



PRAIRIE PROVINCES WATER BOARD

Report #174 B

Review of the 1992
Interprovincial Water Quality Objectives
and
Recommendations for Change
APPENDICES 11 and 12

Prepared for the Prairie Provinces Water Board
By the Committee on Water Quality

November 2015

Appendix 11: 1992-2012 PPWB Objectives Comparison

2012-1992 Objectives Comparison Summary Chart – Alberta/Saskatchewan Border								
Parameter Nutrients	Proposed Objective	Jurisdiction	Use	1992 Objective	Comparison	Notes	Last Objective Update	Currently Monitored
Ammonia Dissolved (mg/L)	N/A			Calculated ^a	Removed	Replaced with ammonia un-ionized CCME guideline		Monitored
Ammonia Un-ionized (mg/L)	0.019 ^b	CCME	PAL	N/A	New	Replaced ammonia dissolved	2001 ²	Monitored
Nitrate as N (mg/L)	3	CCME	PAL	10	Updated	More stringent updated CCME guideline	2012 ²	Monitored
Nitrogen Total (mg/L)	Background	PPWB	PAL	N/A	New	PPWB developed background value based on historical record	2012	Monitored
Phosphorous Total (mg/L)	Background	PPWB	PAL	N/A	New	PPWB developed background value based on historical record	2012	Monitored
Phosphorous Total Dissolved (mg/L)	Background	PPWB	PAL	N/A	New	PPWB developed background value based on historical record	2012	Monitored
Major Ions								
Chloride Dissolved (mg/L)	100	CCME	Ag-I	100	Same	Now includes all rivers	1987 ²	Monitored
Fluoride Dissolved (mg/L)	Background	PPWB	PAL	1.5	Updated	Background objective, historical information exceeds lowest water use objective	2012	Monitored
Sodium Dissolved (mg/L)	200	Health Canada	DW	100	Updated	Less stringent, now includes the Red Deer River and South Saskatchewan River	1992 ⁴	Monitored
Sulphate Dissolved (mg/L)	250	CCME	Ag-I+Ag-L	500	Updated	More stringent	CCREM 1987 ³	Monitored
Total Dissolved Solids (mg/L)	500 or Background	CCME + Health Canada or PPWB	Ag-I+DW	500	Same	Now includes Beaver River. New background objective for the Battle River	1987 ² , 1992 ⁴ or 2012	Monitored
Physicals and Other								
pH Lab	6.5-9	CCME	PAL	6.5-9	Same	Now includes all rivers	1987 ²	Monitored
pH Field	6.5-9	CCME	PAL	6.5-9	Same	Now includes all rivers	1987 ²	Monitored
Oxygen Dissolved (mg/L)				6.5		Replaced with open and closed water period objectives		
Open Season (>5°C)	5	USEPA	PAL	6	Updated	Less stringent and extended to all rivers	1986 ⁷	Monitored
Closed Season (<5°C)	3	USEPA	PAL	N/A	Updated	Except for Battle River and Beaver River ¹	1986 ⁷	Monitored
Sodium Adsorption Ratio	3	CCME	Ag-I	3	Same	Now includes all rivers except the Battle River ¹	CCREM 1987 ³	Monitored
Total Suspended Solids (mg/L)	Background	PPWB	PAL	N/A	New	PPWB developed background value based on historical record.	2012	Monitored
Reactive Chlorine Species (mg/L)	0.0005	CCME	PAL	0.002	Updated	More stringent; now includes Red Deer River and South Saskatchewan River	1999 ²	Not Monitored
Cyanide (free) (mg/L)	0.005	CCME	PAL	0.005	Same		1987 ²	Not Monitored
Biota								
<i>E.Coli</i> (No./100mL)	200	Health Canada	Rec	N/A	New		1992 ⁵	Monitored
Coliforms Fecal(No./100mL)	100	CCME+PPWB	Ag-I+DW	100	Same		1987 ² , 1992 ⁵	Monitored

2012-1992 Objectives Comparison Summary Chart – Alberta/Saskatchewan Border								
Parameter Metals	Proposed Objective	Jurisdiction	Use	1992 Objective	Comparison	Notes	Last Objective Update	Currently Monitored
Aluminum Total (µg/L)	N/A			5000	Removed	No objective was established ¹		Monitored
Arsenic Total (µg/L)	5	CCME	PAL	N/A	New	Replaces arsenic dissolved; the previous objective as more stringent	1997 ²	Monitored
Arsenic Dissolved (µg/L)	N/A			50	Removed	Replaced with arsenic total as more stringent		Monitored
Barium Total (µg/L)	1000	Health Canada	DW	1000	Same		1990 ⁴	Monitored
Beryllium Total (µg/L)	100	CCME	Ag-I+Ag-L	N/A	New		1987 ²	Monitored
Boron Total (µg/L)	500 ^c	CCME	Ag-I	5000	Updated	More stringent	1987 ²	Monitored
Cadmium Total (µg/L)	Calculated ^b	CCME	PAL	1	Updated	Replaced with calculated objective CCME update, deleted for Red Deer River ¹	1996 ²	Monitored
Chromium Total (µg/L)	50	Health Canada	DW	11	Updated	Less stringent; CCME guideline	1986 ⁴	Monitored
Cobalt Total (µg/L)	50	CCME	Ag-I	50-1000	Same	Now includes all rivers, more stringent for Red Deer and South Saskatchewan	1987 ²	Monitored
Copper Total (µg/L)	Calculated ^b	CCME	PAL	4.-10	Updated	Replaced with calculated objective; CCME update; deleted for Red Deer ¹	1987 ²	Monitored
Iron Dissolved (µg/L)	300	Health Canada	DW	300-1000	Same	More stringent for Beaver River and South Saskatchewan River	2005 ⁴	Monitored
Lead Total (µg/L)	Calculated ^b	CCME	PAL	7.-20	Updated	Replaced with calculated objective; CCME update.	1987 ²	Monitored
Lithium Total (µg/L)	2500	CCME	Ag-I	N/A	New		1987 ²	Monitored
Manganese Dissolved (µg/L)	50	Health Canada	DW	50-200	Same	Same except deleted for the Battle River and Beaver River ¹	1987 ⁴	Monitored
Mercury (total) (µg/L)	0.026	CCME	PAL	N/A	New	Added to Alberta-Saskatchewan Border; previously only on the Saskatchewan/Manitoba border	2003 ²	Not Monitored
Molybdenum Total (µg/L)	10 ^e	CCME	Ag-I	N/A	New		1987 ²	Monitored
Nickel Total (µg/L)	N/A			25-100	Removed	Replaced with nickel dissolved as more stringent		Monitored
Nickel Dissolved (µg/L)	Calculated ^b	USEPA	PAL	N/A	New	Calculated objective replaces nickel total as more stringent	1995 ⁷	Monitored
Selenium Total (µg/L)	1	CCME	PAL	N/A	New	Replaces selenium dissolved as more stringent	1987 ²	Monitored
Selenium Dissolved (µg/L)	N/A			1.-2	Removed	Replaced by selenium total guideline as more stringent		Monitored
Silver Total (µg/L)	0.1	CCME	PAL	0.1	Same	Now includes all rivers	1987 ²	Monitored
Thallium Total (µg/L)	0.8	CCME	PAL	N/A	New		1999 ²	Monitored
Uranium Total (µg/L)	10	CCME	Ag-I	20	Updated	More stringent, now includes the Red Deer River and the South Saskatchewan River	1987 ²	Monitored
Vanadium Total (µg/L)	100	CCME	Ag-I+Ag-L	100	Same	Now includes Beaver River	1987 ²	Monitored
Zinc Total (µg/L)	30	CCME	PAL	30-50	Same		1987 ²	Monitored

2012-1992 Objectives Comparison Summary Chart – Alberta/Saskatchewan Border								
Parameter Pesticides	Proposed Objective	Jurisdiction	Use	1992 Objective	Comparison	Notes	Last Objective Update	Currently Monitored
<i>Acid Herbicides</i>								
2,4-D (µg/L)	4	CCME	PAL	4	Same		1987 ²	Monitored
Bomoxynil (µg/L)	0.33	CCME	Ag-I	N/A	New		1993 ²	Monitored
Dicamba (µg/L)	0.006	CCME	Ag-I	N/A	New		1993 ²	Monitored
MCPA (µg/L)	0.025	CCME	Ag-I	N/A	New		1995 ²	Monitored
Picloram (µg/L)	29	CCME	PAL	N/A	New		1990 ²	Monitored
2,4,5-TP (Silvex) (µg/L)	N/A			10		Removed; was a Health Canada guideline that has now been archived		Monitored
<i>Organochlorine Pesticides in Water</i>								
Endosulfan (µg/L)	0.003	CCME	PAL	N/A	New		2010 ²	Monitored
Hexachlorocyclohexane (gamma-HCH) (Lindane) (µg/L)	0.01	CCME	PAL	0.1	Updated	More stringent	1987 ²	Monitored
Hexachlorobenzene (µg/L)	0.52	CCME	Ag-L	N/A	New		1991 ²	Monitored
Chlorophenols (µg/L)	N/A			1	Removed	Removed; no longer has an active guideline		Not Monitored
Pentachlorophenol (PCP) (µg/L)	0.5	CCME	PAL	0.5	Same	Now includes the Red Deer River and South Saskatchewan River	1987 ²	Not Monitored
<i>Neutral Herbicides in Water</i>								
Atrazine (µg/L)	1.8	CCME	PAL	N/A	New		1989 ²	Monitored
Diclofopmethyl (Hoegrass) (µg/L)	0.18	CCME	Ag-I	N/A	New		1993 ²	Monitored
Metolachlor (µg/L)	7.8	CCME	PAL	N/A	New		1991 ²	Monitored
Metribuzin (µg/L)	0.5	CCME	Ag-I	N/A	New		1990 ²	Monitored
Simazine (µg/L)	0.5	CCME	Ag-I	N/A	New		1991 ²	Monitored
Triallate (µg/L)	0.24	CCME	PAL	N/A	New		1992 ²	Monitored
Trifluralin (µg/L)	0.2	CCME	PAL	N/A	New		1993 ²	Monitored
<i>Other</i>								
Glyphosate (µg/L)	Report Detections	PPWB	PAL	N/A	New	Concerns over the acceptable value, breakdown products and surfactants; PPWB did not adopt a value but will report detections	2012	Monitored

Superscripts

- Value is temperature and pH dependent. Water quality guidelines for total ammonia for the protection of aquatic life (mg/L NH₃).
- Ammonia guideline: Expressed as µg unionized ammonia-L-1. This would be equivalent to 15.2 µg ammonia-nitrogen-L-1. Guideline for total ammonia is temperature and pH dependent, please consult factsheet for more information.
- Guideline is crop-specific 500 to 6000µg/L.
- Value is a function of hardness (mg/L) in the water column. The objective is a calculated value.
- Molybdenum guideline = up to 50 µg·L-1 for short-term use on acidic soils.

Notes

- No Objectives were established at a number of the PPWB Transboundary sites including dissolved oxygen, SAR and metals. These objectives were considered to be inappropriate for these river sites.
While frequent exceedances have historically been observed of the lowest water use objectives this may be a result of the natural ambient water quality condition. The COWQ has not set objectives, but recommends further investigation into the causal relationship of these higher concentrations. Background objectives may be considered in the next review of these objectives.

2012-1992 Objectives Comparison Summary Chart – Alberta/Saskatchewan Border									
Fish Tissue	Parameter	Proposed Objective	Jurisdiction	Use	1992 Objective	Comparison	Notes	Last Objective Update	Currently Monitored
Mercury in Fish (muscle) (µg/kg)		200	PPWB	FC	500	Updated	More stringent on Alberta Border	1992 ⁶	Not Monitored
Arsenic in Fish (muscle) (µg/kg)		3500	Health Canada	FC	N/A	New		Food and Drugs Act of 1985 ⁸	Not Monitored
Lead in Fish (muscle) (µg/kg)		500	Health Canada	FC	N/A	New		Food and Drugs Act of 1985 ⁸	Not Monitored
DDT total in Fish (muscle) (µg/kg)		5000	Health Canada	FC	N/A	New		Pest Control Products Act 2002 ⁹	Not Monitored
PCB in Fish (muscle) (µg/kg)		N/A			2000	Removed	Removed; guideline is no longer supported by Health Canada		Not Monitored
Aquatic Biota Consumption									
PCB in Fish (µgTEQ/kg diet wet weight)									
	Mammalian (muscle)	0.00079	CCME	FC	N/A	New		1998 ²	Not Monitored
	Avian (muscle)	0.0024	CCME	FC	N/A	New		1998 ²	Not Monitored
DDT (total) in Fish (muscle) (µg/kg diet wet weight)		14	CCME	FC	N/A	New		1997 ²	Not Monitored
Toxaphene in Fish (muscle) (µg/kg diet wet weight)		6.3	CCME	FC	N/A	New		1997 ²	Not Monitored
Radioactive									
Cesium – 137 (Bq/L)		10	Health Canada	DW	N/A	New	Now included on the Alberta/Saskatchewan Border; previously only Saskatchewan/Manitoba border	2009 ⁴	Not Monitored
Iodine – 131 (Bq/L)		6	Health Canada	DW	N/A	New	Now included on the Alberta/Saskatchewan Border; previously only Saskatchewan/Manitoba border	2009 ⁴	Not Monitored
Lead – 210 (Bq/L)		0.2	Health Canada	DW	N/A	New		2009 ⁴	Not Monitored
Radium – 226 (Bq/L)		0.5	Health Canada	DW	N/A	New	Now included on the Alberta/Saskatchewan Border; previously only Saskatchewan/Manitoba border	2009 ⁴	Not Monitored
Strontium – 90 (Bq/L)		5	Health Canada	DW	N/A	New	Now included on the Alberta/Saskatchewan Border; previously only Saskatchewan/Manitoba border	2009 ⁴	Not Monitored
Tritium (Bq/L)		7000	Health Canada	DW	N/A	New	Now included on the Alberta/Saskatchewan Border; previously only Saskatchewan/Manitoba border	2009 ⁴	Not Monitored

2012-1992 Objectives Comparison Summary Chart –Saskatchewan/Manitoba Border								
Parameter Nutrients	Proposed Objective	Jurisdiction	Use	1992 Objective	Comparison	Notes	Last Objective Update	Currently Monitored
Ammonia Dissolved (mg/L)	N/A			Calculated ^a	Removed	Replaced with ammonia un-ionized CCME guideline		Monitored
Ammonia Un-ionized (mg/L)	0.019 ^b	CCME	PAL	N/A	New	Replaces ammonia dissolved	2001 ²	Monitored
Nitrate as N (mg/L)	3	CCME	PAL	10	Updated	More stringent; updates CCME guideline	2012 ²	Monitored
Nitrogen Total (mg/L)	Background	PPWB	PAL	N/A	New	PPWB developed background value based on historical record	2012	Monitored
Phosphorous Total (mg/L)	Background	PPWB	PAL	0.05-50	New	PPWB developed background value based on historical record	2012	Monitored
Phosphorous Total Dissolved (mg/L)	Background	PPWB	PAL	N/A	New	PPWB developed background value based on historical record	2012	Monitored
Major Ions								
Chloride Dissolved (mg/L)	100 or Background	CCME or PPWB	Ag-I	68-250	Same	Same except more stringent for Churchill River and less stringent for Saskatchewan River. New background objective for the Carrot River	1987 ² or 2012	Monitored
Fluoride Dissolved (mg/L)	Background	PPWB	PAL	1-1.5	Updated	Updated to new background objective	2012	Monitored
Sodium Dissolved/Filtered (mg/L)	200 or Background	Health Canada or PPWB	DW	100-300	Updated	Less stringent except more stringent on the Churchill River. New background objective for the Carrot River	1992 ⁴ or 2012	Monitored
Sulphate Dissolved (mg/L)	250 or Background	CCME or PPWB	Ag-I+Ag-L	250-500	Updated	More stringent except same on Saskatchewan River. New background objectives on the Assiniboine River and the Qu'Appelle River	CCREM 1987 ³ or 2012	Monitored
Total Dissolved Solids (mg/L)	500 or Background	CCME + Health Canada or PPWB	Ag-I+DW	N/A	New	Added to Manitoba-Saskatchewan Border. Assiniboine, Carrot and Qu'Appelle Rivers have new background objectives	1987 ² , 1992 ⁴ or 2012	Monitored
Physicals and Other								
pH Lab	6.5-9	CCME	PAL	6.5-9	Same		1987	Monitored
pH Field	6.5-9	CCME	PAL	6.5-9	Same		1987	Monitored
Oxygen Dissolved (mg/L)				6-6.5		Replaced with open and closed water period objectives		
Open Season (>5°C)	5	USEPA	PAL	6.5	Updated	Less stringent and now includes all rivers	1986	Monitored
Closed Season (<5°C)	3	USEPA	PAL	N/A	New	New except for Carrot River ¹	1986	Monitored
Sodium Adsorption Ratio	3	CCME	Ag-I+Ag-L	N/A	New	Added to Manitoba-Saskatchewan Border except for Carrot River and Qu'Appelle River ¹	CCREM 1987 ³	Monitored
Total Suspended Solids (mg/L)	Background	PPWB	PAL	N/A	New	PPWB developed background value based on historical record	2012	Monitored
Reactive Chlorine Species (mg/L)	0.0005	CCME	PAL	0.002	Updated	More stringent; CCME update	1999 ²	Not Monitored
Cyanide (free) (mg/L)	0.005	CCME	PAL	0.005	Same		1987 ²	Not Monitored
Biota								
<i>E.Coli</i> (No./100mL)	200	Health Canada	Rec	N/A	New		1992 ⁵	Monitored
Coliforms Fecal(No./100mL)	100	CCME	Ag-I+DW	100-200	Updated	More stringent except same on Qu'Appelle River	1987 ²	Monitored

2012-1992 Objectives Comparison Summary Chart – Saskatchewan/Manitoba Border								
Parameter Metals	Proposed Objective	Jurisdiction	Use	1992 Objective	Comparison	Notes	Last Objective Update	Currently Monitored
Aluminum Total (µg/L)	N/A			N/A	Same			Monitored
Arsenic Total (µg/L)	N/A			N/A	Same			Monitored
Arsenic Dissolved (µg/L)	50	PPWB	PAL	50	Same		1992 ⁶	Monitored
Barium Total (µg/L)	1000	Health Canada	DW	1000	Same		1990 ⁴	Monitored
Beryllium Total (µg/L)	100	CCME	Ag-I+Ag-L	N/A	New		1987 ²	Monitored
Boron Total (µg/L)	500 ^e	CCME	Ag-I	500-5000	Updated	More stringent than the 1992 objective except the same on the Saskatchewan River	1987 ²	Monitored
Cadmium Total (µg/L)	Calculated ^b	CCME	PAL	0.58-1	Updated	Replaced with calculated objective; CCME update	1996 ²	Monitored
Chromium Total (µg/L)	50	Health Canada	DW	11	Updated	Less stringent; Health Canada guideline	1986 ⁴	Monitored
Cobalt Total (µg/L)	50	CCME	Ag-I	N/A	New	Added to Saskatchewan/Manitoba Border; previously on the Alberta/Saskatchewan border only	1987 ²	Monitored
Copper Total (µg/L)	Calculated ^b	CCME	PAL	5.7-10	Updated	Replaced with calculated objective; CCME update	1987 ²	Monitored
Iron Dissolved (µg/L)	300	Health Canada	DW	300	Same	Same except deleted on the Carrot River ¹	1986 ⁴	Monitored
Lead Total (µg/L)	Calculated ^b	CCME	PAL	6.1-20	Updated	Replaced with calculated objective; CCME update	1987 ²	Monitored
Lithium Total (µg/L)	2500	CCME	Ag-I	N/A	New		1987 ²	Monitored
Manganese Dissolved (µg/L)	50	Health Canada	DW	50	Same	Same except deleted on the Assiniboine River, Carrot River, and Qu'Appelle River ¹	1987 ⁴	Monitored
Mercury (total) (µg/L)	0.026	CCME	PAL	0.006	Updated	Less stringent; CCME guideline and now includes all rivers	2003 ²	Not Monitored
Molybdenum Total (µg/L)	10 ^e	CCME	Ag-I	N/A	New		1987 ²	Monitored
Nickel Total (µg/L)	N/A			25-100	Removed	Replaced with nickel dissolved as more stringent		Monitored
Nickel Dissolved (µg/L)	Calculated ^b	USEPA	PAL	N/A	New	Calculated objective replaces nickel total as more stringent	1995 ⁷	Monitored
Selenium Total (µg/L)	1	CCME	PAL	N/A	New	New replaces selenium dissolved as more stringent	1987 ²	Monitored
Selenium Dissolved (µg/L)	N/A			10	Removed	Replaced by selenium total guideline as more stringent		Monitored
Silver Total (µg/L)	0.1	CCME	PAL	N/A	New	Added to Saskatchewan/Manitoba Border; previously on the Alberta/Saskatchewan border only	1987 ²	Monitored
Thallium Total (µg/L)	0.8	CCME	PAL	N/A	New		1999 ²	Monitored
Uranium Total (µg/L)	10	CCME	Ag-I	20	Updated	More stringent; CCME guideline.	1987 ²	Monitored
Vanadium Total (µg/L)	100	CCME	Ag-I+Ag-L	N/A	New	Added to Saskatchewan/Manitoba Border; previously on the Alberta/Saskatchewan border only	1987 ²	Monitored
Zinc Total (µg/L)	30	CCME	PAL	47	Updated	More stringent; CCME guideline.	1987 ²	Monitored

2012-1992 Objectives Comparison Summary Chart – Alberta/Saskatchewan Border								
Parameter Pesticides	Proposed Objective	Jurisdiction	Use	1992 Objective	Comparison	Notes	Last Objective Update	Currently Monitored
<i>Acid Herbicides</i>								
2,4-D (µg/L)	4	CCME	PAL	4	Same		1987 ²	Monitored
Bomoxynil (µg/L)	0.33	CCME	Ag-I	N/A	New		1993 ²	Monitored
Dicamba (µg/L)	0.006	CCME	Ag-I	N/A	New		1993 ²	Monitored
MCPA (µg/L)	0.025	CCME	Ag-I	N/A	New		1995 ²	Monitored
Picloram (µg/L)	29	CCME	PAL	N/A	New		1990 ²	Monitored
2,4,5-TP (Silvex) (µg/L)	N/A			10	Removed	Removed; was a Health Canada guideline that has now been archived.		Monitored
<i>Organochlorine Pesticides in Water</i>								
Endosulfan (µg/L)	0.003	CCME	PAL	N/A	New		2010 ²	Monitored
Hexachlorocyclohexane (gamma-HCH) (Lindane) (µg/L)	0.01	CCME	PAL	0.08	Updated	More stringent	1987 ²	Monitored
Hexachlorobenzene (µg/L)	0.52	CCME	Ag-L	N/A	New		1991 ²	Monitored
Chlorophenols (µg/L)	N/A			1	Removed	Removed; no longer has an active guideline		Not Monitored
Pentachlorophenol (PCP) (µg/L)	0.0005	CCME	PAL	0.0005	Same		1987 ²	Not Monitored
<i>Neutral Herbicides in Water</i>								
Atrazine (µg/L)	1.8	CCME	PAL	N/A	New		1989 ²	Monitored
Diclofopmethyl (Hoegrass) (µg/L)	0.18	CCME	Ag-I	N/A	New		1993 ²	Monitored
Metolachlor (µg/L)	7.8	CCME	PAL	N/A	New		1991 ²	Monitored
Metribuzin (µg/L)	0.5	CCME	Ag-I	N/A	New		1990 ²	Monitored
Simazine (µg/L)	0.5	CCME	Ag-I	N/A	New		1991 ²	Monitored
Triallate (µg/L)	0.24	CCME	PAL	N/A	New		1992 ²	Monitored
Trifluralin (µg/L)	0.2	CCME	PAL	N/A	New		1993 ²	Monitored
<i>Other</i>								
Glyphosate (µg/L)	Report Detections	PPWB	PAL	N/A	New	Concerns over the acceptable value, breakdown products and surfactants; PPWB did not adopt a value but will report detections	2012	Monitored

Superscripts

- Value is temperature and pH dependent. Water quality guidelines for total ammonia for the protection of aquatic life (mg/L NH₃).
- Ammonia guideline: Expressed as µg unionized ammonia·L⁻¹. This would be equivalent to 15.2 µg ammonia-nitrogen·L⁻¹. Guideline for total ammonia is temperature and pH dependent, please consult factsheet for more information.
- Guideline is crop-specific 500 to 6000µg/L.
- Value is a function of hardness (mg/L) in the water column. The objective is a calculated value.
- Molybdenum guideline = up to 50 µg·L⁻¹ for short-term use on acidic soils.

