-	-	-	-
Total Barium	mg/L	83	0.174	0.086	-	-	-	-	-	-	2	0.0621	0.0621	2	0.209	0.209	-	-	-	-	-	-	-	-	-	-	-	-
Total Beryllium	mg/L	81	0.00149	0.0005	-	-	-	-	-	-	2	0.0005	0.0005	2	0.0005	0.0005	-	-	-	-	-	-	-	-	-	-	-	-
Total Cadmium	mg/L	81	0.00149	0.0005	-	-	-	-	-	-	2	0.0005	0.0005	2	0.0005	0.0005	-	-	-	-	-	-	-	-	-	-	-	-
Total Calcium	mg/L	83	64.5	26.3	-	-	-	-	-	-	2	5.99	5.99	2	80.8	80.8	-	-	-	-	-	-	-	-	-	-	-	-
Total Chromium	mg/L	82	0.0218	0.008	-	-	-	-	-	-	2	0.00132	0.00132	2	0.00125	0.00125	-	-	-	-	-	-	-	-	-	-	-	-
Total Cobalt	mg/L	82	0.00973	0.005	-	-	-	-	-	-	2	0.00118	0.00118	2	0.00175	0.00175	-	-	-	-	-	-	-	-	-	-	-	-
Total Coliform	MPN*/100ml or cfu/100mL	68	220000	30000	1	>12000	>12000	2	>12000	>12000	2	>12000	>12000	2	6900	6900	1	>12000	>12000	5	>12000	>12000	1	>12000	>12000	5	7790	>12000
Total Copper	mg/L	91	0.16	0.014	-	-	-	-	-	-	2	0.00306	0.00306	2	0.006	0.006	-	-	-	-	-	-	-	-	-	-	-	-
Total Dissolved P (365.2)	mg/L	38	0.568	0.183	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Dissolved P (4500PF)	mg/L	46	4.68	0.582	1	596	596	2	165	165	2	0.607	0.607	2	3.09	3.09	2	148	73.9	4	37.9	38.5	2	37.4	37.4	4	28.3	27.8
Total Dissolved P (6010)	mg/L	45	1.37	0.737	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Dissolved P (6020)	mg/L	46	5.92	0.788	1	443	443	2	134	134	2	0.523	0.523	2	2.7	2.7	1	83	83	5	27.4	27.2	1	43.1	43.1	5	19.8	19
Total Dissolved Solids	mg/L	65	401	224	1	20900	20900	2	5580	5580	2	98	98	2	590	590	1	3330	3330	5	918	965	1	1630	1630	5	407	290
Total Iron	mg/L	83	11.9	5.69	-	-	-	-	-	-	2	2.45	2.45	2	0.122	0.122	-	-	-	-	-	-	-	-	-	-	-	-
Total Kjeldahl Nitrogen	mg/L	79	24.2	3.6	-	-	-	2	603	603	2	4.19	4.19	2	2.1	2.1	-	-	-	5	45.2	42.5	-	-	-	5	45.5	27.5
Total Lead	mg/L	83	0.0172	0.008	-	-	-	-	-	-	2	0.00348	0.00348	2	0.00425	0.00425	-	-	-	-	-	-	-	-	-	-	-	-
Total Magnesium	mg/L	83	6.95	3.1	-	-	-	-	-	-	2	2.19	2.19	2	12.3	12.3	-	-	-	-	-	-	-	-	-	-	-	-
Total Manganese	mg/L	83	0.661	0.24	-	-	-	-	-	-	2	0.197	0.197	2	0.107	0.107	-	-	-	-	-	-	-	-	-	-	-	-
Total Mercury	mg/L	81	0.000115	0.0001	-	-	-	-	-	-	2	0.0001	0.0001	2	0.0001	0.0001	-	-	-	-	-	-	-	-	-	-	-	-
Total Molybdenum	mg/L	54	0.00403	0.0025	-	-	-	-	-	-	2	0.0005	0.0005	2	0.0025	0.0025	-	-	-	-	-	-	-	-	-	-	-	-
Total Nickel	mg/L	83	0.0179	0.008	-	-	-	-	-	-	2	0.00241	0.00241	2	0.0065	0.0065	-	-	-	-	-	-	-	-	-	-	-	-
Total ortho P (365.2)	mg/L	35	2.29	1.06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total P (365.2)	mg/L	21	2.13	0.305	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total P (4500PF)	mg/L	46	7.81	1.12	-	-	-	-	-	-	2	1.1	1.1	2	3.2	3.2	-	-	-	-	-	-	-	-	-	-	-	-
Total P (6010)	mg/L	45	5.17	2.29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total P (6020)	mg/L	46	40.6	1.07	-	-	-	-	-	-	2	0.827	0.827	2	2.82	2.82	-	-	-	-	-	-	-	-	-	-	-	-

Table 6.4-2a: Chemical and Bacterial Compounds of Poultry and Cattle Wastes (Water)

Parameter	Units	POULTRY									CATTLE																	
		Edge of Field			SPLP Leach						Edge of Field			Cattle Impacted Spring			SPLP Leach on Fresh Manure						SPLP Leach on Dry Manure					
					4:1 Ratio			20:1 Ratio									4:1 Ratio			20:1 Ratio			4:1 Ratio			20:1 Ratio		
		Number of Samples	CDM Average	CDM Median	Number of Samples	CDM Average	CDM Median	Number of Samples	CDM Average	CDM Median	Number of Samples	CDM Average	CDM Median	Number of Samples	CDM Average	CDM Median	Number of Samples	CDM Average	CDM Median	Number of Samples	CDM Average	CDM Median	Number of Samples	CDM Average	CDM Median	Number of Samples	CDM Average	CDM Median
Total Potassium	mg/L	83	46.2	8.89	-	-	-	-	-	-	2	8.34	8.34	2	28.3	28.3	-	-	-	-	-	-	-	-	-	-	-	-
Total Selenium	mg/L	81	0.0035	0.001	-	-	-	-	-	-	2	0.0005	0.0005	2	0.0005	0.0005	-	-	-	-	-	-	-	-	-	-	-	-
Total Silver	mg/L	81	0.0022	0.0005	-	-	-	-	-	-	2	0.0005	0.0005	2	0.0005	0.0005	-	-	-	-	-	-	-	-	-	-	-	-
Total Sodium	mg/L	83	19.1	3.24	-	-	-	-	-	-	2	1.42	1.42	2	31.4	31.4	-	-	-	-	-	-	-	-	-	-	-	-
Total Sulfate (SO4)	mg/L	67	20.4	9.8	-	-	-	2	384	384	2	3.34	3.34	2	34.1	34.1	-	-	-	5	10	10	-	-	-	5	10	10
Total Suspended Solids	mg/L	65	266	113	-	-	-	-	-	-	2	153	153	2	7	7	-	-	-	-	-	-	-	-	-	-	-	-
Total Thallium	mg/L	81	0.006	0.0005	-	-	-	-	-	-	2	0.0005	0.0005	2	0.0005	0.0005	-	-	-	-	-	-	-	-	-	-	-	-
Total Vanadium	mg/L	83	0.029	0.005	-	-	-	-	-	-	2	0.00805	0.00805	2	0.0085	0.0085	-	-	-	-	-	-	-	-	-	-	-	-
Total Zinc	mg/L	91	0.154	0.045	-	-	-	-	-	-	2	0.0198	0.0198	2	0.00575	0.00575	-	-	-	-	-	-	-	-	-	-	-	-

(-) samples were not analyzed for the parameter of interest for the sample of interest
Non-detects treated as 1/2 the detection limit

Table 6.4-2b: Chemical and Bacterial Compounds of Poultry and Wastewater Treatment Plant Wastes (Water)

Parameter	Units	Poultry									Wastewater Treatment Plant					
		Edge of Field			SPLP Leach											
					4:1 Ratio			20:1 Ratio			Direct Discharge			Impacted Surface Water		
		Number of Samples	CDM Average	CDM Median	Number of Samples	CDM Average	CDM Median	Number of Samples	CDM Average	CDM Median	Number of Samples	CDM Average	CDM Median	Number of Samples	CDM Average	CDM Median
17a-estradiol	ng/L	43	2.48	0.5	-	-	-	2	273	273	-	-	-	16	1.25	0.5
17b-estradiol	ng/L	43	2.49	2.11	-	-	-	2	0.05	0.05	-	-	-	16	1.07	0.5
Alkalinity (as CaCO3)	mg/L	67	110	60	1	3680	3680	2	1610	1610	3	75.3	69	25	100	104
Ammonia Nitrogen	mg/L	66	4.26	0.369	-	-	-	-	-	-	3	0.95	0.05	24	0.0565	0.05
Brevibacteria 16S rRNA	Copies/L	38	5310000	73700	-	-	-	-	-	-	-	-	-	12	6590	-
Campylobacter species	MPN*/100ml or cfu/100mL	60	29.6	1	-	-	-	-	-	-	-	-	-	9	0.561	0.561
Chloride	mg/L	67	22.3	5.08	1	1840	1840	2	402	402	3	46.9	42.7	25	48.1	49.1
Conductivity	mmhos/cm	43	0.196	0.15	-	-	-	-	-	-	-	-	-	11	0.422	0.422
Dissolved Aluminum	mg/L	81	0.334	0.159	1	0.5	0.5	2	1.23	1.23	3	0.05	0.05	25	0.0479	0.05
Dissolved Antimony	mg/L	81	0.00362	0.001	1	0.005	0.005	2	0.005	0.005	3	0.0005	0.0005	25	0.000574	0.0005
Dissolved Arsenic	mg/L	91	0.823	0.005	1	1.44	1.44	2	0.238	0.238	3	0.00131	0.0013	25	0.00136	0.00118
Dissolved Barium	mg/L	83	0.0573	0.037	1	0.495	0.495	2	0.202	0.202	3	0.00852	0.0079	25	0.0389	0.039
Dissolved Beryllium	mg/L	81	0.00119	0.0005	1	0.005	0.005	2	0.005	0.005	3	0.0005	0.0005	25	0.0005	0.0005
Dissolved Boron	mg/L	1	0.021	0.021	-	-	-	-	-	-	-	-	-	2	0.101	0.101
Dissolved Cadmium	mg/L	81	0.00147	0.0005	1	0.005	0.005	2	0.005	0.005	3	0.0005	0.0005	25	0.000508	0.0005
Dissolved Calcium	mg/L	83	37.2	22	1	106	106	2	45.4	45.4	3	36.1	35.9	25	48.1	51.5
Dissolved Chromium	mg/L	83	0.00809	0.0025	1	0.059	0.059	2	0.037	0.037	3	0.193	0.00456	25	0.00642	0.001
Dissolved Cobalt	mg/L	81	0.153	0.001	1	0.118	0.118	2	0.0265	0.0265	3	0.00733	0.0005	25	0.00109	0.0005
Dissolved Copper	mg/L	91	0.123	0.0125	1	10.4	10.4	2	4.54	4.54	3	0.0302	0.0205	25	0.00386	0.003
Dissolved Iron	mg/L	82	0.607	0.175	1	16.6	16.6	2	7.47	7.47	3	1.33	0.165	25	0.0902	0.05
Dissolved Lead	mg/L	81	0.00259	0.003	1	0.016	0.016	2	0.005	0.005	3	0.0005	0.0005	25	0.000549	0.0005
Dissolved Magnesium	mg/L	83	6.17	2.46	1	141	141	2	59.7	59.7	3	2.53	2.53	25	2.64	2.65
Dissolved Manganese	mg/L	83	0.254	0.03	1	5.04	5.04	2	1.54	1.54	3	0.113	0.0836	25	0.00624	0.005
Dissolved Mercury	mg/L	79	0.000104	0.0001	-	-	-	-	-	-	3	0.0000001	0.0000001	25	0.0000846	0.0001
Dissolved Molybdenum	mg/L	69	0.0159	0.0025	1	0.186	0.186	2	0.115	0.115	3	0.00478	0.0053	25	0.00369	0.0025
Dissolved Nickel	mg/L	82	0.0123	0.005	1	0.785	0.785	2	0.235	0.235	3	0.166	0.00716	25	0.00695	0.004
Dissolved Ortho P (365.2)	mg/L	35	0.304	0.043	-	-	-	-	-	-	-	-	-	9	0.436	0.436
Dissolved Potassium	mg/L	83	41.8	7.13	1	3070	3070	2	976	976	3	10.7	10.8	25	12.8	11.1
Dissolved Selenium	mg/L	81	0.0035	0.001	1	0.07	0.07	2	0.0165	0.0165	3	0.0005	0.0005	25	0.000613	0.0005
Dissolved Silver	mg/L	81	0.00223	0.0005	1	0.005	0.005	2	0.005	0.005	3	0.0005	0.0005	25	0.000533	0.0005
Dissolved Sodium	mg/L	83	19.3	3.75	1	802	802	2	295	295	3	42.9	45	25	48.3	42.7
Dissolved Strontium	mg/L	1	0.0005	0.0005	-	-	-	-	-	-	-	-	-	2	0.0005	0.0005
Dissolved Thallium	mg/L	81	0.006	0.0005	1	0.005	0.005	2	0.005	0.005	3	0.0005	0.0005	25	0.000657	0.0005
Dissolved Titanium	mg/L	1	0.0005	0.0005	-	-	-	-	-	-	-	-	-	2	0.0005	0.0005
Dissolved Vanadium	mg/L	81	0.0118	0.005	1	0.42	0.42	2	0.34	0.34	3	0.103	0.00798	25	0.0101	0.005
Dissolved Zinc	mg/L	91	0.0811	0.023	1	13.8	13.8	2	2.57	2.57	3	0.0276	0.0308	25	0.0174	0.015
E. coli	MPN*/100ml or cfu/100mL	67	88300	5950	1	12000	12000	2	12000	12000	2	9.5	9.5	21	1080	95.5
Enterococcus Group	ng/L	67	122000	11000	1	5400	5400	2	8000	8000	2	4.5	4.5	21	652	180
Estriol	ng/L	43	32.6	0.5	-	-	-	2	0.05	0.05	-	-	-	16	12.5	0.5

