

Attachment I - Anti-Deg Mass Balance Calculation SGI Northern Tract Quarry - SS- TC- US

Date Sampled	Sur. Elev	Flow GPM	Field pH	Lab PH	Spec Cond	Temp •C	Aik mg/1	Acid mg/1	Iron mg/1	Mang mg/1	Alum mg/1	Sulf mg/1	Susp Solid	T1 Dis Solid
7/13/2016		667.54											7	
8/18/2016		521.46											7	
9/27/2016		335.97											5	
10/26/2016		292.78											5	
12/7/2016		1641.35											5	
12/29/2016		836.93											5	

Average Flow	716.005
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	Iron	Manganes	Aluminum		
Averages	#DIV/0!	#DIV/0!	#DIV/0!		5.666667
Alpha (95%)	0.05	0.05	0.05		0.05
Std Dev	#DIV/0!	#DIV/0!	#DIV/0!		0.942809
Size	127	127	7		7
Confidence	#DIV/0!	#DIV/0!	#DIV/0!		0.69843
Mean	#DIV/0!	#DIV/0!	#DIV/0!		5.666667
Upper Bound	#DIV/0!	#DIV/0!	#DIV/0!		6.365097

Sample Date	Flow GPM	pH/Field	Lab pH S.U.	Spec. Cond. pmhos/cm	Temp. °C	Alkalinity mg/L	Acidity mg/L	Iron mg/L	Mn mg/L	Al mg/L	Sulphate mg/L	TSS mg/L
	10											
								Iron	Manganese	Aluminum		
Average Flow	10						Averages	#REF!	#REF!	#REF!		

Strict Anti-Deg Method

TSS		
$\frac{(Q_{\text{discharge}} \times C_{\text{discharge}}) + (Q_{\text{upstream}} \times C_{\text{upstream}})}{(Q_{\text{total}} \times C_{\text{total}})} =$		
$Q_{\text{discharge}}$	10 GPM	Average discharge flow (from cell B6 in sheet discharge)
$C_{\text{discharge}}$	mg/L	Discharge concentration (factor being solved for)
Q_{upstream}	467 GPM	Upstream flow (harmonic mean flow from StreamStats)
C_{upstream}	5.67 mg/L	Upstream concentration (mean TSS concentration, from cell N10 in sheet US)
Q_{total}	477 GPM	Combined downstream flow ($Q_{\text{discharge}} + Q_{\text{upstream}}$)
C_{total}	6.37 mg/L	Target concentration (upper bound of 95% confidence interval for
Calculation Result (LTA):	39.06	
Resulting Monthly Average:	67.18	
Resulting Daily Maximum:	134.37	
Reresulting Instantaneous Maximum:		167.96