Notes

- No Objectives were established at a number of the PPWB Transboundary sites including dissolved oxygen, SAR and metals. These objectives were considered to be inappropriate for these river sites.
While frequent exceedances have historically been observed of the lowest water use objectives this may be a result of the natural ambient water quality condition. The COWQ has not set objectives, but recommends further investigation into the causal relationship of these higher concentrations. Background objectives may be considered in the next review of these objectives.

2012-1992 Objectives Comparison Summary Chart –Saskatchewan/Manitoba Border								
Parameter Fish Tissue	Proposed Objective	Jurisdiction	Use	1992 Objective	Comparison	Notes	Last Objective Update	Currently Monitored
Mercury in Fish (muscle) (µg/kg)	200	PPWB	FC	200-500	Updated	More stringent except the same on Saskatchewan River and the Churchill River	1992 ⁶	Not Monitored
Arsenic in Fish (muscle) (µg/kg)	3500	Health Canada	FC	N/A	New		Food and Drugs Act of 1985 ⁸	Not Monitored
Lead in Fish (muscle) (µg/kg)	500	Health Canada	FC	N/A	New		Food and Drugs Act of 1985 ⁸	Not Monitored
DDT (total) in Fish (muscle) (µg/kg)	5000	Health Canada	FC	N/A	New		Pest Control Products Act 2002 ⁹	Not Monitored
PCB in Fish (muscle) (µg/kg)	N/A			2000	Removed	Removed; guideline is no longer supported by Health Canada		Not Monitored
Aquatic Biota Consumption								
PCB in Fish (µgTEQ/kg diet wet weight)								
Mammalian (muscle)	0.00079	CCME	FC	N/A	New		CCME 1998 ²	Not Monitored
Avian (muscle)	0.0024	CCME	FC	N/A	New		CCME 1998 ²	Not Monitored
DDT (total) in Fish (muscle) (µg/kg diet wet weight)	14	CCME	FC	N/A	New		CCME 1997 ²	Not Monitored
Toxaphene in Fish (muscle) (µg/kg diet wet weight)	6.3	CCME	FC	N/A	New		CCME 1997 ²	Not Monitored
Radioactive								
Cesium – 137 (Bq/L)	10	Health Canada	DW	50	Updated	More stringent; CCME update	2009 ⁴	Not Monitored
Iodine – 131 (Bq/L)	6	Health Canada	DW	10	Updated	More stringent; CCME update	2009 ⁴	Not Monitored
Lead – 210 (Bq/L)	0.2	Health Canada	DW	N/A	New	CCME update		Not Monitored
Radium – 226 (Bq/L)	0.5	Health Canada	DW	1	Updated	More stringent; CCME update	2009 ⁴	Not Monitored
Strontium – 90 (Bq/L)	5	Health Canada	DW	10	Updated	More stringent; CCME update	2009 ⁴	Not Monitored
Tritium (Bq/L)	7000	Health Canada	DW	4000	Updated	Less stringent; CCME update	2009 ⁴	Not Monitored

Objective Source

2. CCME, Canadian Environmental Quality Guidelines
<http://ceqg-rcqe.ccme.ca/>
3. CCME, CCREM (1987), Canadian Water Quality Guidelines
4. Health Canada, Drinking Water Quality Guidelines
http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/2010-sum_guide-res_recom/index-eng.php
5. Health Canada (2010), Guidelines for Recreational Water Quality
http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/guide_water-2012-guide_eau/index-eng.php
6. PPWB (1992) – Schedule E, Master Agreement on Apportionment
7. USEPA (for Protection of Aquatic Life)
<http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm>
8. Food and Drug Regulations (Division 15) 1985
http://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,_c._870/page-159.html#h-109
9. Pest Control Products Act (2002)
http://www.hc-sc.gc.ca/cps-spc/alt_formats/pdf/pest/part/protect-proteger/food-nourriture/mrl-lmr-eng.pdf

**Appendix 12: Comparison of the 1992 and proposed 2012
Interprovincial Water Quality Objectives**

**Comparison of the 1992 and Proposed 2012
Interprovincial Water Quality Objectives**

**Prepared for the
Prairie Provinces Water Board**

Prepared by the PPWB Secretariat for the COWQ
March 2013

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1.0 INTRODUCTION

In 1992, the governments of Alberta, Saskatchewan, Manitoba and Canada agreed to interprovincial water quality objectives for eleven transboundary river reaches. These are the Battle River, Beaver River, North Saskatchewan River, Red Deer River near Bindloss, South Saskatchewan River, Assiniboine River, Carrot River, Churchill River, Red Deer River near Erwood, Qu'Appelle River, and the Saskatchewan River. The number of objectives established in 1992 and the numerical values were not the same for all transboundary river reaches. The objectives were based on current or anticipated water uses that were being protected for each river reach. The interprovincial water quality objectives, by river reach, are included in Appendix A.

Over the last several years, the Prairie Provinces Water Board (PPWB) has been conducting a review of the interprovincial water quality objectives. This review has resulted in a recommendation from the Committee on Water Quality (COWQ) of seventy-one objectives (Appendix B). The proposed 2012 interprovincial water quality objectives also included the Cold River at the Alberta/Saskatchewan border, which did not have interprovincial water quality objectives in 1992. The proposed objectives were developed to protect all water uses for all river reaches. While the majority of objectives were based on water use objectives, background objectives were developed for nutrients, TSS, and major ions for select rivers.

The purpose of this report is to compare the 1992 and proposed 2012 interprovincial water quality objectives in terms of overall adherence rates and more detailed examination of the number of excursions and the parameters that exceeded objectives over the last ten years.

2.0 COMPARISON OF THE 1992 AND PROPOSED 2012 INTERPROVINCIAL WATER QUALITY OBJECTIVES

Using the PPWB historic water quality database the number of excursions and annual percent adherence rates were calculate for the 1992 and proposed (2012) interprovincial water quality objectives (Appendices' C, D and E).

For the nutrient objectives developed for the proposed 2012 objectives, when there was a significant trend in the historic data, two background objectives were proposed. These are based on the 90th percentile of the data (full period of record) and the 90th percentile of the lowest running ten year average. The COWQ has not at the time of writing this comparison, decided on the specifics of if/how these will be incorporated into the adherence rate calculation. However, for the purpose of this report analyses were conducted using the proposed 90th percentile of the lowest running ten year average (when applicable). These objectives are lower and therefore represent the lowest potential adherence rates for the proposed 2012 objectives.

2.1 Overall Adherence Rates

The average adherence rates for the last ten years were calculated for both sets of WQOs to see if implementation of the proposed 2012 interprovincial water quality objectives would result in changes in the adherence rates (Table 1). Comparison of the

last ten years of historic water quality data showed that four rivers had a greater adherence rate, four rivers had a lower adherence rate, and three rivers had no change. The Battle, Assiniboine, Carrot and Qu'Appelle rivers showed an increase in adherence rates. Even though the Cold River did not have interprovincial water quality objectives in 1992, the river had the third highest adherence rate when the historical data was compared to the proposed 2012 objectives (96.8%).

In contrast, the North Saskatchewan, South Saskatchewan, Churchill rivers and the Red Deer River (near Erwood) showed a decreased in adherence rates. Three rivers that showed virtually no change included the Beaver River, Red Deer River (near Bindloss) and the Saskatchewan River.

For all twelve transboundary river reaches, there was no river that had an average adherence rate below 93.4% when compared to the proposed 2012 WQOs, with the lowest being the Red Deer River (Erwood, 93.4%) and the highest being the Churchill River (97.7%). Adherence rate graphs were generated for all twelve transboundary river reaches using the 1992 objectives and the proposed objectives (Appendix C).

Table 1 Summary of changes in adherence to current and proposed WQOs from 2002 to 2011

River	Average Adherence to WQOs - 2002 to 2011 (%)		Difference in Adherence Proposed - 1992	Change in Adherence - 1992 to Proposed (No. Yr's)		WQ Variables with ≥ 10 Excursions of Proposed WQOs - 2002 to 2011
	1992	Proposed		Increase	Decrease	
Cold	----	96.8	----	----	----	None
Beaver	97.8	97.2	-0.6	5	5	Fe, DP, TSS
North Saskatchewan	98.4	96.3	-2.1		10	Cd, FC, Cu, TN, TP, TDP, TSS, Ag
Battle	89.9	94.1	4.2	10		As, Cd, FC, Cu, Fe, TN, TP, TDP, Ag, TDS, TSS
Red Deer, Bindloss	93.9	93.7	-0.2	7	3	As, Cr, FC, E coli, Pb, TN, TP, TDP, Ag, TSS, Zn
South Saskatchewan	98.8	96.1	-2.7		10	Cd, Cu, TN, TP, TDP, Ag
Max	98.8	97.2				
Min	89.9	93.7				
Assiniboine	91.8	95.9	4.1	10		MCPA, TDS, SO4, TN, Dicamba, E.Coli, TSS, Ag, As
Carrot	87.5	94.5	7.0	10		TDP, TP, TN, Cd, DO, TSS, Dicamba, MCPA
Churchill	99.5	97.8	-1.7		8	None
Qu'Appelle	86.7	94.8	8.1	10		TDP, TSS, TP, TN
Red Deer, Erwood	95.8	93.4	-2.4		10	TDP, TP, TN, Cd.
Saskatchewan	97.6	96.9	-0.7	4	5	TDP, TP, TN Cd, F, Ag
Max	99.5	97.8				
Min	86.7	93.4				

2.2 Number of Excursions

Using the historical water quality data the excursions were identified on an annual basis when compared to the 1992 objectives (Appendix D). Similarly, using the 2012 proposed interprovincial water quality objectives, the parameters that would exceed these objectives were identified (Appendix E). Parameters missing from these tables either had no excursions, or no objective was established for the river. A summary at the end of each table gives the total number of excursions between 1974 and 2011, the total number of excursions between 2002 and 2011, and the median number of excursions between 2002 and 2011. The median was included because its value showed the regularity of excursions.

2.3 Comparison of 1992 and 2012 Interprovincial Water Quality Objectives

When comparing the 1992 and proposed 2012 interprovincial water quality objectives, the following were assessed, the number of parameters with excursions ≥ 10 over a ten year period, the total number of excursions (including all parameters), and the average adherence rates (Appendix F).

Differences in adherence rates between the two sets of interprovincial water quality objectives occurred for a number of reasons. One difference was the number of transboundary water quality objectives in 1992 as compared to the number of objectives proposed in 2012. In 1992 there was a maximum of 38 interprovincial water quality objectives while for the proposed interprovincial water quality objectives there are 71 objectives. There may also be a few parameters that exhibit more excursions than others, such as nutrients. Only the Saskatchewan-Manitoba border had nutrient objectives in 1992 (total phosphorus), while all rivers in 2012 have proposed nutrient objectives and were developed using a seasonal background approach. This means that all rivers have two or four objectives per nutrient (B-3 in Appendix B). Having a greater number of nutrient objectives increases the chances of a nutrient exceeding one of these objectives for any given river. Metals and pesticides also have a greater number of objectives in the proposed 2012 interprovincial water quality objectives. Metals had 23 objectives in the proposed 2012 objectives compared to 18 in 1992, and pesticides have 17 objectives in 2012 as compared to five in 1992.

The following analysis is based on examining water quality parameters with ≥ 10 excursions from 2002 to 2011, using the 1992 objectives. Comparison of the 1992 interprovincial water quality objectives with ≥ 10 excursions to the proposed 2012 objectives showed that for six of the transboundary river reaches there was either no change or the number of excursions decreased. These rivers included the Battle River, Assiniboine River, Carrot River, Qu'Appelle River, Red Deer River near Erwood, and the Saskatchewan River (Table 2).

When comparing results considering all parameters for these same six transboundary river reaches there were generally fewer excursions with the 1992 objectives when compared to the proposed 2012 objectives. The overall number of parameters with excursions to the 2012 objectives (≥ 10 over the last ten years) increased in all six of the transboundary river reaches; however, as noted elsewhere this is in large part a consequence of the increase in the number of parameters with objectives for the proposed 2012 objectives.

Of the 12 transboundary rivers, the North Saskatchewan River, South Saskatchewan River and the Red Deer River near Bindloss all showed either no change between the 1992 objectives and the proposed 2012 objectives for parameters that showed excursions in 1992 or a slight increase in the number of excursions (Table 3). Increases in the number of excursions occurred for a number of the metals. This included an increase in the number of total copper excursions on the North Saskatchewan, and increase in the total lead for the Red Deer River near Bindloss. For the South Saskatchewan River, when historical data were compared to the 1992 interprovincial water quality objectives, there were no parameters with excursions ≥ 10 in the last ten years. However, when the historical data were compared to the proposed 2012 objectives there were a number of parameters with ≥ 10 excursions, including

several metals (e.g. total copper, and total cadmium) that did have objectives in 1992. The reason for the difference between the 1992 and proposed 2012 objectives for these metals is that CCME has updated the protection of aquatic life guidelines for these metals so that they are now calculated based on water hardness.

For the Beaver River, manganese was the only objective to have ≥ 10 excursions over the last ten years when compared to the 1992 interprovincial water quality objectives. No objective was established for manganese in the proposed 2012 objectives, as this objective is still under review.

The Churchill River did not have any parameters in 1992 or 2012 with excursions greater than or equal to ten, but its average adherence rate decreased. While the overall achievement of objectives declined for the Churchill River, it still had the highest adherence rate out of all the rivers when compared to the proposed 2012 interprovincial water quality objectives (97.6%). Although the Cold River did not have any objectives in 1992, this river reach did not have any parameters with excursions greater than or equal to ten in 2012, and also had the third highest average adherence rate (96.8%).

The parameters that showed the highest excursion rates when the water quality data were compared to the 1992 interprovincial water quality objectives were not necessarily the same as those when compared to the 2012 proposed interprovincial water quality objectives (Appendix F).

Table 2 Comparison of Excursions to the 1992 and Proposed 2012 Interprovincial Water Quality Objectives for River Reaches that Showed Decreases or No Change in the Number of Excursions (Excursions ≥ 10 over the period 2002 to 2011).

River	Parameter	1992 Total # of Excursions	2012 Total # of Excursions
Battle River	Total Dissolved Solids	94	13
	Sodium (dissolved)	93	8
	Manganese (dissolved)	34	No Objective
	Coliforms fecal	24	24
	Copper (total)	22	22
	Iron (dissolved)	15	15
Assiniboine River	Total Phosphorus	117	6
	Manganese (dissolved)	86	No Objective
	Oxygen Dissolved	28	7
	Arsenic Total	No Objective	28
Carrot River	Total phosphorus	105	49
	Manganese (dissolved)	81	No Objective
	chloride (dissolved)	40	3
	Sodium (dissolved)	29	3
	Oxygen Dissolved	27	11
	Iron (dissolved)	26	No Objective
Qu'Appelle River	Total Phosphorus	119	29
	Sodium (dissolved)	83	3
	Manganese (dissolved)	42	No Objective
	Oxygen Dissolved	12	3
Red Deer River near Erwood	Total Phosphorus	26	19
Saskatchewan River	Total Phosphorus	44	17

Table 3 Comparison of Excursions to the 1992 and Proposed 2012 Interprovincial Water Quality Objectives for River Reaches that Showed Increases or No Change in the Number of Excursions (Excursions \geq 10 over the period 2002 to 2011).

River	Parameter	1992 Total # of Excursions	2012 Total # of Excursions
North Saskatchewan River	Coliforms fecal	14	14
	Copper (total)	16	20
Red Deer River near Bindloss	Copper (total)	44	No Objective
	Zinc (total)	19	19
	Coliforms fecal	18	18
	Lead (total)	17	26
	Chromium (total),	12	1
	Nickel (total)	12	0
	Cadmium (total)	3	16
South Saskatchewan River	Copper (total)	4	21

2.4.1 Nutrients

The proposed interprovincial water quality objectives for nutrients are based on a seasonal background approach for all transboundary river reaches. In the 1992 interprovincial water quality objectives total phosphorus objectives were only established on the river reaches on the Saskatchewan/Manitoba border. These objectives were not based on ambient data more typical of prairie systems and therefore regular and frequent excursions were observed. The proposed 2012 nutrient objectives were established for total phosphorus, total dissolved phosphorus and total nitrogen and were based on the ambient historical data and are site specific. These objectives were developed with a two tiered approach depending on whether there was a significant trend in the historical dataset. When there was a significant trend two objectives for a season (open or closed) were established, the first being the 90th percentile of the lowest ten years and the second the 90th percentile of the period of record. A 10% excursion frequency is expected for the period of record objective, while the expected frequency using the lowest ten years is not known and will be different among parameters and each sites because of the different nature of the trends for each parameter and each site. When comparing nutrient concentrations to the proposed 2012 objectives the COWQ has recommended that excursions be reported when the lowest running ten year objective is exceeded; however, the manner in which it will be reported has not yet been resolved by COWQ.

When assessing the historical dataset for excursions to the nutrient objectives the results were broken down into the period of record (1974 to 2011) and the last ten years (2002 to 2011), for both the 90th percentile and the lowest running ten year 90th percentile objectives when there was a significant trend (Table 4 and Table 5). More excursions were reported for the lowest running 10 year objectives, but generally the pattern of excursions were the same for the lowest running ten year and period of record objectives.

Table 4 Number of Nutrient Excursions and the Percentage Exceedance Rate when compared to the 2012 proposed Background Objectives over the Period of Record (1974 to 2011).

Total Number of Excursions and Percentage Exceedance Rate (Lowest Running 10 Year)

	Nutrient Excursions											
	Total Phosphorus				Total Dissolved Phosphorus				Total Nitrogen			
	1974-2011		2002-2011		1974-2011		2002-2011		1993-2011		2002-2011	
Battle River Near Urwin	73	16.11%	24	20.00%	47	10.96%	16	13.33%	22	10.43%	12	10.16%
Beaver River at Beaver Crossing	40	9.66%	6	5.77%	87	22.19%	11	10.58%	20	10.64%	9	9.38%
Cold River at Outlet of Cold Lake	7	10.77%	4	10.53%	12	18.46%	8	21.05%	11	17.19%	8	21.62%
North Saskatchewan River at Hwy 17	62	21.91%	13	10.83%	85	30.04%	12	10.00%	27	12.80%	13	11.50%
Red Deer River Near Bindloss	96	20.82%	29	24.34%	110	25.11%	23	19.44%	28	14%	21	19.44%
South Saskatchewan River	115	21.90%	12	10.08%	163	32.53%	20	16.81%	33	14.86%	20	18.02%
Assiboine River at Hwy 8 Bridge	46	9.79%	6	5.08%	47	10.49%	10	8.47%	28	13.73%	19	17.27%
Carrot River near Turnberry	97	23.21%	49	42.61%	116	28.93%	67	58.26%	54	26.73%	40	37.38%
Churchill River below Wasawakaskik	24	10.39%	4	11.43%	30	14.08%	4	11.43%	8	11.27%	4	12.12%
Qu'Appelle River	103	25.50%	29	24.17%	162	40.10%	49	40.83%	19	10.33%	11	9.82%
Red Deer River at Erwood	65	20.12%	19	36.54%	71	23.67%	25	48.08%	14	13.59%	10	20.83%
Saskatchewan River	99	25.32%	17	17.00%	91	24.46%	19	19.00%	18	10.17%	12	12.50%

Table 5 Number of Nutrient Excursions and the Percentage Exceedance Rate when compared to the 2012 proposed Background Objectives for the Last Ten Years (2002 to 2011)

Total Number of Excursions and Percentage Exceedance Rate (Period of Record)

	Nutrient Excursions											
	Total Phosphorus				Total Dissolved Phosphorus				Total Nitrogen			
	1974-2011		2002-2011		1974-2011		2002-2011		1993-2011		2002-2011	
Battle River Near Urwin	48	10.60%	16	13.33%	47	10.96%	16	13.33%	22	10.43%	12	10.16%
Beaver River at Beaver Crossing	40	9.66%	6	5.77%	38	9.69%	5	4.81%	20	10.64%	9	9.38%
Cold River at Outlet of Cold Lake	7	10.77%	4	10.53%	12	18.46%	8	21.05%	20	12.50%	6	16.22%
North Saskatchewan River at Hwy 17	29	10.25%	10	8.33%	28	9.89%	4	3.33%	21	9.95%	10	8.85%
Red Deer River Near Bindloss	51	11.06%	19	15.97%	46	10.50%	9	7.56%	28	13.59%	21	19.44%
South Saskatchewan River	51	9.71%	5	4.20%	60	11.98%	8	6.72%	25	11.26%	17	15.32%
Assiboine River at Hwy 8 Bridge	26	9.79%	6	5.08%	47	10.49%	10	8.47%	28	13.73%	19	17.27%
Carrot River near Turnberry	47	11.24%	26	22.61%	46	11.47%	35	30.43%	23	11.39%	17	15.89%
Churchill River below Wasawakaskik	24	10.39%	4	11.43%	30	14.08%	4	11.43%	8	11.27%	4	12.12%
Qu'Appelle River	46	11.39%	15	12.50%	48	11.88%	13	10.83%	19	10.33%	11	9.82%
Red Deer River at Erwood	36	11.15%	13	25.00%	33	11.00%	12	23.08%	14	13.59%	10	20.83%
Saskatchewan River	42	10.74%	8	8.00%	38	10.22%	9	9.00%	18	10.17%	12	12.50%

No Significant Trend
 Significant Increasing Trend
 Significant Decreasing Trend

3.0 CONCLUSIONS

To compare the 1992 interprovincial water quality objectives to the proposed 2012 objectives both overall adherence rate and the number of excursions in the last ten years were examined. In summary for the 12 transboundary rivers the results showed:

- No overall change in adherence rate for the Beaver, Red Deer and Saskatchewan River
- Greater adherence for the Battle, Assiniboine, Carrot and Qu'Appelle rivers.
- Decreased adherence for the North and South Saskatchewan rivers, Churchill River and Red Deer River near Erwood.
- The Churchill River showed the highest overall adherence rate.

- No ≥ 10 excursions over 10 years were found for the Cold River or the Churchill River.

The increases or decreases in adherence rates are largely caused by now having nutrient WQOs at all sites and changes to some water quality objectives (e.g. increase or decrease in the value) or elimination of a current WQO. This highlights the importance of ensuring appropriate reporting of nutrient excursions.

Using a conservative guide of ≥ 10 excursions over the last ten years, nutrients are usually highlighted along with TSS, and a few select metals in most rivers. Pesticide excursions occurred at a rate of ≥ 10 excursions over the last ten years in the two rivers (Assiniboine River and Carrot River) that have been monitored monthly for the period of record.