Table 6.4-2b: Chemical and Bacterial Compounds of Poultry and Wastewater Treatment Plant Wastes (Water)

Parameter	Units	Poultry									Wastewater Treatment Plant					
		Edge of Field			SPLP Leach											
					4:1 Ratio			20:1 Ratio			Direct Discharge			Impacted Surface Water		
		Number of Samples	CDM Average	CDM Median	Number of Samples	CDM Average	CDM Median	Number of Samples	CDM Average	CDM Median	Number of Samples	CDM Average	CDM Median	Number of Samples	CDM Average	CDM Median
Estrone	ng/L	43	5.26	0.5	-	-	-	2	0.05	0.05	-	-	-	16	14.5	11.3
Fecal Coliform	MPN*/100ml or cfu/100mL	68	89900	5000	1	12000	12000	2	12000	12000	2	70	70	21	1400	240
Nitrite + Nitrate (as N)	mg/L	69	1.63	1.21	-	-	-	2	1	1	3	3.47	3.23	26	3.95	3.46
pH (1:1)	s.u.	67	6.82	6.7	1	7.3	7.3	2	7.45	7.45	3	7	7	24	7.45	7.4
Salmonella species	MPN*/100ml or cfu/100mL	68	2.3	1	-	-	-	2	1	1	2	1	1	21	2.87	1
Soluble Reactive P (4500PF)	mg/L	46	3.66	0.529	1	487	487	2	131	131	3	0.916	0.0442	23	0.524	0.298
Staphylococcus aureus	MPN*/100ml or cfu/100mL	67	11	1	-	-	-	2	1.5	1.5	2	0.55	0.55	21	44.2	0.55
TOC	mg/L	71	57.8	10	1	13.5	13.5	2	10.2	10.2	3	5.32	5.31	26	3.67	3.44
Total Aluminum	mg/L	83	9.14	4.09	-	-	-	-	-	-	3	0.05	0.05	25	0.109	0.063
Total Antimony	mg/L	81	0.00354	0.002	-	-	-	-	-	-	3	0.0005	0.0005	25	0.000574	0.0005
Total Arsenic	mg/L	91	0.0171	0.005	-	-	-	-	-	-	3	0.0012	0.00123	25	0.00145	0.00129
Total Barium	mg/L	83	0.174	0.086	-	-	-	-	-	-	3	0.00969	0.0126	25	0.0402	0.04
Total Beryllium	mg/L	81	0.00149	0.0005	-	-	-	-	-	-	3	0.0005	0.0005	25	0.0005	0.0005
Total Cadmium	mg/L	81	0.00149	0.0005	-	-	-	-	-	-	3	0.0005	0.0005	25	0.000508	0.0005
Total Calcium	mg/L	83	64.5	26.3	-	-	-	-	-	-	3	33.2	33.6	25	47.2	52
Total Chromium	mg/L	82	0.0218	0.008	-	-	-	-	-	-	3	0.0018	0.00111	25	0.00121	0.00121
Total Cobalt	mg/L	82	0.00973	0.005	-	-	-	-	-	-	3	0.0055	0.0005	25	0.000997	0.0005
Total Coliform	MPN*/100ml or cfu/100mL	68	220000	30000	1	12000	12000	2	12000	12000	2	9800	9800	17	3950	2400
Total Copper	mg/L	91	0.16	0.014	-	-	-	-	-	-	3	0.00249	0.00212	25	0.00156	0.002
Total Dissolved P (365.2)	mg/L	38	0.568	0.183	-	-	-	-	-	-	-	-	-	9	0.494	0.494
Total Dissolved P (4500PF)	mg/L	46	4.68	0.582	1	596	596	2	165	165	3	1.01	0.0732	23	0.568	0.312
Total Dissolved P (6010)	mg/L	45	1.37	0.737	-	-	-	-	-	-	-	-	-	3	1.93	1.93
Total Dissolved P (6020)	mg/L	46	5.92	0.788	1	443	443	2	134	134	3	0.935	0.0681	22	0.575	0.315
Total Dissolved Solids	mg/L	65	401	224	1	20900	20900	2	5580	5580	3	274	273	25	302	298
Total Iron	mg/L	83	11.9	5.69	-	-	-	-	-	-	3	0.175	0.05	25	0.118	0.05
Total Kjeldahl Nitrogen	mg/L	79	24.2	3.6	-	-	-	2	603	603	3	6.34	5.22	26	2.02	1.98
Total Lead	mg/L	83	0.0172	0.008	-	-	-	-	-	-	3	0.0005	0.0005	25	0.000555	0.0005
Total Magnesium	mg/L	83	6.95	3.1	-	-	-	-	-	-	3	2.51	2.43	25	2.66	2.62
Total Manganese	mg/L	83	0.661	0.24	-	-	-	-	-	-	3	0.0545	0.0518	25	0.0139	0.014
Total Mercury	mg/L	81	0.000115	0.0001	-	-	-	-	-	-	3	0.0001	0.0001	25	0.0001	0.0001
Total Molybdenum	mg/L	54	0.00403	0.0025	-	-	-	-	-	-	3	0.00309	0.00269	25	0.00331	0.0025
Total Nickel	mg/L	83	0.0179	0.008	-	-	-	-	-	-	3	0.0034	0.00197	25	0.00417	0.004
Total ortho P (365.2)	mg/L	35	2.29	1.06	-	-	-	-	-	-	-	-	-	9	0.454	0.454
Total P (365.2)	mg/L	21	2.13	0.305	-	-	-	-	-	-	-	-	-	9	0.602	0.602
Total P (4500PF)	mg/L	46	7.81	1.12	-	-	-	-	-	-	3	1.23	0.231	23	0.594	0.341
Total P (6010)	mg/L	45	5.17	2.29	-	-	-	-	-	-	-	-	-	3	1.97	1.97
Total P (6020)	mg/L	46	40.6	1.07	-	-	-	-	-	-	3	1.06	0.164	22	0.606	0.341
Total Potassium	mg/L	83	46.2	8.89	-	-	-	-	-	-	3	10.9	11	25	12.5	11.9
Total Selenium	mg/L	81	0.0035	0.001	-	-	-	-	-	-	3	0.0005	0.0005	25	0.000613	0.0005

Table 6.4-2b: Chemical and Bacterial Compounds of Poultry and Wastewater Treatment Plant Wastes (Water)

Parameter	Units	Poultry									Wastewater Treatment Plant					
		Edge of Field			SPLP Leach						Direct Discharge			Impacted Surface Water		
					4:1 Ratio			20:1 Ratio								
		Number of Samples	CDM Average	CDM Median	Number of Samples	CDM Average	CDM Median	Number of Samples	CDM Average	CDM Median	Number of Samples	CDM Average	CDM Median	Number of Samples	CDM Average	CDM Median
Total Silver	mg/L	81	0.0022	0.0005	-	-	-	-	-	-	3	0.0005	0.0005	25	0.000533	0.0005
Total Sodium	mg/L	83	19.1	3.24	-	-	-	-	-	-	3	43.5	46.2	25	48.6	42.5
Total Sulfate (SO4)	mg/L	67	20.4	9.8	-	-	-	2	384	384	3	55.4	44.5	25	51.2	43
Total Suspended Solids	mg/L	65	266	113	-	-	-	-	-	-	3	4.67	3	25	4.07	4
Total Thallium	mg/L	81	0.006	0.0005	-	-	-	-	-	-	3	0.0005	0.0005	25	0.000659	0.0005
Total Vanadium	mg/L	83	0.029	0.005	-	-	-	-	-	-	3	0.00547	0.00541	25	0.036	0.027
Total Zinc	mg/L	91	0.154	0.045	-	-	-	-	-	-	3	0.0238	0.0251	25	0.0187	0.012

(-) samples were not analyzed for the parameter of interest for the sample of interest
Non-detects treated as 1/2 the detection limit

Table 6.4-3: Comparison: Poultry Waste and Cattle Manure

Parameter	Units	Poultry Waste	Fresh Cattle Manure	Dry Cattle Manure
		CDM Average	Factor	Factor
Estriol	ng/g	5.87	n.v.	n.v.
17a-estradiol	ng/g	3.18	n.v.	n.v.
Estrone	ng/g	13.2	n.v.	n.v.
17b-estradiol	ng/g	3.01	n.v.	n.v.
Campylobacter species	MPN*/gram	0.126	n.v.	n.v.
E. coli	MPN*/gram	40400	0.0501	0.236
Enterococcus Group	MPN*/gram	107000	0.532	0.704
Total Coliform	MPN*/gram	47500	0.0589	0.235
Staphylococcus aureus	MPN*/gram	0.11	0.182	0.379
Salmonella species	MPN*/gram	0.232	0.384	0.8
Fecal Coliform	MPN*/gram	46900	0.0582	0.274
Organic Matter	%	73.2	0.848	0.845
Solids Total	%	81.6	3.29	2.58
Moisture	%	18.4	0.245	0.269
Total Molybdenum	mg/kg	3.56	1.19	2.39
Total Barium	mg/kg	48.8	0.594	0.531
Total Cadmium	mg/kg	0.307	0.216	0.373
Total P (6020)	mg/kg	20100	3.4	7.47
Nitrogen Total (Inorganic + Organic)	mg/kg	30000	0.98	1
Ammonium (Water Soluble)	mg/kg	1700	2.1	7.91
Total Mercury	mg/kg	0.00561	0.0679	0.367
Phosphorus (Mehlich 3)	mg/kg	5410	1.65	3.36
Total Beryllium	mg/kg	0.307	0.216	0.373
Total Chromium	mg/kg	7.33	5.16	8.92
Phosphorus (Water Soluble)	mg/kg	1440	0.477	1.52
Sulfate (Water Soluble)	mg/kg	4410	7.75	63.1
Total Aluminum	mg/kg	1930	3.91	3.43
Total Antimony	mg/kg	0.307	0.216	0.373
Total Arsenic	mg/kg	18.7	13.2	22.7
Chloride (Water Soluble)	mg/kg	3880	1.22	12.7
Total Iron	mg/kg	1100	2.1	2.16
Total Calcium	mg/kg	34400	3.82	4.94
Total Nickel	mg/kg	14	7.53	17
Total Cobalt	mg/kg	1.81	1.27	2.2
Total Copper	mg/kg	417	29.8	39.7
Nitrate-N (Water Soluble)	mg/kg	248	8.73	15.1
Total Manganese	mg/kg	1490	4.36	4.28
Total Lead	mg/kg	1.82	1.28	2.21
Total Magnesium	mg/kg	5900	1.22	2.08
Total Selenium	mg/kg	1.2	0.845	1.46

Table 6.4-3: Comparison: Poultry Waste and Cattle Manure

Parameter	Units	Poultry Waste	Fresh Cattle Manure	Dry Cattle Manure
		CDM Average	Factor	Factor
Total Potassium	mg/kg	30700	3.31	15.7
Total Vanadium	mg/kg	17.6	2.48	4.28
Total Thallium	mg/kg	0.307	0.216	0.373
Total Sodium	mg/kg	8090	6.69	50.9
Total Silver	mg/kg	8.23	5.8	10
Total Zinc	mg/kg	506	6.83	6.94
Soluble Salts (1:2)	mmhos/cm	11.8	3.06	5.41
pH (1:1)	s.u.	7.93	1.07	1.05
Brevibacteria 16S rRNA	Copies/g	1100000000	n.v.	n.v.

n.v: non value: samples were not analyzed for the parameter of interest for the sample of interest.
Non-detects treated as 1/2 the detection limit

