Table 8-1
Leachate Water Type at Weeks 1 and 14

Sample	BCS3-PA	HCS-IN	KBF-WV	LKFC-PA	MKSS-PA
Week 1 Water Type	Ca-Mg- SO_4 - HCO_3	Mg-Ca - SO_4	Mg-Ca - HCO_3	Mg-Ca - SO_4	Ca -Mg- HCO_3
Week 14 Water Type	Ca-Mg- HCO_3- SO_4	Mg-Ca - SO_4	Mg-Ca - HCO_3	Mg-Ca - SO_4	Ca -Mg- HCO_3
Calcite Saturated	Yes	No	Yes	No	Yes

The column leaching waters have compositions characteristic of mine waters. Cravotta (2008a, 2008b) sampled about 140 surface and underground mine discharges in Appalachia, including strata that is similar to some of the study samples. Cravotta's data when replotted to show cation/anion composition, shows water much like those in Figure 8-5.

The test produced leachates of different chemical composition as shown by comparing mean (average) leachate composition for the five rocks over the 14 week test. These data are summarized in Table 8-2 for the major elements, pH and specific conductance. Chemical concentrations were compared using analysis of variance techniques (ANOVA). The test compares the mean values of 14 weeks of data among the different rocks. Statistically significant differences occur for each chemical parameter. The ANOVA F-test showed that that the differences are not likely due to chance. Alkalinity concentrations were distinct for each rock, and specific conductance values were divided among four categories. Calcium and magnesium concentration also shows distinct difference, with the BCS3-PA and HCS-IN leaching the highest concentrations of these two elements. These rocks contained the most carbonates. Sulfate concentrations were also divided among several categories and generally follow the total sulfur content of the rocks. Table 8-2 shows that the test produces waters of different composition from both geochemical and statistical bases, and has value for discriminating among the weathering behavior of rocks. Leaching of the trace element zinc was distinct only for the HCS-IN.

Table 8-2
Mean Leachate Composition for Five Rocks(1)

Sample	**pH**	**Alkalinity (mg/L)**	**Specific Conductance**	**Calcium (mg/L)**	**Magnesium (mg/L)**	**Sulfate (mg/L)**	**Zinc (ug/L)**
BCS3-PA	7.23*	368****	1131**	157**	75**	220*	35.2*
HCS-IN	5.12***	76**	3851****	458***	337***	2609***	19862**
KBF-WV	6.99*	427*****	958**	99*	83**	592**	44*
LKFC-PA	6.10**	38*	1464***	109*	100**	95*	283*
MKSS-PA	7.14*	250***	604*	102*	22*	17*	74*

(1) Values followed by the same number of asterisks (*) are **not** statistically significantly different at a probability level of p=0.05. Values with differing number of asterisks **are** statistically significantly different. Means computed from week 1 to week 14 data inclusive. F-test indicates ANOVA model is statistically significant.