

Appendix F: Trending Summary Tables

Table F1: Trending Summary for Battle River – Flow-Weighted Trend

Parameter	Z Critical = 1.960				Rank Von Neumann (alpha=0.05)
	n	Z Calc	p<0.05	Slope (units/yr)	
Nutrients					
Ammonia Dissolved	356	-5.433	Sig	-0.0009968	Yes
Nitrate as N	505	-6.084	Sig	-0.00007556	Yes
Nitrogen Total	176	-0.9634	Not Sig	-0.006245	Yes
Phosphorous Total	420	5.886	Sig	0.0008223	Yes
Phosphorous Total Dissolved	393	0.7233	Not Sig	0.00003676	Yes
Major Ions					
Chloride Dissolved	509	12.39	Sig	0.2969	Yes
Fluoride Dissolved	455	6.55	Sig	0.001204	Yes
Sodium Dissolved/Filtered	509	5.052	Sig	0.4522	Yes
Sulphate Dissolved	508	3.07	Sig	0.3392	Yes
Total Dissolved Solids (TDS)	332	7.111	Sig	3.822	Yes
Physicals					
Oxygen Dissolved	415	1.876	Not Sig	0.03594	Yes
pH – Field	414	7.625	Sig	0.01343	Yes
Sodium Adsorption Ratio (SAR)	401	2.426	Sig	0.00869	Yes
Total Suspended Solids (TSS)	437	5.883	Sig	0.3053	Yes
Metals					
Aluminum Total	175	-1.987	Sig	-3.877	Yes
Chromium Total	175	-1.954	Not Sig	-0.008097	Yes
Cobalt Dissolved	118	-6.58	Sig	-0.08403	Yes
Cobalt Total	175	-0.1316	Not Sig	-0.000631	Yes
Copper Dissolved	118	-3.304	Sig	-0.09507	Yes
Copper Total	175	-2.591	Sig	-0.04362	Yes
Iron Dissolved	175	1.077	Not Sig	0.3636	Yes
Iron Total	120	1.204	Not Sig	13.98	Yes
Lithium Dissolved	118	2.161	Sig	1.047	Yes
Lithium Total	120	-2.781	Sig	-1.965	Yes
Manganese Dissolved	175	1.804	Not Sig	0.345	Yes
Manganese Total	120	1.567	Not Sig	4.038	Yes
Molybdenum Dissolved	118	-4.584	Sig	-0.07641	Yes
Molybdenum Total	120	0.1089	Not Sig	0.001424	Yes
Nickel Total	175	0.9936	Not Sig	0.02575	Yes
Vanadium Total	175	-0.2761	Not Sig	-0.004318	Yes
Zinc Total	175	-0.653	Not Sig	-0.01826	Yes

	No Seasonality
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Table F2: Trending Summary for Battle River – Concentration Trend

Parameter	Z Critical = 1.960				Rank Von Neumann (impact at alpha 0.05)
	n	Z Calc	p<0.05	Slope units/yr	
Nutrients					
Ammonia Dissolved	356	-5.005	Sig	-0.0006275	Yes
Nitrate as N	505	-7.707	Sig	0	Yes
Nitrogen Total	176	-0.6608	Not Sig	-0.005117	Yes
Phosphorous Total	420	0.9896	Not Sig	0.0001668	Yes
Phosphorous Total Dissolved	393	-0.1074	Not Sig	0	Yes
Major Ions					
Chloride Dissolved	509	10.52	Sig	0.3452	Yes
Fluoride Dissolved	455	6.658	Sig	0.001422	Yes
Sodium Dissolved/Filtered	509	5.703	Sig	0.8029	Yes
Sulphate Dissolved	508	4.544	Sig	0.6712	Yes
Total Dissolved Solids (TDS)	332	7.767	Sig	8.039	Yes
Physicals					
Oxygen Dissolved	415	-1.393	Not Sig	-0.01365	Yes
pH – Field	414	7.429	Sig	0.01045	Yes
Sodium Adsorption Ratio (SAR)	401	3.101	Sig	0.01479	Yes
Total Suspended Solids (TSS)	437	0.05636	Not Sig	0	Yes
Metals					
Aluminum Total	175	-2.048	Sig	-3.621	Yes
Chromium Total	175	-1.692	Not Sig	-0.003693	Yes
Cobalt Dissolved	118	-6.723	Sig	-0.04828	Yes
Cobalt Total	175	-0.3411	Not Sig	0	Yes
Copper Dissolved	118	-3.366	Sig	-0.08673	Yes
Copper Total	175	-2.87	Sig	-0.05762	Yes
Iron Dissolved	175	1.755	Not Sig	0.5503	Yes
Iron Total	120	0.8063	Not Sig	12.47	Yes
Lithium Dissolved	118	0.7043	Not Sig	0.5141	Yes
Lithium Total	120	-2.496	Sig	-2.505	Yes
Manganese Dissolved	175	1.492	Not Sig	0.2002	Yes
Manganese Total	120	1.561	Not Sig	4.065	Yes
Molybdenum Dissolved	118	-4.473	Sig	-0.06695	Yes
Molybdenum Total	120	-0.4119	Not Sig	-0.004106	Yes
Nickel Total	175	0.5843	Not Sig	0.01571	Yes
Vanadium Total	175	-0.3527	Not Sig	-0.002015	Yes
Zinc Total	175	-0.53	Not Sig	-0.01628	Yes


 No Seasonality

Table F3: Trending Summary for Beaver River – Flow-Weighted Trend

Parameter	Z Critical = 1.960				Rank Von Neumann (alpha=0.05)
	n	Z Calc	p<0.05	Slope (units/yr)	
Nutrients					
Ammonia Dissolved	304	-3.739	Sig	-0.001061	Yes
Nitrate as N	414	-8.032	Sig	-0.001441	Yes
Nitrogen Total	154	-0.4973	Not Sig	-0.002892	Yes
Phosphorous Total	384	-1.595	Not Sig	-0.0002472	Yes
Phosphorous Total Dissolved	356	-7.497	Sig	-0.0004983	Yes
Major Ions					
Chloride Dissolved	387	-1.761	Not Sig	-0.009358	Yes
Fluoride Dissolved	373	-2.195	Sig	-0.0002487	Yes
Sodium Dissolved/Filtered	388	-5.665	Sig	-0.08433	Yes
Sulphate Dissolved	388	-7.06	Sig	-0.168	Yes
Total Dissolved Solids (TDS)	253	-0.9767	Not Sig	-0.222	Yes
Physicals					
Oxygen Dissolved	373	1.863	Not Sig	0.03674	Yes
pH – Field	370	7.019	Sig	0.01266	Yes
Sodium Adsorption Ratio (SAR)	335	-3.26	Sig	-0.001625	Yes
Total Suspended Solids (TSS)	387	2.832	Sig	0.06881	Yes
Metals					
Aluminum Total	153	-1.832	Not Sig	-1.295	Yes
Boron Dissolved	153	-0.6784	Not Sig	-0.0929	Yes
Chromium Total	153	-4.042	Sig	-0.01462	Yes
Cobalt Dissolved	95	-6.948	Sig	-0.03641	Yes
Cobalt Total	153	-4.061	Sig	-0.009019	Yes
Copper Total	153	-2.576	Sig	-0.01325	Yes
Iron Dissolved	153	-1.013	Not Sig	-1.832	Yes
Lithium Dissolved	95	-0.3567	Not Sig	-0.02043	Yes
Lithium Total	97	-1.839	Not Sig	-0.1613	Yes
Manganese Dissolved	153	-2.584	Sig	-1.035	Yes
Manganese Total	97	0.4114	Not Sig	1.101	Yes
Molybdenum Dissolved	95	-4.938	Sig	-0.03355	Yes
Molybdenum Total	97	-2.275	Sig	-0.01301	Yes
Zinc Total	153	-1.553	Not Sig	-0.03151	Yes


