



Modeling development for the LBR Total Phosphorus TMDL

July 30, 2014



IDAHO DEPARTMENT OF ENVIRONMENTAL QUALITY



AQUATOX MODELING DEVELOPMENTS

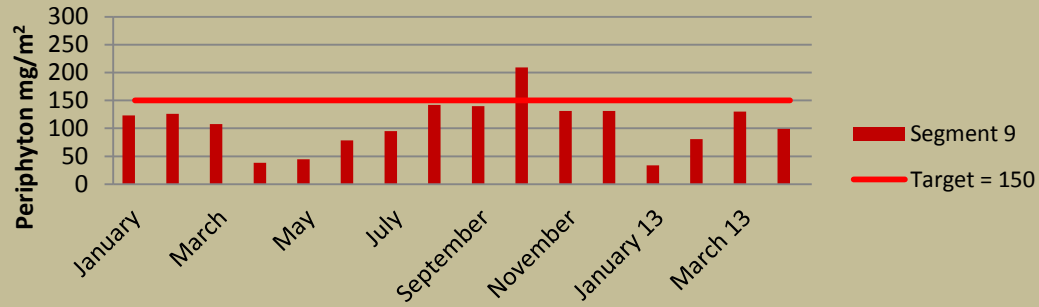
- Model Scenarios Including:
- Facility design flows
 - Facilities on the LBR, direct flow/concentration
 - Facilities on tributaries, flow/concentration ratios
- TP and other commensurate nutrient reductions
 - Facilities and nonpoint sources
- Remineralization rates
- Sensitivity to physical parameters



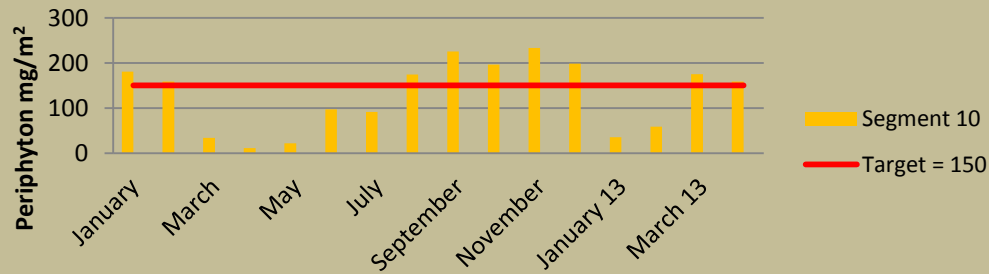
PRELIMINARY SCENARIOS

- Scenario 1
 - Current Conditions
- Scenario 2
 - WWTFs May – September @ 0.1 mg/L TP
 - WWTFs October – April @ 0.3 mg/L TP
 - Tributaries and water @ 0.07
- Scenario 3
 - All sources at 0.07 mg/L TP

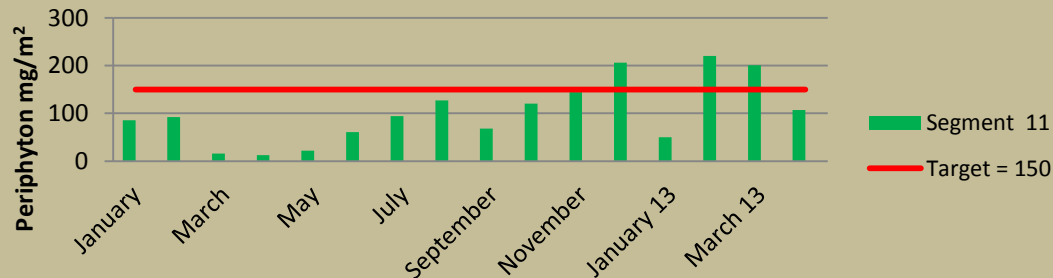
Segment 9 Current Conditions Monthly Periphyton



