

# Musselshell Watershed Coalition

## Salinity Meter End of Season Assessment October 2015

*Summary Prepared by Erin Wall and Adam Sigler 2/8/2016*

On October 26<sup>th</sup> 2015, all 5 meters were assessed at the same time for reading agreement. This was conducted at the MSUEWQ office in Bozeman MT by Matt Schmidt, Erin Wall and Adam Sigler. All five meters were placed in the same tub of water and readings were written down at the same time while slugs of salt water were added to assess agreement among the meters over the range of salinities observed during the monitoring season. The full results are in the table below. The largest relative percent differences (RPD) in meter readings were observed immediately after salt slugs were added which indicates time required for equilibration of meters is approximately 2 minutes. RPD was calculated as the percent difference of each meter from the mean of all the meters. At no point did the RPD for any meter exceed 3% after the meters had been given 2 minutes to equilibrate with salinity in solution.

Time	LMCD 1		LMCD 2		LMCD 3		LMCD 4		ProPlus		Avg	Notes
	SC	RPD	SC	RPD	SC	RPD	SC	RPD	SC	RPD		
10:07							86.6					Marsh Lab tap water in tub
10:12	128		213.7		212		172.5		meter in late			
10:15	211.5	-2.1%	204.9	-5.1%	212.1	-1.8%	212.2	-1.7%	239	10.7%	215.94	
10:17	219	0.6%	205	-5.9%	212	-2.7%	214	-1.7%	239	9.7%	217.8	
10:19												Mixing water in tub to ensure mixed
10:20	212.8	0.2%	206.2	-2.9%	215	1.2%	213.7	0.6%	214.1	0.8%	212.36	
10:25	213.8	0.2%	207.6	-2.7%	215.7	1.1%	214.5	0.6%	214.8	0.7%	213.28	
10:27	212.9	-0.3%	208	-2.6%	215.8	1.1%	214.8	0.6%	216.1	1.2%	213.52	
10:32	209	-1.1%	215.9	2.2%	209.2	-1.0%	211.2	0.0%	211.1	-0.1%	211.28	Added salt and started over with fresh water
10:34	208.9	-1.1%	215.7	2.1%	209.3	-0.9%	211.1	0.0%	211	-0.1%	211.2	
10:35												Added salt from pre-mixed bottle
10:35	463	-6.9%	563	13.1%	478	-3.9%	503	1.1%	480.9	-3.4%	497.58	
10:37	506	-2.4%	534	3.0%	508	-2.0%	525	1.3%	519.1	0.1%	518.42	
10:41	507	-2.2%	534	3.0%	509	-1.8%	525	1.2%	517.7	-0.2%	518.54	
10:46	508	-2.1%	534	2.9%	511	-1.6%	525	1.1%	517.4	-0.3%	519.08	
10:47												Added salt from pre-mixed bottle
10:48	2496	3.0%	2133	-11.9%	2872	18.6%	2005	-17.2%	2606	7.6%	2422.4	
10:50	2291	-0.1%	2294	0.0%	2302	0.3%	2291	-0.1%	2294	0.0%	2294.4	
11:02												Probes are moved; 4L tap water & 1sp salt
11:06	3315	0.1%	3302	-0.3%	3317	0.1%	3319	0.2%	3312	0.0%	3313	
11:15	3306	-0.1%	3302	-0.2%	3304	-0.2%	3312	0.1%	3322	0.4%	3309.2	

Matt Schmidt subsequently cleaned all the meters and recorded meter readings in 1413 solution before and after cleaning. The RPD between pre and post cleaning was not greater than 1% for any of the meters. All meters read greater than 1413 in the calibration solution but not by more than 7%.

		LMCD 1			LMCD 2			LMCD 3			LMCD 4			ProPlus		
		Time	SC	Temp	Time	SC	Temp	Time	SC	Temp	Time	SC	Temp	Time	SC	Temp
2015	Before Cleaning	11:31	1492	18.1	11:41	1495	18.2	11:49	1492	18.2	11:57	1480	18.4	11:59	1505	18.4
	After Cleaning	12:05	1482	18.9	12:11	1501	18.9	12:15	1504	19	12:22	1495	19.2	12:29	1511	19.2
	RPD (pre vs post cleaning)		0.7%			-0.4%			-0.8%			-1.0%			-0.4%	
	RPD (post clean reading vs 1413 solution)		4.9%			6.2%			6.4%			5.8%			6.9%	

In summary, with calibration only one time at the beginning of the 2015 season, the meters produced reliable data. Difference among meters at the end of the season was less than 3% across salinity levels and difference from calibration solution was less than 7%.