 No Seasonality

Table F4: Trending Summary for Beaver River – Concentration Trend

Parameter	Z Critical = 1.960				Rank Von Neumann (impact at alpha 0.05)
	n	Z Calc	p<0.05	Slope units/yr	
Nutrients					
Ammonia Dissolved	304	-5.925	Sig	-0.0009534	Yes
Nitrate as N	414	-7.766	Sig	-0.001029	Yes
Nitrogen Total	154	-0.5722	Not Sig	-0.002616	Yes
Phosphorous Total	384	-2.299	Sig	-0.0003667	Yes
Phosphorous Total Dissolved	356	-7.425	Sig	-0.0005205	Yes
Major Ions					
Chloride Dissolved	387	1.96	Not Sig	0.01359	Yes
Fluoride Dissolved	373	1.901	Not Sig	0	Yes
Sodium Dissolved/Filtered	388	0.8656	Not Sig	0.02204	Yes
Sulphate Dissolved	388	-4.586	Sig	-0.1113	Yes
Total Dissolved Solids (TDS)	253	-1.915	Not Sig	-0.8217	Yes
Physicals					
Oxygen Dissolved	373	-1.634	Not Sig	-0.01635	Yes
pH – Field	370	6.922	Sig	0.01083	Yes
Sodium Adsorption Ratio (SAR)	335	0.6959	Not Sig	0.0006475	Yes
Total Suspended Solids (TSS)	387	0.3099	Not Sig	0	Yes
Metals					
Aluminum Total	153	-0.06248	Not Sig	-0.6355	Yes
Boron Dissolved	153	-0.6188	Not Sig	-0.1398	Yes
Chromium Total	153	-3.628	Sig	-0.01325	Yes
Cobalt Dissolved	95	-7.174	Sig	-0.05834	Yes
Cobalt Total	153	-3.829	Sig	-0.00831	Yes
Copper Total	153	-1.656	Not Sig	-0.009148	Yes
Iron Dissolved	153	-1.08	Not Sig	-2.072	Yes
Lithium Dissolved	95	-4.443	Sig	-0.5412	Yes
Lithium Total	97	-4.137	Sig	-0.6687	Yes
Manganese Dissolved	153	-3.1	Sig	-0.7454	Yes
Manganese Total	97	0.4195	Not Sig	0.744	Yes
Molybdenum Dissolved	95	-5.478	Sig	-0.05453	Yes
Molybdenum Total	97	-3.629	Sig	-0.02996	Yes
Zinc Total	153	-2.154	Sig	-0.04527	Yes

	No Seasonality
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Table F5: Trending Summary for Cold River – Flow-Weighted Trend

Parameter	Z Critical = 1.960				Rank Von Neumann (alpha=0.05)
	n	Z Calc	p<0.05	Slope (units/yr)	
Nutrients					
Ammonia Dissolved	55	3.543	Sig	0.0005489	No
Nitrate as N	55	1.491	Not Sig	0.00007914	Yes
Nitrogen Total	54	2.111	Sig	0.002242	No
Phosphorous Total	55	-0.08439	Not Sig	-0.0000164	No
Phosphorous Total Dissolved	55	-0.4361	Not Sig	-0.00004868	No
Major Ions					
Chloride Dissolved	78	-3.769	Sig	-0.0125	Yes
Fluoride Dissolved	78	1.979	Sig	0.00000073	Yes
Sodium Dissolved/Filtered	78	1.469	Not Sig	0.01288	No
Sulphate Dissolved	78	-3.676	Sig	-0.0676	Yes
Total Dissolved Solids (TDS)	74	1.903	Not Sig	0.1485	Yes
Physicals					
Oxygen Dissolved	75	2.527	Sig	0.08753	Yes
pH – Field	73	3.6	Sig	0.01957	Yes
Sodium Adsorption Ratio (SAR)	78	0.999	Not Sig	0.0002721	No
Total Suspended Solids (TSS)	55	-0.1829	Not Sig	-0.001492	No
Metals					
Aluminum Total	65	-3.278	Sig	-0.3531	No
Iron Total	42	0.3685	Not Sig	0.09968	No
Lithium Dissolved	40	-78a	Not Sig	-0.03451	No
Lithium Total	42	-0.1951	Not Sig	-0.009399	Yes
Manganese Total	42	0.1084	Not Sig	0.002047	No
Molybdenum Total	42	-1.582	Not Sig	-0.002235	No

	No Seasonality
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Table F6: Trending Summary for Cold River – Concentration Trend

Parameter	Z Critical = 1.960				Rank Von Neumann (impact at alpha 0.05)
	n	Z Calc	p<0.05	Slope units/yr	
Nutrients					
Ammonia Dissolved	55	2.059	Sig	0.0003872	No
Nitrate as N	55	0.6374	Not Sig	0	No
Nitrogen Total	54	1.709	Not Sig	0.001671	No
Phosphorous Total	55	0.2405	Not Sig	0	Yes
Phosphorous Total Dissolved	55	-0.7402	Not Sig	0	No
Major Ions					
Chloride Dissolved	78	-4.622	Sig	-0.01496	Yes
Fluoride Dissolved	78	1.425	Not Sig	0	Yes
Sodium Dissolved/Filtered	78	1.528	Not Sig	0.01367	No
Sulphate Dissolved	78	-5.726	Sig	-0.09438	Yes
Total Dissolved Solids (TDS)	74	1.506	Not Sig	0.1165	Yes
Physicals					
Oxygen Dissolved	75	1.591	Not Sig	0.05676	No
pH – Field	73	4.971	Sig	0.02883	Yes
Sodium Adsorption Ratio (SAR)	78	1.267	Not Sig	0.0003449	No
Total Suspended Solids (TSS)	55	-0.08819	Not Sig	0	No
Metals					
Aluminum Total	65	-3.478	Sig	-0.3657	No
Iron Total	42	-1.431	Not Sig	-0.3403	No
Lithium Dissolved	40	-41a	Not Sig	0	No
Lithium Total	42	-1.14	Not Sig	-0.04916	Yes
Manganese Total	42	0.1735	Not Sig	0.006487	No
Molybdenum Total	42	-1.3	No Sig	-0.001461	No