4.0 REFERENCES

Prairie Provinces Water Board. (n.d.). *Prairie Provinces Water Board*. Retrieved December 14, 2012, from <http://www.ppwb.ca/>

Prairie Provinces Water Board: About Us. (n.d.). *Prairie Provinces Water Board*. Retrieved December 17, 2012, from <http://www.ppwb.ca/information/2/index.html>

Appendix A – 1992 Objectives

Parameter	Unit	Alberta - Saskatchewan Border						Manitoba - Saskatchewan Border					
		Battle	Beaver	Cold	North Sask	Red Deer	South Sask	Assiniboine	Carrot	Churchill	Qu'Appelle	Red Deer	Sask
Nutrients													
Ammonia Dissolved	mg/L	Calculated	Calculated	No Objective	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	
Nitrogen Dissolved NO3 & NO2	mg/L	10	10	No Objective	10	10	10	10	10	10	10	10	
Phosphorous Total	mg/L	No Objective	No Objective	No Objective	No Objective	No Objective	No Objective	0.05	0.05	0.05	0.05	0.05	
Major Ions													
Chloride Dissolved	mg/L	100	100	No Objective	100	No Objective	No Objective	100	100	250	100	100	68
Fluoride Dissolved	mg/L	1.5	1.5	No Objective	1.5	1.5	1.5	1	1	1.5	1	1	1
Sodium Dissolved	mg/L	100	100	No Objective	100	No Objective	No Objective	100	100	300	100	100	100
Sulphate Dissolved	mg/L	500	500	No Objective	500	500	500	500	500	500	500	500	250
Total Dissolved Solids	mg/L	500	No Objective	No Objective	500	500	500	No Objective	No Objective	No Objective	No Objective	No Objective	No Objective
Physicals													
Oxygen Dissolved	mg/L	6.0*	6.0*	No Objective	6.5	No Objective	No Objective	6	6.5*	6.5	6	6	6.5
pH	pH units	6.5-9.0	6.5-9.0	No Objective	6.5-9.0	No Objective	No Objective	6.5-9.0	6.5-9.0	6.5-9.0	6.5-9.0	6.5-9.0	6.5-9.0
Sodium Adsorption Ratio	rel units	No Objective	No Objective	No Objective	No Objective	3	3	No Objective	No Objective	No Objective	No Objective	No Objective	No Objective
Biota													
Coliforms Fecal	NO/100mL	100	100	No Objective	100	100	100	200	200	200	100	200	200
Pesticides													
2,4-D	ng/L	4000	4000	No Objective	4000	4000	4000	4000	4000	4000	4000	4000	4000
Chlorophenols Total	mg/L	0.001	0.001	No Objective	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Gamma-Benzenehexachloride	ng/L	100	100	No Objective	100	100	100	80	80	80	80	80	80
PCP	mg/L	0.0005	0.0005	No Objective	0.0005	No Objective	No Objective	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Silvex	ng/L	10000	10000	No Objective	10000	10000	10000	10000	10000	10000	10000	10000	10000
Metals													
Aluminum Total	µg/L	5000	No Objective	No Objective	5000	No Objective	No Objective	No Objective	No Objective	No Objective	No Objective	No Objective	No Objective
Arsenic Dissolved	µg/L	50	50	No Objective	50	50	50	50	50	50	50	50	50
Barium Total	µg/L	1000	1000	No Objective	1000	1000	1000	1000	1000	1000	1000	1000	1000
Boron Total	µg/L	5000	5000	No Objective	5000	5000	5000	2000	2000	5000	2000	5000	500
Cadmium Total	µg/L	1	1	No Objective	1	1	1	1	1	0.58	1	0.58	1
Chromium Total	µg/L	11	11	No Objective	11	11	11	11	11	11	11	11	11
Cobalt Total	µg/L	50	No Objective	No Objective	50	1000	1000	No Objective	No Objective	No Objective	No Objective	No Objective	No Objective
Copper Total	µg/L	4	4	No Objective	4	4	10	10	10	5.7	10	10	10
Iron Dissolved	µg/L	300	1000	No Objective	300	300	300	300	300	300	300	300	300
lead Total	µg/L	7	7	No Objective	7	7	20	20	15	11	20	11.8	6.1
Manganese Dissolved	µg/L	50	200	No Objective	50	50	50	50	50	50	50	50	50
Mercury Total	µg/L	No Objective	No Objective	No Objective	No Objective	No Objective	No Objective	No Objective	No Objective	No Objective	No Objective	No Objective	No Objective
Nickel Total	µg/L	100	100	No Objective	100	25	25	100	100	25	100	100	100
Selenium Dissolved	µg/L	1	1	No Objective	1	1	2	10	10	10	10	10	10
Silver Total	µg/L	No Objective	0.1	No Objective	No Objective	No Objective	No Objective	No Objective	No Objective	No Objective	No Objective	No Objective	No Objective
Uranium Total	µg/L	20	20	No Objective	20	No Objective	No Objective	20	20	20	20	20	20
Vanadium Total	µg/L	100	No Objective	No Objective	100	100	100	No Objective	No Objective	No Objective	No Objective	No Objective	No Objective
Zinc Total	µg/L	30	30	No Objective	30	30	50	47	47	47	47	47	47
Contaminants													
Chlorine	mg/L	2	2	No Objective	2	No Objective	No Objective	2	2	2	2	2	2
Cyanide Free	mg/L	0.005	0.005	No Objective	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
Mercury in Fish	µg/g	0.5	0.5	No Objective	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PCB in Fish	µg/g	2	2	No Objective	2	2	2	2	2	2	2	2	2
Radioactive													
Cesium-137	Bq/L	No Objective	No Objective	No Objective	No Objective	No Objective	No Objective	50	50	50	50	50	50
Iodine-131	Bq/L	No Objective	No Objective	No Objective	No Objective	No Objective	No Objective	10	10	10	10	10	10
Radium-226	Bq/L	No Objective	No Objective	No Objective	No Objective	No Objective	No Objective	1	1	1	1	1	1
Strontium-90	Bq/L	No Objective	No Objective	No Objective	No Objective	No Objective	No Objective	10	10	10	10	10	10
Tritium	Bq/L	No Objective	No Objective	No Objective	No Objective	No Objective	No Objective	4000	4000	4000	4000	4000	4000

*open season only

Appendix B – 2012 Objectives

2012 Recommended Interprovincial Water Quality Objectives– AB/SK Border currently monitored						
Parameter	River					
	Battle River	Beaver River	Cold River	North Saskatchewan River	Red Deer River (Bindloss)	South Saskatchewan River
Nutrients						
Nitrate as N (mg/L)	3	3	3	3	3	3
Ammonia Un-ionized (mg/L)	0.019 ^a	0.019 ^a	0.019 ^a	0.019 ^a	0.019 ^a	0.019 ^a
Major Ions						
Total Dissolved Solids (mg/L)	872	500	500	500	500	500
Sulphate Dissolved (mg/L)	250	250	250	250	250	250
Sodium Dissolved (mg/L)	200	200	200	200	200	200
Fluoride Dissolved (mg/L)	0.31	0.19	0.12	0.18	0.2	0.19
Chloride Dissolved (mg/L)	100	100	100	100	100	100
Physicals and Other						
pH Lab	6.5-9.0	6.5-9.0	6.5-9.0	6.5-9.0	6.5-9.0	6.5-9.0
pH Field	6.5-9.0	6.5-9.0	6.5-9.0	6.5-9.0	6.5-9.0	6.5-9.0
Oxygen Dissolved (mg/L)						
Open Season (>5°C)	5	5	5	5	5	5
Closed Season (<5°C)	Under Review	Under Review	3	3	3	3
Sodium Adsorption Ratio	Under Review	3	3	3	3	3
Total Suspended Solids (mg/L)	5.0 - 320.0	3.0 - 48.8	1.2 - 4.8	5.0 - 295.8	30.0 - 832.6	5.6 - 339.8
Biota						
<i>E. Coli</i> (No./100 mL)	200	200	200	200	200	200
Coliforms Fecal (No./100 mL)	100	100	100	100	100	100
Metals						
Arsenic Total (µg/L)	5	5	5	5	5	5
Arsenic Dissolved (µg/L)	No Objective	No Objective	No Objective	No Objective	No Objective	No Objective
Barium Total (µg/L)	1000	1000	1000	1000	1000	1000
Beryllium Total (µg/L)	100	100	100	100	100	100
Boron Total (µg/L)	500 ^b	500 ^b	500 ^b	500 ^b	500 ^b	500 ^b
Cadmium Total (µg/L)	Calculated ^c	Calculated ^c	Calculated ^c	Calculated ^c	Under Review	Calculated ^c
Chromium Total (µg/L)	50	50	50	50	50	50
Cobalt Total (µg/L)	50	50	50	50	50	50
Copper Total (µg/L)	Calculated ^c	Calculated ^c	Calculated ^c	Calculated ^c	Under Review	Calculated ^c
Iron Dissolved (µg/L)	300	300	300	300	300	300
Lead Total (µg/L)	Calculated ^c	Calculated ^c	Calculated ^c	Calculated ^c	Calculated ^c	Calculated ^c
Lithium Total (µg/L)	2500	2500	2500	2500	2500	2500
Manganese Dissolved (µg/L)	Under Review	Under Review	50	50	50	50
Molybdenum Total (µg/L)	10 ^d	10 ^d	10 ^d	10 ^d	10 ^d	10 ^d
Nickel Dissolved (µg/L)	Calculated ^c	Calculated ^c	Calculated ^c	Calculated ^c	Calculated ^c	Calculated ^c
Selenium Total (µg/L)	1	1	1	1	1	1
Silver Total (µg/L)	0.1	0.1	0.1	0.1	0.1	0.1
Thallium Total (µg/L)	0.8	0.8	0.8	0.8	0.8	0.8
Uranium Total (µg/L)	10	10	10	10	10	10
Vanadium Total (µg/L)	100	100	100	100	100	100
Zinc Total (µg/L)	30	30	30	30	30	30

2012 Recommended Water Quality Objectives – AB/SK Border

Parameter	River					
	Battle River	Beaver River	Cold River	North Saskatchewan River	Red Deer River (Bindloss)	South Saskatchewan River
Pesticides						
<i>Acid Herbicides</i>						
2,4-D (µg/L)	4	4	4	4	4	4
Bromoxynil (µg/L)	0.33	0.33	0.33	0.33	0.33	0.33
Dicamba (µg/L)	0.006	0.006	0.006	0.006	0.006	0.006
MCPA (µg/L)	0.025	0.025	0.025	0.025	0.025	0.025
Picloram (µg/L)	29	29	29	29	29	29
<i>Organochlorine Pesticides in Water</i>						
Endosulfan (µg/L)	0.003	0.003	0.003	0.003	0.003	0.003
Hexachlorocyclohexane (gamma-HCH) (Lindane) (µg/L)	0.01	0.01	0.01	0.01	0.01	0.01
Hexachlorobenzene (µg/L)	0.52	0.52	0.52	0.52	0.52	0.52
Pentachlorophenol (PCP) (µg/L)	0.5	0.5	0.5	0.5	0.5	0.5
<i>Neutral Herbicides in Water</i>						
Atrazine (µg/L)	1.8	1.8	1.8	1.8	1.8	1.8
Diclofopmethyl (Hoegrass)* (µg/L)	0.18	0.18	0.18	0.18	0.18	0.18
Metolachlor (µg/L)	7.8	7.8	7.8	7.8	7.8	7.8
Metribuzin (µg/L)	0.5	0.5	0.5	0.5	0.5	0.5
Simazine (µg/L)	0.5	0.5	0.5	0.5	0.5	0.5
Triallate (µg/L)	0.24	0.24	0.24	0.24	0.24	0.24
Trifluralin (µg/L)	0.2	0.2	0.2	0.2	0.2	0.2
<i>Other</i>						
Glyphosate (µg/L)	Report Detections	Report Detections	Report Detections	Report Detections	Report Detections	Report Detections

Superscripts

- Ammonia guideline: Expressed as µg unionized ammonia-L-1. This would be equivalent to 15.6 µg ammonia-nitrogen-L-1. Guideline for total ammonia is temperature and pH dependent, please consult factsheet for more information.
- Guideline is crop-specific 500 to 6000µg/L.
- Value is a function of hardness (mg/L) in the water column. The objective is a calculated value.
- Molybdenum guideline = up to 50 µg·L-1 for short-term use on acidic soils.

Legend

Protection of Aquatic Life	Ag-Livestock	Ag-Irrigation	Recreation	Treatability	Ag-Irrigation + Treatability	Ag-Irrigation and Livestock	Fish Consumption
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2012 Recommended Interprovincial Water Quality Objectives – SK/MB Border currently monitored							
Parameter	River						
	Assiniboine River	Carrot River		Churchill River	Qu'Appelle River	Red Deer River (Erwood)	Saskatchewan River
		Open	Closed				
Nutrients							
Nitrate as N (mg/L)	3	3		3	3	3	3
Ammonia Un-ionized (mg/L)	0.019 ^a	0.019 ^a		0.019 ^a	0.019 ^a	0.019 ^a	0.019 ^a
Major Ions							
Total Dissolved Solids (mg/L)	834	742	1672	500	1144	500	500
Sulphate Dissolved (mg/L)	299	250		250	486	250	250
Sodium Dissolved (mg/L)	200	164	442	200	200	200	200
Fluoride Dissolved (mg/L)	0.26	0.20	0.29	0.12	0.25	0.18	0.18
Chloride Dissolved (mg/L)	100	267	728	100	100	100	100
Physicals and Other							
pH Lab	6.5-9.0	6.5-9.0		6.5-9.0	6.5-9.0	6.5-9.0	6.5-9.0
pH Field	6.5-9.0	6.5-9.0		6.5-9.0	6.5-9.0	6.5-9.0	6.5-9.0
Oxygen Dissolved (mg/L)							
Open Season (>5°C)	5	5		5	5	5	5
Closed Season (<5°C)	3	Under Review		3	3	3	3
Sodium Adsorption Ratio	3	Under Review		3	Under Review	3	3
Total Suspended Solids (mg/L)	5.0 - 69.2	6.08 - 98.2		2.2 - 6.2	22.6 - 122.2	1.0 - 19.7	27.0 - 125.0
Biota							
<i>E. Coli</i> (No./100 mL)	200	200		200	200	200	200
Coliforms Fecal (No./100 mL)	100	100		100	100	100	100
Metals							
Arsenic Total (µg/L)	5	No Objective		5	No Objective	5	5
Arsenic Dissolved (µg/L)	No Objective	50		No Objective	50	No Objective	No Objective
Barium Total (µg/L)	1000	1000		1000	1000	1000	1000
Beryllium Total (µg/L)	100	100		100	100	100	100
Boron Total (µg/L)	500 ^b	500 ^b		500 ^b	500 ^b	500 ^b	500 ^b
Cadmium Total (µg/L)	Calculated ^c	Calculated ^c		Calculated ^c	Calculated ^c	Calculated ^c	Calculated ^c
Chromium Total (µg/L)	50	50		50	50	50	50
Cobalt Total (µg/L)	50	50		50	50	50	50
Copper Total (µg/L)	Calculated ^c	Calculated ^c		Calculated ^c	Calculated ^c	Calculated ^c	Calculated ^c
Iron Dissolved (µg/L)	300	Under Review		300	300	300	300
Lead Total (µg/L)	Calculated ^c	Calculated ^c		Calculated ^c	Calculated ^c	Calculated ^c	Calculated ^c
Lithium Total (µg/L)	2500	2500		2500	2500	2500	2500
Manganese Dissolved (µg/L)	Under Review	Under Review		50	Under Review	50	50
Molybdenum Total (µg/L)	10 ^d	10 ^d		10 ^d	10 ^d	10 ^d	10 ^d
Nickel Dissolved (µg/L)	Calculated ^c	Calculated ^c		Calculated ^c	Calculated ^c	Calculated ^c	Calculated ^c
Selenium Total (µg/L)	1	1		1	1	1	1
Silver Total (µg/L)	0.1	0.1		0.1	0.1	0.1	0.1
Thallium Total	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Uranium Total (µg/L)	10	10		10	10	10	10
Vanadium Total (µg/L)	100	100		100	100	100	100
Zinc Total (µg/L)	30	30		30	30	30	30

2012 Recommended Water Quality Objectives– SK/MB Border

Parameter	River						
	Assiniboine River	Carrot River		Churchill River	Qu'Appelle River	Red Deer River (Erwood)	Saskatchewan River
		Open	Closed				
Pesticides							
<i>Acid Herbicides</i>							
2,4-D (µg/L)	4	4	4	4	4	4	4
Bromoxynil (µg/L)	0.33	0.33	0.33	0.33	0.33	0.33	0.33
Dicamba (µg/L)	0.006	0.006	0.006	0.006	0.006	0.006	0.006
MCPA (µg/L)	0.025	0.025	0.025	0.025	0.025	0.025	0.025
Picloram (µg/L)	29	29	29	29	29	29	29
<i>Organochlorine Pesticides in Water</i>							
Endosulfan (µg/L)	0.003	0.003	0.003	0.003	0.003	0.003	0.003
Hexachlorocyclohexane (gamma-HCH) (Lindane) (µg/L)	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Hexachlorobenzene (µg/L)	0.52	0.52	0.52	0.52	0.52	0.52	0.52
Pentachlorophenol (PCP) (µg/L)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
<i>Neutral Herbicides in Water</i>							
Atrazine (µg/L)	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Diclofopmethyl (Hoegrass)* (µg/L)	0.18	0.18	0.18	0.18	0.18	0.18	0.18
Metolachlor (µg/L)	7.8	7.8	7.8	7.8	7.8	7.8	7.8
Metribuzin (µg/L)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Simazine (µg/L)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Triallate (µg/L)	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Trifluralin (µg/L)	0.2	0.2	0.2	0.2	0.2	0.2	0.2
<i>Other</i>							
Glyphosate (µg/L)	Report Detections	Report Detections	Report Detections	Report Detections	Report Detections	Report Detections	Report Detections

- Ammonia guideline: Expressed as µg unionized ammonia-L-1. This would be equivalent to 15.6 µg ammonia-nitrogen-L-1. Guideline for total ammonia is temperature and pH dependent, please consult factsheet for more information.
- Guideline is crop-specific 500 to 6000µg/L.
- Value is a function of hardness (mg/L) in the water column. The objective is a calculated value.
- Molybdenum guideline = up to 50 µg·L-1 for short-term use on acidic soils.

Legend

Protection of Aquatic Life	Ag-Livestock	Ag-Irrigation	Recreation	Treatability	Ag-Irrigation + Treatability	Ag-Irrigation and Livestock	Fish Consumption
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2012 Recommended Water Quality Objectives – Alberta/Saskatchewan Border; not currently monitored

Parameter	River					
	Battle River	Beaver River	Cold River	North Saskatchewan River	Red Deer River (Bindloss)	South Saskatchewan River
Physicals and Other						
Reactive Chlorine Species (mg/L)	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Cyanide (free) (mg/L)	0.005	0.005	0.005	0.005	0.005	0.005
Metals						
Mercury (total) (µg/L)	0.026	0.026	0.026	0.026	0.026	0.026
Fish Tissue						
Mercury in Fish (muscle) (µg/kg)	200	200	200	200	200	200
Arsenic in fish (muscle) (µg/kg)	3500	3500	3500	3500	3500	3500
Lead In fish (muscle) (µg/kg)	500	500	500	500	500	500
DDT (total) in fish (muscle) (µg/kg)	5000	5000	5000	5000	5000	5000
Aquatic Biota Consumption						
PCB in fish (muscle) mammalian (µg TEQ/kg diet wet weight)	0.00079	0.00079	0.00079	0.00079	0.00079	0.00079
PCB in fish (muscle) avian (µg TEQ/kg diet wet weight)	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024
DDT total in fish (muscle) (µg/kg diet wet weight)	14	14	14	14	14	14
Toxaphene in fish (muscle) (µg/kg diet wet weight)	6.3	6.3	6.3	6.3	6.3	6.3
Radioactive						
Cesium-137 (Bq/L)	10	10	10	10	10	10
Iodine-131 (Bq/L)	6	6	6	6	6	6
Lead-210 (Bq/L)	0.2	0.2	0.2	0.2	0.2	0.2
Radium-226 (Bq/L)	0.5	0.5	0.5	0.5	0.5	0.5
Strontium-90 (Bq/L)	5	5	5	5	5	5
Tritium (Bq/L)	7000	7000	7000	7000	7000	7000

Legend

Protection of Aquatic Life	Treatability	Fish Consumption
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2012 Recommended Water Quality Objectives– Saskatchewan/Manitoba Border not currently monitored

Parameter	River						
	Assiniboine River	Carrot River		Churchill River	Qu'Appelle River	Red Deer River (Erwood)	Saskatchewan River
		Open	Closed				
Physicals and Other							
Reactive Chlorine Species (mg/L)	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Cyanide (free) (mg/L)	0.005	0.005	0.005	0.005	0.005	0.005	0.005
Metals							
Mercury (total) (µg/L)	0.026	0.026	0.026	0.026	0.026	0.026	0.026
Fish Tissue							
Mercury in Fish (muscle) (µg/kg)	200	200	200	200	200	200	200
Arsenic in fish (muscle) (µg/kg)	3500	3500	3500	3500	3500	3500	3500
Lead In fish (muscle) (µg/kg)	500	500	500	500	500	500	500
DDT (total) in fish (muscle) (µg/kg)	5000	5000	5000	5000	5000	5000	5000
Aquatic Biota Consumption							
PCB in fish (muscle) mammalian (µg TEQ/kg diet wet weight)	0.00079	0.00079	0.00079	0.00079	0.00079	0.00079	0.00079
PCB in fish (muscle) avian (µg TEQ/kg diet wet weight)	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024
DDT total in fish (muscle) (µg/kg diet wet weight)	14	14	14	14	14	14	14
Toxaphene in fish (muscle) (µg/kg diet wet weight)	6.3	6.3	6.3	6.3	6.3	6.3	6.3
Radioactive							
Cesium-137 (Bq/L)	10	10	10	10	10	10	10
Iodine-131 (Bq/L)	6	6	6	6	6	6	6
Lead-210 (Bq/L)	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Radium-226 (Bq/L)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Strontium-90 (Bq/L)	5	5	5	5	5	5	5
Tritium (Bq/L)	7000	7000	7000	7000	7000	7000	7000

Legend

Protection of Aquatic Life	Treatability	Fish Consumption
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Recommended Nutrient Objectives for the Transboundary River Reaches Based on a Background Approach

Recommended Nutrient Objectives						
Proposed Objectives for Nutrients		Total Phosphorus (mg/L)		Total Dissolved Phosphorus (mg/L)		Total Nitrogen (mg/L)
Alberta - Saskatchewan Border						
Battle River Near Unwin	Summer	0.267	0.335	0.051		2.260
	Winter	0.075	0.100	0.045		1.550
Beaver River at Beaver Crossing	Summer	0.171		0.043	0.060	1.140
	Winter	0.127		0.042	0.060	1.862
Cold River at Outlet of Cold Lake	Summer	0.023		0.010		0.453
	Winter	0.024		0.017		0.452
North Saskatchewan River at Highway 17	Summer	0.253	0.278	0.026	0.046	1.169
	Winter	0.063	0.115	0.048	0.101	1.175
Red Deer River Near Bindloss	Summer	0.315	0.563	0.023	0.035	2.320
	Winter	0.035	0.069	0.008	0.024	0.860
South Saskatchewan River	Summer	0.159	0.246	0.014	0.018	1.073
	Winter	0.054	0.110	0.010	0.067	1.638

Recommended Nutrient Objectives						
Proposed Objectives for Nutrients		Total Phosphorus (mg/L)		Total Dissolved Phosphorus (mg/L)		Total Nitrogen (mg/L)
Saskatchewan - Manitoba Border						
Assiniboine River at Hwy 8 Bridge	Summer	0.311		0.186		1.801
	Winter	0.180		0.115		2.252
Carrot River near Turnberry	Summer	0.099	0.140	0.027	0.057	1.087
	Winter	0.170	0.266	0.031	0.059	1.814
Churchill River below Wasawakasik	Summer	0.025		0.010		0.484
	Winter	0.021		0.010		0.411
Qu'Appelle River	Summer	0.278	0.304	0.156	0.190	1.822
	Winter	0.221	0.290	0.129	0.249	1.767
Red Deer River at Erwood	Summer	0.052	0.066	0.021	0.029	1.195
	Winter	0.074	0.161	0.025	0.055	1.998
Saskatchewan River	Summer	0.088	0.124	0.014	0.018	0.838
	Winter	0.028	0.034	0.011	0.017	0.761