Table 6.4-4: Comparison: Synthetic Leachates - Poultry Waste and Cattle Manure

Parameter	Units	Poultry Waste 20:1	Fresh Cattle Manure SPLP 20:1	Dry Cattle Manure SPLP 20:1
		CDM Average	Factor	Factor
17a-estradiol	ng/L	272.525	2.42	5450
17b-estradiol	ng/L	0.05	1	1
Estriol	ng/L	0.05	1	1
Estrone	ng/L	0.05	0.000773	1
Alkalinity (as CaCO3)	mg/L	1610	5.33	10.6
Chloride	mg/L	22.3	8.34	22.6
Dissolved Aluminum	mg/L	1.23	2.46	2.46
Dissolved Antimony	mg/L	0.005	1	1
Dissolved Arsenic	mg/L	0.238	47.6	47.6
Dissolved Barium	mg/L	0.202	1.02	1.39
Dissolved Beryllium	mg/L	0.005	1	1
Dissolved Cadmium	mg/L	0.005	1	1
Dissolved Calcium	mg/L	45.4	0.985	1.32
Dissolved Chromium	mg/L	0.037	7.4	7.4
Dissolved Cobalt	mg/L	0.0265	5.3	5.3
Dissolved Copper	mg/L	4.54	188	264
Dissolved Iron	mg/L	7.47	14.9	14.9
Dissolved Lead	mg/L	0.005	1	1
Dissolved Magnesium	mg/L	59.7	2.12	2.99
Dissolved Manganese	mg/L	1.54	1.99	5.07
Dissolved Molybdenum	mg/L	0.115	23	23
Dissolved Nickel	mg/L	0.235	30.9	47
Dissolved Potassium	mg/L	976	13.4	51.4
Dissolved Selenium	mg/L	0.0165	3.3	3.3
Dissolved Silver	mg/L	0.005	1	1
Dissolved Sodium	mg/L	295	7.02	33.3
Dissolved Thallium	mg/L	0.005	1	1
Dissolved Vanadium	mg/L	0.34	1.1	0.988
Dissolved Zinc	mg/L	2.57	21.6	25.9
E. coli	MPN*/100ml	12000	1	1.63
Enterococcus Group	MPN*/100ml	8000	0.962	1.47
Fecal Coliform	MPN*/100ml	12000	1	1.63
Nitrite + Nitrate (as N)	mg/L	1	1	1
pH (1:1)	s.u.	7.45	1.01	1.02
Salmonella species	MPN*/100ml	1	1	1
Soluble Reactive P (4500PF)	mg/L	131	4.3	5
Staphylococcus aureus	MPN*/100ml	1.5	0.852	0.146
TOC	mg/L	10.2	0.201	0.739
Total Coliform	MPN*/100ml	12000	1	1.54
Total Dissolved P (4500PF)	mg/L	165	4.35	5.83
Total Dissolved P (6020)	mg/L	134	4.89	6.77
Total Dissolved Solids	mg/L	5580	6.08	13.7
Total Kjeldahl Nitrogen	mg/L	603	13.3	13.3
Total Sulfate (SO4)	mg/L	384	38.4	38.4

Table 6.4-5: Comparison: EOF, Cattle Impacted Springs and WWTP

Parameter	Units	Poultry EOF	Cattle EOF	Cattle Impacted Springs	WWTP Discharge	WWTP Impacted Surface Water
		CDM Average	Factor	Factor	Factor	Factor
17a-estradiol	ng/L	2.48	49.6	4.96	n.v.	1.98
17b-estradiol	ng/L	2.49	49.8	4.98	n.v.	2.33
Alkalinity (as CaCO3)	mg/L	110	4.4	0.585	1.46	1.1
Ammonia Nitrogen	mg/L	4.26	29.4	61.3	4.48	75.4
Brevibacteria 16S rRNA	Copies/L	5310000	n.v.	n.v.	n.v.	806
Campylobacter species	MPN*/100ml or cfu/100mL	29.6	n.v.	n.v.	n.v.	52.8
Chloride	mg/L	22.3	6.16	0.43	0.475	0.464
Conductivity	mmhos/cm	0.196	n.v.	n.v.	n.v.	0.464
Dissolved Aluminum	mg/L	0.334	6.68	6.68	6.68	6.97
Dissolved Antimony	mg/L	0.00362	7.24	7.24	7.24	6.31
Dissolved Arsenic	mg/L	0.823	470	274	628	605
Dissolved Barium	mg/L	0.0573	3.37	0.275	6.73	1.47
Dissolved Beryllium	mg/L	0.00119	2.38	2.38	2.38	2.38
Dissolved Boron	mg/L	0.021	n.v.	n.v.	n.v.	0.208
Dissolved Cadmium	mg/L	0.00147	2.94	2.94	2.94	2.89
Dissolved Calcium	mg/L	37.2	6.47	0.368	1.03	0.773
Dissolved Chromium	mg/L	0.00809	6.86	6.47	0.0419	1.26
Dissolved Cobalt	mg/L	0.153	306	87.4	20.9	140
Dissolved Copper	mg/L	0.123	3.25	18.9	4.07	31.9
Dissolved Iron	mg/L	0.607	6.26	12.1	0.456	6.73
Dissolved Lead	mg/L	0.00259	5.18	0.384	5.18	4.72
Dissolved Magnesium	mg/L	6.17	3.15	0.417	2.44	2.34
Dissolved Manganese	mg/L	0.254	63.3	4.2	2.25	40.7
Dissolved Mercury	mg/L	0.000104	1040	1.04	1040	1.23
Dissolved Molybdenum	mg/L	0.0159	31.8	6.36	3.33	4.31
Dissolved Nickel	mg/L	0.0123	14.6	1.89	0.0741	1.77
Dissolved Ortho P (365.2)	mg/L	0.304	n.v.	n.v.	n.v.	0.697
Dissolved Potassium	mg/L	41.8	5.51	0.818	3.91	3.27
Dissolved Selenium	mg/L	0.0035	7	7	7	5.71
Dissolved Silver	mg/L	0.00223	4.46	4.46	4.46	4.18
Dissolved Sodium	mg/L	19.3	10.1	0.524	0.45	0.4

Table 6.4-5: Comparison: EOF, Cattle Impacted Springs and WWTP

Parameter	Units	Poultry EOF	Cattle EOF	Cattle Impacted Springs	WWTP Discharge	WWTP Impacted Surface Water
		CDM Average	Factor	Factor	Factor	Factor
Dissolved Strontium	mg/L	0.0005	n.v.	n.v.	n.v.	1
Dissolved Thallium	mg/L	0.006	12	12	12	9.13
Dissolved Titanium	mg/L	0.0005	n.v.	n.v.	n.v.	1
Dissolved Vanadium	mg/L	0.0118	4.72	2.36	0.115	1.17
Dissolved Zinc	mg/L	0.0811	2.60	12.0	2.94	4.66
E. coli	MPN*/100ml or cfu/100mL	88300	7.36	108	9290	81.8
Enterococcus Group	ng/L	122000	10.2	20.3	27100	187
Estriol	ng/L	32.6	652	65.2	n.v.	2.61
Estrone	ng/L	5.26	105	10.5	n.v.	0.363
Fecal Coliform	MPN*/100ml or cfu/100mL	89900	7.49	134	1280	64.2
Nitrite + Nitrate (as N)	mg/L	1.63	8.27	0.0488	0.47	0.413
pH (1:1)	s.u.	6.82	1.05	1.07	0.974	0.915
Salmonella species	MPN*/100ml	2.3	2.3	2.3	2.3	0.801
Soluble Reactive P (4500PF)	mg/L	3.66	6.62	1.24	4	6.98
Staphylococcus aureus	MPN*/100ml or cfu/100mL	11	13.3	20	20	0.249
TOC	mg/L	57.8	4.94	5.07	10.9	15.7
Total Aluminum	mg/L	9.14	3.31	183	183	83.9
Total Antimony	mg/L	0.00354	7.08	7.08	7.08	6.17
Total Arsenic	mg/L	0.0171	6.06	4.89	14.3	11.8
Total Barium	mg/L	0.174	2.8	0.833	18	4.33
Total Beryllium	mg/L	0.00149	2.98	2.98	2.98	2.98
Total Cadmium	mg/L	0.00149	2.98	2.98	2.98	2.93
Total Calcium	mg/L	64.5	10.8	0.798	1.94	1.37
Total Chromium	mg/L	0.0218	16.5	17.4	12.1	18
Total Cobalt	mg/L	0.00973	8.25	5.56	1.77	9.76
Total Coliform	MPN*/100ml or cfu/100mL	220000	18.3	31.9	22.4	55.7
Total Copper	mg/L	0.16	52.3	26.7	64.3	103
Total Dissolved P (365.2)	mg/L	0.568	n.v.	n.v.	n.v.	1.15
Total Dissolved P (4500PF)	mg/L	4.68	7.71	1.51	4.63	8.24
Total Dissolved P (6010)	mg/L	1.37	n.v.	n.v.	n.v.	0.71
Total Dissolved P (6020)	mg/L	5.92	11.3	2.19	6.33	10.3

Table 6.4-5: Comparison: EOF, Cattle Impacted Springs and WWTP

Parameter	Units	Poultry EOF	Cattle EOF	Cattle Impacted Springs	WWTP Discharge	WWTP Impacted Surface Water
		CDM Average	Factor	Factor	Factor	Factor
Total Dissolved Solids	mg/L	401	4.09	0.68	1.46	1.33
Total Iron	mg/L	11.9	4.86	97.5	68	101
Total Kjeldahl Nitrogen	mg/L	24.2	5.78	11.5	3.82	12
Total Lead	mg/L	0.0172	4.94	4.05	34.4	31
Total Magnesium	mg/L	6.95	3.17	0.565	2.77	2.61
Total Manganese	mg/L	0.661	3.36	6.18	12.1	47.6
Total Molybdenum	mg/L	0.00403	8.06	1.61	1.3	1.22
Total Nickel	mg/L	0.0179	7.43	2.75	5.26	4.29
Total ortho P (365.2)	mg/L	2.29	n.v.	n.v.	n.v.	5.04
Total P (365.2)	mg/L	2.13	n.v.	n.v.	n.v.	3.54
Total P (4500PF)	mg/L	7.81	7.1	2.44	6.35	13.1
Total P (6010)	mg/L	5.17	n.v.	n.v.	n.v.	2.62
Total P (6020)	mg/L	40.6	49.1	14.4	38.3	67
Total Potassium	mg/L	46.2	5.54	1.63	4.24	3.7
Total Selenium	mg/L	0.0035	7	7	7	5.71
Total Silver	mg/L	0.0022	4.4	4.4	4.4	4.13
Total Sodium	mg/L	19.1	13.5	0.608	0.439	0.393
Total Sulfate (SO4)	mg/L	20.4	6.11	0.598	0.368	0.398
Total Suspended Solids	mg/L	266	1.74	38	57	65.4
Total Thallium	mg/L	0.006	12	12	12	9.1
Total Vanadium	mg/L	0.029	3.6	3.41	5.3	0.806
Total Zinc	mg/L	0.154	7.78	26.8	6.47	8.24

n.v: non value: samples were not analyzed for the parameter of interest for the sample of interest.
Non-detects treated as 1/2 the detection limit

Table 6.4.6 Discharge Volumes

WWTP	Flow (mgd)
Springdale	12.4
Siloam Springs	2.68
Fayetteville-Noland	5.18
Rogers	5.71
Lincoln	0.44
Prairie Grove	0.32
Tahlequah	2.65
Stillwell	0.81
Westville	0.14
Gentry	0.44

Table 6.4-7a: Potential Masses in Leachates

Parameter	Units	Poultry-Greatest Leachable Concentration			Fresh Manure-Greatest Leachable Concentration		Dry Manure-Greatest Leachable Concentration	
		20:1 Ratio			20:1 Ratio		20:1 Ratio	
		Number of Samples	Low limit	High limit	Number of Samples	Averag	Number of Samples	Average
17a-estradiol	kg	2	2.37E+06	3.34E+06	3	9.80E+05	1	4.34E+02
17b-estradiol	kg	2	4.34E+02	6.12E+02	3	4.34E+02	1	4.34E+02
Alkalinity (as CaCO3)	kg	2	1.40E+10	1.97E+10	5	1.93E+09	5	9.70E+08
Chloride	kg	2	3.49E+09	4.92E+09	5	1.73E+08	5	6.38E+07
Dissolved Aluminum	kg	2	1.07E+07	1.51E+07	5	3.19E+06	5	3.19E+06
Dissolved Antimony	kg	2	4.34E+04	6.12E+04	5	3.19E+04	5	3.19E+04
Dissolved Arsenic	kg	2	2.06E+06	2.91E+06	5	3.19E+04	5	3.19E+04
Dissolved Barium	kg	2	1.75E+06	2.47E+06	5	1.26E+06	5	9.25E+05
Dissolved Beryllium	kg	2	4.34E+04	6.12E+04	5	3.19E+04	5	3.19E+04
Dissolved Cadmium	kg	2	4.34E+04	6.12E+04	5	3.19E+04	5	3.19E+04
Dissolved Calcium	kg	2	3.94E+08	5.56E+08	5	2.94E+08	5	2.19E+08
Dissolved Chromium	kg	2	3.21E+05	4.53E+05	5	3.19E+04	5	3.19E+04
Dissolved Cobalt	kg	2	2.30E+05	3.25E+05	5	3.19E+04	5	3.19E+04
Dissolved Copper	kg	2	3.94E+07	5.56E+07	5	1.54E+05	5	1.10E+05
Dissolved Iron	kg	2	6.48E+07	9.15E+07	5	3.19E+06	5	3.19E+06
Dissolved Lead	kg	2	4.34E+04	6.12E+04	5	3.19E+04	5	3.19E+04
Dissolved Magnesium	kg	2	5.18E+08	7.31E+08	5	1.79E+08	5	1.28E+08
Dissolved Manganese	kg	2	1.34E+07	1.89E+07	5	4.93E+06	5	1.94E+06
Dissolved Molybdenum	kg	2	9.97E+05	1.41E+06	5	3.19E+04	5	3.19E+04
Dissolved Nickel	kg	2	2.04E+06	2.88E+06	5	4.85E+04	5	3.19E+04
Dissolved Potassium	kg	2	8.46E+09	1.20E+10	5	4.66E+08	5	1.21E+08
Dissolved Selenium	kg	2	1.43E+05	2.02E+05	5	3.19E+04	5	3.19E+04
Dissolved Silver	kg	2	4.34E+04	6.12E+04	5	3.19E+04	5	3.19E+04
Dissolved Sodium	kg	2	2.56E+09	3.61E+09	5	2.68E+08	5	5.65E+07
Dissolved Thallium	kg	2	4.34E+04	6.12E+04	5	3.19E+04	5	3.19E+04