 No Seasonality

Table F7: Trending Summary for North Saskatchewan River – Flow-Weighted Trend

Parameter	Z Critical = 1.960				Rank Von Neumann (alpha=0.05)
	n	Z Calc	p<0.05	Slope (units/yr)	
Nutrients					
Ammonia Dissolved	248	-1.32	Not Sig	-0.0003096	Yes
Nitrate as N	248	-3.793	Sig	-0.006197	Yes
Nitrogen Total	176	-4.235	Sig	-0.02225	Yes
Phosphorous Total	247	-5.206	Sig	-0.002085	Yes
Phosphorous Total Dissolved	247	-7.87	Sig	-0.001425	Yes
Major Ions					
Chloride Dissolved	193	1.37	Not Sig	0.01608	Yes
Fluoride Dissolved	192	-2.407	Sig	-0.0005748	Yes
Sodium Dissolved/Filtered	192	0.02471	Not Sig	0.0005159	Yes
Sulphate Dissolved	193	5.138	Sig	0.3305	Yes
Total Dissolved Solids (TDS)	192	3.817	Sig	0.7868	Yes
Physicals					
Oxygen Dissolved	245	0.8579	Not Sig	0.01741	Yes
pH – Field	246	2.437	Sig	0.00963	Yes
Sodium Adsorption Ratio (SAR)	192	-0.8391	Not Sig	-0.0006459	Yes
Total Suspended Solids (TSS)	248	-0.9573	Not Sig	-0.09624	Yes
Metals					
Aluminum Total	174	-2.257	Sig	-5.846	Yes
Chromium Total	174	-4.406	Sig	-0.02566	Yes
Cobalt Dissolved	117	-8.488	Sig	-0.06496	Yes
Cobalt Total	174	-3.466	Sig	-0.01129	Yes
Copper Total	174	-3.364	Sig	-0.04298	Yes
Iron Dissolved	173	0.8493	Not Sig	0.12	Yes
Iron Total	120	-1.397	Not Sig	-9.818	Yes
Lithium Dissolved	117	-0.7305	Not Sig	-0.01971	Yes
Lithium Total	120	-1.13	Not Sig	-0.04594	Yes
Manganese Total	120	-0.02722	Not Sig	-0.008396	Yes
Molybdenum Dissolved	117	-3.402	Sig	-0.04645	Yes
Molybdenum Total	120	0.9822	Not Sig	0.006088	Yes
Nickel Total	174	-1.583	Not Sig	-0.01977	Yes
Vanadium Total	174	-1.905	Not Sig	-0.0149	Yes
Zinc Total	174	-1.502	Not Sig	-0.04668	Yes

	No Seasonality
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Table F8: Trending Summary for North Saskatchewan River – Concentration Trend

Parameter	Z Critical = 1.960				Rank Von Neumann (impact at alpha 0.05)
	n	Z Calc	p<0.05	Slope units/yr	
Nutrients					
Ammonia Dissolved	248	-0.788	Not Sig	-0.00007035	Yes
Nitrate as N	248	-3.676	Sig	-0.006023	Yes
Nitrogen Total	176	-4.177	Sig	-0.02314	Yes
Phosphorous Total	247	-5.293	Sig	-0.002466	Yes
Phosphorous Total Dissolved	247	-7.963	Sig	-0.001335	Yes
Major Ions					
Chloride Dissolved	193	1.639	Not Sig	0.02073	Yes
Fluoride Dissolved	192	-2.48	Sig	0	Yes
Sodium Dissolved/Filtered	192	0.08265	Not Sig	0.001499	Yes
Sulphate Dissolved	193	4.414	Sig	0.3101	Yes
Total Dissolved Solids (TDS)	192	3.774	Sig	0.7901	Yes
Physicals					
Oxygen Dissolved	245	0.5939	Not Sig	0.01251	Yes
pH – Field	246	2.523	Sig	0.009384	Yes
Sodium Adsorption Ratio (SAR)	192	-0.6633	Not Sig	-0.0004746	Yes
Total Suspended Solids (TSS)	248	-0.8639	Not Sig	-0.06621	Yes
Metals					
Aluminum Total	174	-1.844	Not Sig	-4.177	Yes
Chromium Total	174	-3.11	Sig	-0.01972	Yes
Cobalt Dissolved	117	-8.294	Sig	-0.06232	Yes
Cobalt Total	174	-2.979	Sig	-0.008522	Yes
Copper Total	174	-3.212	Sig	-0.03573	Yes
Iron Dissolved	173	0.8681	Not Sig	0.09847	Yes
Iron Total	120	0.4589	Not Sig	1.963	Yes
Lithium Dissolved	117	-0.8477	Not Sig	-0.01964	Yes
Lithium Total	120	-0.571	Not Sig	-0.02403	Yes
Manganese Total	120	1.227	Not Sig	0.2405	Yes
Molybdenum Dissolved	117	-3.723	Sig	-0.02605	Yes
Molybdenum Total	120	0.1462	Not Sig	0	Yes
Nickel Total	174	-2.309	Sig	-0.02433	Yes
Vanadium Total	174	-1.675	Not Sig	-0.01008	Yes
Zinc Total	174	-1.529	Not Sig	-0.04221	Yes


 No Seasonality

Table F9: Trending Summary for Red Deer River near Bindloss – Flow-Weighted Trend

Parameter	Z Critical = 1.960				Rank Von Neumann (alpha=0.05)
	n	Z Calc	p<0.05	Slope (units/yr)	
Nutrients					
Ammonia Dissolved	353	-6.867	Sig	-0.0008934	Yes
Nitrate as N	506	-3.525	Sig	-0.00005224	Yes
Nitrogen Total	173	1.839	Not Sig	0.008156	Yes
Phosphorous Total	434	-2.191	Sig	-0.0003667	Yes
Phosphorous Total Dissolved	403	-3.227	Sig	-0.00009875	Yes
Major Ions					
Chloride Dissolved	457	11.78	Sig	0.0908	Yes
Fluoride Dissolved	399	4.539	Sig	0.0005605	Yes
Sodium Dissolved/Filtered	458	0.5039	Not Sig	0.01667	Yes
Sulphate Dissolved	457	-1.16	Not Sig	-0.07328	Yes
Total Dissolved Solids (TDS)	265	4.063	Sig	1.337	Yes
Physicals					
Oxygen Dissolved	414	-1.784	Not Sig	-0.01928	Yes
pH – Field	425	6.157	Sig	0.008754	Yes
Sodium Adsorption Ratio (SAR)	356	0.4858	Not Sig	0.0006872	Yes
Total Suspended Solids (TSS)	452	-1.095	Not Sig	-0.1749	Yes
Metals					
Aluminum Total	175	-1.442	Not Sig	-12.81	Yes
Chromium Total	174	-1.383	Not Sig	-0.01411	Yes
Cobalt Dissolved	117	-8.061	Sig	-0.06755	Yes
Cobalt Total	174	-0.9668	Not Sig	-0.008333	Yes
Copper Dissolved	117	-2.904	Sig	-0.06794	Yes
Copper Total	174	-1.269	Not Sig	-0.03337	Yes
Iron Dissolved	173	-2.507	Sig	-0.2737	Yes
Iron Total	120	-2.101	Sig	-41.63	Yes
Lead Total	174	-0.1196	Not Sig	-0.0007243	Yes
Lithium Dissolved	117	1.124	Not Sig	0.1212	Yes
Lithium Total	120	-0.4151	Not Sig	-0.05369	Yes
Manganese Dissolved	173	-0.5693	Not Sig	-0.007603	Yes
Manganese Total	120	-0.922	Not Sig	-0.9016	Yes
Molybdenum Dissolved	117	-3.588	Sig	-0.05906	Yes
Molybdenum Total	120	0.8234	Not Sig	0.009963	Yes
Nickel Total	174	0.9371	Not Sig	0.02549	Yes
Vanadium Total	174	-0.4535	Not Sig	-0.01033	Yes
Zinc Total	174	-1.958	Not Sig	-0.1135	Yes


 No Seasonality

Table F10: Trending Summary for Red Deer River near Bindloss – Concentration Trend