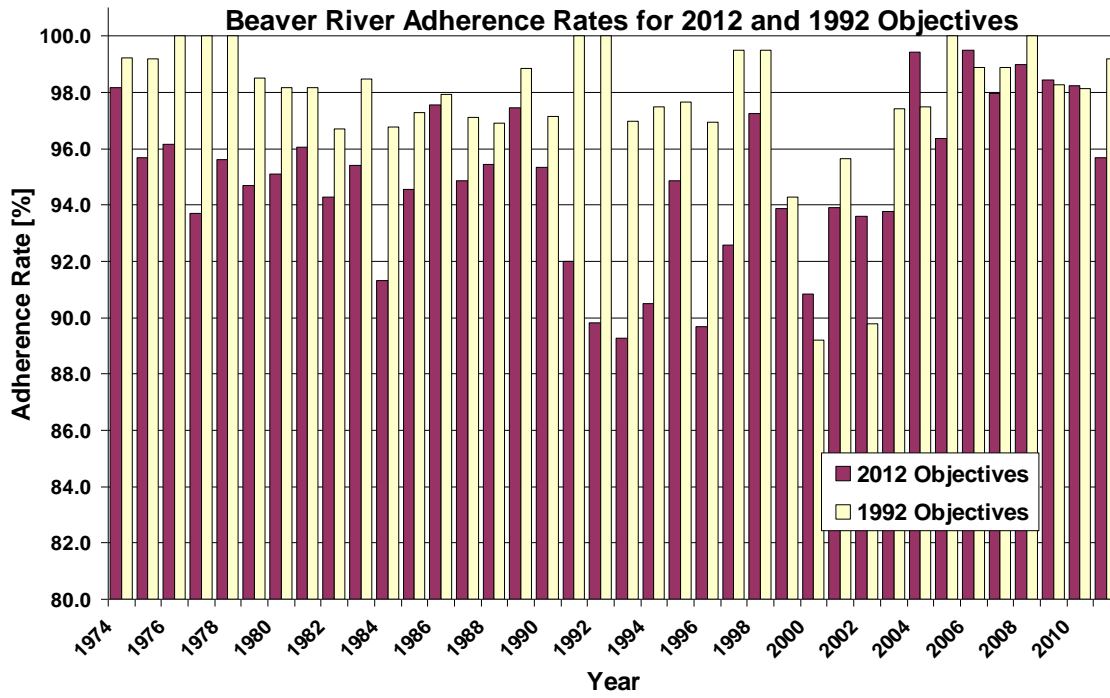
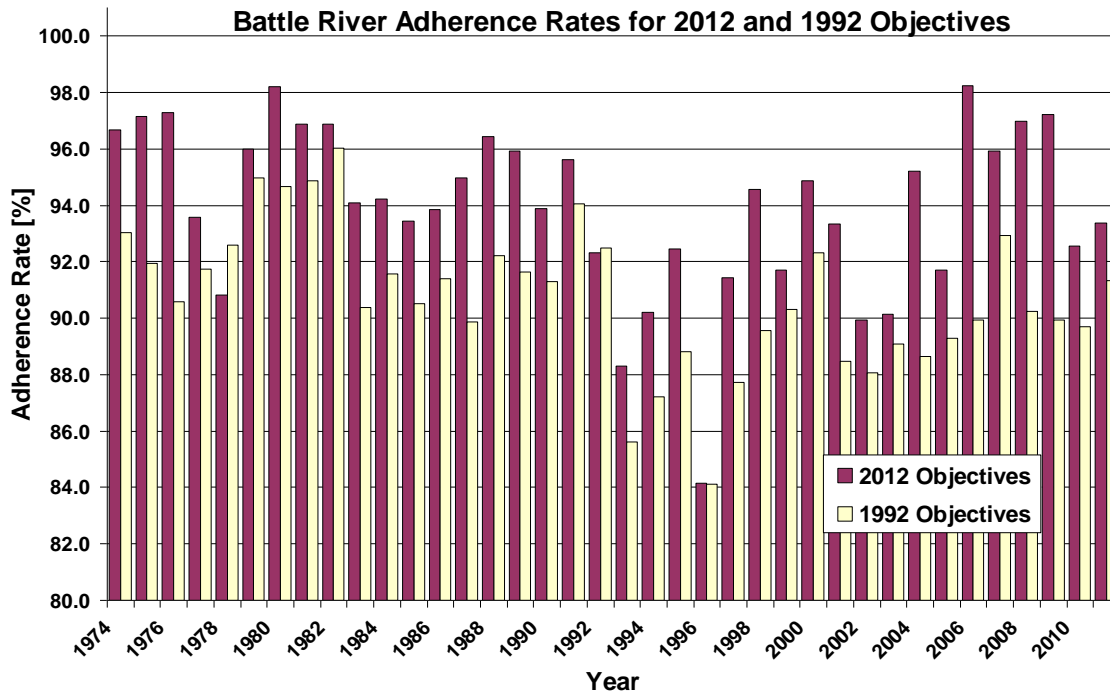
No Trend - 90th % of Database

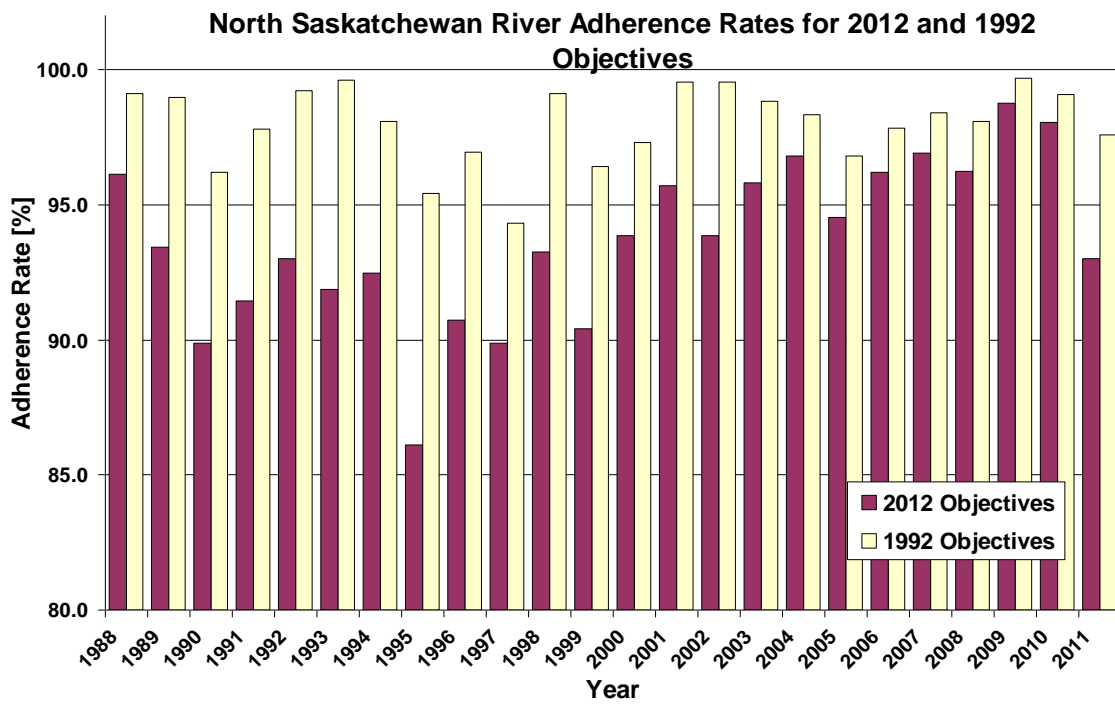
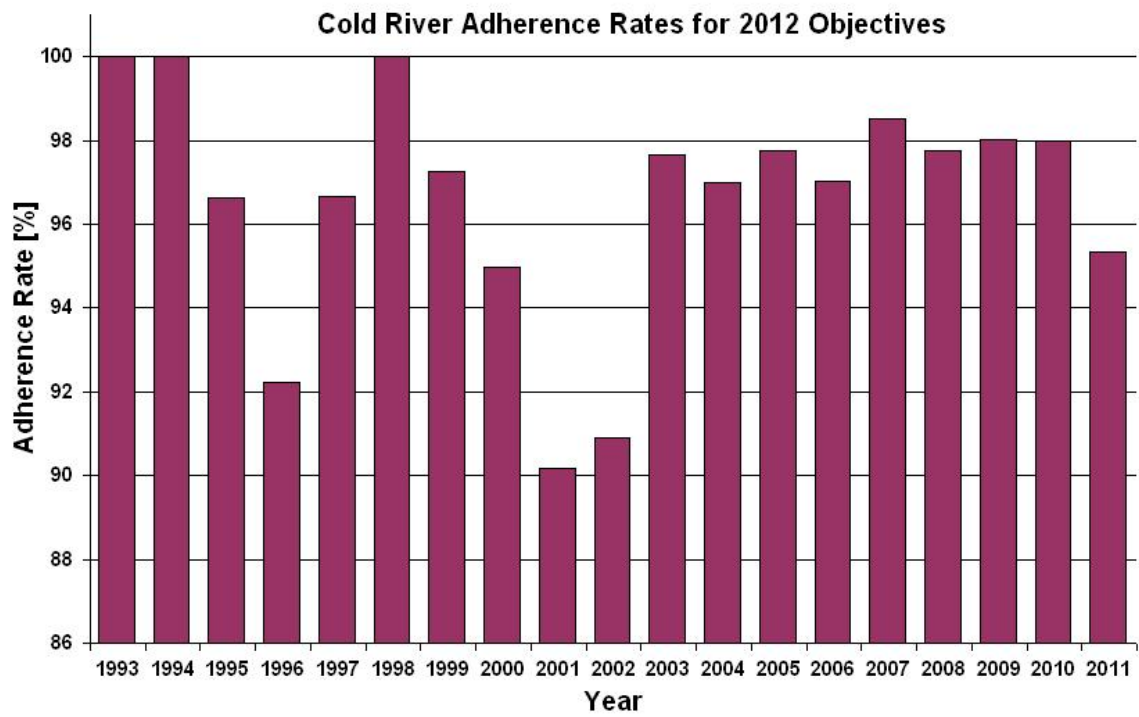
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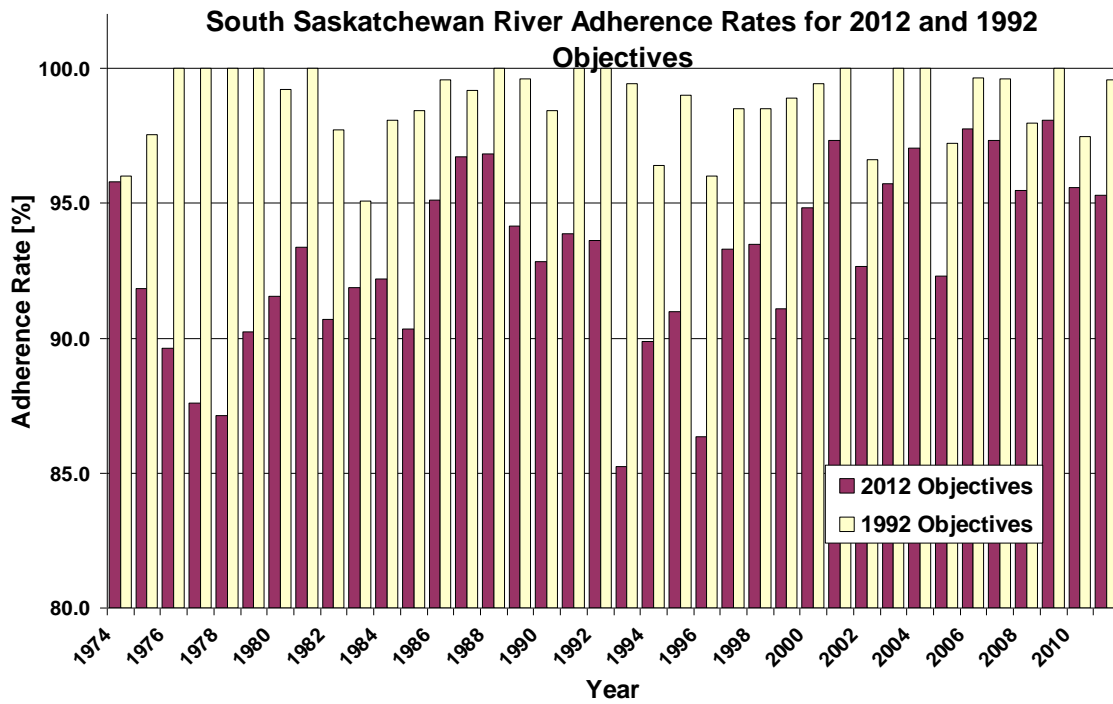
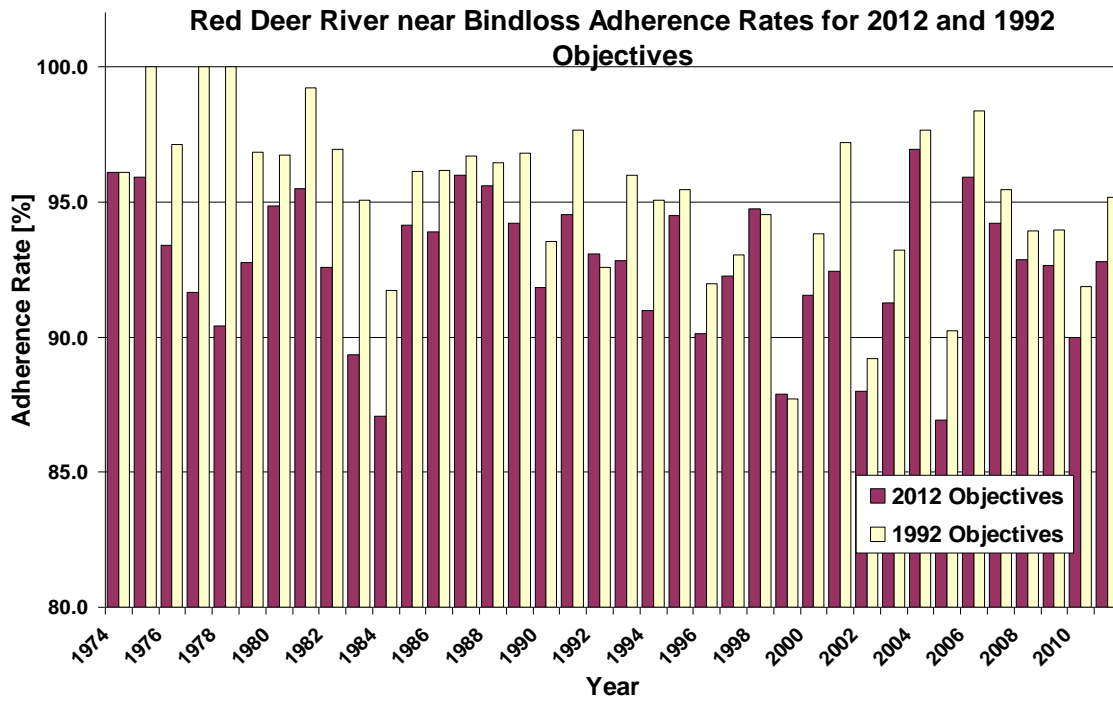
Decreasing Trend - Lowest 90th % of 10yr Running

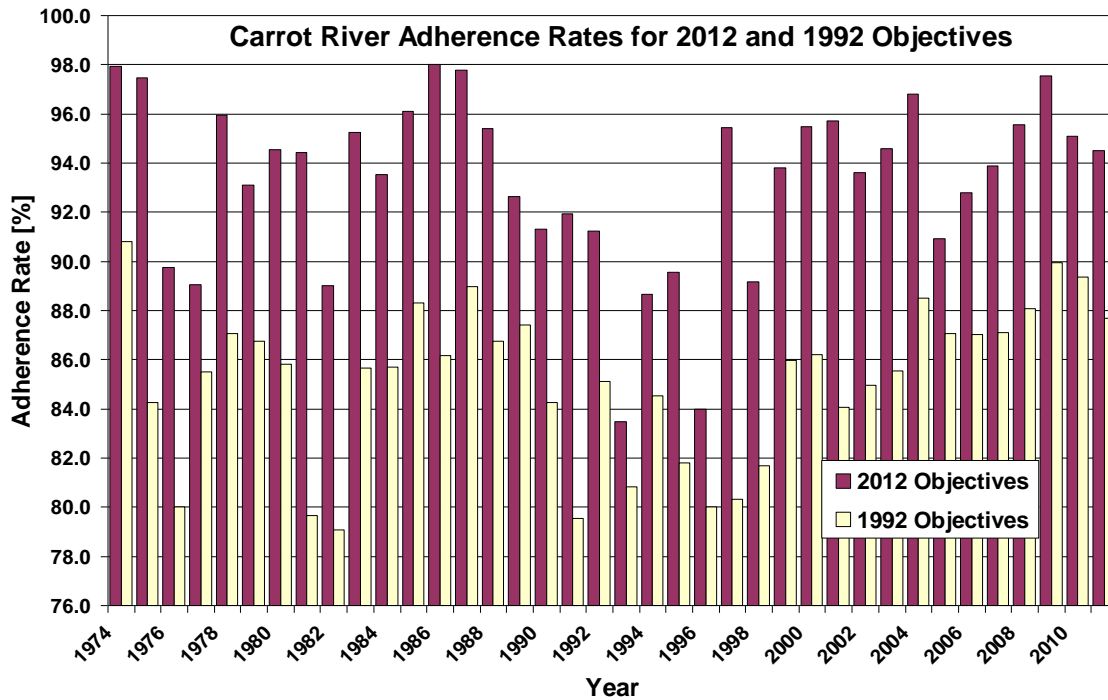
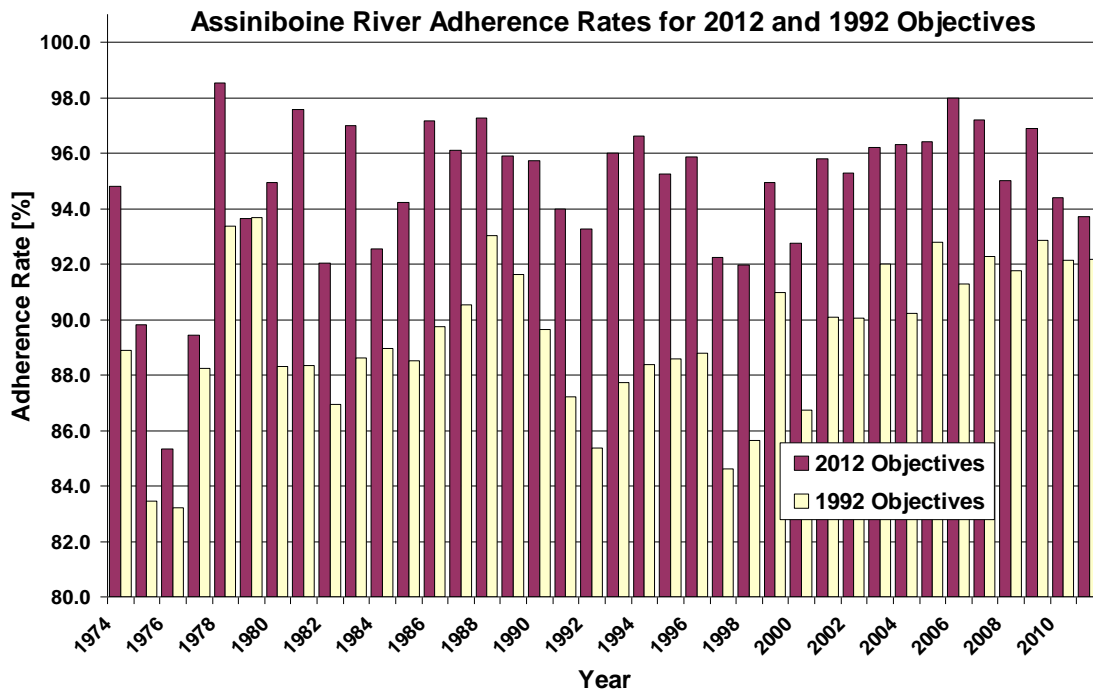
Increasing Trend - Lowest 90th % of 10yr Running

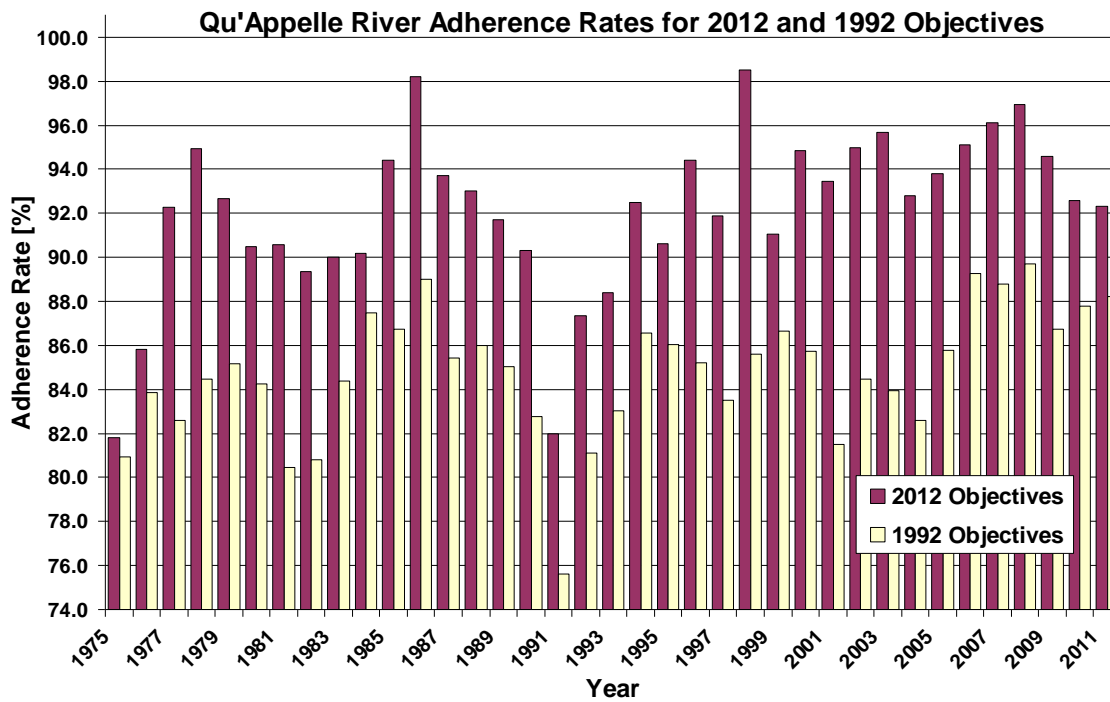
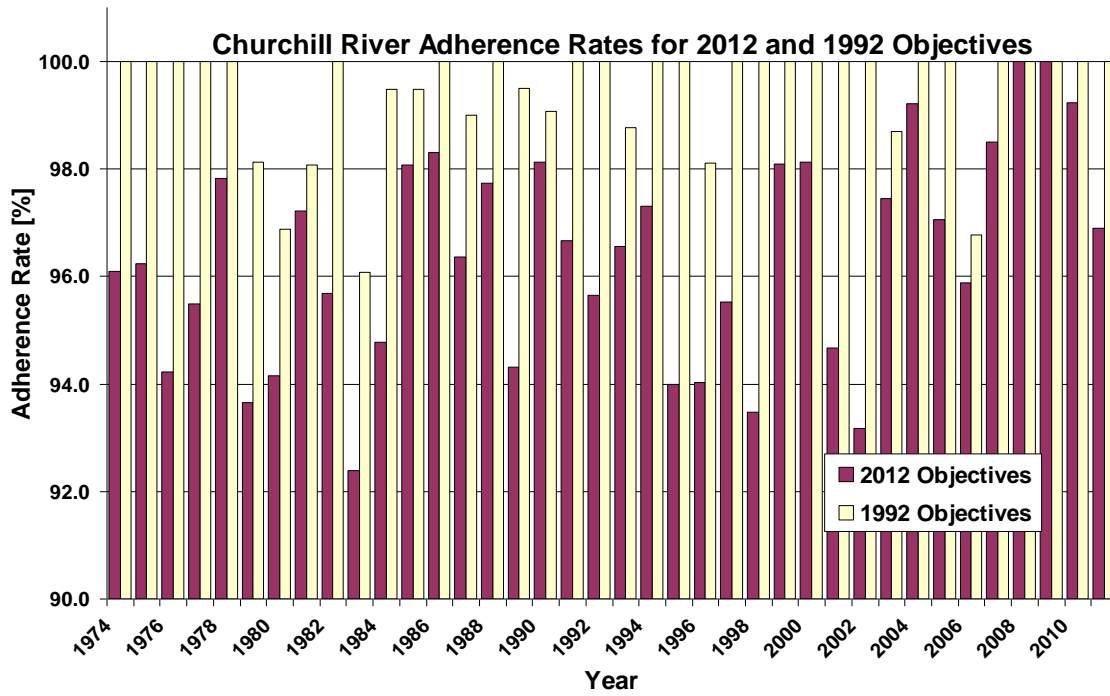
Appendix C – Adherence Rate Graphs