Table 6.4-7a: Potential Masses in Leachates

Parameter	Units	Poultry-Greatest Leachable Concentration			Fresh Manure-Greatest Leachable Concentration		Dry Manure-Greatest Leachable Concentration	
		20:1 Ratio			20:1 Ratio		20:1 Ratio	
		Number of Samples	Low limit	High limit	Number of Samples	Averag	Number of Samples	Average
Dissolved Vanadium	kg	2	2.95E+06	4.16E+06	5	1.97E+06	5	2.19E+06
Dissolved Zinc	kg	2	2.23E+07	3.15E+07	5	7.59E+05	5	6.34E+05
E. coli	MPN* or cfu	2	1.04E+15	1.47E+15	5	1.04E+15	5	6.37E+14
Enterococcus Group	kg	2	6.94E+07	9.80E+07	5	7.21E+07	5	4.72E+07
Estriol	kg	2	4.34E+02	6.12E+02	3	4.34E+02	1	4.34E+02
Estrone	kg	2	4.34E+02	6.12E+02	3	5.61E+05	1	4.34E+02
Fecal Coliform	MPN* or cfu	2	1.04E+15	1.47E+15	5	1.04E+15	5	6.37E+14
Nitrite + Nitrate (as N)	kg	2	8.67E+06	1.22E+07	5	6.38E+06	5	6.38E+06
Salmonella species	MPN* or cfu	2	8.67E+10	1.22E+11	5	8.67E+10	5	8.67E+10
Soluble Reactive P (4500PF)	kg	2	1.14E+09	1.60E+09	4	1.95E+08	4	1.67E+08
Staphylococcus aureus	MPN* or cfu	2	1.30E+11	1.84E+11	4	1.53E+11	6	8.93E+11
TOC	kg	2	8.84E+07	1.25E+08	5	3.23E+08	5	8.80E+07
Total Coliform	MPN* or cfu	2	1.04E+15	1.47E+15	5	1.04E+15	5	6.75E+14
Total Dissolved P (4500PF)	kg	2	1.43E+09	2.02E+09	4	2.42E+08	4	1.81E+08
Total Dissolved P (6020)	kg	2	1.16E+09	1.64E+09	5	1.75E+08	5	1.26E+08
Total Dissolved Solids	kg	2	4.84E+10	6.83E+10	5	5.86E+09	5	2.60E+09
Total Kjeldahl Nitrogen	kg	2	5.23E+09	7.39E+09	5	2.88E+08	5	2.90E+08
Total Sulfate (SO4)	kg	2	3.33E+09	4.70E+09	5	6.38E+07	5	6.38E+07

Non-detects treated as 1/2 the detection limit

Table 6.4-7b: Comparison of Potential Masses in Leachates

Parameter	Units	Poultry-Greatest Leachable Concentration			Fresh Manure-Greatest Leachable Concentration			Dry Manure-Greatest Leachable Concentration		
		20:1 Ratio			20:1 Ratio			20:1 Ratio		
		Number of Samples	Low Limit	High Limit	Number of Samples	Low Limit Factor	High Limit Factor	Number of Samples	Low Limit Factor	High Limit Factor
17a-estradiol	kg	2	2.37E+06	3.34E+06	3	2.42	3.41	1	5460	7710
17b-estradiol	kg	2	4.34E+02	6.12E+02	3	1	1.41	1	1	1.41
Alkalinity (as CaCO3)	kg	2	1.40E+10	1.97E+10	5	7.25	10.2	5	14.4	20.3
Chloride	kg	2	3.49E+09	4.92E+09	5	20.2	28.5	5	54.6	77.2
Dissolved Aluminum	kg	2	1.07E+07	1.51E+07	5	3.34	4.72	5	3.34	4.72
Dissolved Antimony	kg	2	4.34E+04	6.12E+04	5	1.36	1.92	5	1.36	1.92
Dissolved Arsenic	kg	2	2.06E+06	2.91E+06	5	64.7	91.4	5	64.7	91.4
Dissolved Barium	kg	2	1.75E+06	2.47E+06	5	1.39	1.96	5	1.89	2.67
Dissolved Beryllium	kg	2	4.34E+04	6.12E+04	5	1.36	1.92	5	1.36	1.92
Dissolved Cadmium	kg	2	4.34E+04	6.12E+04	5	1.36	1.92	5	1.36	1.92
Dissolved Calcium	kg	2	3.94E+08	5.56E+08	5	1.34	1.89	5	1.79	2.53
Dissolved Chromium	kg	2	3.21E+05	4.53E+05	5	10.1	14.2	5	10.1	14.2
Dissolved Cobalt	kg	2	2.30E+05	3.25E+05	5	7.2	10.2	5	7.2	10.2
Dissolved Copper	kg	2	3.94E+07	5.56E+07	5	255	360	5	359	507
Dissolved Iron	kg	2	6.48E+07	9.15E+07	5	20.3	28.7	5	20.3	28.7
Dissolved Lead	kg	2	4.34E+04	6.12E+04	5	1.36	1.92	5	1.36	1.92
Dissolved Magnesium	kg	2	5.18E+08	7.31E+08	5	2.89	4.08	5	4.06	5.73
Dissolved Manganese	kg	2	1.34E+07	1.89E+07	5	2.71	3.82	5	6.89	9.72
Dissolved Molybdenum	kg	2	9.97E+05	1.41E+06	5	31.3	44.2	5	31.3	44.2
Dissolved Nickel	kg	2	2.04E+06	2.88E+06	5	42	59.4	5	63.9	90.2
Dissolved Potassium	kg	2	8.46E+09	1.20E+10	5	18.1	25.6	5	69.8	98.6
Dissolved Selenium	kg	2	1.43E+05	2.02E+05	5	4.49	6.33	5	4.49	6.33
Dissolved Silver	kg	2	4.34E+04	6.12E+04	5	1.36	1.92	5	1.36	1.92
Dissolved Sodium	kg	2	2.56E+09	3.61E+09	5	9.55	13.5	5	45.3	63.9

Table 6.4-7b: Comparison of Potential Masses in Leachates

Parameter	Units	Poultry-Greatest Leachable Concentration			Fresh Manure-Greatest Leachable Concentration			Dry Manure-Greatest Leachable Concentration		
		20:1 Ratio			20:1 Ratio			20:1 Ratio		
		Number of Samples	Low Limit	High Limit	Number of Samples	Low Limit Factor	High Limit Factor	Number of Samples	Low Limit Factor	High Limit Factor
Dissolved Thallium	kg	2	4.34E+04	6.12E+04	5	1.36	1.92	5	1.36	1.92
Dissolved Vanadium	kg	2	2.95E+06	4.16E+06	5	1.5	2.12	5	1.34	1.9
Dissolved Zinc	kg	2	2.23E+07	3.15E+07	5	29.4	41.5	5	35.1	49.6
E. coli	MPN* or cfu	2	1.04E+15	1.47E+15	5	1	1.41	5	1.63	2.31
Enterococcus Group	kg	2	6.94E+07	9.80E+07	5	0.962	1.36	5	1.47	2.08
Estriol	kg	2	4.34E+02	6.12E+02	3	1	1.41	1	1	1.41
Estrone	kg	2	4.34E+02	6.12E+02	3	0.000773	0.00109	1	1	1.41
Fecal Coliform	MPN* or cfu	2	1.04E+15	1.47E+15	5	1	1.41	5	1.63	2.31
Nitrite + Nitrate (as N)	kg	2	8.67E+06	1.22E+07	5	1.36	1.92	5	1.36	1.92
Salmonella species	MPN* or cfu	2	8.67E+10	1.22E+11	5	1	1.41	5	1	1.41
Soluble Reactive P (4500PF)	kg	2	1.14E+09	1.60E+09	4	5.84	8.25	4	6.8	9.6
Staphylococcus aureus	MPN* or cfu	2	1.30E+11	1.84E+11	4	0.852	1.2	6	0.146	0.206
TOC	kg	2	8.84E+07	1.25E+08	5	0.273	0.386	5	1	1.42
Total Coliform	MPN* or cfu	2	1.04E+15	1.47E+15	5	1	1.41	5	1.54	2.18
Total Dissolved P (4500PF)	kg	2	1.43E+09	2.02E+09	4	5.92	8.36	4	7.92	11.2
Total Dissolved P (6020)	kg	2	1.16E+09	1.64E+09	5	6.65	9.39	5	9.2	13
Total Dissolved Solids	kg	2	4.84E+10	6.83E+10	5	8.26	11.7	5	18.6	26.3
Total Kjeldahl Nitrogen	kg	2	5.23E+09	7.39E+09	5	18.1	25.6	5	18	25.4
Total Sulfate (SO4)	kg	2	3.33E+09	4.70E+09	5	52.2	73.7	5	52.2	73.7

Non-detects treated as 1/2 the detection limit

Table 6.5-1: Average Concentrations by Environmental Component (Surface Water)

Parameter	Units	EOF	Small Tributaries		Surface Water		USGS		Tenkiller Lake	Reference
			High	Base	High	Base	High	Base		
Phosphorus (T)[1]	mg/L	8.14	0.312	0.337	0.119	0.147	0.176	0.163	0.0378	0.0138
TOC	mg/L	58.7	4.25	2.26	2.31	2.22	4.65	1.66	2.15	2.26
Copper (T)	ug/L	180	2.5	1.3	1.5	1.3	1.6	0.9	1.4	0.5[2]
Zinc (T)	ug/L	165	15.4	11.2	8.3	10.1	4.7	1.2	4.1	2.5[2]
Potassium (T)	mg/L	48	4.28	4.32	3.73	4.58	4.01	3.83	2.96	1.61
Enterococcus Group	MPN/100 mL	126000	21700	548	844	606	4480	108	5.07	83.5
Fecal Coliform	MPN/100 mL	89900	3210	3010	1060	824	2510	161	44.7	25.3
E. coli	MPN/100 mL	89700	3300	182	658	464	2530	99.5	3.74	16.1
Coliforms	MPN/100 mL	220000	7910	4080	3080	2330	14300	1090	92.9	262
TKN	mg/L	24.4	3.31	2.09	2.78	1.62	0.477*	0.25*	2.18	1.38
Aluminum (T)	mg/L	9.5	0.314	0.113	0.691	0.0879	0.483	0.0492	0.124	0.0767
Iron (T)	mg/L	12.2	0.333	0.184	0.969	0.131	0.675	0.0664	0.202	0.0646
Estrone	ng/L	7.67	3.33	6.25	2.48	2.59	1.91	1.34	1.27	1.42
Sodium (T)	mg/L	19.9	9.15	11	7.96	13.6	10.9	12.1	6.71	4.24
Alkalinity (as $CaCO_3$)	mg/L	112	98.5	135	83.4	107	87.3	106	76.3	145
Calcium (T)	mg/L	64.8	43.1	53.2	39	50	40.8	44.6	30.9	39.6
Arsenic (T)	ug/L	19.6	1.5	2.1	0.9	1.5	0.8	0.6	2.7	0.9
Magnesium (T)	mg/L	7.15	2.5	2.56	2.09	2.36	1.98	1.98	1.88	1.47
Total Dissolved Solids	mg/L	405	213	205	151	179	163	178	130	123

1 - Method 4500PF

2 - Non-detects treated as 1/2 the detection limit

3 - Following USGS method

Table 6.5-2: Average Concentrations by Environmental Components (Groundwater)

Parameter	Units	EOF	Groundwater	Groundwater	Groundwater
			Geoprobe	Springs	Well
Phosphorus (T)[1]	mg/L	8.9	71.3	0.217	0.0203
TOC	mg/L	61.9	2.34	1.58	0.606
Copper (T)	ug/L	188	109	1.6	19.5
Zinc (T)	ug/L	171	456	4.6	37
Potassium (T)	mg/L	50.1	15.6	2.99	1.73
Enterococcus Group	MPN/100 mL	133000	1370	657	251
Fecal Coliform	MPN/100 mL	95300	1350	344	40.9
E. coli	MPN/100 mL	95400	1310	353	4.81
Coliforms	MPN/100 mL	233000	2510	1730	456
TKN	mg/L	25.6	10.3	2.17	2.03
Aluminum (T)	mg/L	9.81	196	0.137	0.296
Iron (T)	mg/L	12.5	248	0.248	0.365
Estrone	ng/L	8.23	0.5[2]	0.645	0.5[2]
Sodium (T)	mg/L	20.7	5.92	5.6	12.9
Alkalinity (as $CaCO_3$)	mg/L	111	91.4	122	129
Calcium (T)	mg/L	51	88	52.6	65.8
Arsenic (T)	ug/L	20.2	81.7	2.5	0.8
Magnesium (T)	mg/L	7.34	16.7	2.1	3.61
Total Dissolved Solids	mg/L	422	300	187	240

1 - Method 4500PF

2 - Non-detects treated as 1/2 the detection limit

Table 6.5-3: Average Concentration by Environmental Component (Solids)

Parameter	Units	Poultry Waste	Soil 0-2" with Poultry Waste Application	River Sediments	Tenkiller Lake Sediments	Reference Soil 0-2"
Phosphorus (T)[1]	mg/kg	20100	1050	522	967	311
Organic Matter	%	73	3.2	1.81	1.44	3.05
Copper (T)	ug/kg	417000	28200	11400	12900	5590
Zinc (T)	ug/kg	496000	45300	53900	61200	23400
Potassium (T)	mg/kg	30700	798	654	78.2	526
Arsenic (T)	ug/kg	18600	3320	7530	7520	2640
Calcium (T)	mg/kg	34300	2920	9130	10200	1150
Estrone	ng/g	12.1	0.45	8.43	n.v.	0.753
E. coli	MPN*/gram	42000	116	561	n.v.	37.2
Enterococcus Group	MPN*/gram	103000	7020	422	n.v.	1.32
Fecal Coliform	MPN*/gram	48600	3670	7030	n.v.	37.3
Coliforms	MPN*/gram	49100	35800	9520	n.v.	256
Nitrogen (T)	mg/kg	30300	3730	4130	6180	2330
Soluble Salts	mmhos/cm	11.7	0.381	0.367	0.563	0.258
Sodium (T)	mg/kg	8080	46.6	30.3	1540	25.4
Magnesium (T)	mg/kg	6670	683	591	1200	575
Sulfate (SO4)	mg/kg	4400	52.2	38.2	847	92.2
Phosphorus (water soluble)	mg/kg	1440	71.4	49	78.4	9.09

1 - Method 6020

n.v: non value: samples were not analyzed for the parameter of interest for the sample of interest.