Parameter	Z Critical = 1.960				Rank Von Neumann (impact at alpha 0.05)
	n	Z Calc	p<0.05	Slope units/yr	
Nutrients					
Ammonia Dissolved	353	-7.016	Sig	-0.0008714	Yes
Nitrate as N	506	-3.656	Sig	0	Yes
Nitrogen Total	173	1.46	Not Sig	0.008063	Yes
Phosphorous Total	434	0.1205	Not Sig	0	Yes
Phosphorous Total Dissolved	403	-1.594	Not Sig	-0.00004122	Yes
Major Ions					
Chloride Dissolved	457	10.29	Sig	0.08466	Yes
Fluoride Dissolved	399	3.758	Sig	0.0004196	Yes
Sodium Dissolved/Filtered	458	0.7263	Not Sig	0.02383	Yes
Sulphate Dissolved	457	-1.389	Not Sig	-0.09787	Yes
Total Dissolved Solids (TDS)	265	3.991	Sig	1.359	Yes
Physicals					
Oxygen Dissolved	414	-0.5379	Not Sig	-0.006419	Yes
pH – Field	425	6.831	Sig	0.008597	Yes
Sodium Adsorption Ratio (SAR)	356	0.5905	Not Sig	0.0007872	Yes
Total Suspended Solids (TSS)	452	-0.4699	Not Sig	-0.03596	Yes
Metals					
Aluminum Total	175	-1.383	Not Sig	-7.923	Yes
Chromium Total	174	-1.117	Not Sig	-0.006356	Yes
Cobalt Dissolved	117	-7.987	Sig	-0.06536	Yes
Cobalt Total	174	-0.9532	Not Sig	-0.003121	Yes
Copper Dissolved	117	-1.914	Not Sig	-0.04282	Yes
Copper Total	174	-0.7328	Not Sig	-0.01771	Yes
Iron Dissolved	173	-1.699	Not Sig	-0.1721	Yes
Iron Total	120	0.01715	Not Sig	0	Yes
Lead Total	174	0.1708	Not Sig	0	Yes
Lithium Dissolved	117	0.4313	Not Sig	0.04672	Yes
Lithium Total	120	-0.07721	Not Sig	0	Yes
Manganese Dissolved	173	-0.3263	Not Sig	0	Yes
Manganese Total	120	1.411	Not Sig	0.7295	Yes
Molybdenum Dissolved	117	-3.658	Sig	-0.06361	Yes
Molybdenum Total	120	0.4631	Not Sig	0.002893	Yes
Nickel Total	174	1.211	Not Sig	0.02805	Yes
Vanadium Total	174	-0.4488	Not Sig	-0.002973	Yes
Zinc Total	174	-1.194	Not Sig	-0.06832	Yes

	No Seasonality
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Table F11: Trending Summary for South Saskatchewan River – Flow-Weighted Trend

Parameter	Z Critical = 1.960				Rank Von Neumann (alpha=0.05)
	n	Z Calc	p<0.05	Slope (units/yr)	
Nutrients					
Ammonia Dissolved	347	-7.808	Sig	-0.001221	Yes
Nitrate as N	530	0.5417	Not Sig	0.00002984	Yes
Nitrogen Total	189	2.291	Sig	0.008935	Yes
Phosphorous Total	508	-8.255	Sig	-0.001228	Yes
Phosphorous Total Dissolved	466	-8.597	Sig	-0.0002663	Yes
Major Ions					
Chloride Dissolved	402	14.5	Sig	0.1383	Yes
Fluoride Dissolved	391	10.34	Sig	0.001244	Yes
Sodium Dissolved/Filtered	406	7.119	Sig	0.1417	Yes
Sulphate Dissolved	402	5.586	Sig	0.2974	Yes
Total Dissolved Solids (TDS)	260	7.15	Sig	1.668	Yes
Physicals					
Oxygen Dissolved	412	-1.506	Not Sig	-0.01396	Yes
pH – Field	417	5.607	Sig	0.008335	Yes
Sodium Adsorption Ratio (SAR)	352	5.548	Sig	0.00418	Yes
Total Suspended Solids (TSS)	500	-0.3569	Not Sig	-0.03039	Yes
Metals					
Aluminum Total	174	-3.68	Sig	-14.19	Yes
Chromium Total	174	-3.434	Sig	-0.02045	Yes
Cobalt Dissolved	118	-7.899	Sig	-0.06518	Yes
Cobalt Total	174	-2.968	Sig	-0.01122	Yes
Copper Dissolved	118	-2.3	Sig	-0.03875	Yes
Copper Total	174	-3.159	Sig	-0.04297	Yes
Iron Dissolved	174	-0.6443	Not Sig	-0.06817	Yes
Iron Total	120	-3.414	Sig	-33.22	Yes
Lithium Dissolved	118	0.04872	Not Sig	0.003071	Yes
Lithium Total	120	-2.333	Sig	-0.1579	Yes
Manganese Dissolved	174	-0.4738	Not Sig	-0.00537	Yes
Manganese Total	120	-2.865	Sig	-1.208	Yes
Molybdenum Dissolved	118	-3.052	Sig	-0.0415	Yes
Nickel Total	175	-0.7321	Not Sig	-0.008168	Yes
Vanadium Total	174	-3.302	Sig	-0.03371	Yes
Zinc Total	174	-1.47	Not Sig	-0.04889	Yes


 No Seasonality

Table F12: Trending Summary for South Saskatchewan River – Concentration Trend

Parameter	Z Critical = 1.960				Rank Von Neumann (impact at alpha 0.05)
	n	Z Calc	p<0.05	Slope units/yr	
Nutrients					
Ammonia Dissolved	347	-7.909	Sig	-0.001188	Yes
Nitrate as N	530	0.4205	Not Sig	0	Yes
Nitrogen Total	189	1.75	Not Sig	0.00688	Yes
Phosphorous Total	508	-4.812	Sig	-0.0007861	Yes
Phosphorous Total Dissolved	466	-8.217	Sig	-0.000258	Yes
Major Ions					
Chloride Dissolved	402	10.85	Sig	0.1356	Yes
Fluoride Dissolved	391	8.581	Sig	0.001103	Yes
Sodium Dissolved/Filtered	406	4.821	Sig	0.1305	Yes
Sulphate Dissolved	402	2.86	Sig	0.2154	Yes
Total Dissolved Solids (TDS)	260	5.036	Sig	1.294	Yes
Physicals					
Oxygen Dissolved	412	-1.844	Not Sig	-0.01627	Yes
pH – Field	417	5.498	Sig	0.008134	Yes
Sodium Adsorption Ratio (SAR)	352	2.91	Sig	0.002702	Yes
Total Suspended Solids (TSS)	500	0.0572	Not Sig	0	Yes
Metals					
Aluminum Total	174	-2.292	Sig	-8.404	Yes
Chromium Total	174	-2.159	Sig	-0.01298	Yes
Cobalt Dissolved	118	-8.238	Sig	-0.06251	Yes
Cobalt Total	174	-2.377	Sig	-0.006566	Yes
Copper Dissolved	118	-2.641	Sig	-0.04028	Yes
Copper Total	174	-2.616	Sig	-0.03009	Yes
Iron Dissolved	174	-0.8674	Not Sig	-0.04193	Yes
Iron Total	120	-0.6991	Not Sig	-6.079	Yes
Lithium Dissolved	118	-1.252	Not Sig	-0.1003	Yes
Lithium Total	120	-2.218	Sig	-0.1499	Yes
Manganese Dissolved	174	-0.2993	Not Sig	0	Yes
Manganese Total	120	-1.046	Not Sig	-0.3069	Yes
Molybdenum Dissolved	118	-3.558	Sig	-0.06688	Yes
Nickel Total	175	-0.0543	Not Sig	0	Yes
Vanadium Total	174	-2.163	Sig	-0.01976	Yes
Zinc Total	174	-1.343	Not Sig	-0.05552	Yes