Segment 10 Current Conditions Monthly Periphyton

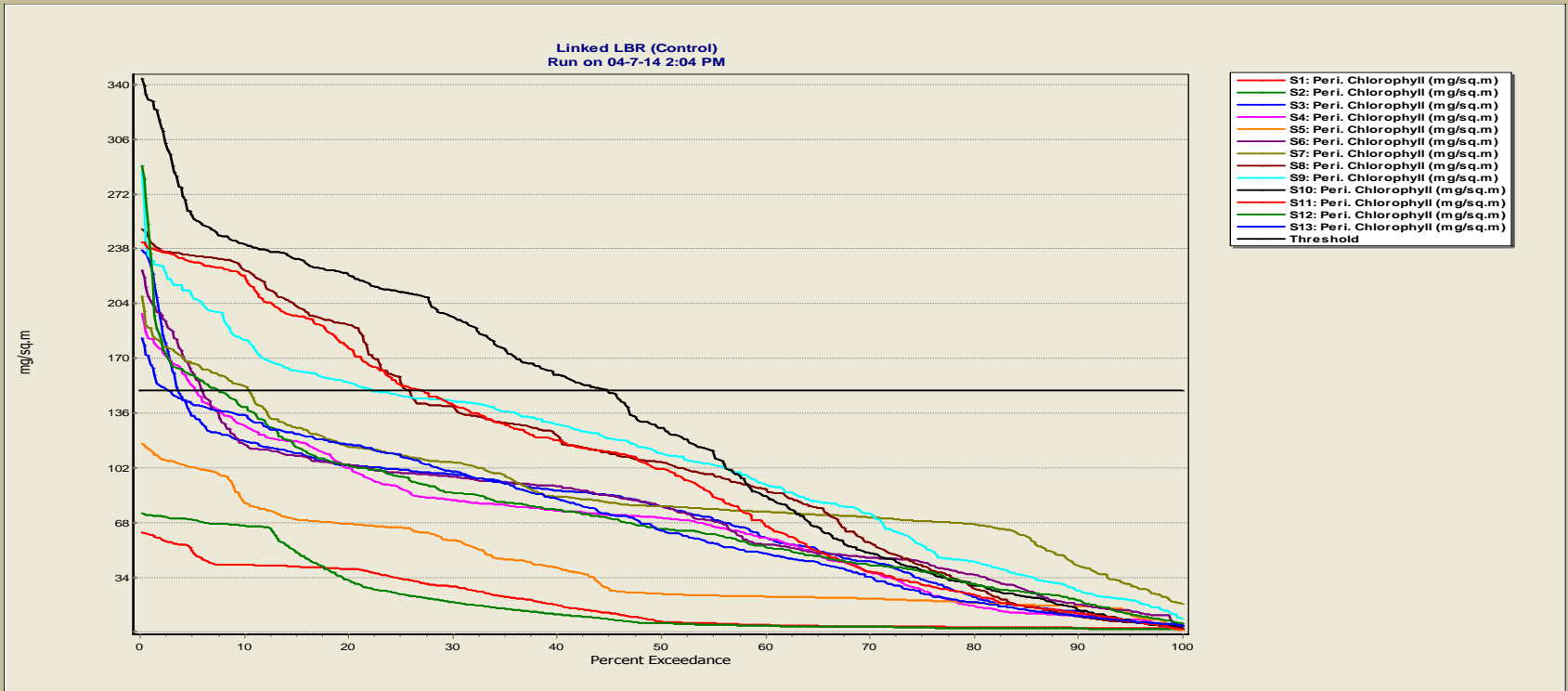


Segment 11 Current Conditions Monthly Periphyton





CURRENT CONDITIONS



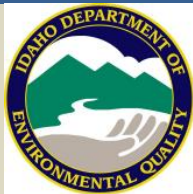
S9: Peri. Chlorophyll (mg/sq.m) is exceeded 15.5% of the time.

S10: Peri. Chlorophyll (mg/sq.m) is exceeded 43.5% of the time.

S11: Peri. Chlorophyll (mg/sq.m) is exceeded 19.7% of the time.

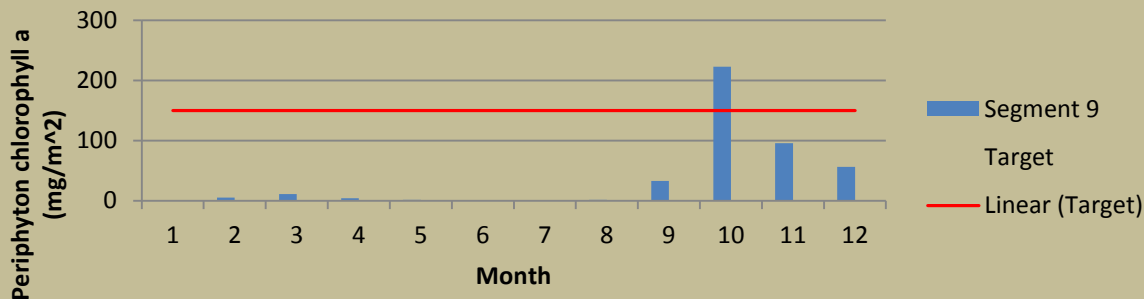
S12: Peri. Chlorophyll (mg/sq.m) is exceeded 6.3% of the time.

S13: Peri. Chlorophyll (mg/sq.m) is exceeded 1.5% of the time.