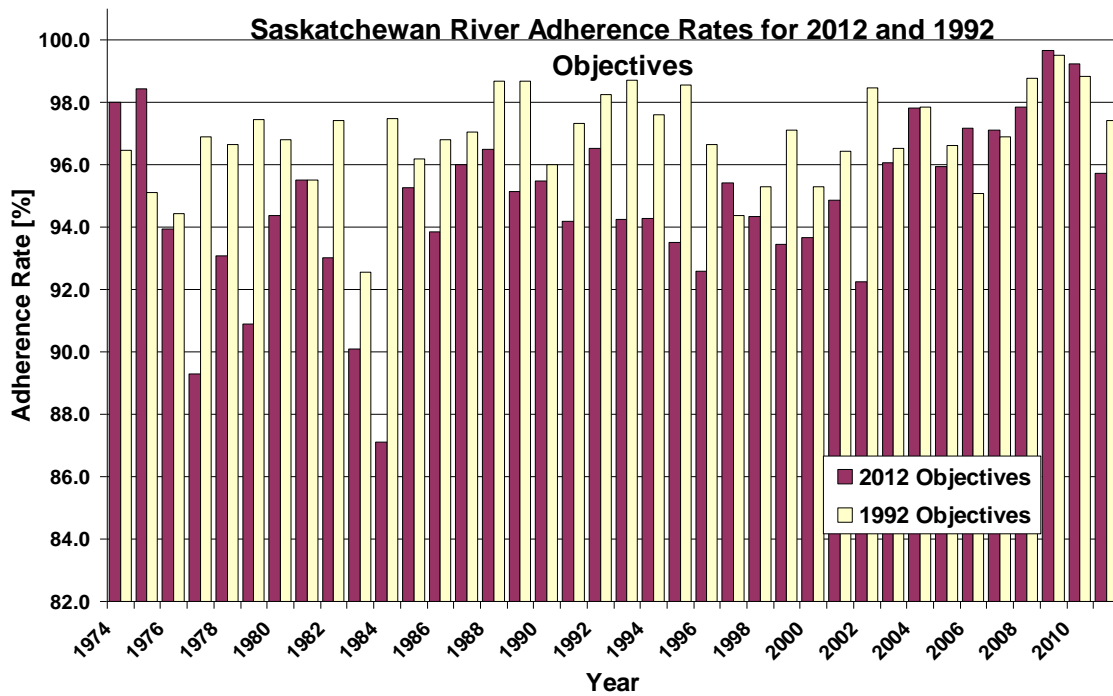
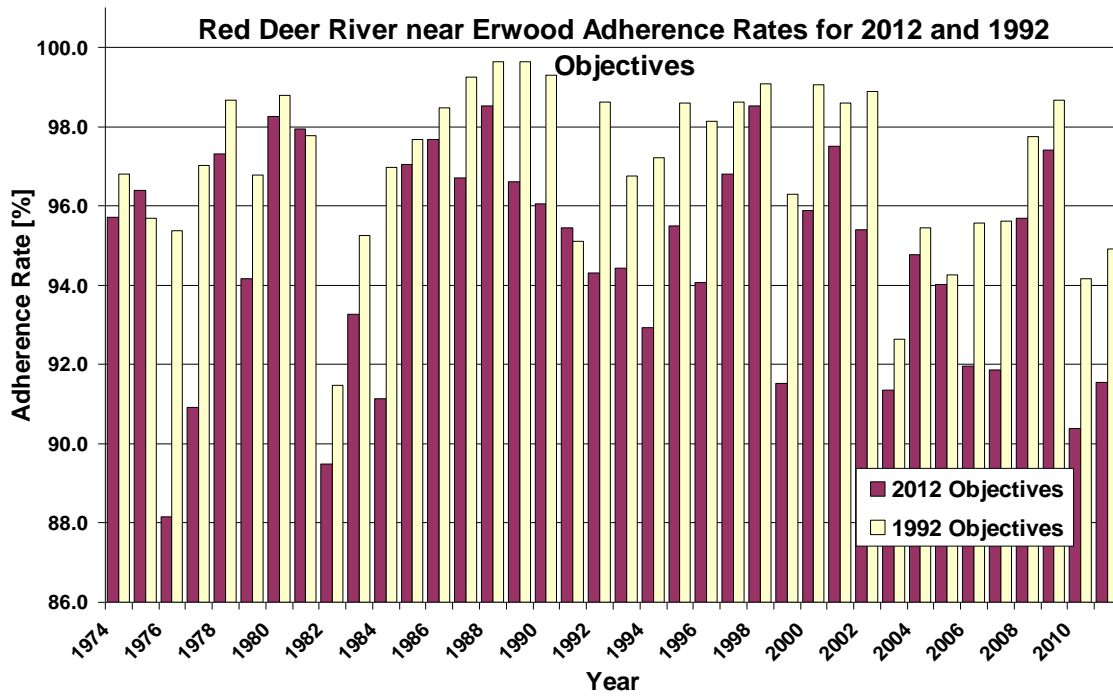












Appendix D – Excursion Summary Tables: 1992 Objectives

Battle River Excursion Summary - 1992 Objectives																								
Parameter	Number of Excursions																							
	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
ADHERENCE RATE [%]	93.0	91.9	90.6	91.7	92.6	95.0	94.7	94.9	96.0	90.4	91.6	90.5	91.4	89.9	92.2	91.6	91.3	94.1	92.5	85.6	87.2	88.8	84.1	87.7
ALUMINUM TOTAL																				1	0	0	1	1
AMMONIA DISSOLVED														0	0	0	0	0	0	0	0	0	0	0
CADMIUM TOTAL										0	0	0	0	0	0	0	0	0	0	1	0	0	2	4
CHROMIUM TOTAL										0	1	0	0	0	0	0	2	0	0	1	0	0	1	0
COLIFORMS FECAL	2	1	0	0	0	0	0	2	1	1	1	0	1	1	1	0	1	0	2	2	5	3	3	2
COPPER TOTAL										3	5	4	6	7	2	2	4	4	3	4	4	2	5	5
IRON DISSOLVED							0	0	0	1	0	1	3	0	0	3	2	0	1	3	1	0	5	0
LEAD TOTAL										0	0	1	1	1	0	0	1	0	0	1	0	0	2	2
MANGANESE DISSOLVED							1	2	3	6	4	4	3	4	1	3	4	2	0	4	1	3	4	1
OXYGEN DISSOLVED	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
SODIUM DISSOLVED/FILTERED	6	9	11	10	10	7	4	3	0	4	10	9	4	7	10	9	5	5	7	9	11	11	8	8
SULPHATE DISSOLVED	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL DISSOLVED SOLIDS							4	2	3	5		6	5	8	9	8	5	5	6	9	11	10	8	8
ZINC TOTAL										0	0	1	1	1	0	0	1	0	0	1	0	0	2	1
Parameter	Number of Excursions														Summary									
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total Excursions 1974 - 2011	Total Excursions 2002 - 2011	Median Number of Excursions 2002 - 2011							
ADHERENCE RATE [%]	89.6	90.3	92.3	88.5	88.1	89.1	88.6	89.3	89.9	92.9	90.3	89.9	89.7	91.3										
ALUMINUM TOTAL	0	1	0	0	0	1	0	1	0	0	0	0	1	1	8	4	0							
AMMONIA DISSOLVED	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0							
CADMIUM TOTAL	1	1	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0							
CHROMIUM TOTAL	0	0	0	0	0	0	0	1	0	0	0	0	0	1	7	2	0							
COLIFORMS FECAL	2	1	0	4	2	2	4	4	4	0	4	2	1	1	60	24	2							
COPPER TOTAL	1	5	1	0	1	2	0	5	1	4	1	0	4	4	89	22	1.5							
IRON DISSOLVED	0	0	0	0	2	3	2	2	0	1	0	2	2	1	35	15	2							
LEAD TOTAL	0	1	0	0	0	1	0	1	0	0	0	0	2	2	16	6	0							
MANGANESE DISSOLVED	1	2	2	4	3	3	3	3	4	4	3	4	2	5	93	34	3							
OXYGEN DISSOLVED	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	1	0							
PH	0	0	0	0	0	0	2	0	0	0	0	0	0	0	3	2	0							
SODIUM DISSOLVED/FILTERED	11	6	8	11	12	9	12	7	11	7	11	12	8	4	306	93	10							
SULPHATE DISSOLVED	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0							
TOTAL DISSOLVED SOLIDS	11	7	9	11	11	9	12	8	11	7	11	11	9	5	244	94	10							
ZINC TOTAL	0	1	0	0	0	1	0	1	0	0	0	0	2	2	15	6	0							

Beaver River Excursion Summary - 1992 Objectives																									
Parameter	Number of Excursions																								
	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	
ADHERENCE RATE [%]	99.2	99.2	100.0	100.0	100.0	98.5	98.2	98.2	96.7	98.5	96.8	97.3	97.9	97.1	96.9	98.8	97.2	100.0	100.0	97.0	97.5	97.7	96.9	99.5	
AMMONIA DISSOLVED														0	0	0	0	0	0	0	0	0	0	0	
CADMIUM TOTAL										0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	
CHROMIUM TOTAL										0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
COLIFORMS FECAL	1	0	0	0	0	1	0	1	1	0	0	0	0	0	0	2	0	0							
COPPER TOTAL										0	4	3	0	4	1	0	0		0	0	0	1	0	0	
IRON DISSOLVED	0					0	0	0	0	0	0	0	1	0	1	0	0		0	3	1	0	0	0	
MANGANESE DISSOLVED	0					0	3	2	4	3	2	3	4	3	3	3	3		0	3	4	4	3	0	
OXYGEN DISSOLVED	0	0	0	0	0	1	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	2	0
PH	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
SILVER TOTAL																									
Parameter	Number of Excursions														Summary										
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total Excursions 1974 - 2011	Total Excursions 2002 - 2011	Median Number of Excursions 2002 - 2011								
ADHERENCE RATE [%]	99.5	94.3	89.2	95.7	89.8	97.4	97.5	100.0	98.9	98.9	100.0	98.3	98.1	99.2											
AMMONIA DISSOLVED	0	0	0	0	0	1	0	0	0	0	0	0	1	0	2	2	0								
CADMIUM TOTAL	0	0	2	0	0	0	0	0	0	0	0	0	0	0	4	0	0								
CHROMIUM TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0								
COLIFORMS FECAL		1	0	1	0	1	0	0	0	0	0	0	0	0	9	1	0								
COPPER TOTAL	0	1	0	0	0	0	0	0	0	0	0	1	0	0	15	1	0								
IRON DISSOLVED	0	0	2	1	2	1	0	0	0	0	0	1	0	0	13	4	0								
MANGANESE DISSOLVED	1	3	3	1	3	1	3	0	3	3	0	4	3	2	77	22	3								
OXYGEN DISSOLVED	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0								
PH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0								
SILVER TOTAL		6	5	4	5	1	0	0	0	0	0	0	0	0	21	6	0								

North Saskatchewan River Excursion Summary - 1992 Objectives																		
	Number of Excursions																	
Parameter	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	
ADHEREIICE RATE [%]	99.1	99.0	96.2	97.8	99.2	99.6	98.1	95.4	97.0	94.3	99.1	96.4	97.3	99.5	99.6	98.8	98.3	
ALUMINUM TOTAL						0	0	0	0	1	0	1	1	0	0	0	0	
AMMONIA DISSOLVED	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	
CADMIUM TOTAL	0	0	0	0	0	0	0	0	0	3	0	1	1	0	0	0	0	
CHROMIUM TOTAL	0	0	1	1	0	0	0	0	0	1	0	1	0	0	0	0	0	
COLIFORMS FECAL	1	1	3	3	1	1	2	5	2	3	1	1	1	1	0	1	2	
COPPER TOTAL	0	2	3	2	0	0	2	6	2	2	1	2	1	0	1	2	0	
LEAD TOTAL	0	0	2	0	0	0	0	0	0	1	0	1	1	0	0	0	0	
MANGANESE DISSOLVED	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	
OXYGEN DISSOLVED	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	
PH	1	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	3	
ZINC TOTAL	0	0	2	0	0	0	0	0	0	1	0	1	1	0	0	0	0	
	Number of Excursions							Summary										
Parameter	2005	2006	2007	2008	2009	2010	2011	Total Excursions 1974 - 2011		Total Excursions 2002 - 2011		Median Number of Excursions 2002 - 2011						
ADHEREIICE RATE [%]	96.8	97.9	98.4	98.1	99.7	99.1	97.6											
ALUMINUM TOTAL	2	1	0	1	0	0	0	7		4		0						
AMMONIA DISSOLVED	0	0	0	0	0	0	0	1		0		0						
CADMIUM TOTAL	0	0	0	0	0	0	0	5		0		0						
CHROMIUM TOTAL	1	1	0	0	0	0	0	6		2		0						
COLIFORMS FECAL	1	2	2	2	0	1	3	40		14		1.5						
COPPER TOTAL	2	1	2	2	1	2	3	39		16		2						
LEAD TOTAL	1	1	0	0	0	0	0	7		2		0						
MANGANESE DISSOLVED	0	0	0	0	0	0	0	1		0		0						
OXYGEN DISSOLVED	0	0	0	0	0	0	0	4		0		0						
PH	0	0	0	0	0	0	0	7		3		0						
ZINC TOTAL	2	1	1	1	0	0	1	11		6		0.5						

Red Deer River near Bindloss Excursion Summary - 1992 Objectives																								
Parameter	Number of Excursions																							
	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
ADHERENCE RATE [%]	96.1	100.0	97.1	100.0	100.0	96.8	96.7	99.2	97.0	95.1	91.7	96.1	96.2	96.7	96.5	96.8	93.5	97.7	92.6	96.0	95.1	95.5	92.0	93.0
BARIUM TOTAL										0	0	0	0	0	0	0	0		0	0	0	0	0	0
CADMIUM TOTAL										0	0	0	0	0	1	0	0		1	0	0	0	1	3
CHROMIUM TOTAL										0	1	0	0	0	1	0	0		0	0	0	0	1	1
COLIFORMS FECAL	2	0	2	0	0	3	4	1	2	1	2	0	1	0	1	2	4	2	3	0	4	4	3	1
COPPER TOTAL										1	12	8	6	6	3	4	4		5	6	4	5	7	5
IRON DISSOLVED						0	0	0	0	0	0	0	0	0	0	2	1		1	0	1	0	1	0
LEAD TOTAL										0	5	1	1	1	1	0	1		1	1	0	0	2	2
MANGANESE DISSOLVED							0	0	1	6	0	0	0	0	0	0	0		0	0	0	0	0	0
NICKEL TOTAL										0	1	0	0	0	1	0	0		0	0	0	0	0	1
SELENIUM DISSOLVED	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0							
TOTAL DISSOLVED SOLIDS							0	0	1			0	0	0	0	0	0	0	0	0	0	0	0	0
VANADIUM TOTAL										0	0	0	0	0	0	0	0		0	0	0	0	0	0
ZINC TOTAL										0	4	1	1	1	1	0	1		0	1	0	0	1	1
Parameter	Number of Excursions														Summary									
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total Excursions 1974 - 2011	Total Excursions 2002 - 2011	Median Number of Excursions 2002 - 2011							
ADHERENCE RATE [%]	94.5	87.7	93.8	97.2	89.2	93.2	97.7	90.2	98.4	95.5	93.9	94.0	91.9	95.2										
BARIUM TOTAL	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	0							
CADMIUM TOTAL	2	3	1	1	2	1	0	1	0	0	0	1	0	0	18	5	0							
CHROMIUM TOTAL	0	3	0	0	2	2	0	3	0	0	1	2	2	0	19	12	1.5							
COLIFORMS FECAL	2	4	4	1	3	1	2	2	1	0	3	1	4	1	71	18	1.5							
COPPER TOTAL	5	5	4	1	6	4	1	5	3	7	4	3	7	4	135	44	4							
IRON DISSOLVED	0	0	0	0	1	0	0	0	0	0	0	1	0	1	9	3	0							
LEAD TOTAL	1	3	1	1	2	2	1	3	0	2	2	2	2	1	39	17	2							
MANGANESE DISSOLVED	0	0	0	0	0	0	0	0	0	0	0	0	0	2	9	2	0							
NICKEL TOTAL	0	1	0	0	1	2	0	2	0	0	2	2	2	1	16	12	1.5							
SELENIUM DISSOLVED						0	0	0	0	0	0	1	0	0	3	1	0							
TOTAL DISSOLVED SOLIDS	0	0	0	0	0	0	0	0	0	1	0	0	1	0	3	2	0							
VANADIUM TOTAL	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	0							
ZINC TOTAL	1	3	1	1	2	2	1	3	0	2	3	2	2	2	37	19	2							

South Saskatchewan River Excursion Summary - 1992 Objectives																								
Parameter	Number of Excursions																							
	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
ADHERENCE RATE [%]	96.0	97.5	100.0	100.0	100.0	100.0	99.2	100.0	97.7	95.1	98.1	98.4	99.6	99.2	100.0	99.6	98.4	100.0	100.0	99.4	96.4	99.0	96.0	98.5
AMMONIA DISSOLVED														0	0	0	0	0	0	0	0	0	1	0
CADMIUM TOTAL										0	0	0	0	0	0	0	0	0	0	0	2	0	2	3
CHROMIUM TOTAL										1	0	0	0	0	0	0	2	0	0	0	0	0	0	0
COLIFORMS FECAL	2	2	0	0	0	0	1	0	3	1	1	1	0	0	0	1	1	0	0	0	1	2	2	0
COPPER TOTAL										0	5	3	1	2	0	0	1	0	0	0	1	0	2	0
LEAD TOTAL										0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
MANGANESE DISSOLVED							0	0	0	6	0	0	0	0	0	0	0	0	0	1	0	0	0	0
NICKEL TOTAL										0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
SELENIUM DISSOLVED	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
ZINC TOTAL										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parameter	Number of Excursions														Summary									
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total Excursions 1974 - 2011	Total Excursions 2002 - 2011	Median Number of Excursions 2002 - 2011							
ADHERENCE RATE [%]	98.5	98.9	99.4	100.0	96.6	100.0	100.0	97.2	99.6	99.6	98.0	100.0	97.5	99.6										
AMMONIA DISSOLVED	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0							
CADMIUM TOTAL	1	1	1	0	1	0	0	0	0	0	0	0	1	1	13	3	0							
CHROMIUM TOTAL	0	0	0	0	1	0	0	1	0	0	1	0	1	0	7	4	0							
COLIFORMS FECAL	2	1	0	0	2	0	0	2	1	1	1	0	1	0	29	8	1							
COPPER TOTAL	0	0	0	0	1	0	0	1	0	0	1	0	1	0	19	4	0							
LEAD TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3	1	0							
MANGANESE DISSOLVED	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0							
NICKEL TOTAL	0	0	0	0	0	0	0	1	0	0	1	0	1	0	4	3	0							
SELENIUM DISSOLVED						0	0	0	0	0	0	0	0	0	1	0	0							
ZINC TOTAL	0	0	0	0	1	0	0	1	0	0	1	0	1	0	4	4	0							

Assiniboine River Excursion Summary - 1992 Objectives																									
Parameter	Number of Excursions																								
	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	
ADHERENCE RATE [%]	88.9	83.5	83.2	88.2	93.4	93.7	88.3	88.3	86.9	88.6	89.0	88.5	89.7	90.5	93.0	91.6	89.7	87.2	85.4	87.7	88.4	88.6	88.8	84.6	
AMMONIA DISSOLVED														0	0	1	0	0	0	0	0	0	0	0	
CADMIUM TOTAL										0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	4
CHLORIDE DISSOLVED	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	1	0	0	0	0	0	
CHROMIUM TOTAL										0	0	0	0	0	0	0	1								
COLIFORMS FECAL	3	8	6	3	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	
COPPER TOTAL										0	1	2	1	2	0	0	0								
IRON DISSOLVED						0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	
LEAD TOTAL										0	0	0	0	0	0	0	0								
MANGANESE DISSOLVED						1	7	8	9	12	12	11	8	10	7	8	5	1	4	7	10	8	9	9	
OXYGEN DISSOLVED	1	3	4	3	2	0	0	2	3	0	2	2	2	0	0	4	3	4	2	2	3	3	2	2	
PH	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
PHOSPHOROUS TOTAL	10	12	12	10	8	9	10	11	11	11	12	12	12	12	12	9	9	12	28	16	12	12	12	9	
SODIUM DISSOLVED/FILTERED	0	0	0	0	0	0	2	0	0	0	1	1	2	1	0	0	1	0	1	0	1	0	0	0	
SULPHATE DISSOLVED	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	
Parameter	Number of Excursions													Summary											
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total Excursions 1974 - 2011	Total Excursions 2002 - 2011	Median Number of Excursions 2002 - 2011								
ADHERENCE RATE [%]	85.7	91.0	86.7	90.1	90.0	92.0	90.2	92.8	91.3	92.3	91.7	92.9	92.2												
AMMONIA DISSOLVED	0	0	0	0	0	0	0	0	0	0	0	0	0	0				1			0			0	
CADMIUM TOTAL	1	0	0	0	0	0	0	0	0	0	0	0	0	0				7			0			0	
CHLORIDE DISSOLVED	0	0	0	0	1	0	1	0	0	0	0	0	0	0				6			2			0	
CHROMIUM TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0				1			0			0	
COLIFORMS FECAL	2	0	4	0	0	0	3	0	1	0	0	0	1	1				34			6			0	
COPPER TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0				9			0			0	
IRON DISSOLVED	0	0	0	0	0	0	0	0	0	2	2	0	0	0				6			4			0	
LEAD TOTAL	1	0	0	0	0	0	0	0	0	0	0	0	0	0				1			0			0	
MANGANESE DISSOLVED	8	8	11	11	8	6	12	7	8	10	11	7	7	10				270			86			8	
OXYGEN DISSOLVED	7	2	6	3	4	5	3	4	6	0	0	2	3	1				95			28			3	
PH	0	0	0	0	0	1	0	0	0	0	0	0	0	0				2			1			0	
PHOSPHOROUS TOTAL	12	12	12	12	10	11	12	12	12	12	12	12	12	12				448			117			12	
SODIUM DISSOLVED/FILTERED	1	0	0	1	1	0	1	0	0	0	0	0	0	0				14			2			0	
SULPHATE DISSOLVED	0	0	0	0	0	0	0	0	0	0	0	0	0	0				2			0			0	

Carrot River Excursion Summary - 1992 Objectives																								
Parameter	Number of Excursions																							
	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
ADHERENCE RATE [%]	90.8	84.3	80.0	85.5	87.1	86.8	85.8	79.7	79.1	85.6	85.7	88.3	86.2	89.0	86.8	87.4	84.2	79.5	85.1	80.8	84.5	81.8	80.0	80.3
CADMIUM TOTAL										0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
CHLORIDE DISSOLVED	2	8	8	8	7	8	7	11	8	6	8	6	9	8	10	9	5	3	8	7	8	5	3	5
COLIFORMS FECAL	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
COPPER TOTAL										0	1	1	0	2	0	0	0		0	0	0	1	0	0
IRON DISSOLVED							0	1	3	0	3	2	2	1	1	3	2		0	5	2	1	1	1
MANGANESE DISSOLVED							6	12	10	12	9	10	12	10	11	9	4		4	11	9	7	6	5
OXYGEN DISSOLVED	0	2	0	0	0	1	0	0	2	2	2	0	1	0	0	0	0	0	0	2	0	4	6	0
PH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
PHOSPHOROUS TOTAL	4	5	9	4	6	4	5	2	5	5	5	5	5	4	4	5	7	4	2	10	8	7	10	6
SODIUM DISSOLVED/FILTERED	1	5	8	7	6	7	6	9	8	4	6	6	7	4	10	8	5	2	8	6	7	5	1	5
Parameter	Number of Excursions													Summary										
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total Excursions 1974 - 2011	Total Excursions 2002 - 2011	Median Number of Excursions 2002 - 2011							
ADHERENCE RATE [%]	81.7	86.0	86.2	84.1	85.0	85.6	88.5	87.1	87.0	87.1	88.1	89.9	89.4	87.7										
CADMIUM TOTAL	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0							
CHLORIDE DISSOLVED	6	4	4	8	6	4	2	1	3	6	6	5	2	5	229	40	4.5							
COLIFORMS FECAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0							
COPPER TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0							
IRON DISSOLVED	0	1	1	1	3	1	2	2	4	3	5	2	2	2	57	26	2							
MANGANESE DISSOLVED	6	6	6	8	5	5	5	5	11	11	10	10	9	10	254	81	9.5							
OXYGEN DISSOLVED	4	1	4	3	0	3	1	6	7	3	0	0	4	3	61	27	3							
PH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0							
PHOSPHOROUS TOTAL	4	5	6	5	8	10	11	12	12	12	9	10	10	11	256	105	10.5							
SODIUM DISSOLVED/FILTERED	6	4	3	7	4	4	2	1	2	4	4	3	2	3	190	29	3							