 No Seasonality

Table F13: Trending Summary for Assiniboine River – Flow-Weighted Trend

Parameter	Z Critical = 1.960				Rank Von Neumann (alpha=0.05)
	n	Z Calc	p<0.05	Slope (units/yr)	
Nutrients					
Ammonia Dissolved	361	0.5105	Not Sig	0.00009451	Yes
Nitrate as N	463	-3.019	Sig	-0.0001887	Yes
Nitrogen Total	170	1.551	Not Sig	0.009502	Yes
Phosphorous Total	450	0.8946	Not Sig	0.0002115	Yes
Phosphorous Total Dissolved	412	-0.2198	Not Sig	-0.00003556	Yes
Major Ions					
Chloride Dissolved	444	5.995	Sig	0.2281	Yes
Fluoride Dissolved	432	6.803	Sig	0.001186	Yes
Sodium Dissolved/Filtered	446	5.092	Sig	0.2992	Yes
Sulphate Dissolved	446	2.45	Sig	0.6101	Yes
Total Dissolved Solids (TDS)	316	3.701	Sig	2.987	Yes
Physicals					
Oxygen Dissolved	407	-3.759	Sig	-0.04643	Yes
pH – Field	430	0.7686	Not Sig	0.0007872	Yes
Sodium Adsorption Ratio (SAR)	395	3.301	Sig	0.004109	Yes
Total Suspended Solids (TSS)	427	2.541	Sig	0.08931	Yes
Metals					
Aluminum Total	170	-2.158	Sig	-4.129	Yes
Chromium Total	170	-1.148	Not Sig	-0.004631	Yes
Cobalt Dissolved	117	-6.158	Sig	-0.05465	Yes
Cobalt Total	170	-1.177	Not Sig	-0.003582	Yes
Copper Dissolved	117	-0.9658	Not Sig	-0.01144	Yes
Copper Total	170	-1.622	Not Sig	-0.01584	Yes
Iron Dissolved	170	1.396	Not Sig	0.3412	Yes
Iron Total	120	0.8212	Not Sig	5.929	Yes
Lithium Dissolved	117	3.47	Sig	1.502	Yes
Lithium Total	120	-1.261	Not Sig	-0.656	Yes
Manganese Dissolved	170	0.4918	Not Sig	0.699	Yes
Manganese Total	120	1.612	Not Sig	4.813	Yes
Molybdenum Dissolved	117	-3.867	Sig	-0.08232	Yes
Molybdenum Total	120	0.1361	Not Sig	0.003184	Yes
Vanadium Total	170	-0.7364	Not Sig	-0.009833	Yes
Zinc Total	170	-2.218	Sig	-0.05717	Yes


 No Seasonality

Table F14: Trending Summary for Assiniboine River – Concentration Trend

Parameter	Z Critical = 1.960				Rank Von Neumann (impact at alpha 0.05)
	n	Z Calc	p<0.05	Slope units/yr	
Nutrients					
Ammonia Dissolved	361	-0.2886	Not Sig	0	Yes
Nitrate as N	463	-2.676	Sig	0	Yes
Nitrogen Total	170	1.095	Not Sig	0.007239	Yes
Phosphorous Total	450	1.77	Not Sig	0.000448	Yes
Phosphorous Total Dissolved	412	0.5672	Not Sig	0.00008279	Yes
Major Ions					
Chloride Dissolved	444	5.033	Sig	0.1968	Yes
Fluoride Dissolved	432	4.689	Sig	0.0008312	Yes
Sodium Dissolved/Filtered	446	2.369	Sig	0.1482	Yes
Sulphate Dissolved	446	0.8602	Not Sig	0.2375	Yes
Total Dissolved Solids (TDS)	316	1.126	Not Sig	0.9144	Yes
Physicals					
Oxygen Dissolved	407	-3.794	Sig	-0.04664	Yes
pH – Field	430	0.9364	Not Sig	0	Yes
Sodium Adsorption Ratio (SAR)	395	1.251	Not Sig	0.001702	Yes
Total Suspended Solids (TSS)	427	3.768	Sig	0.157	Yes
Metals					
Aluminum Total	170	-2.15	Sig	-4.482	Yes
Chromium Total	170	-1.37	Not Sig	-0.002975	Yes
Cobalt Dissolved	117	-7.071	Sig	-0.06127	Yes
Cobalt Total	170	-1.802	Not Sig	-0.002902	Yes
Copper Dissolved	117	-0.638	Not Sig	0	Yes
Copper Total	170	-1.665	Not Sig	-0.01536	Yes
Iron Dissolved	170	0.8164	Not Sig	0.3146	Yes
Iron Total	120	1.647	Not Sig	14.59	Yes
Lithium Dissolved	117	0.9589	Not Sig	0.4818	Yes
Lithium Total	120	-3.478	Sig	-1.755	Yes
Manganese Dissolved	170	0.394	Not Sig	0.5322	Yes
Manganese Total	120	0.6261	Not Sig	2.083	Yes
Molybdenum Dissolved	117	-4.439	Sig	-0.09468	Yes
Molybdenum Total	120	-0.4525	Not Sig	-0.01029	Yes
Vanadium Total	170	-0.9223	Not Sig	-0.0129	Yes
Zinc Total	170	-1.81	Not Sig	-0.05897	Yes

	No Seasonality
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Table F15: Trending Summary for Carrot River – Flow-Weighted Trend

Parameter	Z Critical = 1.960				Rank Von Neumann (alpha=0.05)
	n	Z Calc	p<0.05	Slope (units/yr)	
Nutrients					
Ammonia Dissolved	313	0.7905	Not Sig	0.000232	Yes
Nitrate as N	393	-3.084	Sig	-0.000173	Yes
Nitrogen Total	169	3.661	Sig	0.0273	Yes
Phosphorous Total	386	7.397	Sig	0.001208	Yes
Phosphorous Total Dissolved	368	7.358	Sig	0.0003758	Yes
Major Ions					
Chloride Dissolved	337	-5.386	Sig	-1.581	Yes
Fluoride Dissolved	339	5.419	Sig	0.001082	Yes
Sodium Dissolved/Filtered	339	-5.384	Sig	-0.9035	Yes
Sulphate Dissolved	341	-1.014	Not Sig	-0.1371	Yes
Total Dissolved Solids (TDS)	249	-0.6381	Not Sig	-0.6673	Yes
Physicals					
Oxygen Dissolved	379	-1.671	Not Sig	-0.02797	Yes
pH – Field	387	2.994	Sig	0.004507	Yes
Sodium Adsorption Ratio (SAR)	327	-5.329	Sig	-0.02428	Yes
Total Suspended Solids (TSS)	389	2.768	Sig	0.1558	Yes
Metals					
Aluminum Total	114	-1.146	Not Sig	-2.409	Yes
Boron Dissolved	114	0.08186	Not Sig	0.05636	Yes
Cadmium Total	114	-7.783	Sig	-0.008713	Yes
Chromium Total	113	-1.488	Not Sig	-0.008936	Yes
Cobalt Dissolved	81	-4.084	Sig	-0.0545	Yes
Cobalt Total	114	0.1788	Not Sig	0.0007549	Yes
Copper Dissolved	81	-1.27	Not Sig	-0.02153	Yes
Copper Total	114	-3.052	Sig	-0.04773	Yes
Iron Total	82	0.1872	Not Sig	2.691	Yes
Lead Total	114	0.905	Not Sig	0.001988	Yes
Lithium Dissolved	81	0.7411	Not Sig	0.3502	Yes
Lithium Total	82	-1.895	Not Sig	-1.087	Yes
Manganese Dissolved	114	1.137	Not Sig	2.188	Yes
Manganese Total	82	1.61	Not Sig	8.067	Yes
Molybdenum Dissolved	81	-1.175	Not Sig	-0.04814	Yes
Molybdenum Total	82	-1.049	Not Sig	-0.02864	Yes
Vanadium Total	114	0.3593	Not Sig	0.005156	Yes
Zinc Dissolved	81	-0.4364	Not Sig	-0.009997	Yes
Zinc Total	114	-1.851	Not Sig	-0.05135	Yes