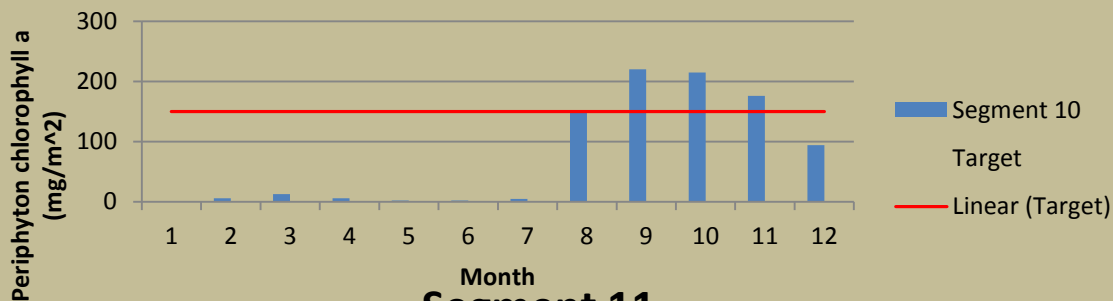


WWTFs 0.1 SUMMER, 0.3 WINTER, TRIBUTARIES AND GROUND WATER 0.07

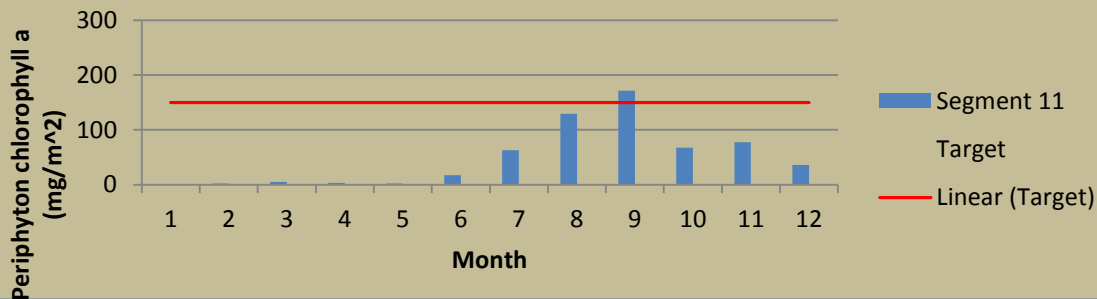
Segment 9

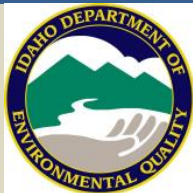


Segment 10

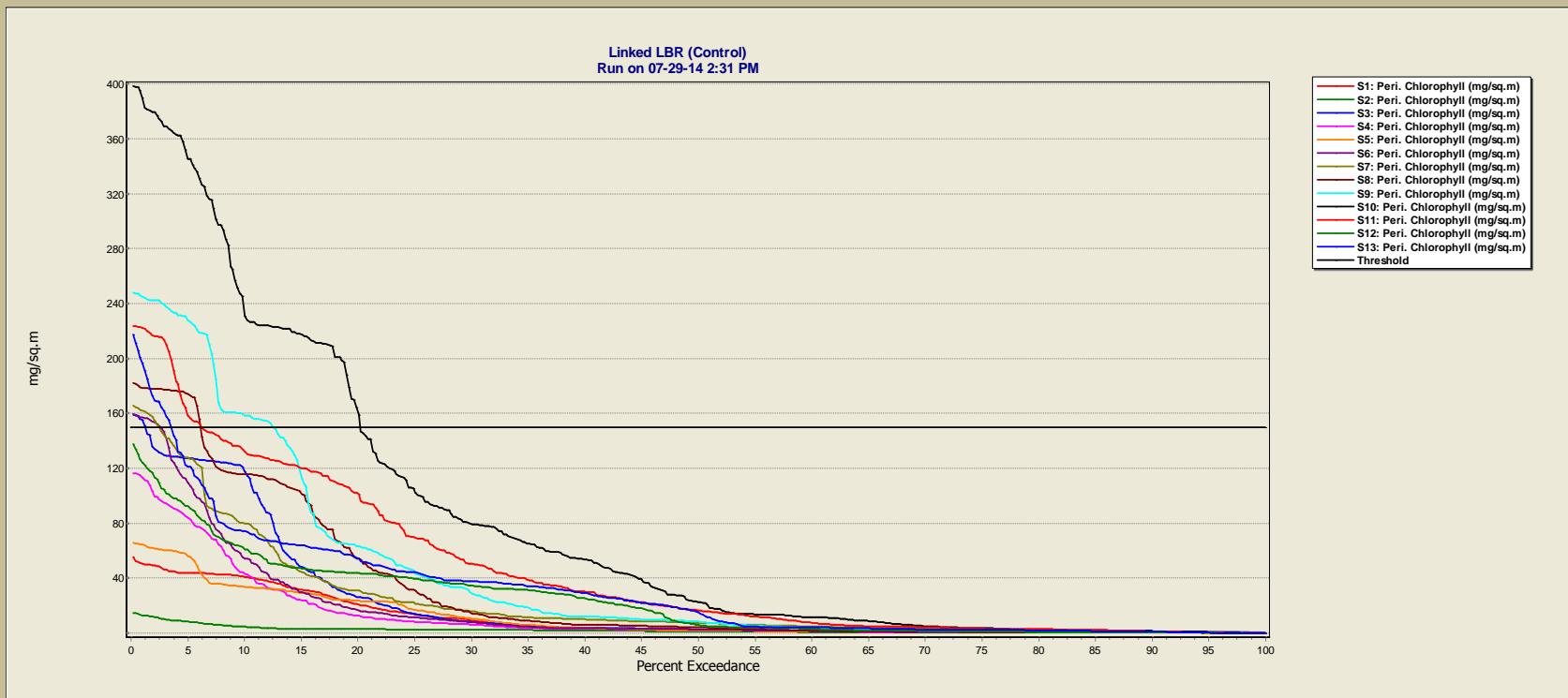


Segment 11





WWTFs 0.1 SUMMER, 0.3 WINTER, TRIBUTARIES AND GROUND WATER 0.07

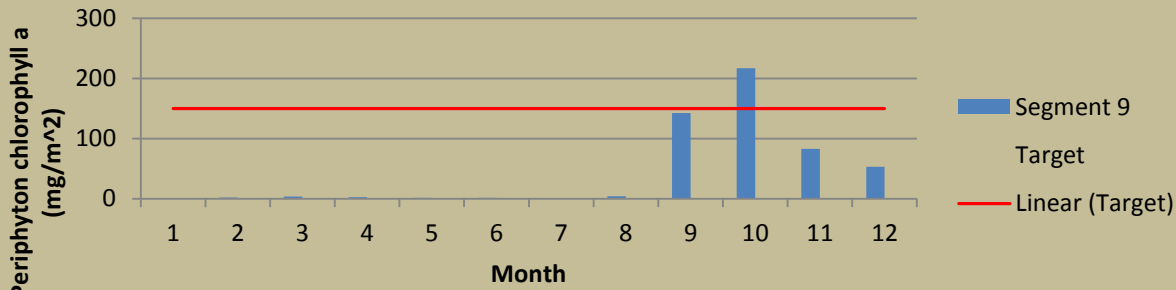


S9: Peri. Chlorophyll (mg/sq.m) is exceeded 12.6% of the time.
S10: Peri. Chlorophyll (mg/sq.m) is exceeded 20.1% of the time.
S11: Peri. Chlorophyll (mg/sq.m) is exceeded 6.1% of the time.
S12: Peri. Chlorophyll (mg/sq.m) is exceeded 0.0% of the time.
S13: Peri. Chlorophyll (mg/sq.m) is exceeded 3.3% of the time.