Churchill River Excursion Summary - 1992 Objectives																								
Parameter	Number of Excursions																							
	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
ADHERENCE RATE [%]	100.0	100.0	100.0	100.0	100.0	98.1	96.9	98.1	100.0	96.1	99.5	99.5	100.0	99.0	100.0	99.5	99.1	100.0	100.0	98.8	100.0	100.0	98.1	100.0
CHROMIUM TOTAL										0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
COPPER TOTAL										0	0	1	0	2	0	0	0	0	0	0	0	0	0	0
MANGANESE DISSOLVED						0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OXYGEN DISSOLVED	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
PH	0	0	0	0	0	0	4	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0
PHOSPHOROUS TOTAL	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0
Parameter	Number of Excursions														Summary									
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total Excursions 1974 - 2011	Total Excursions 2002 - 2011	Median Number of Excursions 2002 - 2011							
ADHERENCE RATE [%]	100.0	100.0	100.0	100.0	100.0	98.7	100.0	100.0	96.8	100.0	100.0	100.0	100.0											
CHROMIUM TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0								
COPPER TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0								
MANGANESE DISSOLVED	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0								
OXYGEN DISSOLVED	0	0	0	0	0	1	0	0	2	0	0	0	0	5	3	0								
PH	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0								
PHOSPHOROUS TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0								

Qu'Appelle River Excursion Summary - 1992 Objectives																							
Parameter	Number of Excursions																						
	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
ADHERENCE RATE [%]	81.0	83.8	82.6	84.5	85.2	84.3	80.4	80.8	84.4	87.5	86.7	89.0	85.4	86.0	85.0	82.8	75.6	81.1	83.0	86.5	86.0	85.2	83.5
2,4-D		0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0					
AMMONIA DISSOLVED													0	0	0	0	0	0	0	0	0	0	0
CADMIUM TOTAL									0	1	0	0	0	0	0	0		0	0	0	0	1	4
CHLORIDE DISSOLVED	0	0	0	0	0	0	0	0	1	0	1	0	0	1	3	2	3	5	8	2	0	0	0
CHROMIUM TOTAL									0	0	0	0	0	0	0	1		0	0	0	0	0	0
COLIFORMS FECAL	0	0	1	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1	3	1	0
COPPER TOTAL									0	0	2	0	3	0	0	0		0	0	0	0	0	0
GAMMA-HCH		0	0	0	0	0	0	0	0	0	0	0	0	1	0	0							
IRON DISSOLVED					0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0
MANGANESE DISSOLVED					2	5	12	7	6	8	9	6	10	10	10	6		3	4	1	5	5	3
OXYGEN DISSOLVED	0	0	0	0	0	0	0	2	0	0	1	0	0	0	1	0	1	0	0	0	1	3	2
PH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
PHOSPHOROUS TOTAL	2	10	12	12	12	12	12	12	12	12	12	12	11	11	12	12	12	12	12	12	12	12	9
SODIUM DISSOLVED/FILTERED	2	11	10	11	10	11	10	12	12	11	9	11	10	10	12	12	11	11	11	12	10	11	9
SULPHATE DISSOLVED	0	0	0	0	0	0	1	1	2	0	0	0	0	1	3	2	3	3	3	2	0	0	0
ZINC TOTAL									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parameter	Number of Excursions														Summary								
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total Excursions 1974 - 2011	Total Excursions 2002 - 2011	Median Number of Excursions 2002 - 2011						
ADHERENCE RATE [%]	85.6	86.7	85.7	81.5	84.5	83.9	82.6	85.8	89.3	88.8	89.7	86.7	87.8	88.2									
2,4-D											0						0						
AMMONIA DISSOLVED	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1		1						
CADMIUM TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6		0						
CHLORIDE DISSOLVED	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26		0						
CHROMIUM TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1		0						
COLIFORMS FECAL	0	0	0	0	0	0	1	0	0	2	0	0	0	1	12		4						
COPPER TOTAL	0	0	0	0	0	0	0	0	0	0	0	1	0	0	6		1						
GAMMA-HCH											0				1		0						
IRON DISSOLVED	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1		1						
MANGANESE DISSOLVED	3	1	2	3	2	2	2	1	2	6	5	8	4	10	163		42						
OXYGEN DISSOLVED	1	1	0	3	0	1	2	2	4	0	0	2	1	0	28		12						
PH	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2		1						
PHOSPHOROUS TOTAL	6	4	4	10	12	12	12	12	12	12	11	12	12	12	402		119						
SODIUM DISSOLVED/FILTERED	6	4	3	4	4	3	3	9	11	10	12	10	12	9	339		83						
SULPHATE DISSOLVED	0	0	0	0	0	0	0	0	0	0	1	1	3	0	26		5						
ZINC TOTAL	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1		1						

Red Deer River near Erwood Excursion Summary - 1992 Objectives																								
	Number of Excursions																							
Parameter	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
ADHERENCE RATE [%]	96.8	95.7	95.4	97.0	98.7	96.8	98.8	97.8	91.5	95.3	97.0	97.7	98.5	99.3	99.6	99.6	99.3	95.1	98.6	96.8	97.2	98.6	98.1	98.6
COLIFORMS FECAL	1	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0							
COPPER TOTAL										0	1	3	0	1	0	0	0		0	0	0	0	0	1
IRON DISSOLVED							0	0	2	0	0	0	0	0	0	0	0		0	0	0	0	0	0
MANGANESE DISSOLVED							0	1	6	7	2	0	0	0	0	0	0		1	0	1	0	1	0
OXYGEN DISSOLVED	0	0	0	3	0	0	0	1	5	0	2	1	1	0	0	0	0	1	0	1	1	0	0	0
PH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PHOSPHOROUS TOTAL	3	3	6	1	1	5	2	2	2	3	3	2	3	1	1	1	1	1	1	5	4	2	1	0
ZINC TOTAL										0	0	0	0	0	0	0	0		0	1	0	0	0	0
	Number of Excursions													Summary										
Parameter	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total Excursions 1974 - 2011	Total Excursions 2002 - 2011	Median Number of Excursions 2002 - 2011							
ADHERENCE RATE [%]	99.1	96.3	99.1	98.6	98.9	92.6	95.5	94.3	95.6	95.6	97.8	98.7	94.2	94.9										
COLIFORMS FECAL									0	1	0	0	0	0	6	1	0							
COPPER TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0							
IRON DISSOLVED	0	0	0	0	0	1	1	1	0	0	0	1	0	0	6	4	0							
MANGANESE DISSOLVED	0	1	0	0	1	1	0	1	0	0	1	0	2	3	29	9	1							
OXYGEN DISSOLVED	0	1	0	0	0	0	1	1	1	0	0	0	1	0	21	4	0							
PH	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	2	0							
PHOSPHOROUS TOTAL	1	2	1	1	0	1	2	2	4	5	2	1	5	4	85	26	2							
ZINC TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0							

Saskatchewan River Excursion Summary - 1992 Objectives																								
Parameter	Number of Excursions																							
	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
ADHERENCE RATE [%]	96.5	95.1	94.4	96.9	96.7	97.5	96.8	95.5	97.4	92.6	97.5	96.2	96.8	97.0	98.7	98.7	96.0	97.3	98.3	98.7	97.6	98.6	96.7	94.4
CADMIUM TOTAL										0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
CHLORIDE DISSOLVED	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
CHROMIUM TOTAL										0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
COPPER TOTAL										0	0	3	0	2	0	0	0	0	0	0	0	0	0	0
IRON DISSOLVED						0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LEAD TOTAL										0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
MANGANESE DISSOLVED						0	0	1	0	6	0	0	0	0	1	0	0	0	0	0	1	0	0	0
OXYGEN DISSOLVED	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
PH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
PHOSPHOROUS TOTAL	3	6	7	4	5	4	5	6	3	6	6	6	7	4	2	3	6	5	4	3	2	3	3	4
SODIUM DISSOLVED/FILTERED	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
ZINC TOTAL										0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Parameter	Number of Excursions														Summary									
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total Excursions 1974 - 2011	Total Excursions 2002 - 2011	Median Number of Excursions 2002 - 2011							
ADHERENCE RATE [%]	95.3	97.1	95.3	96.4	98.5	96.5	97.8	96.6	95.1	96.9	98.8	99.5	98.8	97.4										
CADMIUM TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0							
CHLORIDE DISSOLVED	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3	0	0							
CHROMIUM TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0							
COPPER TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0							
IRON DISSOLVED	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	1	0							
LEAD TOTAL	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0							
MANGANESE DISSOLVED	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0							
OXYGEN DISSOLVED	5	1	3	2	0	1	0	1	3	1	0	0	0	1	23	7	0.5							
PH	0	0	0	0	0	1	0	0	0	0	0	0	0	0	3	1	0							
PHOSPHOROUS TOTAL	5	4	5	3	3	5	5	6	7	5	3	1	3	6	168	44	5							
SODIUM DISSOLVED/FILTERED	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2	0	0							
ZINC TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0							

Appendix E – Excursion Summary Tables: 2012 Objectives

Battle River Excursion Summary - 2012 Objectives																									
Parameter	Number of Excursions																				Summary				
	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
ADHERENCE RATE [%]	96.7	97.1	97.3	93.6	90.8	96.0	98.2	96.9	96.9	94.1	94.2	93.5	93.9	95.0	96.4	95.9	93.9	95.6	92.3	88.3	90.2	92.5	84.2	91.4	94.6
Ammonia Unionized														0	0	0	1	0	0	0	0	0	0	0	0
Arsenic Total																									
Cadmium Total											0	0	0	0	3	1	2	6	5	8	8	5	7	8	6
Coliforms Fecal	2	1	1	0	0	0	0	2	1	1	1	0	1	1	1	0	1	0	2	2	5	3	3	2	
Copper Total											3	9	4	6	7	2	2	4	4	4	4	2	5	5	
Dicamba													0	0	0	1	0	0	1	0					
E. Coli																								1	
Endosulfan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Fluoride Dissolved	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	3	5	2	3	1	3	1	4	1	
gamma-HCH	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	
Iron Dissolved							0	0	0	1	0	1	3	0	0	3	2	0	1	3	1	0	5	0	
Lead Total											0	2	1	1	1	0	0	1	0	0	1	0	2	2	
MCPA	0	0	0	0	0	1	0	0	0	0	0	0	1	1	0	0	1	2	0						
Nitrogen Total					0	3	0	1	0	2	1	0	2	1	1	0	1	1	0	2	1	1	1	4	
Oxygen Dissolved	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	
pH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	
Phosphorous Total	1	2	1	0	4	3	1	4	2	3	0	2	3	2	2	0	2	1	2	1	2	1	5	3	
Phosphorous Total Dissolved	0	1	2	5	2	1	0	0	2	1	1	3	1	1	1	2	1	1	1	1	1	0	3	0	
Total Suspended Solids	1	1	2	4	5	2	1	1	2	3	1	3	1	1	0	0	2	0	2	1	0	0	2	2	
Silver Total																									
Sodium Dissolved	0	0	2	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	1	1	0	0	
Sulphate Dissolved	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	
Total Dissolved Solids								0	0	0	0	2	0	0	3	2	0	0	0	3	3	1	2	0	
Trifluralin	1	0	0	0								0	0	0	0	0	0	0	0	0	0	0	0	0	
Zinc Total											0	0	1	1	0	0	1	0	0	1	0	0	2	1	
Parameter	Number of Excursions											Summary													
Parameter	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total Excursions 1993 - 2011	Total Excursions 1974 - 2011*	Total Excursions 2002 - 2011	Median Number of Excursions 2002 - 2011								
ADHERENCE RATE [%]	91.7	94.9	93.3	89.9	90.2	95.2	91.7	98.2	95.9	97.0	97.2	92.6	93.4												
Ammonia Unionized	0	0	0	0	0	0	0	0	0	0	0	0	0			1	0								
Arsenic Total		0	0	0	2	0	5	0	0	1	0	2	2			12	12								
Cadmium Total	8	9	4	3	2	0	2	1	2	1	0	3	3			103	17								
Coliforms Fecal	1	0	4	2	2	4	4	4	0	4	2	1	1			61	24								
Copper Total	5	2	0	1	2	0	5	1	4	1	0	4	4			95	22								
Dicamba									1				0			3	1								
E. Coli	0	0	1	2	2	2	1	0	0	0	1	1	0			11	9								
Endosulfan									1				0			1	1								
Fluoride Dissolved	1	1	6	5	1	0	0	0	0	0	1	0	0			43	7								
gamma-HCH									0				0			2	0								
Iron Dissolved	0	0	0	2	3	2	2	0	1	0	2	2	1			35	15								
Lead Total	1	0	0	0	1	0	1	0	0	0	0	2	3			19	7								
MCPA									3				2			11	5								
Nitrogen Total	2	0	0	1	3	0	2	0	0	1	0	3	2		22	38	12								
Oxygen Dissolved	0	0	0	0	0	0	0	0	0	0	0	0	0			2	0								
pH	0	0	0	0	0	2	0	0	0	0	0	0	0			3	2								
Phosphorous Total	1	0	0	1	3	1	6	1	3	2	0	4	3			73	24								
Phosphorous Total Dissolved	0	0	0	1	2	1	2	0	3	0	0	3	4			47	16								
Total Suspended Solids	1	0	1	0	2	5	1	0	2	1	0	1	2			53	14								
Silver Total	4	6	5	8	2	0	1	0	0	1	0	1	1			29	14								
Sodium Dissolved	0	0	0	2	3	0	0	0	0	0	3	0	0			17	8								
Sulphate Dissolved	0	0	0	2	3	0	0	0	0	0	1	0	0			8	6								
Total Dissolved Solids	2	0	3	6	4	2	0	0	0	0	1	0	0			34	13								
Trifluralin										0			0			1	0								
Zinc Total	1	0	0	0	1	0	1	0	0	0	0	2	2			15	6								

* Note in the annual summary of excursions, from 1974-2011, that data does not exist for certain parameters, such as some of the metals.

Beaver River Excursion Summary - 2012 Objectives																									
Parameter	Number of Excursions																								
	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
ADHERENCE RATE [%]	98.2	95.7	96.2	93.7	95.6	94.7	95.1	96.1	94.3	95.4	91.3	94.6	97.6	94.9	95.4	97.4	95.3	92.0	89.8	89.3	90.5	94.9	89.7	92.6	97.3
Ammonia Unionized													0	0	0	0	0	0	0	0	0	0	0	0	0
Cadmium Total											0	0	0	0	3	3	1	2	3	7	7	6	9	5	6
Coliforms Fecal	1	0	0	0	0	1	0	1	1	0	0	0	0	0	2	0	0								
Copper Total										2	6	3	0	4	1	0	0		0	0	1	1	1	0	0
E. Coli																									
Fluoride Dissolved	0	1	0	2	0	0	0	1	2	1	1	1	3	2	3	5	4	2	4	3	1	2	1	0	0
Iron Dissolved	1					2	0	0	1	0	2	2	1	1	2	1	0	0	7	5	2	6	7	0	0
Lead Total										0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0
MCPA	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0								
Nitrogen Total				0	3	0	4	1	1	0		1	0	0	1	0	1	0	0	0	2	1	3	2	0
pH	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Phosphorous Total	0	1	1	1	2	1	2	2	1	0	2	5	2	0	2	0	1	0	1	3	2	0	1	1	0
Phosphorous Total Dissolved		1	3	6	1	2	3	3	4	6	6	2	3	6	4	1	1	1	4	4	3	2	3	3	0
Total Suspended Solids	1	2	1	0	2	3	2	1	2	2	2	4	0	2	0	2	1	1	5	2	3	0	2	1	1
Silver Total																									
Total Dissolved Solids							0	0	0			0	0	0	0	0	0	0	1	0	0	0	0	0	0
Parameter	Number of Excursions													Summary											
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total Excursions 1993 - 2011	Total Excursions 1974 - 2011*	Total Excursions 2002 - 2011	Median Number of Excursions 2002 - 2011								
ADHERENCE RATE [%]	93.9	90.9	93.9	93.6	93.8	99.4	96.4	99.5	98.0	99.0	98.4	98.3	95.7												
Ammonia Unionized	0	0	0	0	1	0	0	0	0	0	0	0	0			1	1	0							
Cadmium Total	4	1	3	1	1	0	0	0	1	0	1	1	3			68	8	1							
Coliforms Fecal	1	0	1	0	1	0	0	0	0	0	0	0	0			9	1	0							
Copper Total	1	0	1	0	0	0	0	0	1	0	1	0	0			23	2	0							
E. Coli	0	0	0	0	1	0	0	0	0	0	0	0	0			1	1	0							
Fluoride Dissolved	1	1	1	1	1	0	0	0	0	0	1	1	0			45	3	0							
Iron Dissolved	1	2	1	3	4	1	2	1	2	2	1	4	3			67	23	2							
Lead Total	0	1	0	0	0	0	0	0	0	0	0	0	0			6	0	0							
MCPA													0			2	0	0							
Nitrogen Total	1	1	1	0	2	0	1	0	0	2	1	1	2	20		32	9	1							
pH	0	0	0	0	0	0	0	0	0	0	0	0	0			1	0	0							
Phosphorous Total	0	2	1	0	1	0	2	0	1	0	1	0	1			40	6	0.5							
Phosphorous Total Dissolved	1	2	1	0	3	0	3	0	1	0	1	0	3			87	11	0.5							
Total Suspended Solids	0	0	0	0	0	2	1	2	0	2	0	4	0			53	11	0.5							
Silver Total	6	5	4	5	1	0	0	0	0	0	0	0	0			21	6	0							
Total Dissolved Solids	0	0	1	0	1	0	0	0	0	0	0	0	0			3	1	0							

* Note in the annual summary of excursions, from 1974-2011, that data does not exist for certain parameters, such as some of the metals.

Cold River Excursion Summary - 2012 Objectives														
	Number of Excursions													
Parameter	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
ADHERENCE RATE [%]	100.0	100.0	96.6	92.2	96.7	100.0	97.2	95.0	90.2	90.9	97.7	97.0	97.8	97.0
Cadmium Total	0	0	1	0	1	0	0	0	1	0	0	0	0	0
Copper Total	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Fluoride Dissolved	0	0	3	2	0	0	0	1	4	3	2	2	0	0
Nitrogen Total			0	0	1	0	0	1	1	1	0	1	1	1
Phosphorous Total			0	2	0	0	0	0	1	1	1	0	1	0
Phosphorous Total Dissolved			0	2	1	0	0	0	1	1	0	1	1	1
Total Suspended Solids			0	1	0	0	1	1	1	1	0	0	0	2
Silver Total							1	3	3	4	0	0	0	0
	Number of Excursions					Summary								
Parameter	2007	2008	2009	2010	2011	Total Excursions 1993 - 2011		Total Excursions 2002 - 2011		Median Number of Excursions 2002 - 2011				
ADHERENCE RATE [%]	98.5	97.8	98.0	98.0	95.3									
Cadmium Total	0	0	0	0	2					2		0		
Copper Total	0	0	0	0	0					0		0		
Fluoride Dissolved	1	0	0	1	0	11				9		0.5		
Nitrogen Total	0	1	0	1	2					8		1		
Phosphorous Total	0	1	0	0	0					4		0		
Phosphorous Total Dissolved	1	1	1	0	1					8		1		
Total Suspended Solids	0	0	1	1	1					6		0.5		
Silver Total	0	0	0	0	0					4		0		

* Note in the annual summary of excursions, from 1993-2011, that data does not exist for certain parameters, such as some of the metals.

North Saskatchewan River Excursion Summary - 2012 Objectives																			
Parameter	Number of Excursions																		
	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	
ADHERENCE RATE [%]	96.1	93.4	89.9	91.4	93.0	91.9	92.5	86.1	90.7	89.9	93.2	90.4	93.9	95.7	93.9	95.8	96.8	94.6	
Ammonia Unionized	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	
Arsenic Total													0	0	0	0	0	1	
Bromoxynil	0	0	0	1	0														
Cadmium Total	2	2	3	7	9	7	4	7	5	4	1	1	1	1	1	0	1	1	
Coliforms Fecal	1	1	3	3	1	1	2	5	2	3	1	1	1	1	0	1	2	1	
Copper Total	1	4	3	3	0	1	2	6	2	2	2	4	2	1	2	2	1	1	
Dicamba	0	0	0	1	0														
E. Coli										1	1	1	0	0	0	0	0	0	
Fluoride Dissolved	0	4	6	4	3	3	0	0	0	2	0	1	1	3	0	1	0	1	
gamma-HCH	1	0	1	0	0														
Lead Total	0	0	2	1	0	0	0	1	0	1	2	3	1	0	2	2	0	1	
Manganese Dissolved	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	
MCPA	0	0	1	1	0														
Molybdenum Total										0	0	0	0	0	0	0	0	1	
Nitrogen Total	0	3	4	1	0	0	1	3	4	3	0	2	1	0	2	2	2	2	
pH	1	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	3	0	
Phosphorous Total	0	4	7	5	3	4	5	5	4	4	4	3	1	0	0	1	2	3	
Phosphorous Total Dissolved	6	8	7	6	5	7	6	6	7	6	5	2	1	1	1	2	2	2	
Total Suspended Solids	0	1	3	2	1	0	0	3	0	2	0	3	2	1	1	2	0	2	
Silver Total												4	5	5	10	1	0	2	
Zinc Total	0	0	2	0	0	0	0	0	0	1	0	1	1	0	0	0	0	2	
Parameter	Number of Excursions						Summary												
	2006	2007	2008	2009	2010	2011	Total Excursions 1993 - 2011	Total Excursions 1988 - 2011*	Total Excursions 2002 - 2011	Median Number of Excursions 2002 - 2011									
ADHERENCE RATE [%]	96.2	96.9	96.3	98.8	98.1	93.0													
Ammonia Unionized	0	0	0	0	0	0			1	0									
Arsenic Total	1	0	0	0	1	0			3	3									
Bromoxynil	0				0				1	0									
Cadmium Total	2	2	2	1	3	6			73	19									
Coliforms Fecal	2	2	2	0	1	3			40	14									
Copper Total	2	2	2	1	3	4			53	20									
Dicamba	0				1				2	1									
E. Coli	2	1	1	0	0	2			9	6									
Fluoride Dissolved	2	0	0	0	0	0			31	4									
gamma-HCH	0				0				2	0									
Lead Total	1	1	1	0	0	1			20	9									
Manganese Dissolved	0	0	0	0	0	0			1	0									
MCPA	0				0				2	0									
Molybdenum Total	0	0	0	0	0	0			1	1									
Nitrogen Total	1	0	1	0	0	3	27		35	13									
pH	0	0	0	0	0	0			7	3									
Phosphorous Total	1	1	2	0	0	3			62	13									
Phosphorous Total Dissolved	0	1	0	1	0	3			85	12									
Total Suspended Solids	3	2	2	2	2	2			36	18									
Silver Total	1	0	2	0	0	0			30	16									
Zinc Total	1	1	1	0	0	1			11	6									

* Note in the annual summary of excursions, from 1988-2011, that data does not exist for certain parameters, such as some of the metals.