Table 6.9-1: Potential Total Phosphorus Predictor Variables

Variable	Description	Rationale
Total House Density (THD)	density (houses per mi^2) of all identified poultry houses, including inactive houses, in sub-basin	poultry waste is spread on fields in vicinity of poultry houses *(expected positive correlation)*
Active House Density (AHD)	density (houses per mi^2) of all identified active poultry houses in sub-basin	""
THD – 1 mile buffered	density (houses per mi^2) of all identified poultry houses in sub-basin plus 1 mile perimeter buffer	tributary water quality may be impacted by poultry houses a short distance outside of sub-basin (waste transported from a house outside the basin to a field inside the basin) *(expected positive correlation)*
AHD – 1 mile buffered	density (houses per mi^2) of all identified active poultry houses in sub-basin plus 1 mile perimeter buffer	""
THD – 2 mile buffered	density (houses per mi^2) of all identified poultry houses in sub-basin plus 2 mile perimeter buffer	approximately 60% of poultry waste is spread on fields within 2 miles of poultry house (Fisher) *(expected positive correlation)*
AHD – 2 mile buffered	density (houses per mi^2) of all identified active poultry houses in sub-basin plus 2 mile perimeter buffer	""
SCS CN	Soil Conservation Service Curve Number	sub-basins with varying runoff potential may differ in their impact on receiving stream water quality
Septic Tank Density	estimated density (tanks per mi^2) of septic tanks in sub-basin	leaching from septic tanks may carry a significant phosphorus load *(expected positive correlation)*
% Pasture	percent of pasture in sub-basin	amount of pasture in a sub-basin can serve as a surrogate for agricultural activity which may be a good predictor of stream phosphorus concentration *(expected positive correlation)*
% Riparian Buffer	percent of stream length in sub-basin that is buffered by forest	riparian buffers can filter nutrients from runoff prior to entering streams *(expected negative correlation)*
Median Distance to Chicken Houses	median of distances (mi) from poultry houses in the sub-basin to the sampling site	poultry houses closer to the stream may have a greater impact on water quality than those further away *(expected negative correlation)*

Table 6.9-2: Regression Analysis Results Summary[1]

	2005 Baseflow	2005 Highflow	2006 Baseflow	2006 Highflow	2005 – 06 Baseflow	2005 – 06 Highflow
THD	0.66	0.65	0.14	0.65	0.76	0.68
AHD	0.34	0.43	0.26	0.47	0.58	0.47
THD – 1 mi	0.31	0.32	0.39	0.32	0.65	0.3
AHD – 1 mi	0.15	0.18	0.49	0.19	0.5	0.19
THD – 2 mi	0.52	0.42	0.27	0.37	0.73	0.33
AHD – 2 mi	0.54	0.43	0.28	0.35	0.74	0.33
SCS CN	0.11	0.06	0.14	0.43	0.23	0.25
Septic Tanks	0.38	0.08	0.15	0.58	0.37	0.39
% Pasture	0.13	0.03	0.09	0.01	0.12	0.03
% Rip. Buff.	0.06	0.03	0.49	0.21	0.18	0.13
Med. Dist. CH	0.19	q	-0.25	0.01	0.04	0.001

1: statistically significant correlations ($p \leq 0.05$) indicated by yellow highlighting

Table 6.11-1 References Using PCA for Environmental Evaluations
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Table 6.11-1b Excerpts from Selected References

Reference: 1
"Multivariate Statistical Assessment of the Pollution sources along the stream of Kamchia River, Bulgaria"

"PCA of each sampling site was performed in order to identify emitting sources and compare them to really existing industries and anthropogenic waste inlets along the stream. In table 2 the results of the PCA carried out are presented along with the location of real emitters in the vicinity of each sampling site. The source identification by PCA is performed using the Varimax rotation mode of PCA. As statistically significant, loadings higher then 0.70 are taken into account (Malinowski, 1991).

Each latent factor (PC) is presented in the table with the correlated variables (statistically significant factor loadings), with its conditional name and percentage of explained variance.

It might be seen that each sampling region offers its specific pattern of pollution. The identification of polluting sources by PCA reveals that in some cases the correlation between the water parameters varies from site to site indicating in one case a certain latent factor, in another case – quite different. This is no surprise as the water quality at the different sites also differs due to the variability of the emitters. A very important and specific validation of the PCA models for any sampling site is not only the percentage of the explained total variance (over 75% at almost all sites) but the very exact coincidence between the latent factors and the real emitters in the vicinity of the sites. Thus, the approach applied offers a simple opportunity for source identification and apportioning.

Conclusion
The study carried out makes it possible to gain specific information about polluting sources along the stream of Kamchia River. The known industrial wastes (from metallurgy, food production, wineries, domestic inorganic and organic inlets to the river flow, etc.) as well as natural sources are additionally recognized and apportioned by the use of principal components analysis."

Mihailov, G.; V. Simeonov; N. Nikolov; G. Mirinchev. 2005. "Multivariate Statistical Assessment of the Pollution Sources Along the Stream of Kamchia River, Bulgaria." *Water Sciences and Technology*. V 51, n 11, pp. 37-43. IWA Publishing.

Reference: 2
"Chemometric Analysis of Hydro-Chemical Data of an Alluvial River- A Case Study"

"The second PC accounting for 15.2% of total variance showed high positive loadings on dissolved oxygen, moderate loadings on pH and negative loadings on BOD and COD, whereas, the third PC capturing 10.8% of variance was negatively correlated with fecal and streptococcus coliforms. Both these PCs represent anthropogenic pollution sources and can be explained that high levels of dissolved organic matter consume large amounts of oxygen."

"PCA performed on complete data matrix yielded 6-significant PCs explaining 71% of the data variance. The first PC mainly contained variables having origin in hydro geometrical processes, whereas, second and third PCs correlated anthropogenic pollution indicator variables."

Singh, Kunwar P.; Amrita Malik; Vinod K. Singh. 2006. "Chemometric Analysis of Hydro-chemical Data of an Alluvial River – A Case Study." *Water, Air, and Soil Pollution*. V 170, n 1-4, pp 383-404. Kluwer Academic Publishers. February.

Reference: 3
"Assessment of the surface water quality in Northern Greece"

"PCA is a powerful pattern recognition technique that attempts to explain the variance of a large dataset of intercorrelated variables with a smaller set of independent variables (principal components) [20]. PCA was employed on our dataset to compare the compositional patterns between the examined water systems and to identify the factors that influence each one.

Six principal components were obtained with eigenvalues > 1 summing almost 90% of the total variance in the water dataset (Table 2). The first PC, accounting for 22.1% of the total variance was correlated with COD. BOD_5, TON, TP and PO^{3-}_4. This "organic" factor may be interrupted as representing influences from point sources such as municipal and industrial effluents. The second PC, accounting for 19.8% of the total variance was correlated primarily with water soluble N-species, NO^-_2, NH^+_4 and NO^-_3 and secondarily with PO^{3-}_4 or TP. This "nutrient" factor represents influences from non-point sources such as agricultural runoff and atmospheric deposition."

Simeonov, V.; J. A. Stratis; C. Samara; G. Zachariadis; D. Voutsa; A. Anthemidis; M. Sofoniou; Th. Kouimtzis. 2003. "Assessment of the Surface Water Quality in Northern Greece." *Water Research*. V 37, pp. 4119-4124.

Reference: 4
"Polychlorinated Biphenyls in Narragansett Bay Surface Sediments"

"Principal component analysis (PCA) of the surface sediment PCBs separated the Taunton River samples from the rest of the samples. This result suggests that this river has a different PCB composition and sources than the other areas investigated. It also showed that this river has a limited influence on other bay stations as the adjacent samples downstream did not have the same chemical signature."

Hartmann, Paul C.; James G. Quinn; Robert W. Cairns; John W. King. 2004. "Polychlorinated Biphenyls in Narragansett Bay Surface Sediments. *Chemosphere*. V 57, n 1, pp. 9-20. Elsevier Ltd. October.

Table 6.11-2 Comparison of IRW Study to Published Literature

Paper	Rivers	Watershed size (sq.mi.)	No. of Sampling Locations	No. of Samples	Yr of sampling	No. of Parameters used in PCA	No. of Data points	No. of Major Sources Identified	No. of meaningful PCs	% variance explained by Meaningful PCs	% variance explained by PC1
Singh et al	Gomti (India)	9,900	10	1080	3	20	21,600	6	6	71	25.3
Mihailov et al	Kamchia (Bulgaria)	2,060	16	1000	5 to 10	11	900	6	4	75	?
Hartmann et al	Tauton, Seekonk, Providence (RI)	500	41	82	2	24	1,968	2	2	36	20.5
Simeonov et al	Aliakmon, Loudias, Gallikos, Axios (Greece)	3,200	25	900	3	22	22,350	4	6	90	22
IRW	Illinois, Baron, Caney	1,645	279	621	2.5	25	14,700	2	2	56	38

Table 6.11-4a Parameters Not Retained (water)

ParamID	Action-Reason	ParamID	Action-Reason
Specific Conductance	Not Retained - Insufficient Percent Complete	Dissolved Boron	Not Retained - Insufficient Percent Complete
Turbidity	Not Retained - Insufficient Percent Complete	Dissolved Strontium	Not Retained - Insufficient Percent Complete
Conductivity	Not Retained - Insufficient Percent Complete	Dissolved Titanium	Not Retained - Insufficient Percent Complete
Water Temperature	Not Retained - Insufficient Percent Complete	Pheophytin a	Not Retained - Insufficient Percent Complete
DO	Not Retained - Insufficient Percent Complete	Phytoplankton Biomass - Ash Free Dry Mass	Not Retained - Insufficient Percent Complete
Barometric pressure	Not Retained - Insufficient Percent Complete	Sample purpose, code	Not Retained - Insufficient Percent Complete
Turbidity - White Light	Not Retained - Insufficient Percent Complete	Biomass/chlorophyll ratio	Not Retained - Insufficient Percent Complete
Gage height	Not Retained - Insufficient Percent Complete	Phytoplankton Biomass - Ash Weight	Not Retained - Insufficient Percent Complete
Discharge	Not Retained - Insufficient Percent Complete	Phytoplankton Biomass - Dry Weight	Not Retained - Insufficient Percent Complete
Air Temperature	Not Retained - Insufficient Percent Complete	1,2,3,4-Tetrachlorobenzene	Not Retained - Insufficient Percent Complete
Total P (6010)	Not Retained - Inaccurate Data	1,2,4,5-Tetrachlorobenzene	Not Retained - Insufficient Percent Complete
Total Dissolved P (6010)	Not Retained - Inaccurate Data	1,2,4-Trichlorobenzene	Not Retained - Insufficient Percent Complete
Turbidity - IR LEE Light	Not Retained - Insufficient Percent Complete	1,2-Dichlorobenzene	Not Retained - Insufficient Percent Complete
COD (Chemical Oxygen Demand)	Not Retained - Insufficient Percent Complete	1,3-Dichlorobenzene	Not Retained - Insufficient Percent Complete
TTHMFP as CHCl3	Not Retained - Insufficient Percent Complete	1,4-Dichlorobenzene	Not Retained - Insufficient Percent Complete
Sampling method, code	Not Retained - Insufficient Percent Complete	2,3,4,6-Tetrachlorophenol	Not Retained - Insufficient Percent Complete
Sampler type, code	Not Retained - Insufficient Percent Complete	2,4,5-Trichlorophenol	Not Retained - Insufficient Percent Complete
Suspended sediment <0.063 mm	Not Retained - Insufficient Percent Complete	2,4,6-Trichlorophenol	Not Retained - Insufficient Percent Complete
Suspended sediment concentration	Not Retained - Insufficient Percent Complete	2,4-Dichlorophenol	Not Retained - Insufficient Percent Complete
Agency analyzing sample, code	Not Retained - Insufficient Percent Complete	2,4-Dimethylphenol	Not Retained - Insufficient Percent Complete
Bromodichloromethane	Not Retained - Insufficient Percent Complete	2,4-Dinitrophenol	Not Retained - Insufficient Percent Complete
Bromoform	Not Retained - Insufficient Percent Complete	2,4-Dinitrotoluene	Not Retained - Insufficient Percent Complete
Chloroform	Not Retained - Insufficient Percent Complete	2,6-Dichlorophenol	Not Retained - Insufficient Percent Complete
Dibromochloromethane	Not Retained - Insufficient Percent Complete	2,6-Dinitrotoluene	Not Retained - Insufficient Percent Complete
Dissolved oxygen (%)	Not Retained - Insufficient Percent Complete	2-Chloronaphthalene	Not Retained - Insufficient Percent Complete
Bromochloroacetic Acid	Not Retained - Insufficient Percent Complete	2-Chlorophenol	Not Retained - Insufficient Percent Complete