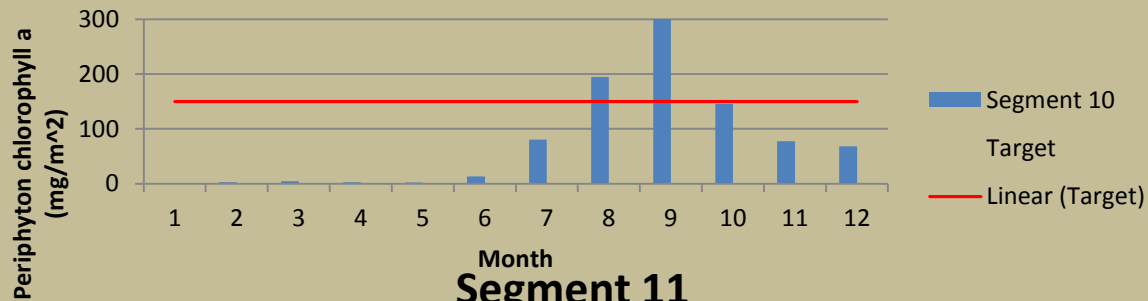


ALL SOURCES 0.07 YEAR ROUND

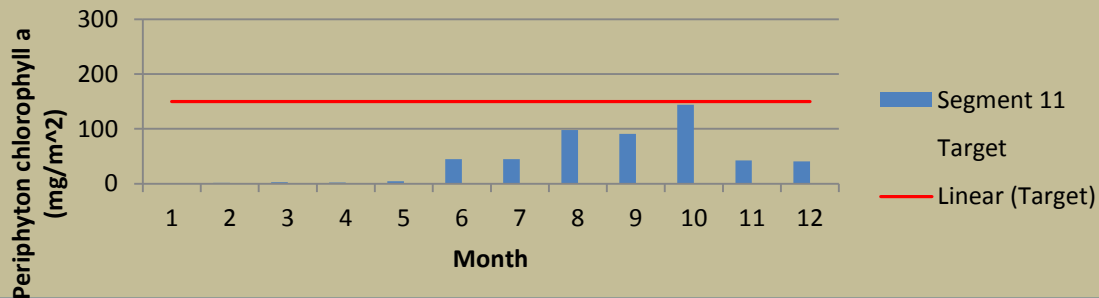
Segment 9

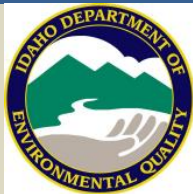


Segment 10



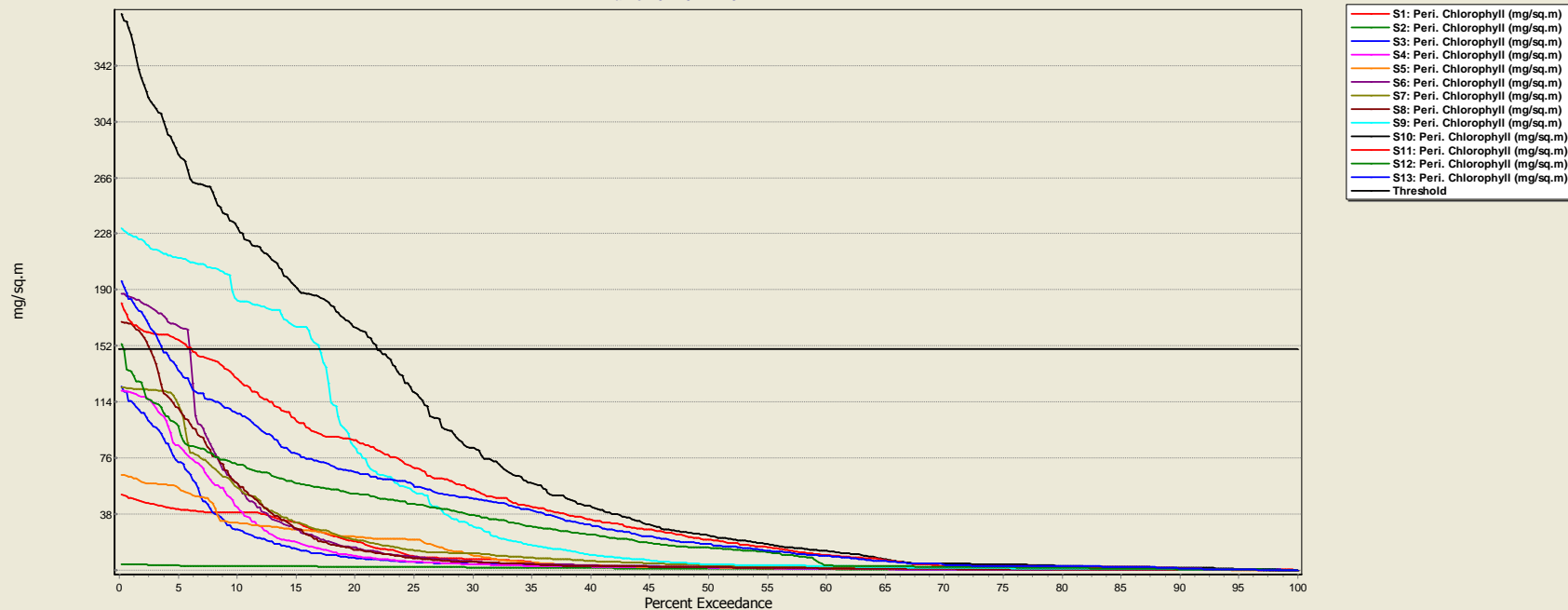
Segment 11





ALL SOURCES 0.07 YEAR ROUND

Linked LBR (Control)
Run on 07-29-14 4:37 PM



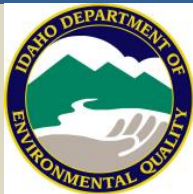
S9: Peri. Chlorophyll (mg/sq.m) is exceeded 16.9% of the time.

S10: Peri. Chlorophyll (mg/sq.m) is exceeded 21.8% of the time.

S11: Peri. Chlorophyll (mg/sq.m) is exceeded 6.1% of the time.

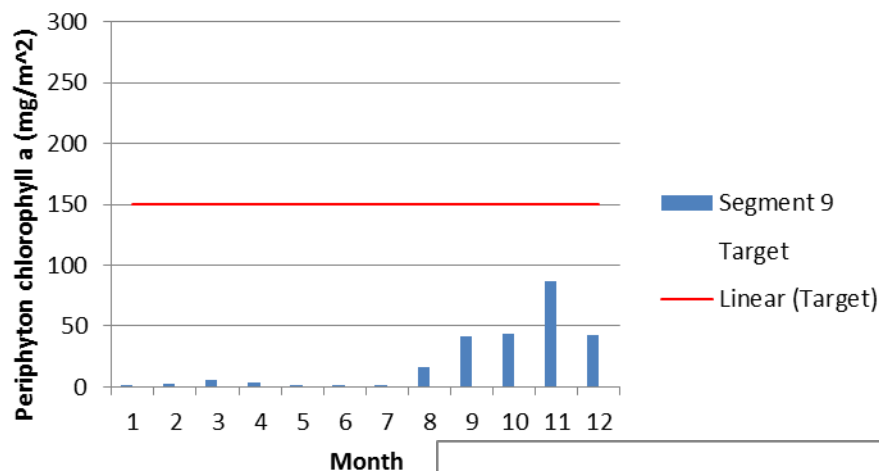
S12: Peri. Chlorophyll (mg/sq.m) is exceeded 0.2% of the time.

S13: Peri. Chlorophyll (mg/sq.m) is exceeded 3.6% of the time.