 No Seasonality

Table F16: Trending Summary for Carrot River – Concentration Trend

Parameter	Z Critical = 1.960				Rank Von Neumann (impact at alpha 0.05)
	n	Z Calc	p<0.05	Slope units/yr	
Nutrients					
Ammonia Dissolved	313	0.4278	Not Sig	0	Yes
Nitrate as N	393	-3.086	Sig	0	Yes
Nitrogen Total	169	3.672	Sig	0.02732	Yes
Phosphorous Total	386	6.261	Sig	0.00128	Yes
Phosphorous Total Dissolved	368	6.319	Sig	0.0003574	Yes
Major Ions					
Chloride Dissolved	337	-2.593	Sig	-1.562	Yes
Fluoride Dissolved	339	4.745	Sig	0.0009858	Yes
Sodium Dissolved/Filtered	339	-2.733	Sig	-0.9999	Yes
Sulphate Dissolved	341	-0.6964	Not Sig	-0.0853	Yes
Total Dissolved Solids (TDS)	249	-2.151	Sig	-3.734	Yes
Physicals					
Oxygen Dissolved	379	-4.49	Sig	-0.05251	Yes
pH – Field	387	2.924	Sig	0.003878	Yes
Sodium Adsorption Ratio (SAR)	327	-2.684	Sig	-0.02097	Yes
Total Suspended Solids (TSS)	389	3.056	Sig	0.1583	Yes
Metals					
Aluminum Total	114	-0.8323	Not Sig	-1.355	Yes
Boron Dissolved	114	-0.7096	Not Sig	-0.3611	Yes
Cadmium Total	114	-7.89	Sig	-0.009031	Yes
Chromium Total	113	-1.362	Not Sig	-0.009093	Yes
Cobalt Dissolved	81	-4.808	Sig	-0.05683	Yes
Cobalt Total	114	0.06834	Not Sig	0	Yes
Copper Dissolved	81	-1.329	Not Sig	-0.02498	Yes
Copper Total	114	-2.94	Sig	-0.04574	Yes
Iron Total	82	-0.5393	Not Sig	-13.17	Yes
Lead Total	114	0.7412	Not Sig	0	Yes
Lithium Dissolved	81	0.1135	Not Sig	0.06207	Yes
Lithium Total	82	-2.599	Sig	-1.447	Yes
Manganese Dissolved	114	-0.3548	Not Sig	-0.6056	Yes
Manganese Total	82	0.4045	Not Sig	1.877	Yes
Molybdenum Dissolved	81	-1.492	Not Sig	-0.04793	Yes
Molybdenum Total	82	-1.528	Not Sig	-0.0434	Yes
Vanadium Total	114	-2.312	Sig	-0.01428	Yes
Zinc Dissolved	81	-0.7493	Not Sig	0	Yes
Zinc Total	114	-1.833	Not Sig	-0.05076	Yes


 No Seasonality

Table F17: Trending Summary for Churchill River – Flow-Weighted Trend

Parameter	Z Critical = 1.960				Rank Von Neumann (alpha=0.05)
	n	Z Calc	p<0.05	Slope (units/yr)	
Nutrients					
Ammonia Dissolved	161	-7.668	Sig	-0.001445	Yes
Nitrate as N	222	-1.338	Not Sig	-0.00001602	No
Nitrogen Total	62	-0.9465	Not Sig	-0.001717	No
Phosphorous Total	221	0.8492	Not Sig	0.00002955	Yes
Phosphorous Total Dissolved	203	1.429	Not Sig	0.00002012	Yes
Major Ions					
Chloride Dissolved	223	0.7983	Not Sig	0.001848	Yes
Fluoride Dissolved	223	3.993	Sig	0.0005355	Yes
Sodium Dissolved/Filtered	223	0.5229	Not Sig	0.002892	Yes
Sulphate Dissolved	223	-0.09158	Not Sig	-0.0003778	Yes
Total Dissolved Solids (TDS)	158	0.01649	Not Sig	0.00221	Yes
Physicals					
Oxygen Dissolved	211	-1.812	Not Sig	-0.02494	Yes
pH – Field	216	3.962	Sig	0.01294	Yes
Sodium Adsorption Ratio (SAR)	215	3.242	Sig	0.0007124	Yes
Total Suspended Solids (TSS)	217	1.694	Not Sig	0.00624	No
Metals					
Copper Total	58	-1	Not Sig	-0.006056	Yes
Manganese Dissolved	58	-0.6991	Not Sig	-0.007411	Yes
Manganese Total	37	-1.425	Not Sig	-0.6639	No
Molybdenum Total	37	37a	Not Sig	0.00164	No
Zinc Total	58	-2.348	Sig	-0.03011	Yes

	No Seasonality
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Table F18: Trending Summary for Churchill River – Concentration Trend

Parameter	Z Critical = 1.960				Rank Von Neumann (impact at alpha 0.05)
	n	Z Calc	p<0.05	Slope units/yr	
Nutrients					
Ammonia Dissolved	161	-8.106	Sig	-0.00143	Yes
Nitrate as N	222	-4.738	Sig	0	Yes
Nitrogen Total	62	0	Not Sig	0	No
Phosphorous Total	221	1.344	Not Sig	0	Yes
Phosphorous Total Dissolved	203	1.911	Not Sig	0	Yes
Major Ions					
Chloride Dissolved	223	1.585	Not Sig	0.002344	Yes
Fluoride Dissolved	223	5.577	Sig	0.0006495	Yes
Sodium Dissolved/Filtered	223	-0.8315	Not Sig	-0.003792	Yes
Sulphate Dissolved	223	-0.4476	Not Sig	0	Yes
Total Dissolved Solids (TDS)	158	-0.2336	Not Sig	-0.013	Yes
Physicals					
Oxygen Dissolved	211	-2.514	Sig	-0.03433	Yes
pH – Field	216	3.528	Sig	0.01205	Yes
Sodium Adsorption Ratio (SAR)	215	3.457	Sig	0.0007584	Yes
Total Suspended Solids (TSS)	217	1.123	Not Sig	0	No
Metals					
Copper Total	58	-1.394	Not Sig	-0.007974	Yes
Manganese Dissolved	58	-1.601	Not Sig	0	Yes
Manganese Total	37	-0.401	Not Sig	-0.1683	No
Molybdenum Total	37	127a	Not Sig	0.005522	No
Zinc Total	58	-2.246	Sig	-0.02964	Yes