Dibromoacetic Acid	Not Retained - Insufficient Percent Complete	2-Methylnaphthalene	Not Retained - Insufficient Percent Complete
Dichloroacetic Acid	Not Retained - Insufficient Percent Complete	2-Methylphenol	Not Retained - Insufficient Percent Complete
Monobromoacetic Acid	Not Retained - Insufficient Percent Complete	2-Nitroaniline	Not Retained - Insufficient Percent Complete
Monochloroacetic Acid	Not Retained - Insufficient Percent Complete	2-Nitrophenol	Not Retained - Insufficient Percent Complete
Trichloroacetic Acid	Not Retained - Insufficient Percent Complete	3&4-Methylphenol	Not Retained - Insufficient Percent Complete
TTHM as CHCl3	Not Retained - Insufficient Percent Complete	3,3'-Dichlorobenzidine	Not Retained - Insufficient Percent Complete
Hardness (as CaCO3)	Not Retained - Insufficient Percent Complete	3,3'-Dimethylbenzidine	Not Retained - Insufficient Percent Complete
Noncarbonate hardness (as CaCO3) - filtered	Not Retained - Insufficient Percent Complete	3-Nitroaniline	Not Retained - Insufficient Percent Complete
Sodium adsorption ratio	Not Retained - Insufficient Percent Complete	4,6-Dinitro-2-methylphenol	Not Retained - Insufficient Percent Complete
Sodium fraction of cations	Not Retained - Insufficient Percent Complete	4-Bromophenyl phenyl ether	Not Retained - Insufficient Percent Complete
Drainage area, square miles	Not Retained - Insufficient Percent Complete	4-Chloro-3-methylphenol	Not Retained - Insufficient Percent Complete
Brevibacteria 16S rRNA	Not Retained - Insufficient Percent Complete	4-Chloroaniline	Not Retained - Insufficient Percent Complete
Altitude of land surface, feet	Not Retained - Insufficient Percent Complete	4-Chlorophenyl phenyl ether	Not Retained - Insufficient Percent Complete
Chlorophyll a	Not Retained - Insufficient Percent Complete	4-Nitroaniline	Not Retained - Insufficient Percent Complete
Microcystin	Not Retained - Insufficient Percent Complete	4-Nitrophenol	Not Retained - Insufficient Percent Complete
Suspended sediment discharge	Not Retained - Insufficient Percent Complete	Acenaphthene	Not Retained - Insufficient Percent Complete
Sample splitter type, field, code	Not Retained - Insufficient Percent Complete	Acenaphthylene	Not Retained - Insufficient Percent Complete
Acetophenone	Not Retained - Insufficient Percent Complete	Fluoranthene	Not Retained - Insufficient Percent Complete
ANC as CaCO3	Not Retained - Insufficient Percent Complete	Fluorene	Not Retained - Insufficient Percent Complete
Aniline	Not Retained - Insufficient Percent Complete	Hexachlorobenzene	Not Retained - Insufficient Percent Complete
Anthracene	Not Retained - Insufficient Percent Complete	Hexachlorobutadiene	Not Retained - Insufficient Percent Complete
Benzidine	Not Retained - Insufficient Percent Complete	Hexachlorocyclopentadiene	Not Retained - Insufficient Percent Complete
Benzo(a)anthracene	Not Retained - Insufficient Percent Complete	Hexachloroethane	Not Retained - Insufficient Percent Complete
Benzo(a)pyrene	Not Retained - Insufficient Percent Complete	Isophorone	Not Retained - Insufficient Percent Complete
Benzo(b)fluoranthene	Not Retained - Insufficient Percent Complete	Indeno(1,2,3-cd)pyrene	Not Retained - Insufficient Percent Complete
Benzo(g,h,i)perylene	Not Retained - Insufficient Percent Complete	Loss on ignition	Not Retained - Insufficient Percent Complete
Benzo(k)fluoranthene	Not Retained - Insufficient Percent Complete	Naphthalene	Not Retained - Insufficient Percent Complete
Benzoic acid	Not Retained - Insufficient Percent Complete	Nitrobenzene	Not Retained - Insufficient Percent Complete

Benzyl alcohol	Not Retained - Insufficient Percent Complete	N-Nitrosodiethylamine	Not Retained - Insufficient Percent Complete
Bis(2-chloroethoxy)methane	Not Retained - Insufficient Percent Complete	N-Nitrosodimethylamine	Not Retained - Insufficient Percent Complete
Bis(2-chloroethyl)ether	Not Retained - Insufficient Percent Complete	N-Nitroso-di-n-butylamine	Not Retained - Insufficient Percent Complete
Bis(2-chloroisopropyl)ether	Not Retained - Insufficient Percent Complete	N-Nitrosodi-n-propylamine	Not Retained - Insufficient Percent Complete
Bis(2-ethylhexyl)phthalate	Not Retained - Insufficient Percent Complete	N-Nitrosodiphenylamine	Not Retained - Insufficient Percent Complete
Butyl benzyl phthalate	Not Retained - Insufficient Percent Complete	Noncarbonate hardness (as CaCO3) - unfiltered	Not Retained - Insufficient Percent Complete
Carbazole	Not Retained - Insufficient Percent Complete	Pentachlorophenol	Not Retained - Insufficient Percent Complete
Chrysene	Not Retained - Insufficient Percent Complete	Phenanthrene	Not Retained - Insufficient Percent Complete
Dibenz(a,h)anthracene	Not Retained - Insufficient Percent Complete	Phenol	Not Retained - Insufficient Percent Complete
Dibenzofuran	Not Retained - Insufficient Percent Complete	Pyrene	Not Retained - Insufficient Percent Complete
Diethyl phthalate	Not Retained - Insufficient Percent Complete	Pyridine	Not Retained - Insufficient Percent Complete
Dimethyl phthalate	Not Retained - Insufficient Percent Complete	Total Residue	Not Retained - Insufficient Percent Complete
Di-n-butyl phthalate	Not Retained - Insufficient Percent Complete	Residue on evap.	Not Retained - Insufficient Percent Complete
Di-n-octyl phthalate	Not Retained - Insufficient Percent Complete	Chlorophyll a, corrected	Not Retained - Not Applicable
Fecal Streptococci	Not Retained - Insufficient Percent Complete	Total Suspended Solids	Not Retained - Not Applicable

Table 6.11-4b Parameters Not Retained (solids)

ParamID	Action-Reason
Salmonella species	Not Retained - Insufficient Percent Complete
17b-estradiol-d3	Not Retained - Insufficient Percent Complete
17b-estradiol	Not Retained - Insufficient Percent Complete
Estriol	Not Retained - Insufficient Percent Complete
Estrone	Not Retained - Insufficient Percent Complete
17a-estradiol	Not Retained - Insufficient Percent Complete
10-Day % Survival	Not Retained - Insufficient Percent Complete
28-Day % Survival	Not Retained - Insufficient Percent Complete
Average Dry Weight	Not Retained - Not Applicable
Brevibacteria 16S rRNA	Not Retained - Insufficient Percent Complete
AL BOUND P	Not Retained - Insufficient Percent Complete
CA BOUND P	Not Retained - Insufficient Percent Complete
FE BOUND P	Not Retained - Insufficient Percent Complete
LOOSLY BOUND P	Not Retained - Insufficient Percent Complete
Total Kjeldahl Nitrogen	Not Retained - Insufficient Percent Complete
Soil Classification	Not Retained - Not Applicable
Total P (6010)	Not Retained - Inaccurate Data
Solids Total	Not Retained - Not Applicable
Moisture	Not Retained - Not Applicable

Table 6.11-5 Percent Detection and Retained Parameters (water)

ParamID or EDA_Variable	Percent Detection	Action - Primary Reason
P_T	95.62	Retained for PCA
P_TD	94.36	Retained for PCA
P_SOL_REAC	86.80	Retained for PCA
NO2_NO3	79.09	Retained for PCA
TOC	84.53	Retained for PCA
TKN	92.20	Retained for PCA
TDS	99.65	Retained for PCA
Dissolved Beryllium	0.12	Not Retained - Insufficient Percent Detection
Dissolved Silver	0.24	Not Retained - Insufficient Percent Detection
Dissolved Thallium	0.48	Not Retained - Insufficient Percent Detection
Dissolved Cadmium	6.59	Not Retained - Insufficient Percent Detection
Dissolved Antimony	11.98	Not Retained - Insufficient Percent Detection
Dissolved Lead	15.09	Not Retained - Insufficient Percent Detection
Dissolved Selenium	23.71	Not Retained - Insufficient Percent Detection
Dissolved Vanadium	28.02	Not Retained - Insufficient Percent Detection
Dissolved Chromium	19.57	Not Retained - Insufficient Percent Detection
Dissolved Cobalt	28.21	Not Retained - Insufficient Percent Detection
Staphylococcus aureus	14.21	Not Retained - Insufficient Percent Detection
Ammonia Nitrogen	48.98	Not Retained - Redundant with TKN
Total Silver	2.67	Not Retained - Insufficient Percent Detection
Total Thallium	3.05	Not Retained - Insufficient Percent Detection
Total Beryllium	7.37	Not Retained - Insufficient Percent Detection
Total Antimony	11.69	Not Retained - Insufficient Percent Detection
Total Cadmium	12.83	Not Retained - Insufficient Percent Detection
Total Lead	35.62	Not Retained - Insufficient Percent Detection
Total Selenium	27.84	Not Retained - Insufficient Percent Detection
Total Cobalt	28.99	Not Retained - Insufficient Percent Detection
Dissolved Molybdenum	25.19	Not Retained - Insufficient Percent Detection
Dissolved Mercury	2.21	Not Retained - Insufficient Percent Detection
Total Chromium	35.51	Not Retained - Insufficient Percent Detection
Total Vanadium	27.08	Not Retained - Insufficient Percent Detection
Total Mercury	6.08	Not Retained - Insufficient Percent Detection
Salmonella species	12.18	Not Retained - Insufficient Percent Detection
AS_D	39.61	Retained for PCA
ZN_D	64.59	Retained for PCA
CU_D	61.17	Retained for PCA
Total Molybdenum	29.11	Not Retained - Insufficient Percent Detection
AS_T	45.63	Retained for PCA
CU_T	54.93	Retained for PCA
ZN_T	55.04	Retained for PCA
COLIFORMS	94.88	Retained for PCA
ALKALINITY	99.76	Retained for PCA
Estriol	4.72	Not Retained - Insufficient Percent Detection
17a-estradiol	5.67	Not Retained - Insufficient Percent Detection
Estrone	15.91	Not Retained - Insufficient Percent Detection
17b-estradiol	19.84	Not Retained - Insufficient Percent Detection

ENTERO	86.14	Retained for PCA
AL_D	30.78	Retained for PCA
BA_D	99.64	Retained for PCA
CA_D	100.00	Retained for PCA
FE_D	31.98	Retained for PCA
K_D	99.52	Retained for PCA
MG_D	99.88	Retained for PCA
MN_D	77.49	Retained for PCA
NA_D	99.88	Retained for PCA
NI_D	57.33	Retained for PCA
CL	96.84	Retained for PCA
FECAL	87.67	Retained for PCA
AL_T	58.73	Retained for PCA
BA_T	99.75	Retained for PCA
CA_T	100.00	Retained for PCA
FE_T	65.09	Retained for PCA
K_T	99.88	Retained for PCA
MG_T	99.88	Retained for PCA
MN_T	88.78	Retained for PCA
NA_T	100.00	Retained for PCA
NI_T	62.78	Retained for PCA
SO4	98.83	Retained for PCA
PH	100.00	Retained for PCA
ECOLI	84.18	Retained for PCA

Table 6.11-6 Percent Detections and Parameter Retained (solid)

ParamID or EDA_Variable	Percent Detection	Action - Primary Reason
AS_T	97.17	Retained for PCA
CU_T	100.00	Retained for PCA
ZN_T	100.00	Retained for PCA
OM	100.00	Retained for PCA
AL_T	99.58	Retained for PCA
NITROGEN	93.60	Retained for PCA
SALTS	100.00	Retained for PCA
P_T	100.00	Retained for PCA
PH	100.00	Retained for PCA
P_MEHLICH	99.74	Retained for PCA
BA_T	100.00	Retained for PCA
BE_T	52.88	Retained for PCA
CA_T	100.00	Retained for PCA
CO_T	95.81	Retained for PCA
CR_T	97.12	Retained for PCA
FE_T	100.00	Retained for PCA
HG_T	73.56	Retained for PCA
K_T	100.00	Retained for PCA
MG_T	100.00	Retained for PCA
MN_T	99.74	Retained for PCA
NA_T	40.58	Retained for PCA
NI_T	97.64	Retained for PCA
PB_T	95.03	Retained for PCA
V_T	95.55	Retained for PCA
Total Antimony	9.79	Not Retained - Insufficient Percent Detection
Total Cadmium	16.32	Not Retained - Insufficient Percent Detection
Total Selenium	19.88	Not Retained - Insufficient Percent Detection
Total Silver	4.45	Not Retained - Insufficient Percent Detection
Total Thallium	2.97	Not Retained - Insufficient Percent Detection
Total Molybdenum	27.22	Not Retained - Insufficient Percent Detection
CLAY	100.00	Retained for PCA
SAND	98.01	Retained for PCA
SILT	95.22	Retained for PCA
COLIFORMS	91.77	Retained for PCA
P_WS	73.73	Retained for PCA
STAPH	30.43	Retained for PCA
NH4_WS	68.72	Retained for PCA
SO4_WS	82.46	Retained for PCA
FECAL	82.44	Retained for PCA
ENTERO	88.41	Retained for PCA
ECOLI	75.00	Retained for PCA