Red Deer River near Bindloss Excursion Summary - 2012 Objectives																												
Parameter	Number of Excursions																				Summary							
	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993				1994	1995	1996	1997	1998
ADHERENCE RATE [%]	96.1	95.9	93.4	91.7	90.4	92.8	94.9	95.5	92.6	91.4	91.6	94.1	95.8	97.6	97.2	95.3	93.0	94.5	96.2	94.6	93.13	96.5	92.9	94.6	96.6			
Arsenic Total																												
Barium Total											0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Chromium Total											0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Coliforms Fecal	2	0	2	0	0	3	4	1	2	1	2	0	1	0	1	2	4	2	2	1	4	4	3	1	2			
Dicamba												0	0	0	0	0	0	0	0									
E. Coli																												
Fluoride Dissolved	1	0	0	2	0	0	1	1	2	0	1	3	0	0	3	4	3	5	0	2	1	1	0	1	1			
Iron Dissolved							0	0	0	0	0	0	0	0	0	2	1		0	1	1	0	1	0	0			
Lead Total											3	15	2	2	1	1	2		1	2	0	1	2	2	1			
Manganese Dissolved							0	0	1	6	0	0	0	0	0	0	0		0	0	0	0	0	0	0			
MCPA	0	0	0	0	0	1	0	0	0	0	2	0	0	0	0	0	1	1	0									
Nitrogen Total				0	4	2	2	1	1	3	0	3	1	0	0	0	1	0	0	0	1	0	2	2	1			
Oxygen Dissolved	0	2	1	1	2	1	0	0	2	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0			
pH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Phosphorous Total	2	3	1	4	4	1	3	3	4	3	2	4	4	1	2	1	4	1	1	5	3	0	3	2	1			
Phosphorous Total Dissolved		1	4	4	5	5	1	3	4	3	3	5	5	3	1	6	4	4	1	6	6	2	5	3	1			
Total Suspended Solids	1	0	1	1	3	2	1	2	1	2	2	1	1	2	2	1	2	1	1	0	0	1	1	2	1			
Selenium Total																												
Silver Total																												
Thallium Total																												
Total Dissolved Solids							0	0	1			0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Vanadium Total										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Zinc Total										0	4	1	1	1	1	0	1		0	1	0	0	1	1	1			
Parameter	Number of Excursions											Summary																
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total Excursions 1993 -2011	Total Excursions 1974 - 2011*	Total Excursions 2002 - 2011	Median Number of Excursions 2002 - 2011											
ADHERENCE RATE [%]	89.8	93.7	94.5	90.4	92.8	98.2	89.4	96.7	95.7	94.1	94.4	91.8	93.7															
Arsenic Total		0	0	0	2	0	3	0	0	1	2	2	1															
Barium Total	0	0	0	0	0	0	1	0	0	0	0	0	0															
Chromium Total	0	0	0	0	0	0	1	0	0	0	0	0	0															
Coliforms Fecal	4	4	1	3	1	2	2	1	0	3	1	4	1															
Dicamba									3				1															
E. Coli	3	1	0	2	1	0	2	2	0	2	1	1	0															
Fluoride Dissolved	0	1	3	1	0	0	1	1	0	0	0	0	0															
Iron Dissolved	0	0	0	1	0	0	0	0	0	1	0	1	0															
Lead Total	5	3	3	6	3	1	4	0	3	3	2	2	2															
Manganese Dissolved	0	0	0	0	0	0	0	0	0	0	0	0	2															
MCPA									1				1															
Nitrogen Total	1	0	0	1	2	0	2	2	0	3	2	5	4															
Oxygen Dissolved	0	0	0	0	0	1	2	0	0	0	0	0	1															
pH	0	0	0	0	0	0	0	0	0	0	0	1	0															
Phosphorous Total	3	2	0	2	3	0	4	1	4	3	3	5	4															
Phosphorous Total Dissolved	1	1	0	0	2	0	2	3	6	0	1	4	5															
Total Suspended Solids	4	1	2	1	3	1	2	2	1	2	3	2	4															
Selenium Total		0	0	0	0	0	1	1	0	1	1	1	0															
Silver Total	3	4	6	9	4	0	3	0	0	2	2	2	1															
Thallium Total					0	0	1	0	0	0	1	0	0															
Total Dissolved Solids	0	0	0	0	0	0	0	0	1	0	0	1	0															
Vanadium Total	0	0	0	0	0	0	1	0	0	0	0	0	0															
Zinc Total	3	1	1	2	2	1	3	0	2	3	2	2	2															

* Note in the annual summary of excursions, from 1974-2011, that data does not exist for certain parameters, such as some of the metals.

South Saskatchewan River Excursion Summary - 2012 Objectives																										
Parameter	Number of Excursions																									
	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	
ADHERENCE RATE [%]	95.8	91.8	89.6	87.6	87.1	90.2	91.6	93.4	90.7	91.9	92.2	90.3	95.1	96.7	96.8	94.1	92.8	93.9	93.6	85.2	89.9	91.0	86.3	93.3	93.5	
Ammonia Unionized													0	0	0	0	0	0	0	0	0	0	1	0	0	
Arsenic Total																										
Cadmium Total											0	0	0	1	2	2	4	4	5	5	6	5	7	8	5	4
Coliforms Fecal	2	2	0	0	0	0	1	0	3	1	1	1	0	0	0	1	1	0	0	0	1	2	2	0	2	
Copper Total										3	10	7	3	5	1	1	2	1	0	1	2	3	4	3	2	
Dicamba													1	0	0	0	0	0	0							
E. Coli																									0	
Fluoride Dissolved	1	0	0	2	0	0	3	1	1	0	0	1	0	0	2	2	2	4	7	3	2	4	1	1	2	
gamma-HCH	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0							
Iron Dissolved						0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	
Lead Total										2	8	3	1	0	0	0	1	0	0	1	1	0	3	1	1	
Manganese Dissolved							0	0	0	6	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	
MCPA	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1	0							
Nitrogen Total				0	5	3	3	1	4	0	0	7	1	0	2	5	6	4	1	6	5	1	4	1	0	
pH	0	0	0	3	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	1	
Phosphorous Total	2	5	5	3	8	6	6	7	6	4	1	5	4	2	0	1	5	4	2	10	3	1	4	3	2	
Phosphorous Total Dissolved		2	7	6	4	8	7	7	7	4	8	8	6	4	6	8	7	4	4	10	6	6	6	3	4	
Total Suspended Solids	1	2	2	4	5	4	0	0	2	1	2	2	1	0	0	0	6	2	4	5	3	2	2	1	1	
Selenium Total																										
Silver Total																										
Zinc Total										0	0	0	1	0	0	0	1	1	0	1	0	0	2	1	0	
Parameter	Number of Excursions											Summary														
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total Excursions 1993 - 2011	Total Excursions 1974 - 2011*	Total Excursions 2002 - 2011	Median Number of Excursions 2002 - 2011									
ADHERENCE RATE [%]	91.1	94.8	97.3	92.6	95.7	97.0	92.3	97.8	97.3	95.5	98.1	95.6	95.3													
Ammonia Unionized	0	0	0	0	0	0	0	0	0	0	0	0	0			1	0									
Arsenic Total		0	0	0	0	0	1	0	0	0	0	1	1			3	3									
Cadmium Total	3	1	1	1	1	0	2	0	2	3	1	2	4			79	16									
Coliforms Fecal	1	0	0	2	0	0	2	1	1	1	0	1	0			29	8									
Copper Total	4	2	0	3	3	0	5	0	3	2	1	1	3			75	21									
Dicamba								4								7	6									
E. Coli	0	0	0	0	0	1	1	1	0	0	0	1	0			4	4									
Fluoride Dissolved	2	1	3	1	0	1	2	1	1	2	0	0	0			53	8									
gamma-HCH								0					0			3	0									
Iron Dissolved	0	0	0	0	0	0	0	0	0	1	0	1	0			3	2									
Lead Total	4	2	0	2	1	1	2	0	0	1	0	1	0			36	8									
Manganese Dissolved	0	0	0	0	0	0	0	0	0	0	0	0	0			7	0									
MCPA								1					3			7	4									
Nitrogen Total	1	1	0	2	3	2	2	1	1	3	2	1	3	33		81	20									
pH	0	0	0	0	0	0	0	0	0	0	0	1	0			7	1									
Phosphorous Total	2	2	0	1	1	1	1	1	2	1	0	2	2			115	12									
Phosphorous Total Dissolved	0	1	0	0	0	4	4	1	1	1	2	3	4			163	20									
Total Suspended Solids	3	0	1	1	2	0	1	1	0	1	1	1	1			65	9									
Selenium Total		0	0	0	0	0	1	0	0	0	1	2	0			4	4									
Silver Total	4	4	3	8	3	0	1	0	0	2	0	1	0			26	15									
Zinc Total	1	1	0	1	0	0	1	0	0	1	0	1	0			13	4									

* Note in the annual summary of excursions from 1974-2011 that data does not exist for certain parameters such as some of the metals

Assiniboine River Excursion Summary - 2012 Objectives																										
		Number of Excursions																								
Parameter	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	
ADHERENCE RATE [%]	94.8	89.8	85.3	89.4	98.5	93.6	95.0	98.0	92.1	97.4	97.5	95.4	97.2	96.9	97.5	96.1	95.7	94.0	93.6	96.0	96.6	95.2	95.9	94.7	93.4	
Ammonia Unionized											0	0	1	0	0	1	0	0	1	0	0	0	0	0	0	
Cadmium Total											0	0	1	0	1	1	3	1	0	4	2	4	5	4	5	
Chloride Dissolved	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	1	0	0	0	0	0	0	
Coliforms Fecal	4	8	7	9	0	0	0	0	1	1	0	1	0	1	0	1	0	0	0	0	0	0	1	0	2	
Copper Total										0	0	1	1	1	3	0	0	1	0	0	0	0	0	1	2	0
Dicamba												0	0	0	0	0	0	0	1	0						
E. Coli																									0	
Endosulfan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
Fluoride Dissolved	1	0	1	1	0	2	2	1	4	0	1	1	1	1	0	3	5	3	4	1	1	0	0	1	1	
gamma-HCH	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	
Iron Dissolved						0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	
MCPA	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	3	0						
Nitrogen Total				0	1	1	1	0	1	1	1	1	1	0	2	1	0	2	3	0	0	2	1	0	1	
Oxygen Dissolved	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	
pH	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Phosphorous Total	0	4	4	3	0	2	3	1	1	1	1	2	1	1	0	1	1	0	1	4	3	1	2	0	1	
Phosphorous Total Dissolved		1	4	2	0	1	1	2	2	1	1	2	1	1	0	1	0	0	4	2	2	2	0	0	1	
Total Suspended Solids	3	2	3	1	2	4	4	0	2	2	1	3	0	1	2	2	3	1	2	0	1	0	0	0	1	
Selenium Total																										
Silver Total																										
Sodium Adsorption Ratio																										
Sodium Dissolved	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	
Sulphate Dissolved	0	1	3	1	0	3	0	0	3	0	1	1	2	1	3	0	1	1	1	0	1	1	2	4	0	
Total Dissolved Solids							0	1	3	0		1	4	1	2	2	1	2	1	0	1	0	0	0	2	
Uranium Total																										
Zinc Total										0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	

		Number of Excursions												Summary				
Parameter	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total Excursions 1993 - 2011	Total Excursions 1974 - 2011*	Total Excursions 2002 - 2011	Median Number of Excursions 2002 - 2011	
ADHERENCE RATE [%]	94.9	92.8	95.8	95.3	96.2	96.3	96.4	98.0	97.2	95.0	96.9	94.4	93.7					
Ammonia Unionized	0	0	0	0	1	0	0	0	0	0	0	0	0			3	1	0
Arsenic Total		1	0	3	5	4	2	3	2	2	3	2	2			29	28	2.5
Cadmium Total	4	4	1	3	0	0	1	0	0	0	1	0	0			45	5	0
Chloride Dissolved	0	0	0	1	0	1	0	0	0	0	0	0	0			6	2	0
Coliforms Fecal	0	4	1	1	0	3	0	1	2	0	0	1	1			50	9	1
Copper Total	0	0	0	0	0	0	0	0	0	0	1	0	0			10	1	0
Dicamba	1	1	2	0	2	2	7	0	1	1	2	0	0			20	15	1
E. Coli	1	2	0	0	0	3	0	1	1	4	0	6	0			18	15	0.5
Endosulfan	0	0	0	0	0	0	0	0	1	0	0	0	0			1	1	0
Fluoride Dissolved	0	1	4	3	2	1	0	0	0	1	0	0	0			47	7	0
gamma-HCH	3	0	0	0	0	0	0	0	0	0	0	0	0			5	0	0
Iron Dissolved	0	0	0	0	0	0	0	0	2	2	0	0	0			6	4	0
MCPA	0	2	2	1	4	4	6	2	2	4	3	4	6			45	36	4
Nitrogen Total	1	2	2	0	0	1	1	1	0	5	2	4	5		28	43	19	1
Oxygen Dissolved	1	1	1	0	2	1	1	3	0	0	0	0	0			17	7	0
pH	0	0	0	0	1	0	0	0	0	0	0	0	0			2	1	0
Phosphorous Total	0	3	0	0	0	0	2	0	0	1	1	1	1			46	6	0.5
Phosphorous Total Dissolved	2	3	1	0	0	1	2	0	0	2	2	3	0			47	10	0.5
Total Suspended Solids	1	2	1	0	0	0	1	1	1	4	1	4	2			58	14	1
Selenium Total		0	1	0	1	1	0	0	0	0	0	0	0			3	2	0
Silver Total	7	9	8	10	3	0	0	0	0	0	0	0	0			37	13	0
Sodium Adsorption Ratio			0	0	1	0	0	0	0	0	0	0	0			1	1	0
Sodium Dissolved	0	0	0	0	0	0	0	0	0	0	0	0	0			1	0	0
Sulphate Dissolved	1	2	1	0	0	1	0	0	3	3		3	10			54	20	1
Total Dissolved Solids	1	0	1	2	1	3	0	0	2	1	1	3	9			45	22	1.5
Uranium Total					0	0	0	0	0	0	0	1	0			1	1	0
Zinc Total	0	0	0	0	0	0	0	0	0	0	0	0	0			1	0	0

* Note in the annual summary of excursions, from 1974-2011, that data does not exist for certain parameters, such as some of the metals.

Carrot River Excursion Summary - 2012 Objectives																									
Parameter	Number of Excursions																								
	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
ADHERENCE RATE [%]	97.9	97.5	89.7	89.1	95.9	93.1	94.5	94.4	89.0	95.3	97.4	96.7	98.0	98.3	95.4	92.6	91.3	92.0	91.2	83.5	88.7	89.6	84.0	95.5	89.2
Ammonia Unionized													0	0	0	0	0	0	0	0	0	0	0	0	0
Cadmium Total										0	0	0	0	2	1	4	4		4	9	7	6	5	2	6
Chloride Dissolved	0	0	1	4	1	0	1	3	3	0	0	0	0	0	2	3	1	1	1	4	2	0	0	0	2
Coliforms Fecal	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1
Copper Total										1	0	2	2	3	1	1	1		0	1	1	2	1	0	1
Dicamba												0	0	0	0	1	0	0							
E. Coli																									1
Endosulfan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0								
Fluoride Dissolved	0	0	0	2	0	2	0	1	4	1	0	1	0	0	1	4	3	1	3	3	1	2	0	1	0
Lead Total										0	0	0	0	0	0	0	0		0	1	0	0	0	0	0
MCPA	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0						
Nitrogen Total				0	1	0	2	0	1	1	0	0	0	0	1	1	1	1	0	2	4	1	3	1	0
Oxygen Dissolved	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	3	0	1
pH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
Phosphorous Total	0	2	2	1	1	3	2	1	3	3	3	1	2	0	1	1	1	2	0	4	4	2	4	0	1
Phosphorous Total Dissolved		0	4	1	3	4	2	0	3	1	2	3	0	0	1	3	1	1	0	4	3	4	5	0	0
Total Suspended Solids	1	1	2	2	0	4	1	2	2	4	1	1	3	0	3	4	3	1	5	3	1	1	3	0	1
Silver Total																									
Sodium Dissolved	0	0	3	4	1	0	1	2	3	0	0	0	0	0	3	3	1	0	1	4	2	0	0	0	2
Total Dissolved Solids							2	2	3	0		0	0	0	2	3	1	0	1	3	2	0	0	1	2
Parameter	Number of Excursions												Summary												
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total Excursions 1993 - 2011	Total Excursions 1974 - 2011*	Total Excursions 2002 - 2011	Median Number of Excursions 2002 - 2011								
ADHERENCE RATE [%]	94.1	95.4	95.7	93.6	94.6	96.8	90.9	92.8	93.9	95.5	97.5	95.1	94.5												
Ammonia Unionized	0	0	0	0	1	0	0	0	0	0	0	0	0			1	1								
Cadmium Total	6	5	4	5	2	1	2	2	2	1	1	0	2			83	18								
Chloride Dissolved	0	0	2	2	1	0	0	0	0	0	0	0	0			34	3								
Coliforms Fecal	0	0	0	0	0	0	0	0	1	0	0	0	0			5	1								
Copper Total	1	0	0	0	1	1	0	0	0	1	2	0	0			23	5								
Dicamba	1	1	0	0	0	2	4	2	2	0	0	0	0			13	10								
E. Coli	0	0	0	0	0	0	0	0	1	4	0	2	0			8	7								
Endosulfan	0	0	0	0	0	0	0	0	1	0	0	0	0			1	1								
Fluoride Dissolved	0	0	4	1	0	0	1	2	0	0	0	0	0			38	4								
Lead Total	0	0	0	0	0	0	0	0	0	0	0	0	0			1	0								
MCPA	0	0	0	0	1	0	2	1	2	1	0	2	1			13	10								
Nitrogen Total	2	2	0	1	2	1	7	5	5	4	2	5	8	54		64	40								
Oxygen Dissolved	0	1	1	0	0	0	3	5	1	0	0	2	0			19	11								
pH	0	0	0	0	0	0	0	0	0	0	0	0	0			1	0								
Phosphorous Total	2	0	2	1	3	2	7	9	10	3	2	4	8			97	49								
Phosphorous Total Dissolved	1	3	0	3	6	4	11	12	8	5	3	8	7			116	67								
Total Suspended Solids	2	0	1	1	2	1	0	0	1	1	2	2	1			63	11								
Silver Total	4	6	5	6	1	0	0	0	0	0	0	0	0			22	7								
Sodium Dissolved	0	0	1	2	0	1	0	0	0	0	0	0	0			34	3								
Total Dissolved Solids	0	0	1	2	0	0	0	0	0	0	0	0	0			25	2								

* Note in the annual summary of excursions, from 1974-2011, that data does not exist for certain parameters, such as some of the metals.

Churchill River Excursion Summary - 2012 Objectives																									
Parameter	Number of Excursions																								
	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
ADHERENCE RATE [%]	96.1	96.2	94.2	95.5	97.8	93.7	94.2	97.2	95.7	92.4	95.3	98.5	98.3	96.4	97.7	94.3	98.1	96.7	95.7	96.6	97.3	94.0	94.0	95.5	93.5
Cadmium Total										0	0	0	0	2	1	3	0	2	2	3	2	2	1	0	1
Copper Total										1	1	2	2	5	2	0	0	0	1	0	0	1	0	0	0
Fluoride Dissolved	0	2	2	0	0	1	1	2	1	1	0	0	0	1	0	7	3	0	1	1	0	3	0	0	
Lead Total										2	0	0	2	2	1	3	0	1	1	1	0	0	0	0	
Manganese Dissolved						0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
MCPA	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0								
Nitrogen Total				1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	
pH	0	0	0	0	0	0	4	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	
Phosphorous Total	1	1	1	0	0	3	1	2	2	2	2	0	1	0	1	1	0	0	0	1	1	0	0	0	
Phosphorous Total Dissolved		1	2	1	1	0	2	0	2	2	5	1	0	0	1	2	0	0	0	0	3	1	1	0	
Total Suspended Solids	2	1	1	3	2	4	2	0	2	1	1	1	0	0	1	1	0	0	0	0	0	0	1	1	
Silver Total																									
Parameter	Number of Excursions													Summary											
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total Excursions 1993 -2011	Total Excursions 1974 - 2011*	Total Excursions 2002 - 2011	Median Number of Excursions 2002 - 2011								
ADHERENCE RATE [%]	98.1	98.1	95.3	94.3	97.5	99.2	97.1	95.9	98.5	100.0	100.0	99.2	96.9												
Cadmium Total	0	0	0	0	0	0	0	0	0	1	0	0	1	0			21	2							
Copper Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0			15	0							
Fluoride Dissolved	1	1	3	1	1	1	1	0	0	0	0	0	0	0			35	4							
Lead Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0			13	0							
Manganese Dissolved	0	0	0	0	0	0	0	0	0	0	0	0	0	0			6	0							
MCPA							0										1	0							
Nitrogen Total	0	0	0	1	0	0	1	0	0	0	0	0	2	0	8		10	4							
pH	0	0	0	0	0	0	0	0	0	0	0	0	0	0			6	0							
Phosphorous Total	0	0	0	1	0	0	0	1	1	0	0	0	1	0			24	4							
Phosphorous Total Dissolved	0	0	0	1	1	0	1	1	0	0	0	0	0	0			30	4							
Total Suspended Solids	0	0	1	0	0	0	0	2	0	0	0	0	0	0			28	2							
Silver Total	1	1	3	1	1	0	0	0	0	0	0	0	0	0			7	2							

* Note in the annual summary of excursions, from 1974-2011, that data does not exist for certain parameters, such as some of the metals.

Qu'Appelle River Excursion Summary - 2012 Objectives																										
	Number of Excursions																									
Parameter	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	
ADHERENCE RATE [%]	81.8	85.8	92.3	94.9	92.7	90.5	90.6	89.3	90.0	90.2	94.4	98.2	93.7	93.0	91.7	90.3	82.0	87.3	88.4	92.5	90.6	94.4	91.9	98.5	91.1	
2,4-D		0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0								
Cadmium Total									0	0	0	0	4	3	5	1		1	3	3	7	5	4	1	2	
Chloride Dissolved	0	0	0	0	0	0	0	0	1	0	1	0	0	1	3	2	3	5	8	2	0	0	0	0	0	
Coliforms Fecal	0	0	1	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1	3	1	0	0	0	
Copper Total									1	10	6	0	5	1	0	1		0	0	3	4	2	4	1	0	
E. Coli																									0	0
Fluoride Dissolved	0	0	0	1	2	1	3	3	1	0	2	0	1	4	5	7	6	5	2	1	1	0	0	0	0	
gamma-HCH		0	0	0	0	0	0	0	0	0	0	0	1	1	0	0										
Iron Dissolved					0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	
Lead Total									0	7	1	0	0	1	0	0	0	0	0	0	0	0	4	0	0	
MCPA		0	0	0	0	0	0	0	0	0	0	1	2	0	1	0	1	0								
Nitrogen Total			1	0	2	3	0	1	0	0	0	0	0	2	0	1	0	0	0	0	4	2	0	0	1	
Oxygen Dissolved	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	
pH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	
Phosphorous Total	2	8	4	2	3	6	6	6	7	4	2	0	1	3	0	3	3	2	0	2	3	1	2	0	2	
Phosphorous Total Dissolved	2	8	6	6	6	8	6	8	8	5	6	5	3	4	6	8	3	0	1	2	2	2	2	0	2	
Total Suspended Solids	0	1	0	1	3	3	2	1	2	2	1	1	1	3	1											
Silver Total																									3	
Sodium Dissolved	0	3	0	0	0	2	2	4	3	0	0	0	0	1	4	5	8	5	8	1	0	0	0	0	0	
Sulphate Dissolved	0	1	0	0	0	0	2	2	3	0	0	0	0	1	5	2	4	5	6	2	0	0	0	0	0	
Total Dissolved Solids						0	2	1	2		0	0	0	2	4	3	5	3	4	2	0	0	0	0	0	
Triallate										0	0	1	1	0	0	0	0									
Trifluralin		0	0		0					0	0	0	1	0	0	0	0	0								
Zinc Total									0	0	0	0	0	0	0	0										
	Number of Excursions											Summary														
Parameter	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total Excursions 1993 -2011	Total Excursions 1975 - 2011*	Total Excursions 2002 - 2011	Median Number of Excursions 2002 - 2011										
ADHERENCE RATE [%]	94.8	93.5	95.0	95.7	92.8	93.8	95.1	96.1	97.0	94.6	92.6	92.3														
2,4-D									0							1	0								0	
Cadmium Total	0	1	2	0	0	0	1	0	0	1	0	0				44	4								0	
Chloride Dissolved	0	0	0	0	0	0	0	0	0	0	0	0				26	0								0	
Coliforms Fecal	0	0	0	0	1	0	0	2	0	0	0	1				12	4								0	
Copper Total	0	0	0	0	0	0	2	6	0	1	0	2				49									0	
E. Coli	2	0	0	1	0	0	0	0	3	0	4	0				10									0	
Fluoride Dissolved	0	1	0	0	0	1	0	0	0	0	0	0				47									0	
gamma-HCH									0							2									0	
Iron Dissolved	0	0	0	0	0	0	0	0	0	0	1	0				1									0	
Lead Total	0	0	0	0	0	0	0	0	0	1	0	0				14									0	
MCPA								1								6									1	
Nitrogen Total	0	1	2	1	0	1	1	0	2	2	0	2				19									1	
Oxygen Dissolved	0	1	0	0	1	1	1	0	0	0	0	0				5									0	
pH	0	0	0	0	0	0	0	0	1	0	0	0				2									0	
Phosphorous Total	0	2	2	2	1	1	3	1	2	4	6	7				103									2	
Phosphorous Total Dissolved	0	1	0	0	5	9	6	0	4	5	9	11				162									5	
Total Suspended Solids	0	3	0	2	2	3	5	6	2	3	4	4				64									3	
Silver Total	3	1	3	1	0	0	0	0	0	0	0	0				11									0	
Sodium Dissolved	0	0	0	0	0	1	0	0	0	0	1	1				49									0	
Sulphate Dissolved	0	0	0	0	0	0	0	0	1	1	3	3				41									0	
Total Dissolved Solids	0	0	0	0	0	0	0	0	0	1	1	0				30									0	
Triallate									0							2									0	
Trifluralin									0							1									0	
Zinc Total	0	0	0	0	0	0	0	0	0	1	0	0				1									0	

* Note in the annual summary of excursions, from 1975-2011, that data does not exist for certain parameters, such as some of the metals.