 No Seasonality

Table F19: Trending Summary for Qu'Appelle River – Flow-Weighted Trend

Parameter	Z Critical = 1.960				Rank Von Neumann (alpha=0.05)
	n	Z Calc	p<0.05	Slope (units/yr)	
Nutrients					
Ammonia Dissolved	304	-1.017	Not Sig	-0.00007681	Yes
Nitrate as N	369	-0.9692	Not Sig	-0.00003444	Yes
Nitrogen Total	150	0.2454	Not Sig	0.0009383	Yes
Phosphorous Total	368	-6.384	Sig	-0.002471	Yes
Phosphorous Total Dissolved	368	-5.894	Sig	-0.001978	Yes
Major Ions					
Chloride Dissolved	329	0.1422	Not Sig	0.01377	Yes
Fluoride Dissolved	332	1.448	Not Sig	0.000262	Yes
Sodium Dissolved/Filtered	329	-2.713	Sig	-0.5096	Yes
Sulphate Dissolved	331	0.6894	Not Sig	0.2122	Yes
Total Dissolved Solids (TDS)	264	-1.344	Not Sig	-1.199	Yes
Physicals					
Oxygen Dissolved	362	-3.148	Sig	-0.03806	Yes
pH – Field	363	-0.9875	Not Sig	-0.001219	Yes
Sodium Adsorption Ratio (SAR)	329	-1.942	Not Sig	-0.006846	Yes
Total Suspended Solids (TSS)	371	1.302	Not Sig	0.1194	Yes
Metals					
Aluminum Total	109	-3.442	Sig	-12.58	Yes
Cadmium Total	109	-7.416	Sig	-0.007553	Yes
Chromium Total	109	-2.319	Sig	-0.01356	Yes
Cobalt Dissolved	62	-4.257	Sig	-0.03605	Yes
Cobalt Total	109	-1.907	Not Sig	-0.00797	Yes
Copper Dissolved	62	-1.275	Not Sig	-0.04636	Yes
Copper Total	109	-1.706	Not Sig	-0.02869	Yes
Iron Dissolved	109	-0.04741	Not Sig	-0.03839	Yes
Iron Total	66	-2.106	Sig	-30.15	Yes
Lithium Dissolved	62	0.8929	Not Sig	0.4786	Yes
Lithium Total	66	-5.225	Sig	-4.551	Yes
Manganese Dissolved	109	0.06285	Not Sig	0.04374	Yes
Manganese Total	66	-0.397	Not Sig	-1.154	Yes
Molybdenum Dissolved	62	1.786	Not Sig	0.08458	Yes
Vanadium Total	109	-0.3659	Not Sig	-0.006181	Yes
Zinc Dissolved	62	-2.879	Sig	-0.08468	No
Zinc Total	109	-3.102	Sig	-0.1257	Yes


 No Seasonality

Table F20: Trending Summary for Qu'Appelle River – Concentration Trend

Parameter	Z Critical = 1.960				Rank Von Neumann (impact at alpha 0.05)
	n	Z Calc	p<0.05	Slope units/yr	
Nutrients					
Ammonia Dissolved	304	-1.053	Not Sig	-0.00007681	Yes
Nitrate as N	369	0.9335	Not Sig	0	Yes
Nitrogen Total	150	-0.3705	Not Sig	-0.001481	Yes
Phosphorous Total	368	-5.418	Sig	-0.002234	Yes
Phosphorous Total Dissolved	368	-5.206	Sig	-0.00185	Yes
Major Ions					
Chloride Dissolved	329	-0.08311	Not Sig	0	Yes
Fluoride Dissolved	332	0.5877	Not Sig	0	Yes
Sodium Dissolved/Filtered	329	-3.596	Sig	-0.6114	Yes
Sulphate Dissolved	331	-0.02678	Not Sig	0	Yes
Total Dissolved Solids (TDS)	264	-2.544	Sig	-2.163	Yes
Physicals					
Oxygen Dissolved	362	-3.204	Sig	-0.0384	Yes
pH – Field	363	-1.177	Not Sig	-0.0009315	Yes
Sodium Adsorption Ratio (SAR)	329	-2.111	Sig	-0.007026	Yes
Total Suspended Solids (TSS)	371	2.393	Sig	0.2588	Yes
Metals					
Aluminum Total	109	-4.231	Sig	-16.88	Yes
Cadmium Total	109	-8.239	Sig	-0.007139	Yes
Chromium Total	109	-3.095	Sig	-0.02105	Yes
Cobalt Dissolved	62	-3.799	Sig	-0.03921	Yes
Cobalt Total	109	-2.644	Sig	-0.01572	Yes
Copper Dissolved	62	-1.203	Not Sig	-0.0524	Yes
Copper Total	109	-2.568	Sig	-0.04471	Yes
Iron Dissolved	109	-0.1445	Not Sig	0	Yes
Iron Total	66	-2.669	Sig	-36.55	Yes
Lithium Dissolved	62	0.807	Not Sig	0.5828	Yes
Lithium Total	66	-3.146	Sig	-3.158	Yes
Manganese Dissolved	109	0.9229	Not Sig	0.5167	Yes
Manganese Total	66	-0.3089	Not Sig	-0.3511	Yes
Molybdenum Dissolved	62	2.249	Sig	0.1078	Yes
Vanadium Total	109	-1.232	Not Sig	-0.02869	Yes
Zinc Dissolved	62	-3.26	Sig	-0.07998	No
Zinc Total	109	-3.675	Sig	-0.1661	Yes


 No Seasonality

Table F21: Trending Summary for Red Deer River at Erwood – Flow-Weighted Trend

Parameter	Z Critical = 1.960				Rank Von Neumann (alpha=0.05)
	n	Z Calc	p<0.05	Slope (units/yr)	
Nutrients					
Ammonia Dissolved	237	-5.013	Sig	-0.0009084	Yes
Nitrate as N	352	-3.107	Sig	-0.00008498	Yes
Nitrogen Total	86	0.2704	Not Sig	0.001495	No
Phosphorous Total	311	2.63	Sig	0.0002274	Yes
Phosphorous Total Dissolved	282	2.767	Sig	0.0001251	Yes
Major Ions					
Chloride Dissolved	358	4.013	Sig	0.03487	Yes
Fluoride Dissolved	330	5.504	Sig	0.001058	Yes
Sodium Dissolved/Filtered	358	3.65	Sig	0.09519	Yes
Sulphate Dissolved	358	-1.242	Not Sig	-0.1954	Yes
Total Dissolved Solids (TDS)	219	4.414	Sig	3.96	Yes
Physicals					
Oxygen Dissolved	298	-0.4082	Not Sig	-0.006108	Yes
pH – Field	309	1.303	Not Sig	0.003004	Yes
Sodium Adsorption Ratio (SAR)	295	3.275	Sig	0.001834	Yes
Total Suspended Solids (TSS)	311	-0.4877	Not Sig	-0.009742	Yes
Metals					
Boron Dissolved	81	1.921	Not Sig	0.5662	No
Cobalt Total	81	0.8769	Not Sig	0.002666	Yes
Copper Dissolved	49	2	Sig	0.03087	Yes
Copper Total	81	0.02435	Not Sig	0.0005663	Yes
Lithium Dissolved	49	2.862	Sig	1.272	No
Lithium Total	50	1.641	Not Sig	0.6492	No
Manganese Dissolved	81	0.4139	Not Sig	0.09467	Yes
Molybdenum Dissolved	49	2.914	Sig	0.09311	Yes
Molybdenum Total	50	3.38	Sig	0.08922	Yes
Zinc Total	81	0.3003	Not Sig	0.007458	No

	No Seasonality
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Table F22: Trending Summary for Red Deer River at Erwood – Concentration Trend