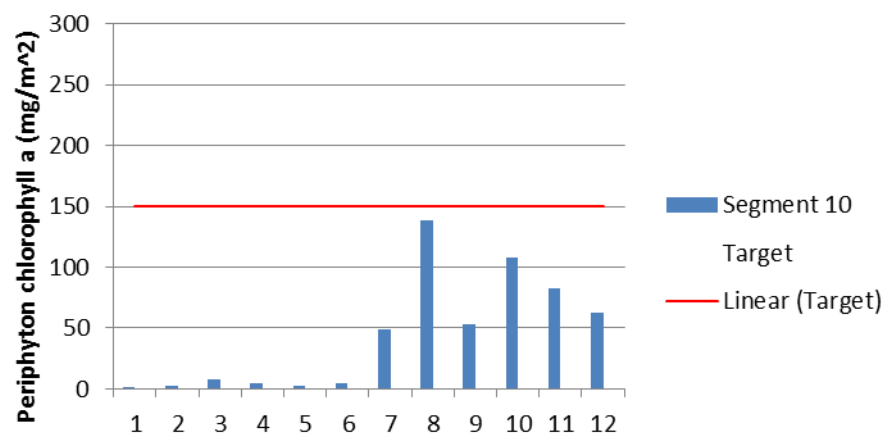


WWTFs 0.1 SUMMER, 0.3 WINTER, TRIBUTARIES AND GROUND WATER 0.07; DEPTH & SHADE

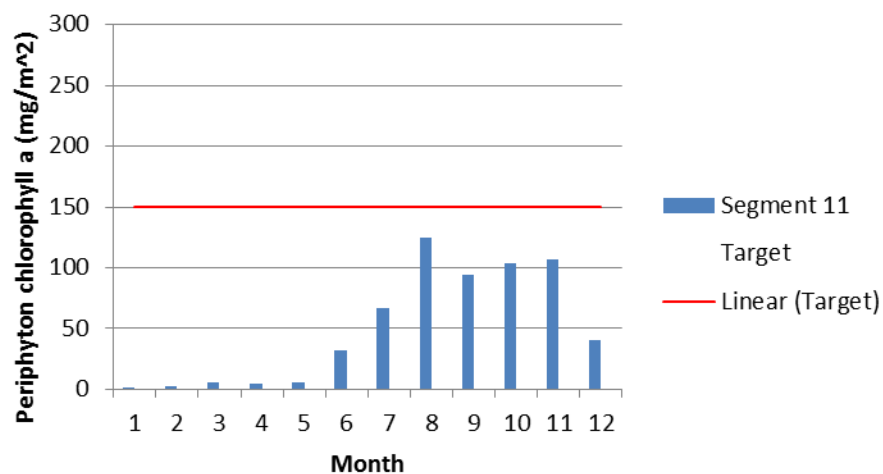
Segment 9

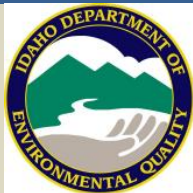


Segment 10

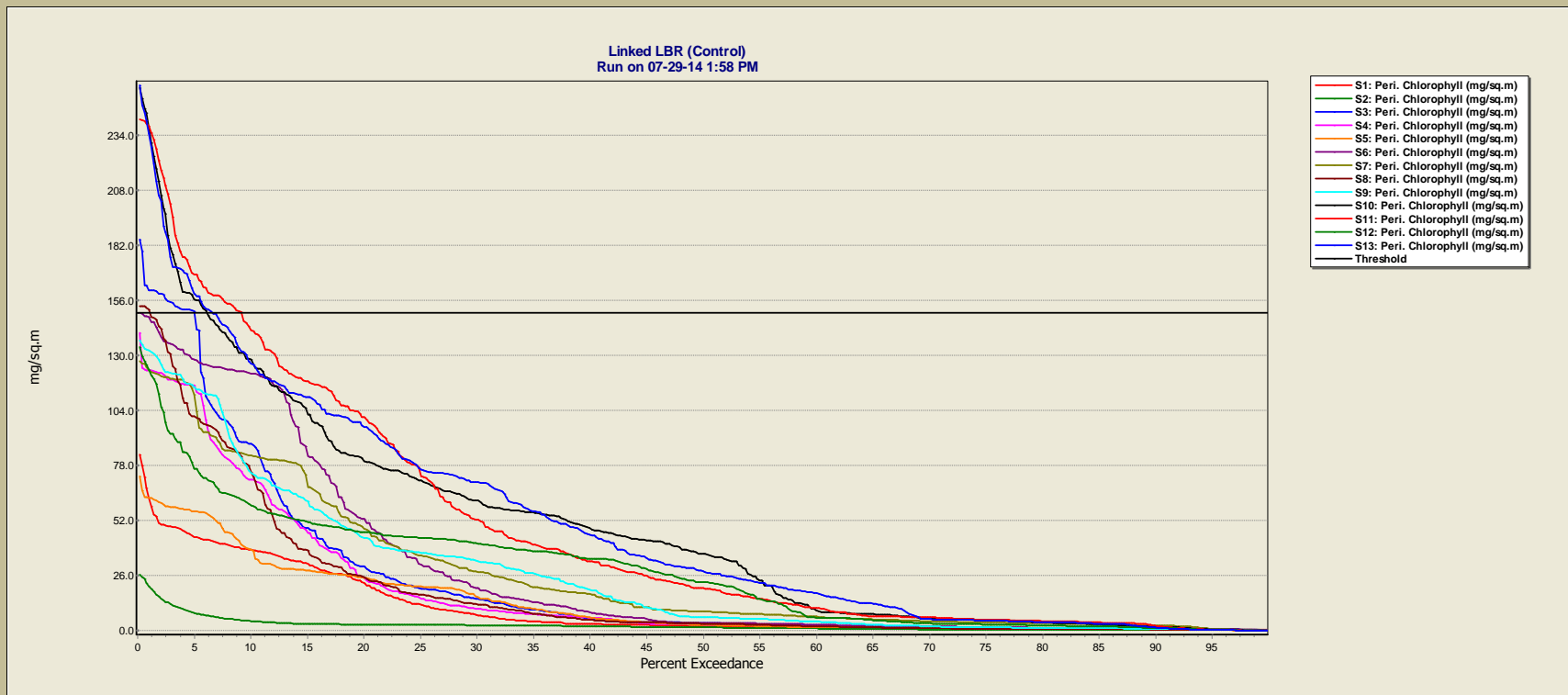


Segment 11





WWTFs 0.1 SUMMER, 0.3 WINTER, TRIBUTARIES AND GROUND WATER 0.07; DEPTH & SHADE



S9: Peri. Chlorophyll (mg/sq.m) is exceeded 0.0% of the time.