Table 6.11-7a: Summary of PCA Run (Water)

Solids Run No.	Summary of Groups Selected	Total Samples	No. of Parameters/ Parameter of Threshold	Purpose
0428_SW_1	Edge of Field Lake - Tenkiller SPLP SPLP – (Cattle only) SW Stream - BFC SW Forest SW Stream - HFC SW Stream – Small Trib – BFC SW Stream – Small Trib – HFC SW Stream PA-BFC SW Stream PA- HFC SW Stream NA SW Stream - Synoptic SW Stream - USGS - BFC SW Stream - USGS - HFC SW Stream - WWTP	583	26/20	Surface Water Run - Total Metals (using >20 variable threshold)
0428_SW_2	Edge of Field Lake - Tenkiller SPLP SPLP - (Cattle only) SW Stream - BFC SW Forest SW Stream - HFC SW Stream – Small Trib – BFC SW Stream – Small Trib – HFC SW Stream PA-BFC SW Stream PA- HFC SW Stream NA SW Stream - Synoptic SW Stream - USGS - BFC SW Stream - USGS - HFC SW Stream - WWTP	617	26/20	Sensitivity - Same as SW_1 using Dissolved Metals

Table 6.11-7a: Summary of PCA Run (Water)

Solids Run No.	Summary of Groups Selected	Total Samples	No. of Parameters/ Parameter of Threshold	Purpose
0427_SW_3	Edge of Field Lake - Tenkiller SW Stream - BFC SW Forest SW Stream - HFC SW Stream – Small Trib – BFC SW Stream – Small Trib – HFC SW Stream PA-BFC SW Stream PA- HFC SW Stream NA SW Stream - Synoptic SW Stream - USGS - BFC SW Stream - USGS - HFC SW Stream - WWTP	573	26/20	Surface water without SPLP (using >20 variable threshold)
0427_SW_4	Edge of Field Lake - Tenkiller SW Stream - BFC SW Forest SW Stream - HFC SW Stream – Small Trib – BFC SW Stream – Small Trib – HFC SW Stream PA-BFC SW Stream PA- HFC SW Stream NA SW Stream - Synoptic SW Stream - USGS - BFC SW Stream - USGS - HFC SW Stream - WWTP	607	26/20	Sensitivity - Same as SW_2 without SPLP
0427_SW_5	Lake - Tenkiller SW Stream - BFC SW Forest SW Stream - HFC SW Stream – Small Trib – BFC SW Stream – Small Trib – HFC SW Stream PA-BFC SW Stream PA- HFC SW Stream NA SW Stream - Synoptic SW Stream - USGS - BFC SW Stream - USGS - HFC SW Stream - WWTP	508	26/20	Investigative - Same as SW_3 without EOF

Table 6.11-7a: Summary of PCA Run (Water)

Solids Run No.	Summary of Groups Selected	Total Samples	No. of Parameters/ Parameter of Threshold	Purpose
0427_SW_6	Lake - Tenkiller SW Stream - BFC SW Forest SW Stream - HFC SW Stream – Small Trib – BFC SW Stream – Small Trib – HFC SW Stream PA-BFC SW Stream PA- HFC SW Stream NA SW Stream - Synoptic SW Stream - USGS - BFC SW Stream - USGS - HFC SW Stream - WWTP	542	26/20	Sensitivity - Same as SW_4 without EOF
0428_SW_7	Edge of Field Lake - Tenkiller SW Stream - BFC SW Forest SW Stream - HFC SW Stream – Small Trib – BFC SW Stream – Small Trib – HFC SW Stream PA-BFC SW Stream PA- HFC SW Stream NA SW Stream - Synoptic SW Stream - USGS - BFC SW Stream - USGS - HFC SW Stream - WWTP	589	24/17	Sensitivity - Same as SW_3 with one P variable
0428_SW_8	Edge of Field Lake - Tenkiller SW Stream - BFC SW Forest SW Stream - HFC SW Stream - Small Trib – BFC SW Stream - Small Trib – HFC SW Stream PA-BFC SW Stream PA- HFC SW Stream NA SW Stream - Synoptic SW Stream - USGS - BFC SW Stream - USGS - HFC SW Stream - WWTP	607	24/17	Sensitivity - Same as SW_4 with one P variable

Table 6.11-7a: Summary of PCA Run (Water)

Solids Run No.	Summary of Groups Selected	Total Samples	No. of Parameters/ Parameter of Threshold	Purpose
0428_SW_9	Edge of Field Lake - Tenkiller SW Stream - BFC SW Forest SW Stream - HFC SW Stream - Small Trib – BFC SW Stream - Small Trib – HFC SW Stream PA-BFC SW Stream PA- HFC SW Stream NA SW Stream - Synoptic SW Stream - USGS - BFC SW Stream - USGS - HFC SW Stream - WWTP	605	23/17	Sensitivity - Same as SW_3 with one bacteria variable (ECOLI)
0428_SW_10	Edge of Field Lake - Tenkiller SW Stream - BFC SW Forest SW Stream - HFC SW Stream - Small Trib – BFC SW Stream - Small Trib – HFC SW Stream PA-BFC SW Stream PA- HFC SW Stream NA SW Stream - Synoptic SW Stream - USGS - BFC SW Stream - USGS - HFC SW Stream - WWTP	641	23/17	Sensitivity - Same as SW_4 with one bacteria variable (ECOLI)

Table 6.11-7a: Summary of PCA Run (Water)

Solids Run No.	Summary of Groups Selected	Total Samples	No. of Parameters/ Parameter of Threshold	Purpose
0428_SW_11	Edge of Field Lake - Tenkiller SW Stream - BFC SW Forest SW Stream - HFC SW Stream - Small Trib – BFC SW Stream - Small Trib – HFC SW Stream PA-BFC SW Stream PA- HFC SW Stream NA SW Stream - Synoptic SW Stream - USGS - BFC SW Stream - USGS - HFC SW Stream - WWTP	605	23/17	Sensitivity - Same as SW_3 with one bacteria variable (ENTERO)
0428_SW_12	Edge of Field Lake - Tenkiller SW Stream - BFC SW Forest SW Stream - HFC SW Stream - Small Trib – BFC SW Stream - Small Trib – HFC SW Stream PA-BFC SW Stream PA- HFC SW Stream NA SW Stream - Synoptic SW Stream - USGS - BFC SW Stream - USGS - HFC SW Stream - WWTP	641	23/17	Sensitivity - Same as SW_4 with one bacteria variable (ENTERO)

Table 6.11-7a: Summary of PCA Run (Water)

Solids Run No.	Summary of Groups Selected	Total Samples	No. of Parameters/ Parameter of Threshold	Purpose
0428_SW_13	Edge of Field Lake - Tenkiller SW Stream - BFC SW Forest SW Stream - HFC SW Stream - Small Trib – BFC SW Stream - Small Trib – HFC SW Stream PA-BFC SW Stream PA- HFC SW Stream NA SW Stream - Synoptic SW Stream - USGS - BFC SW Stream - USGS - HFC SW Stream - WWTP	616	21/14	Sensitivity - Same as SW_3 with one P and one bacteria variable (ENTERO)
0428_SW_14	Edge of Field Lake - Tenkiller SW Stream - BFC SW Forest SW Stream - HFC SW Stream - Small Trib – BFC SW Stream - Small Trib – HFC SW Stream PA-BFC SW Stream PA- HFC SW Stream NA SW Stream - Synoptic SW Stream - USGS - BFC SW Stream - USGS - HFC SW Stream - WWTP	641	21/14	Sensitivity - Same as SW_4 with one P and one bacteria variable (ENTERO)

Table 6.11-7a: Summary of PCA Run (Water)

Solids Run No.	Summary of Groups Selected	Total Samples	No. of Parameters/ Parameter of Threshold	Purpose
0428_SW_15	Edge of Field Lake - Tenkiller SW Stream - BFC SW Forest SW Stream - HFC SW Stream - Small Trib – BFC SW Stream - Small Trib – HFC SW Stream PA-BFC SW Stream PA- HFC SW Stream NA SW Stream - Synoptic SW Stream - USGS - BFC SW Stream - USGS - HFC SW Stream - WWTP	267	26/26	Investigative - Same as SW_3 with no missing data allowed
0428_SW_16	GW Geoprobe GW Spring GW Well Edge of Field Lake - Tenkiller SW Stream - BFC SW Forest SW Stream - HFC SW Stream - Small Trib – BFC SW Stream - Small Trib – HFC SW Stream PA-BFC SW Stream PA- HFC SW Stream NA SW Stream - Synoptic SW Stream - USGS - BFC SW Stream - USGS - HFC SW Stream - WWTP	366	26/26	Investigative - Same as SW_15 with GW added

Table 6.11-7a: Summary of PCA Run (Water)

Solids Run No.	Summary of Groups Selected	Total Samples	No. of Parameters/ Parameter of Threshold	Purpose
0428_SW_17	GW Geoprobe GW Spring GW Well Edge of Field Lake - Tenkiller SW Stream - BFC SW Forest SW Stream - HFC SW Stream - Small Trib – BFC SW Stream - Small Trib – HFC SW Stream PA-BFC SW Stream PA- HFC SW Stream NA SW Stream - Synoptic SW Stream - USGS - BFC SW Stream - USGS - HFC SW Stream - WWTP	699	26/20	Surface and Ground water run same as SW_3 with ground water (using >= 20 variable threshold)
0502_SW_18	SW - Edge of Field SPLP SPLP – (Cattle and Poultry)	66	26/26	Investigative - EOF and SPLP only with no missing data allowed
0502_SW_19	SW - Edge of Field SPLP SPLP – (Cattle only)	64	26/26	Sensitivity - Same as SW_18 with two FAC samples removed
0502_SW_20	SW - Edge of Field	65	26/20	Investigative - EOF only
0502_SW_21	SW - Edge of Field	61	14/11	Investigative - Same as SW_20 with variables based on CP chemistry

Table 6.11-7a: Summary of PCA Run (Water)

Solids Run No.	Summary of Groups Selected	Total Samples	No. of Parameters/ Parameter of Threshold	Purpose
0504_SW_22	GW Spring Edge of Field Lake - Tenkiller SW Stream - BFC SW Forest SW Stream - HFC SW Stream - Small Trib – BFC SW Stream - Small Trib – HFC SW Stream PA-BFC SW Stream PA- HFC SW Stream NA SW Stream - Synoptic SW Stream - USGS - BFC SW Stream - USGS - HFC SW Stream - WWTP	622	26/20	Investigative - Same as SW_3 with Springs added.

Table 6.11-7b: Summary of PCA Run (Solids)

Solids Run No.	Summary of Groups	Total Samples	No. of Parameters/ Parameter of Threshold	Purpose
0502_SD_1	Cow manure, Poultry Waste, Poultry Waste Plus Soil (FAC06), Lake Sediment - Small IRW Reservoirs, Lake Sediment- Lake Tenkiller Grab, Stream Sediment, Surface Soil (0-2")	203	32/26	Solids run (using > 26 variable threshold)
0502_SD_2	Cow Manure, Poultry Waste, Poultry Waste-Plus Soil (FAC06), Sediment-Lake-Small IRW Reservoirs, Sediment-Lake-Tenkiller Grab, Sediment Stream, Surface Soil (0-2")	82	32/32	Sensitivity - Same as SD_1 with no missing data allowed
0501_SD_3	Sediment-Lake-Small IRW Reservoirs. Sediment-Lake-Tenkiller Grab, Sediment Stream, Surface Soil (0-2")	173	32/26	Investigative - Same as SD_1 without Poultry Waste and Cow Manure
0501_SD_4	Sediment-Lake-Small IRW Reservoirs. Sediment-Lake-Tenkiller Grab, Sediment Stream, Surface Soil (0-2")	61	32/32	Sensitivity - Same as SD_2 without Poultry Waste and Cow Manure
0501_SD_5	Sediment-Lake-Tenkiller Core	88	23/18	Investigative - Tenkiller Core samples only
0501_SD_6	Cow manure, Poultry Waste, Poultry Waste Plus Soil (FAC06), Lake Sediment - Small IRW Reservoirs, Lake Sediment- Lake Tenkiller Grab, Lake Sediment – Lake Tenkiller Core, Stream Sediment, Surface Soil (0-2")	299	23/18	Investigative - Same as SD_1 with Core samples
0501_SD_7	Cow Manure, Poultry Waste, Poultry Waste-Plus Soil (FAC06), Sediment-Lake-Small IRW Reservoirs, Sediment-Lake-Tenkiller Grab, Lake Sediment – Lake Tenkiller Core Sediment Stream, Surface Soil (0-2")	274	23/23	Sensitivity - Same as SD_6 with no missing values allowed

Table 6.11-7b: Summary of PCA Run (Solids)

Solids Run No.	Summary of Groups	Total Samples	No. of Parameters/ Parameter of Threshold	Purpose
0502_SD_8	Cow Manure, Poultry Waste, Poultry Waste-Plus Soil (FAC06), Sediment-Lake-Small IRW Reservoirs, Sediment-Lake-Tenkiller Grab, Lake Sediment – Lake Tenkiller Core Sediment Stream, Surface Soil (0-2")	288	32/23	Sensitivity - Combination of SD_1 and SD_6

