Table 19.--Comparison of Pennsylvania, Maryland and West Virginia reservoirs receiving mine drainage and their effects on downstream water quality--Continued

[mi^2, square miles; acre-ft, acre-feet; ft, feet; mi, miles; mg/L, milligrams per liter; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25° Celsius; min., minimum; max., maximum; med., median]

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Location and lake characteristics								Resultant inflow chemistry for Swatara Creek at Inwood and outflowing chemistry for similiar reservoirs							Observed downstream water-quality characteristics
Reservoir location (years data collected)	Drainage area (mi^2)	Surface area normal pool (acres)	Volume of normal pool (acre-ft)	Mean depth (ft)	Maximum depth (ft)	Shore line (mi)	Surface elevation (ft)		pH	Total alkalinity (mg/L as $CaCO_3$)	Total acidity (mg/L as $CaCO_3$)	Specific conductance (µS/cm)	Hardness (mg/L $CaCO_3$)	Total iron (µg/L)	Total aluminum (µg/L)	Total manganese (µg/L)	
Tygart Lake West Virginia (1973-74)	1,184	1,750	109,600	63	134	31	1,094	min.	5.8	3	2	51	28	200		110	Tygart River Lake
								max.	7.3	12	29	160	102	2,800		360	
								[1]mean	6.5	7	5	95	46	600		110	-Temperature fluctuations are less extreme in the outflow than inflow.
																	-Density currents have resulted in acidic interflows that have flowed 10 miles beore reaching the dam. Bottom withdrawal has helped to mix and dilute acidic overflow and interflows in this deep lake (> 134 feet summer pool) but underflows may travel through the entire reservoir and be released as acid slugs in the outflow.
																	-A lack of biochemical-oxygen demand waste load from upstream municipalities or industries and continuous evacuation of hypolimentic water prevents major development of anoxia. Outflows are therefore well oxygenated.
																	-Water quality in the lake has provided benefits from Tygart Reservoir low flow augmentation nearly 135 miles downstream from the dam. Relatively high iron and manganese concentrations that can occur during autumn turnover are the only reported negative downstream water-quality impacts.
Youghiogheny River Pennsylvania-Maryland (1974)	434	2,840	154,300	54.3	121	38	1,439	min.	6.0	7	2	50	20	<100		20	Youghiogeny River Lake
								max.	7.8	16	9	90	53	330		500	
								[2]mean	6.9	11	5	71	34	200		160	-Water temperature at the outflow respond to minor gate changes, and they respond suddenly rather than gradually as normally expected. Warm summer temperatures at the inflow do not occur at the outflow. Temperatures at the outflow are colder than the inflow in the spring, and warmer in the autumn.
																	-Temperature-density currents with relative high iron values were observed at mid-depth in the lake in late spring and summer. On occasion more than one interflow current at different depths have been observed. Thus far these interflows have not been detected at the outflow.
																	-Bottom withdrawal minimizes summer anaerobic conditions observed most of the length of the reservoir. No significant oxygen demanding waste is discharged from upstream municipalities, and authochthonous production from phytoplankton is not excessive so that the impoundment and outflows are well oxygenated.
																	-A pH depression below the dam may occur when flood waters are detained and later used for neutralization and dilution during low-flow augmentation.
																	-Discharges from outflows need to be discharged carefully because density currents in the lake cause plunging of interflows and underflows about 2 miles upstream from the dam where the thalweg elevation drops sharply.

[1] Mean of (H^+) expressed as pH (U.S. Army Corps of Engineers, Pittsburgh District, 1976)

[2] Unadjusted mean of observed pH values (U.S. Army Corps of Engineers,