S10: Peri. Chlorophyll (mg/sq.m) is exceeded 6.1% of the time.

S11: Peri. Chlorophyll (mg/sq.m) is exceeded 9.2% of the time.

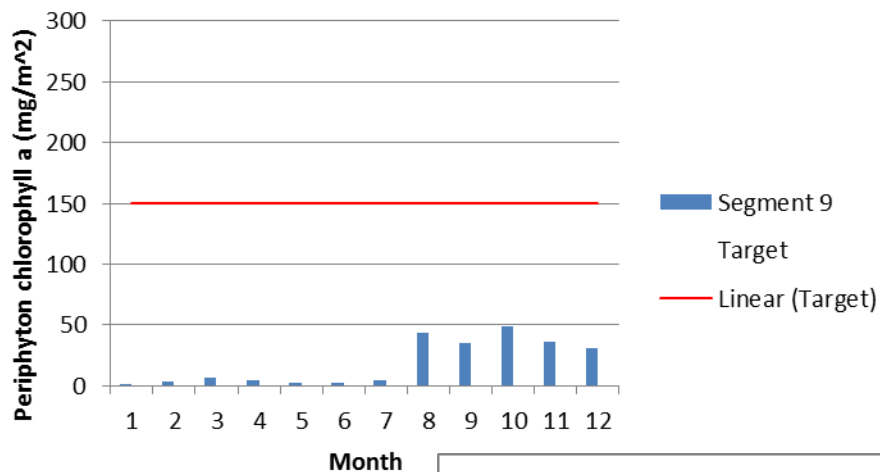
S12: Peri. Chlorophyll (mg/sq.m) is exceeded 0.0% of the time.

S13: Peri. Chlorophyll (mg/sq.m) is exceeded 6.5% of the time.

