

## Appendix 5: Penn Run TMDL Summary

A Total Maximum Daily Loads (TMDL) assessment was completed in the Penn Run watershed in 2006 by PADEP. Table 1 shows the results of this study. The TMDL report found AMD to be the main pollutant source downstream of MP1 instream sampling location and studied two instream locations as well as three tributaries in the watershed show in the table below. Loadings in Penn Run and its' tributaries need to be reduced by 61 to 100% before an attainable level of metals and acidity loadings are achieved in the watershed. Sampling locations from the TMDL were replicated for comparison in this study.

*Table 1: Table 3 from TMDL report with the component summary of the Penn Run watershed. NA = meets water quality standards, and no TMDL necessary.*

Station	Parameter	Existing Load (ppd)	TMDL Allowable Load (ppd)	WLA (ppd)	LA (ppd)	Load Reduction (ppd)	Percent Reduction %
MP1	<i>Penn Run, upstream of mining impacts</i>						
	Fe	8.0	7.3	0.0	7.3	0.7	9
	Mn	1.3	1.3	NA	NA	0.0	0
	Al	12.6	12.6	NA	NA	0.0	0
	Acidity	0.0	0.0	NA	NA	0.0	0
MP7	<i>Mouth of Unnamed Tributary 44281</i>						
	Fe	52.1	4.2	0.0	4.2	47.9	92
	Mn	21.5	5.0	0.0	5.0	16.5	77
	Al	28.3	1.7	0.0	1.7	26.6	94
	Acidity	442.6	48.7	0.0	48.7	393.9	89
MP13	<i>Mouth of Unnamed Tributary 44280</i>						
	Fe	30.8	0.9	0.0	0.9	29.9	97
	Mn	23.1	0.5	0.0	0.5	22.6	98
	Al	10.2	0.4	0.0	0.4	9.8	96
	Acidity	234.2	1.2	0.0	1.2	233.0	100
MP14	<i>Mouth of Unnamed Tributary 44278</i>						
	Fe	1.8	1.8	NA	NA	0.0	0
	Mn	5.1	0.6	0.0	0.6	4.5	88
	Al	2.8	0.3	0.0	0.3	2.4	88
	Acidity	84.6	5.1	0.0	5.1	79.5	94
MP15	<i>Mouth of Penn Run</i>						
	Fe	327.5	29.5	0.0	29.5	219.5	88
	Mn	161.4	24.2	0.0	24.2	93.6	79
	Al	83.9	17.6	0.0	17.6	27.5	61
	Acidity	1,224.9	147.0	0.0	147.0	371.5	72

Another TMDL study was completed by the Environmental Protection Agency (EPA) in 2010 on the Kiskiminetas-Conemaugh watershed of which Two Lick Creek is a part of. Table 2 shows a summary of the results of this study concerning Penn Run. Percent reductions were significantly lower than the 2006 TMDL study, at 12% for Fe and 13% for Al.

*Table 2: TMDL results of the 2010 study for Penn Run.*

Mouth Subwatershed of Impaired Stream	Stream Name	Metal	Baseline LA (ppd)	LA (ppd)	Baseline WLA (ppd)	WLA (ppd)	TMDL (ppd)	% Reduction
4416	Penn Run	Al	5,751	3,636	41,440	37,234	3,021	13
4416	Penn Run	Fe	15,218	9,468	80,189	74,468	88,354	12
4416	Penn Run	Mn	1,529	914	53,010	49,645	53,221	7