Red Deer River near Erwood Excursion Summary - 2012 Objectives																									
Parameter	Number of Excursions																								
	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
ADHERENCE RATE [%]	95.7	96.4	88.1	90.9	97.3	94.2	98.3	97.9	89.5	93.3	91.1	97.1	97.7	96.7	98.5	96.6	96.1	95.5	94.3	94.4	92.9	95.5	94.1	96.8	98.5
Cadmium Total										0	0	0	1	3	1	4	2		4	4	2	2	1	0	1
Coliforms Fecal	2	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0								
Copper Total										0	6	4	1	6	0	0	0		0	0	1	0	0	1	0
Dicamba												0	0	0	1	0	0	0	0						
E. Coli																									
Fluoride Dissolved	0	1	2	2	0	1	0	1	4	0	0	1	0	0	1	3	3	1	2	2	1	2	1	1	0
gamma-HCH	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0								
Iron Dissolved							0	0	2	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0
Lead Total										0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Manganese Dissolved							0	1	6	7	2	0	0	0	0	0	0		1	0	1	0	1	0	0
MCPA	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0						
Nitrogen Total				0	0	1	1	0	0	1	1	0	0	0	0	1	0	0	0	0	2	1	1	0	0
Oxygen Dissolved	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
pH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Phosphorous Total	3	1	5	1	1	5	1	0	2	3	3	2	2	0	1	1	1	0	1	3	4	2	1	0	1
Phosphorous Total Dissolved		0	6	7	3	1	1	1	3	3	3	2	1	0	1	1	1	0	0	3	4	1	2	0	0
Total Suspended Solids	1	0	3	3	0	3	0	1	3	3	1	2	2	3	0	1	0	1	3	2	1	0	0	1	0
Silver Total																									
Total Dissolved Solids							1	1	3	1		1	2	0	1	3	2	0	0	0	3	0	1	0	0
Zinc Total										0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Parameter	Number of Excursions												Summary												
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total Excursions 1993 - 2011	Total Excursions 1974 - 2011*	Total Excursions 2002 - 2011	Median Number of Excursions 2002 - 2011								
ADHERENCE RATE [%]	91.5	95.9	97.5	95.4	91.3	94.8	94.0	92.0	91.9	95.7	97.4	90.4	91.5												
Cadmium Total	2	1	0	0	1	0	1	1	3	1	1	1	1			38	10								
Coliforms Fecal																9	3								
Copper Total	0	0	0	0	0	0	1	0	1	1	0	0	1			23	4								
Dicamba											0					1	0								
E. Coli							0	0	1	2	0	1	0			4	4								
Fluoride Dissolved	1	2	2	2	1	1	0	2	2	0	0	0	0			42	8								
gamma-HCH											0					1	0								
Iron Dissolved	0	0	0	0	1	1	1	0	0	0	1	0	0			6	4								
Lead Total	0	0	0	0	0	0	0	0	0	0	0	0	0			3	0								
Manganese Dissolved	1	0	0	1	1	0	1	0	0	1	0	2	3			29	9								
MCPA											0					2	0								
Nitrogen Total	0	0	0	0	0	1	0	2	1	1	0	3	2		14	19	10								
Oxygen Dissolved	0	0	0	0	0	0	0	0	0	0	0	0	0			3	0								
pH	0	0	0	0	2	0	0	0	0	0	0	0	0			2	2								
Phosphorous Total	2	0	0	0	1	1	1	3	4	1	1	4	3			65	19								
Phosphorous Total Dissolved	2	0	0	0	1	2	2	3	4	1	1	6	5			71	25								
Total Suspended Solids	1	0	0	1	0	0	0	2	0	1	1	2	0			42	7								
Silver Total	4	4	0	2	1	0	0	0	0	0	0	0	0			11	3								
Total Dissolved Solids	1	0	1	1	0	1	1	0	0	0	2	1	2			29	8								
Zinc Total	0	0	0	0	0	0	0	0	0	0	0	0	0			1	0								

* Note in the annual summary of excursions, from 1974-2011, that data does not exist for certain parameters, such as some of the metals.

Saskatchewan River Excursion Summary - 2012 Objectives																										
		Number of Excursions																								
Parameter	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	
ADHERENCE RATE [%]	98.0	98.4	93.9	89.3	93.1	90.9	94.4	95.5	93.0	90.1	87.1	95.3	93.9	96.0	96.5	95.2	95.5	94.2	96.5	94.2	94.3	93.5	92.6	95.4	94.3	
Arsenic Total																										
Cadmium Total											0	0	0	0	2	0	5	3	7	7	8	6	9	9	2	9
Chloride Dissolved	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
Coliforms Fecal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Copper Total											4	9	6	6	3	2	0	1	3	1	0	2	1	3	1	1
Dicamba													0	0	0	0	1	0	0	0	0	0	0	0	0	
E. Coli																									1	
Fluoride Dissolved	0	0	0	1	0	2	0	1	3	0	2	2	2	1	1	4	5	2	2	2	0	3	2	0	0	
gamma-HCH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0					
Iron Dissolved						0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lead Total										2	5	0	0	0	0	0	0	0	0	0	0	1	0	1	2	0
Manganese Dissolved						0	0	1	0	6	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0
MCPA	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1
Nitrogen Total				1	3	3	2	1	1	0	0	1	1	0	0	0	0	0	0	0	1	1	1	3	0	0
Oxygen Dissolved	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
pH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Phosphorous Total	1	2	4	3	4	5	6	3	3	6	4	7	2	2	2	6	4	1	3	1	1	1	1	2	2	
Phosphorous Total Dissolved	0	2	8	2	6	1	0	3	5	9	4	2	3	5	4	3	2	1	2	0	0	6	1	1	1	
Total Suspended Solids	1	0	2	2	4	3	4	2	1	0	0	1	1	0	1	1	1	2	0	2	4	2	1	1	1	
Silver Total																										
Sodium Adsorption Ratio																										
Total Dissolved Solids							0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	
Zinc Total										0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	
		Number of Excursions												Summary												
Parameter	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total Excursions 1993 - 2011	Total Excursions 1974 - 2011*	Total Excursions 2002 - 2011	Median Number of Excursions 2002 - 2011									
ADHERENCE RATE [%]	93.4	93.7	94.9	92.3	96.1	97.8	95.9	97.2	97.1	97.9	99.7	99.2	95.7													
Arsenic Total	0	0	1	0	0	0	0	0	0	0	0	0	0			1	0									
Cadmium Total	9	9	5	7	1	1	2	1	1	1	0	0	1			105	15									
Chloride Dissolved	0	0	1	0	0	0	0	0	0	0	0	0	0			2	0									
Coliforms Fecal	0	1	0	1	0	0	0	0	0	0	0	0	0			3	1									
Copper Total	2	3	0	0	1	1	2	0	0	1	0	0	2			55	7									
Dicamba	0	1	0	0	0	0	0	0	0	0	0	0	0			2	0									
E. Coli	0	0	0	0	0	0	0	0	0	5	0	0	0			6	5									
Fluoride Dissolved	1	1	5	4	4	1	2	0	0	0	1	0	0			54	12									
gamma-HCH										0						2	0									
Iron Dissolved	0	0	0	0	0	0	0	0	1	0	0	0	0			2	1									
Lead Total	1	1	0	0	0	0	0	0	0	0	0	0	0			13	0									
Manganese Dissolved	0	0	0	0	0	0	0	0	0	0	0	0	0			9	0									
MCPA	0	0	0	0	0	0	0	0	0	0	0	0	0			5	0									
Nitrogen Total	0	0	0	2	1	1	1	1	1	1	0	1	3		18	31	12									
Oxygen Dissolved	0	1	0	0	0	0	0	2	0	0	0	0	1			6	3									
pH	0	0	0	0	1	0	0	0	0	0	0	0	0			3	1									
Phosphorous Total	1	0	1	1	1	1	4	1	2	1	0	1	5			99	17									
Phosphorous Total Dissolved	1	0	1	2	0	2	2	3	5	0	0	1	4			91	19									
Total Suspended Solids	1	0	0	2	2	1	0	1	0	1	0	0	2			47	9									
Silver Total	4	5	3	9	2	0	0	0	0	0	0	0	0			23	11									
Sodium Adsorption Ratio			1	0	0	0	0	0	0	0	0	0	0			1	0									
Total Dissolved Solids	0	0	1	0	0	0	0	0	0	0	0	0	0			3	0									
Zinc Total	0	0	0	0	0	0	0	0	0	0	0	0	0			1	0									

* Note in the annual summary of excursions, from 1974-2011, that data does not exist for certain parameters, such as some of the metals.

Appendix F – Adherence Rate and Excursion and Summary
Tables

Battle River Excursion Summary 2002 - 2011					
1992 Objectives			2012 Objectives		
Parameter	# of Excursions	Median # of Excursions	Parameter	# of Excursions	Median # of Excursions
Arsenic Total	No Objective		Arsenic Total	12	0.5
Cadmium Total	0	0	Cadmium Total	17	2
Coliforms Fecal	24	2	Coliforms Fecal	24	2
Copper Total	22	1.5	Copper Total	22	1.5
Iron Dissolved	15	2	Iron Dissolved	15	2
Manganese Dissolved	34	3	Manganese Dissolved	No Objective	
Nitrogen Total	No Objective		Nitrogen Total	12	1
Phosphorous Total	No Objective		Phosphorous Total	24	2.5
Phosphorous Total Dissolved	No Objective		Phosphorous Total Dissolved	16	1.5
Silver Total	No Objective		Silver Total	14	1
Sodium Dissolved/Filtered	93	10	Sodium Dissolved/Filtered	8	0
Total Dissolved Solids	94	10	Total Dissolved Solids	13	0
Total Suspended Solids	No Objective		Total Suspended Solids	14	1
	# of parameters with excursions ≥ 10 = 6			# of parameters with excursions ≥ 10 = 11	
Total # of excursions overall = 305			Total # of excursions overall = 235		

Battle River Adherence Rate Summary 2002 - 2011		
Year	1992 Objectives	2012 Objectives
2002	88.1	89.9
2003	89.1	90.2
2004	88.6	95.2
2005	89.3	91.7
2006	89.9	98.2
2007	92.9	95.9
2008	90.3	97.0
2009	89.9	97.2
2010	89.7	92.6
2011	91.3	93.4
Average	89.9	94.1

No change from 1992.

Increase from 1992.

Decrease from 1992.

Bold number indicates excursions ≥ 10.

Beaver River Excursion Summary 2002 - 2011					
1992 Objectives			2012 Objectives		
Parameter	# of Excursions	Median # of Excursions	Parameter	# of Excursions	Median # of Excursions
Iron Dissolved	4	0	Iron Dissolved	23	2
Manganese Dissolved	22	3	Manganese Dissolved	No Objective	
Phosphorous Total Dissolved	No Objective		Phosphorous Total Dissolved	11	0.5
Total Suspended Solids	No Objective		Total Suspended Solids	11	0.5
	# of parameters with excursions ≥ 10 = 1			# of parameters with excursions ≥ 10 = 3	
Total # of excursions overall = 36			Total # of excursions overall = 83		

Beaver River Adherence Rate Summary 2002 - 2011		
Year	1992 Objectives	2012 Objectives
2002	89.8	93.6
2003	97.4	93.8
2004	97.5	99.4
2005	100.0	96.4
2006	98.9	99.5
2007	98.9	98.0
2008	100.0	99.0
2009	98.3	98.4
2010	98.1	98.3
2011	99.2	95.7
Average	97.8	97.2

No change from 1992.

Increase from 1992.

Decrease from 1992.

Bold number indicates excursions ≥ 10.

Cold River Adherence Rate Summary 2002 - 2011	
Year	2012 Objectives
2002	90.9
2003	97.7
2004	97.0
2005	97.8
2006	97.0
2007	98.5
2008	97.8
2009	98.0
2010	98.0
2011	95.3
Average	96.8

Total # of excursions overall for 1992 = N/A

Total # of excursions overall for 2012 = 41

North Saskatchewan River Excursion Summary 2002 - 2011					
1992 Objectives			2012 Objectives		
Parameter	# of Excursions	Median # of Excursions	Parameter	# of Excursions	Median # of Excursions
Cadmium Total	0	0	Cadmium Total	19	1.5
Coliforms Fecal	14	1.5	Coliforms Fecal	14	1.5
Copper Total	16	2	Copper Total	16	1.5
Nitrogen Total	No Objective		Nitrogen Total	13	1.5
Phosphorous Total	No Objective		Phosphorous Total	13	1
Phosphorous Total Dissolved	No Objective		Phosphorous Total Dissolved	12	1
Total Suspended Solids	No Objective		Total Suspended Solids	18	2
Silver Total	No Objective		Silver Total	16	0.5
	# of parameters with excursions ≥ 10 = 2			# of parameters with excursions ≥ 10 = 8	
Total # of excursions overall = 47			Total # of excursions overall = 150		

North Saskatchewan River Adherence Rate Summary 2002 - 2011		
Year	1992 Objectives	2012 Objectives
2002	99.6	95.1
2003	98.8	97.0
2004	98.3	96.8
2005	96.8	94.6
2006	97.9	96.2
2007	98.4	96.9
2008	98.1	96.3
2009	99.7	98.8
2010	99.1	98.1
2011	97.6	93.0
Average	98.4	96.3

No change from 1992.

Increase from 1992.

Decrease from 1992.

Bold number indicates excursions ≥ 10.

Red Deer River near Bindloss Excursion Summary 2002 - 2011					
1992 Objectives			2012 Objectives		
Parameter	# of Excursions	Median # of Excursions	Parameter	# of Excursions	Median # of Excursions
Arsenic Total	No Objective		Arsenic Total	11	1
Chromium Total	12	1.5	Chromium Total	1	0
Coliforms Fecal	18	1.5	Coliforms Fecal	18	1.5
Copper Total	44	4	Copper Total	No Objective	
E. Coli	No Objective		E. Coli	11	1
Lead Total	17	2	Lead Total	26	1
Nickel Total	12	1.5	Nickel Total	No Objective	
Nitrogen Total	No Objective		Nitrogen Total	21	2
Phosphorous Total	No Objective		Phosphorous Total	29	3
Phosphorous Total Dissolved	No Objective		Phosphorous Total Dissolved	23	2
Silver Total	No Objective		Silver Total	23	2
Total Suspended Solids	No Objective		Total Suspended Solids	21	2
Zinc Total	19	2	Zinc Total	19	2
	# of parameters with excursions ≥ 10 = 6			# of parameters with excursions ≥ 10 = 10	
Total # of excursions overall = 137			Total # of excursions overall = 233		

Red Deer River near Bindloss Adherence Rate Summary 2002 - 2011		
Year	1992 Objectives	2012 Objectives
2002	89.2	90.4
2003	93.2	92.8
2004	97.7	98.2
2005	90.2	89.4
2006	98.4	96.7
2007	95.5	95.7
2008	93.9	94.1
2009	94.0	94.4
2010	91.9	91.8
2011	95.2	93.7
Average	93.9	93.7

No change from 1992.

Increase from 1992.

Decrease from 1992.

Bold number indicates excursions ≥ 10.

South Saskatchewan River Excursion Summary 2002 - 2011					
1992 Objectives			2012 Objectives		
Parameter	# of Excursions	Median # of Excursions	Parameter	# of Excursions	Median # of Excursions
Cadmium Total	3	0	Cadmium Total	16	1.5
Copper Total	4	0	Copper Total	14	1
Nitrogen Total	No Objective		Nitrogen Total	20	2
Phosphorous Total	No Objective		Phosphorous Total	12	1
Phosphorous Total Dissolved	No Objective		Phosphorous Total Dissolved	20	1
Silver Total	No Objective		Silver Total	15	0.5
# of parameters with excursions $\geq 10 = 0$			# of parameters with excursions $\geq 10 = 6$		
Total # of excursions overall = 27			Total # of excursions overall = 154		

South Saskatchewan River Adherence Rate Summary 2002 - 2011		
Year	1992 Objectives	2012 Objectives
2002	96.6	93.6
2003	100.0	96.6
2004	100.0	97.3
2005	97.2	93.5
2006	99.6	97.8
2007	99.6	97.3
2008	98.0	95.5
2009	100.0	98.1
2010	97.5	95.6
2011	99.6	95.3
Average	98.8	96.1

No change from 1992.

Increase from 1992.

Decrease from 1992.

Bold number indicates excursions ≥ 10 .

Assiniboine River Excursion Summary 2002 - 2011					
1992 Objectives			2012 Objectives		
Parameter	# of Excursions	Median # of Excursions	Parameter	# of Excursions	Median # of Excursions
Arsenic Total	No Objective		Arsenic Total	28	2.5
Dicamba	No Objective		Dicamba	15	1
E. Coli	No Objective		E. Coli	15	0.5
Manganese Dissolved	86	8	Manganese Dissolved	No Objective	
MCPA	No Objective		MCPA	36	4
Nitrogen Total	No Objective		Nitrogen Total	19	1
Oxygen Dissolved	28	3	Oxygen Dissolved	7	0
Phosphorous Total	117	12	Phosphorous Total	6	0.5
Phosphorous Total Dissolved	No Objective		Phosphorous Total Dissolved	10	0.5
Silver Total	No Objective		Silver Total	13	0
Sulphate Dissolved	No Objective		Sulphate Dissolved	20	1
Total Dissolved Solids	No Objective		Total Dissolved Solids	22	1.5
Total Suspended Solids	No Objective		Total Suspended Solids	14	1
# of parameters with excursions ≥			# of parameters with excursions ≥		
Total # of excursions overall = 246			Total # of excursions overall = 213		

Assiniboine River Adherence Rate Summary 2002 - 2011		
Year	1992 Objectives	2012 Objectives
2002	90.0	95.3
2003	92.0	96.2
2004	90.2	96.3
2005	92.8	96.4
2006	91.3	98.0
2007	92.3	97.2
2008	91.7	95.0
2009	92.9	96.9
2010	92.2	94.4
2011	92.2	93.7
Average	91.8	95.9

No change from 1992.

Increase from 1992.

Decrease from 1992.

Bold number indicates excursions ≥ 10.

Churchill River Adherence Rate Summary 2002 - 2011		
Year	1992 Objectives	2012 Objectives
2002	100.0	94.3
2003	98.7	97.5
2004	100.0	99.2
2005	100.0	97.1
2006	96.8	95.9
2007	100.0	98.5
2008	100.0	100.0
2009	100.0	100.0
2010	100.0	99.2
2011	100.0	96.0
Average	99.5	96.9

No change from 1992.

Increase from 1992.

Decrease from 1992.

Total # of excursions overall for 1992 = 3

Total # of excursions overall for 2012 = 23

Carrot River Excursion Summary 2002 - 2011					
1992 Objectives			2012 Objectives		
Parameter	# of Excursions	Median # of Excursions	Parameter	# of Excursions	Median # of Excursions
Cadmium Total	0	0	Cadmium Total	18	2
Chloride Dissolved	40	4.5	Chloride Dissolved	3	0
Dicamba	No Objective		Dicamba	10	0
Iron Dissolved	26	2	Iron Dissolved	No Objective	
Manganese Dissolved	81	9.5	Manganese Dissolved	No Objective	
MCPA	No Objective		MCPA	10	1
Nitrogen Total	No Objective		Nitrogen Total	40	4.5
Oxygen Dissolved	27	3	Oxygen Dissolved	11	0
Phosphorous Total	105	10.5	Phosphorous Total	48	3
Phosphorous Total Dissolved	No Objective		Phosphorous Total Dissolved	67	6.5
Sodium Dissolved/Filtered	29	3	Sodium Dissolved/Filtered	3	0
Total Suspended Solids	No Objective		Total Suspended Solids	11	1
	# of parameters with excursions ≥ 10 = 6			# of parameters with excursions ≥ 10 = 8	
Total # of excursions overall = 308			Total # of excursions overall = 250		

Carrot River Adherence Rate Summary 2002 - 2011		
Year	1992 Objectives	2012 Objectives
2002	85.0	93.7
2003	85.6	94.4
2004	88.5	96.8
2005	87.1	90.9
2006	87.0	92.8
2007	87.1	93.9
2008	88.1	95.5
2009	89.9	97.5
2010	89.4	95.1
2011	87.7	94.5
Average	87.5	94.5

No change from 1992.

Increase from 1992.

Decrease from 1992.

Bold number indicates excursions ≥ 10.

Qu'Appelle River Excursion Summary 2002 - 2011					
1992 Objectives			2012 Objectives		
Parameter	# of Excursions	Median # of Excursions	Parameter	# of Excursions	Median # of Excursions
Manganese Dissolved	42	3	Manganese Dissolved	No Objective	
Nitrogen Total	No Objective		Nitrogen Total	11	1
Oxygen Dissolved	12	1	Oxygen Dissolved	3	0
Phosphorous Total	119	12	Phosphorous Total	29	2
Phosphorous Total Dissolved	No Objective		Phosphorous Total Dissolved	49	5
Sodium Dissolved/Filtered	83	9.5	Sodium Dissolved/Filtered	3	0
Total Suspended Solids	No Objective		Total Suspended Solids	31	3
# of parameters with excursions ≥ 10 = 4			# of parameters with excursions ≥ 10 = 4		
Total # of excursions overall = 270			Total # of excursions overall = 163		

Qu'Appelle River Adherence Rate Summary 2002 - 2011		
Year	1992 Objectives	2012 Objectives
2002	84.5	95.0
2003	83.9	95.7
2004	82.6	92.8
2005	85.8	93.8
2006	89.3	95.4
2007	88.8	97.7
2008	89.7	97.0
2009	86.7	94.9
2010	87.8	92.6
2011	88.2	92.8
Average	86.7	94.8

No change from 1992.

Increase from 1992.

Decrease from 1992.

Bold number indicates excursions ≥ 10.

Red Deer River near Erwood Excursion Summary 2002 - 2011					
1992 Objectives			2012 Objectives		
Parameter	# of Excursions	Median # of Excursions	Parameter	# of Excursions	Median # of Excursions
Cadmium Total	No Excursions		Cadmium Total	10	1
Nitrogen Total	No Objective		Nitrogen Total	10	1
Phosphorous Total	26	2	Phosphorous Total	19	1
Phosphorous Total Dissolved	No Objective		Phosphorous Total Dissolved	25	2
# of parameters with excursions ≥ 10 = 1			# of parameters with excursions ≥ 10 = 4		
Total # of excursions overall = 46			Total # of excursions overall = 116		

Red Deer River near Erwood Adherence Rate Summary 2002 - 2011		
Year	1992 Objectives	2012 Objectives
2002	98.9	95.4
2003	92.6	91.3
2004	95.5	94.8
2005	94.3	94.0
2006	95.6	92.0
2007	95.6	91.9
2008	97.8	95.7
2009	98.7	97.4
2010	94.2	90.4
2011	94.9	91.5
Average	95.8	93.4

No change from 1992.

Increase from 1992.

Decrease from 1992.

Bold number indicates excursions ≥ 10.

Saskatchewan River Excursion Summary 2002 - 2011					
1992 Objectives			2012 Objectives		
Parameter	# of Excursions	Median # of Excursions	Parameter	# of Excursions	Median # of Excursions
Cadmium Total	0	0	Cadmium Total	15	1
Fluoride Dissolved	No Excursions		Fluoride Dissolved	12	1
Nitrogen Total	No Objective		Nitrogen Total	12	1
Phosphorous Total	44	5	Phosphorous Total	17	1
Phosphorous Total Dissolved	No Objective		Phosphorous Total Dissolved	19	2
Silver Total	No Objective		Silver Total	11	0
	# of parameters with excursions ≥ 10 = 1			# of parameters with excursions ≥ 10 = 6	
Total # of excursions overall = 53			Total # of excursions overall = 113		

Saskatchewan River Adherence Rate Summary 2002 - 2011		
Year	1992 Objectives	2012 Objectives
2002	98.5	92.3
2003	96.5	96.1
2004	97.8	97.8
2005	96.6	95.9
2006	95.1	97.2
2007	96.9	97.1
2008	98.8	97.9
2009	99.5	99.7
2010	98.8	99.2
2011	97.4	95.7
Average	97.6	96.9

No change from 1992.

Increase from 1992.

Decrease from 1992.

Bold number indicates excursions ≥ 10.



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