Table 6.6 Summary of the before and after changes in the observed BET surfaces areas.

	starting surface area	post leaching surface area A	B	percent change
Kawanwha Black Flint Shale	9.5	9.12	9.07	-4.3
Lower Kittanning Shale	12.4	14.05	13.78	12.2
Houchin Creek Shale	15	12.72	9.87	-24.7
Middle Kittanning Sandstone	2.7	2.87		6.3
Brush Creek Shale	11.1	17.15	17.44	55.8

Shales are mixtures of quartz, feldspars, clays and chlorite plus or minus calcite or dolomite and minor amounts of accessory minerals. They are fine grained with a large, but variable, volume fraction of its constituents made up of phyllosilicates, all of which contribute to themeasured BET surface area which is about a factor of 3 to 10 times larger than limestone or sandstone. Because of the variability in the mineralogical composition of the shales in general, a wider variability in BET surface areas would be anticipated. Shales that have more soluble, fine-grained components will in general present a larger measured surface area after leaching primarily because of the layered structure of the phyllosilicates. In contrast, both sandstone and limestone are more nearly monomineraloic, quartz or dolomite/calcite, respectively. Neither of these minerals have structures that contribute to enhanced surface area.

Previous phases of this program (Hornberger et al., 2003) have looked at other rock types. Figure 6.5 summarized the BET surface areas of all of the rock types tested to date.

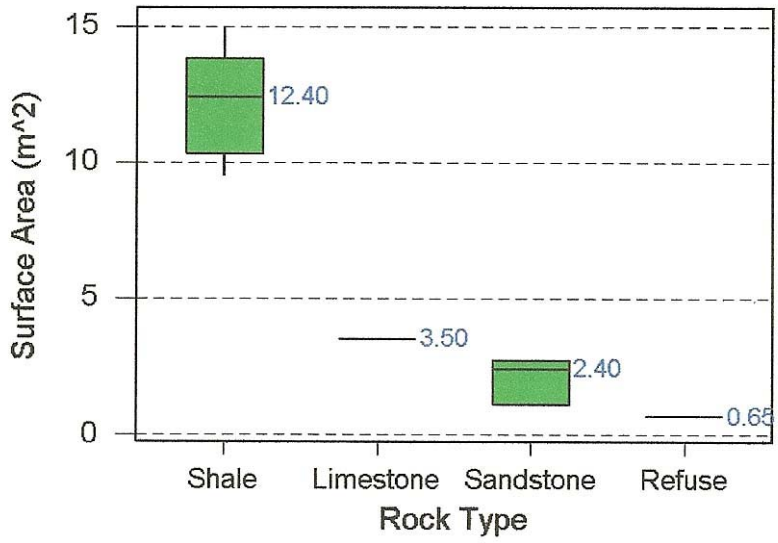

Figure 6.5. Box and whisker plot for BET of different rock types used in this program to date. [Brady, personnel communication]