Parameter	Z Critical = 1.960				Rank Von Neumann (impact at alpha 0.05)
	n	Z Calc	p<0.05	Slope units/yr	
Nutrients					
Ammonia Dissolved	237	-5.313	Sig	-0.0007546	No
Nitrate as N	352	-3.353	Sig	0	Yes
Nitrogen Total	86	0.1781	Not Sig	0.00139	No
Phosphorous Total	311	1.718	Not Sig	0.0001592	Yes
Phosphorous Total Dissolved	282	2.556	Sig	0.0001163	Yes
Major Ions					
Chloride Dissolved	358	3.239	Sig	0.02913	Yes
Fluoride Dissolved	330	4.969	Sig	0.0009975	Yes
Sodium Dissolved/Filtered	358	3.071	Sig	0.07916	Yes
Sulphate Dissolved	358	-1.623	Not Sig	-0.2672	Yes
Total Dissolved Solids (TDS)	219	3.753	Sig	3.394	No
Physicals					
Oxygen Dissolved	298	-0.8768	Not Sig	-0.01283	Yes
pH – Field	309	1.179	Not Sig	0.0006281	Yes
Sodium Adsorption Ratio (SAR)	295	2.484	Sig	0.001697	Yes
Total Suspended Solids (TSS)	311	-0.6737	Not Sig	0	Yes
Metals					
Boron Dissolved	81	1.007	Not Sig	0.3787	No
Cobalt Total	81	0.833	Not Sig	0	Yes
Copper Dissolved	49	1.474	Not Sig	0.01719	Yes
Copper Total	81	-0.5065	Not Sig	-0.002539	Yes
Lithium Dissolved	49	1.311	Not Sig	0.6776	No
Lithium Total	50	0.2653	Not Sig	0.1085	No
Manganese Dissolved	81	0.3592	Not Sig	0.03043	No
Molybdenum Dissolved	49	1.499	Not Sig	0.05238	Yes
Molybdenum Total	50	2.084	Sig	0.0443	Yes
Zinc Total	81	0.4223	Not Sig	0.009887	Yes


 No Seasonality

Table F23: Trending Summary for Saskatchewan River – Flow-Weighted Trend

Parameter	Z Critical = 1.960				Rank Von Neumann (alpha=0.05)
	n	Z Calc	p<0.05	Slope (units/yr)	
Nutrients					
Ammonia Dissolved	278	-6.52	Sig	-0.0008116	Yes
Nitrate as N	358	-4.261	Sig	-0.0005107	Yes
Nitrogen Total	145	-0.3009	Not Sig	-0.0008883	Yes
Phosphorous Total	358	-4.179	Sig	-0.0003239	Yes
Phosphorous Total Dissolved	339	-2.398	Sig	-0.00004643	Yes
Major Ions					
Chloride Dissolved	358	5.255	Sig	0.04454	Yes
Fluoride Dissolved	358	7.293	Sig	0.0009021	Yes
Sodium Dissolved/Filtered	358	1.864	Not Sig	0.02675	Yes
Sulphate Dissolved	358	4.244	Sig	0.189	Yes
Total Dissolved Solids (TDS)	267	3.886	Sig	0.6596	Yes
Physicals					
Oxygen Dissolved	346	-3.32	Sig	-0.03791	Yes
pH – Field	351	4.657	Sig	0.007655	Yes
Sodium Adsorption Ratio (SAR)	348	1.851	Not Sig	0.00082	Yes
Total Suspended Solids (TSS)	357	-0.6769	Not Sig	-0.04343	Yes
Metals					
Aluminum Total	147	-3.239	Sig	-19.26	Yes
Cadmium Total	148	-8.94	Sig	-0.0111	Yes
Chromium Total	146	-1.741	Not Sig	-0.02219	Yes
Cobalt Total	146	-2.963	Sig	-0.01508	Yes
Copper Dissolved	95	0.9409	Not Sig	0.01698	Yes
Copper Total	146	-2.877	Sig	-0.0384	Yes
Iron Total	98	-5.255	Sig	-79.98	Yes
Lead Total	148	-2.066	Sig	-0.01739	Yes
Lithium Dissolved	95	3.764	Sig	0.2796	Yes
Lithium Total	98	-1.111	Not Sig	-0.0559	Yes
Manganese Dissolved	146	0.1619	Not Sig	0.001827	Yes
Manganese Total	98	-3.252	Sig	-1.724	Yes
Molybdenum Dissolved	95	-0.08359	Not Sig	-0.001392	Yes
Molybdenum Total	99	3.123	Sig	0.02801	Yes
Nickel Total	147	0.8226	Not Sig	0.0106	Yes
Vanadium Total	146	-2.462	Sig	-0.03589	Yes
Zinc Total	146	-2.654	Sig	-0.118	Yes



 No Seasonality

Table F24: Trending Summary for Saskatchewan River – Concentration Trend

Parameter	Z Critical = 1.960				Rank Von Neumann (impact at alpha 0.05)
	n	Z Calc	p<0.05	Slope units/yr	
Nutrients					
Ammonia Dissolved	278	-6.982	Sig	-0.0007996	Yes
Nitrate as N	358	-4.745	Sig	-0.0006941	Yes
Nitrogen Total	145	0.9465	Not Sig	0.002451	Yes
Phosphorous Total	358	-4.049	Sig	-0.0003112	Yes
Phosphorous Total Dissolved	339	-2.709	Sig	-0.00004924	Yes
Major Ions					
Chloride Dissolved	358	5.087	Sig	0.0437	Yes
Fluoride Dissolved	358	7.159	Sig	0.0008786	Yes
Sodium Dissolved/Filtered	358	1.856	Not Sig	0.02528	Yes
Sulphate Dissolved	358	4.126	Sig	0.1858	Yes
Total Dissolved Solids (TDS)	267	3.576	Sig	0.6002	Yes
Physicals					
Oxygen Dissolved	346	-3.109	Sig	-0.03695	Yes
pH – Field	351	4.71	Sig	0.007484	Yes
Sodium Adsorption Ratio (SAR)	348	1.614	Not Sig	0.000707	Yes
Total Suspended Solids (TSS)	357	-0.3887	Not Sig	-0.02303	Yes
Metals					
Aluminum Total	147	-3.655	Sig	-17.92	Yes
Cadmium Total	148	-9.076	Sig	-0.01253	Yes
Chromium Total	146	-2.008	Sig	-0.02077	Yes
Cobalt Total	146	-3.526	Sig	-0.01542	Yes
Copper Dissolved	95	0.4635	Not Sig	0	Yes
Copper Total	146	-2.792	Sig	-0.02874	Yes
Iron Total	98	-3.811	Sig	-43.43	Yes
Lead Total	148	-2.16	Sig	-0.01753	Yes
Lithium Dissolved	95	3.714	Sig	0.264	Yes
Lithium Total	98	-1.376	Not Sig	-0.07312	Yes
Manganese Dissolved	146	1.018	Not Sig	0	Yes
Manganese Total	98	-0.7755	Not Sig	-0.4394	Yes
Molybdenum Dissolved	95	-0.9997	Not Sig	-0.004127	Yes
Molybdenum Total	99	1.67	Not Sig	0.01376	Yes
Nickel Total	147	1.499	Not Sig	0.01673	Yes
Vanadium Total	146	-2.876	Sig	-0.03342	Yes
Zinc Total	146	-2.89	Sig	-0.1074	Yes

 No Seasonality