Table 6.11-11 Largest PC2 Scores and Locations

Sample ID	PC2 Score	Location
RBS-0000345:8/11/2006:SW:S:0:-	8.088	downgradient of Springdale
RBS-0000121:8/10/2006:SW:S:0:-	7.898	downgradient of Springdale
HFS-04:8/1/2006:SW:S:-:BF2	7.617	downgradient of Siloam Springs
HFS-04:9/28/2005:SW:S:-:-	7.289	downgradient of Siloam Springs
HFS-04:6/15/2006:SW:S:-:BF1	7.025	downgradient of Siloam Springs
RBS-0000075:8/10/2006:SW:S:0:-	6.999	downgradient of Springdale and Rogers
HFS-04:8/27/2005:SW:S:-:BF2	6.831	downgradient of Siloam Springs
RBS-0000349:8/11/2006:SW:S:0:-	6.468	downgradient of Springdale
SiloamWWTP:3/31/2008:SW:S:-:-	6.356	Siloam Springs Discharge
HFS-04:7/13/2005:SW:S:-:BF1	6.255	downgradient of Siloam Springs
HFS-05:5/10/2006:SW:S:-:EVENTA	6.233	not downgradient of WWTP
HFS-04:3/10/2006:SW:S:-:-	6.175	downgradient of Siloam Springs
HFS-04:4/4/2006:SW:S:-:-	6.161	downgradient of Siloam Springs
HFS-04:6/22/2005:SW:S:-:A	6.045	downgradient of Siloam Springs
HFS-04:4/26/2006:SW:S:-:-	6.010	downgradient of Siloam Springs
HFS-04:3/10/2006:SW:S:-:PEAK	6.000	downgradient of Siloam Springs
SpringdaleWWTP:3/31/2008:SW:S:-:-	5.946	Springdale WWTP Discharge
RBS-0000031:8/16/2006:SW:S:0:-	5.889	downgradient of Fayetteville
RBS-0000350:8/16/2006:SW:S:0:-	5.876	downgradient of Springdale and Rogers
HFS-04:4/8/2006:SW:S:-:-	5.840	downgradient of Siloam Springs
HFS-04:8/20/2005:SW:S:-:B	5.838	downgradient of Siloam Springs
RBS-0000901:8/9/2006:SW:S:0:-	5.771	downgradient of Siloam Springs
BS-HF04:5/1/2007:SW:S:0:-	5.742	downgradient of Siloam Springs
HFS-04:8/20/2005:SW:S:-:A	5.686	downgradient of Siloam Springs
HFS-22:8/1/2006:SW:S:1:BF2	5.628	downgradient of Lincoln
HFS-22:8/28/2005:SW:S:-:BF2	5.586	downgradient of Lincoln
RBS-0000120:8/9/2006:SW:S:0:-	5.507	downgradient of Rogers
HFS-22:4/27/2006:SW:S:-:PEAK	5.435	downgradient of Lincoln
HFS-04:6/22/2005:SW:S:-:B	5.299	downgradient of Siloam Springs
RS-75:5/8/2007:SW:S:0:-	5.254	downgradient of Springdale and Rogers
HFS-22:4/27/2006:SW:S:-:-	5.236	downgradient of Lincoln
HFS-22:5/10/2006:SW:S:-:EVENTA	5.144	downgradient of Lincoln
HFS-04:5/6/2006:SW:S:-:-	5.143	downgradient of Siloam Springs
HFS-22:6/7/2005:SW:S:-:-	5.105	downgradient of Lincoln
SN-SBC2:4/25/2007:SW:S:0:-	5.093	downgradient of Westville
RogersWWTP:4/1/2008:SW:S:-:-	5.073	Rogers WWTP discharge
HFS-22:3/22/2006:SW:S:-:PEAK	5.062	downgradient of Lincoln
RBS-0000109:8/9/2006:SW:S:0:-	5.053	downgradient of Lincoln
HFS-22:6/15/2006:SW:S:-:BF1	5.024	downgradient of Lincoln
HFS-22:6/15/2005:SW:S:-:A	5.017	downgradient of Lincoln
RS-72:5/21/2007:SW:S:0:-	5.001	downgradient of Fayetteville
HFS-22:4/4/2006:SW:S:-:PEAK	4.975	downgradient of Lincoln
HFS-04:5/9/2006:SW:S:-:EVENTA	4.969	downgradient of Siloam Springs
BS-HF22:8/24/2005:SW:S:-:-	4.947	downgradient of Lincoln

Table 6.11-11 Largest PC2 Scores and Locations

Sample ID	PC2 Score	Location
HFS-22:7/12/2005:SW:S:-:BF1	4.923	downgradient of Lincoln
HFS-22:6/15/2005:SW:S:-:B	4.884	downgradient of Lincoln
RBS-0000225:8/11/2006:SW:S:0:-	4.852	not downgradient or WWTP
BS-HF22:5/2/2007:SW:S:0:-	4.844	downgradient of Lincoln
HFS-05:3/22/2006:SW:S:-:PEAK	4.843	not downgradient or WWTP
HFS-22:3/22/2006:SW:S:-:-	4.839	downgradient of Lincoln
RS-122:5/3/2007:SW:S:0:-	4.820	downgradient of Rogers
HFS-22:4/4/2006:SW:S:-:-	4.820	downgradient of Lincoln
USGS-07195500:3/10/2006:SW:S:-:-	4.819	not immediately downgradient of WWTP
RBS-0000246:8/9/2006:SW:S:0:-	4.815	downgradient of Prairie Grove
HFS-04:5/25/2005:SW:S:-:1	4.807	downgradient of Siloam Springs

Table 6.11-8: Chemical and Bacterial Composition for PCA Parameters (Poultry Waste and Cattle Manure)

Parameter	PCA Variable ID	Units	Poultry Waste	Fresh Cattle Manure	Dry Cattle Manure
			CDM Average	CDM Average	CDM Average
Total Sodium	NA_T	mg/Kg	8090	1210	159
Total Potassium	K_T	mg/Kg	30700	9270	1950
Mehlich 3 Phosphorus	P_MEHLICH	mg/Kg	5410	3280	1610
Total P (6020)	P_T	mg/Kg	20100	5920	2690
Soluble Salts	SALTS	mmhos/cm	11.8	3.85	2.18
Organic Matter	OM	%	73.2	86.3	86.6
Total Magnesium	MG_T	mg/Kg	5900	4820	2830
Water Soluble Phosphorus	P_WS	mg/Kg	1440	3020	950
Enterococcus	ENTERO	MPN*/gram	107000	201000	152000
Water Soluble Ammonium	NH4_WS	mg/Kg	1700	808	215
Total Zinc	ZN_T	mg/Kg	506	74.1	72.9
Water Soluble Sulfate	SO4_WS	mg/Kg	4410	569	69.9
E. coli	ECOLI	MPN*/gram	40400	806000	171000
Total Calcium	CA_T	mg/Kg	34400	9010	6960
Total Copper	CU_T	mg/Kg	417	14	10.5
Total Nitrogen	NITROGEN	mg/Kg	30000	30600	30000
Fecal Coliform	FECAL	MPN*/gram	46900	806000	171000
Total Coliform	COLIFORMS	MPN*/gram	47500	806000	202000
pH	PH	s.u.	7.93	7.44	7.58
Total Manganese	MN_T	mg/Kg	1490	342	348
Total Arsenic	AS_T	mg/Kg	18.7	1.42	0.822
Total Barium	BA_T	mg/Kg	48.8	82.2	91.9
Total Nickel	NI_T	mg/Kg	14	1.86	0.822
Total Beryllium	BE_T	mg/Kg	0.307	1.42	0.822
Total Mercury	HG_T	mg/Kg	0.00561	0.0826	0.0153
Staphylococcus	STAPH	MPN*/gram	0.11	0.604	0.29
Total Vanadium	V_T	mg/Kg	17.6	7.11	4.11
Total Aluminum	AL_T	mg/Kg	1930	493	562
Total Chromium	CR_T	mg/Kg	7.33	1.42	0.822
Total Cobalt	CO_T	mg/Kg	1.81	1.42	0.822
Total Lead	PB_T	mg/Kg	1.82	1.42	0.822
Total Iron	FE_T	mg/Kg	1100	525	509

Table 6.11-9: Chemical and Bacterial Composition for PCA Parameters (Synthetic Leachate)

Parameter	PCA Variable ID	Units	Poultry Litter 20:1	Fresh Cattle Manure SPLP 20:1	Dry Cattle Manure SPLP 20:1
			CDM Average	CDM Average	CDM Average
Dissolved Copper	CU_T	mg/L	4.54	0.0242	0.0172
E. coli	ECOLI	MPN*/100ml	12000	12000	7350
Dissolved Iron	FE_T	mg/L	7.47	0.5	0.5
TOC	TOC	mg/L	10.2	50.7	13.8
Dissolved Aluminum	AL_T	mg/L	1.23	0.5	0.5
Dissolved Nickel	NI_T	mg/L	0.235	0.0076	0.005
Fecal Coliform	FECAL	MPN*/100ml	12000	12000	7350
Enterococcus	ENTERO	MPN*/100ml	8000	8320	5440
Total Coliform	COLIFORMS	MPN*/100ml	12000	12000	7790
Dissolved Potassium	K_T	mg/L	976	73.1	19
Dissolved Zinc	ZN_T	mg/L	2.57	0.119	0.0994
Dissolved Manganese	MN_T	mg/L	1.54	0.773	0.304
Dissolved Arsenic	AS_T	mg/L	0.238	0.005	0.005
Total Dissolved P (4500PF)	P_TD	mg/L	165	37.9	28.3
Soluble Reactive P (4500PF)	P_SOL_REAC	mg/L	131	30.5	26.2
Dissolved Magnesium	MG_T	mg/L	59.7	28.1	20
Total Kjeldahl Nitrogen	TKN	mg/L	603	45.2	45.5
Dissolved Barium	BA_T	mg/L	0.202	0.198	0.145
Total Dissolved Solids	TDS	mg/L	5580	918	407
Sulfate	SO4	mg/L	384	10	10
Nitrite + Nitrate	NO2_NO3	mg/L	1	1	1
Chloride	CL	mg/L	226	27.1	10
Dissolved Sodium	NA_T	mg/L	295	42	8.86
Alkalinity (as CaCO3)	ALKALINITY	mg/L	1610	302	152
Dissolved Calcium	CA_T	mg/L	45.4	46.1	34.4

Table 6.11-10: Chemical and Bacterial Composition for PCA Parameters (Water Samples)

Parameter	PCA Variable ID	Units	Poultry EOF	Cattle EOF	Cattle Impacted Springs	WWTP Discharge	WWTP Surface Water
			CDM Average	CDM Average	CDM Average	CDM Average	CDM Average
Total Copper	CU_T	mg/L	0.16	0.00306	0.00483	0.00249	0.00156
E. coli	ECOLI	MPN*/100ml or cfu/100mL	88300	12000	790	9.5	1080
Total Iron	FE_T	mg/L	11.9	2.45	0.318	0.175	0.118
Total Organic Carbon	TOC	mg/L	57.8	11.7	8.72	5.32	3.67
Total P (4500PF)	P_T	mg/L	7.81	1.1	3.2	1.23	0.594
Total Aluminum	AL_T	mg/L	9.14	2.76	0.273	0.05	0.109
Total Nickel	NI_T	mg/L	0.0179	0.00241	0.00517	0.0034	0.00417
Fecal Coliform	FECAL	MPN*/100ml or cfu/100mL	89900	12000	452	70	1400
Enterococcus	ENTERO	ng/L	122000	12000	4100	4.5	652
Total Coliform	COLIFORMS	MPN*/100ml or cfu/100mL	220000	12000	6900	9800	3950
Total Potassium	K_T	mg/L	46.2	8.34	21.3	10.9	12.5
Total Zinc	ZN_T	mg/L	0.154	0.0198	0.0055	0.0238	0.0187
Total Manganese	MN_T	mg/L	0.661	0.197	0.166	0.0545	0.0139
Total Arsenic	AS_T	mg/L	0.0171	0.00282	0.004	0.0012	0.00145
Total Dissolved P (4500PF)	P_TD	mg/L	4.68	0.607	3.09	1.01	0.568
Soluble Reactive P (4500PF)	P_SOL_REAC	mg/L	3.66	0.553	2.94	0.916	0.524
Total Magnesium	MG_T	mg/L	6.95	2.19	9.4	2.51	2.66
Total Kjeldahl Nitrogen	TKN	mg/L	24.2	4.19	1.87	6.34	2.02
Total Barium	BA_T	mg/L	0.174	0.0621	0.176	0.00969	0.0402
Total Dissolved Solids	TDS	mg/L	401	98	457	274	302
Sulfate	SO4	mg/L	20.4	3.34	25.4	55.4	51.2
Nitrite + Nitrate	NO2_NO3	mg/L	1.63	0.197	22.9	3.47	3.95
Chloride	CL	mg/L	22.3	3.62	37.6	46.9	48.1
Total Sodium	NA_T	mg/L	19.1	1.42	22.9	43.5	48.6
Alkalinity (as CaCO3)	ALKALINITY	mg/L	110	25	188	75.3	100
Total Calcium	CA_T	mg/L	64.5	5.99	77.3	33.2	47.2