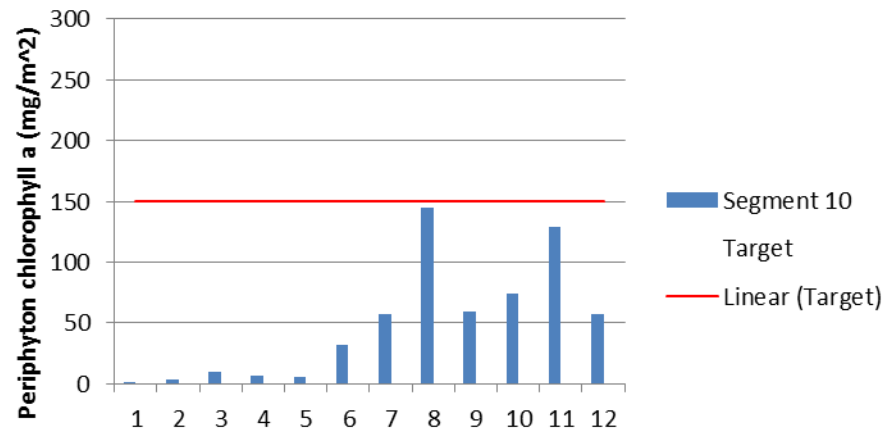


ALL SOURCES 0.07 YEAR ROUND; DEPTH AND SHADE

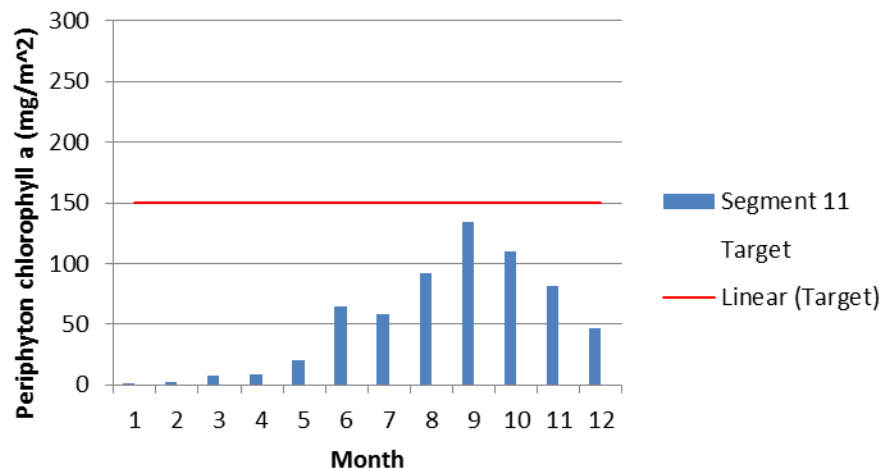
Segment 9



Segment 10

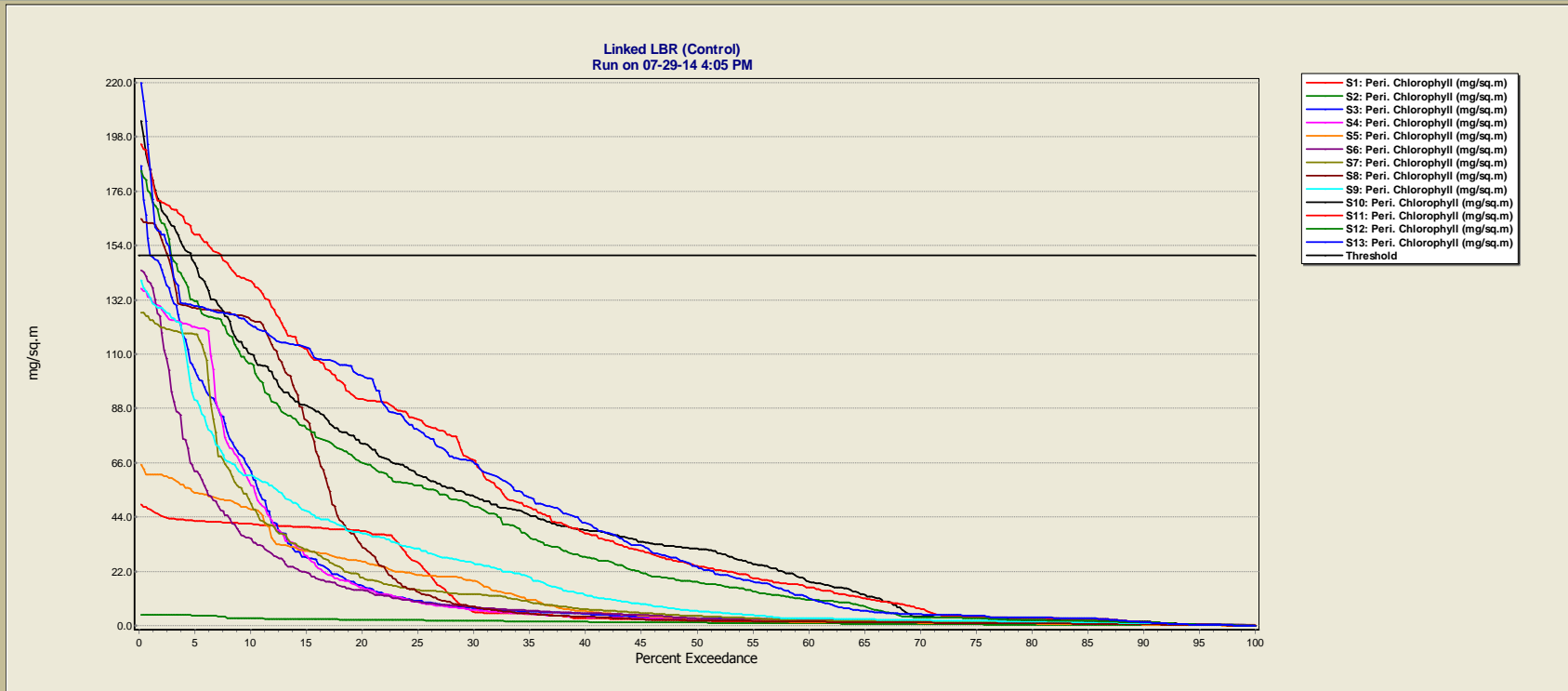


Segment 11





ALL SOURCES 0.07 YEAR ROUND; DEPTH AND SHADE



S9: Peri. Chlorophyll (mg/sq.m) is exceeded 0.0% of the time.

S10: Peri. Chlorophyll (mg/sq.m) is exceeded 4.6% of the time.

S11: Peri. Chlorophyll (mg/sq.m) is exceeded 7.3% of the time.

S12: Peri. Chlorophyll (mg/sq.m) is exceeded 2.7% of the time.

S13: Peri. Chlorophyll (mg/sq.m) is exceeded 2.7% of the time.



OTHER POTENTIAL SCENARIOS/CONSTRAINTS

- Scenario X...
 - WWTFs 0.3 summer, 0.5 winter
 - Other scenarios
- Stormwater??
- Rectify the periphyton target allocations with the load duration targets.



LOAD DURATION ALLOCATIONS TO MEET SR-HC MAY – SEPT 0.07 MG/L TP TARGET

Parma Flow	Background TP Allocations ¹		Projected WWTF and Industry NPDES TP Allocations ²			Projected Aquaculture TP Inputs ³			Tributary TP Allocations w/o NPDES Flows and TP Loads ⁴			Ground Water TP Allocations ⁵			Storm Water TP Allocations ⁶		
	(cfs)	(mg/L)	(lbs/day)	(cfs)	(mg/L)	(lbs/day)	(cfs)	(mg/L)	(lbs/day)	(cfs)	(mg/L)	(lbs/day)	(cfs)	(mg/L)	(lbs/day)	(cfs)	(mg/L)
3268	0.018	317	136.5	0.45	331	42	0.07	16	853	0.070	322	-1284	0.07	-484	107	0.09	52
912	0.018	88	136.5	0.25	184	42	0.07	16	853	0.070	322	58	0.07	22	107	0.09	52
705	0.018	68	136.5	0.20	147	42	0.07	16	860	0.070	324	194	0.07	73	107	0.09	52
624	0.015	50	120.0	0.15	97	34	0.07	13	888	0.070	335	485	0.07	183	107		
620	0.018	60	136.5	0.15	110	34	0.07	13	860	0.070	324	485	0.07	183	107		
383	0.018	37	136.5	0.10	74	42	0.07	16	860	0.070	324	292	0.07	110	107	0.09	52



NEXT STEPS

- Refine the AQUATOX model scenarios
- Identify specific allocations
 - Meet both periphyton and SR-HC targets
- ...Provide draft TMDL to LBWC for review