The purpose of this experiment was to quantify and compare detectable elements, including heavy metals, in soil between three different land use practices associated with the Kentucky State University certified organic High Tunnel complex. This was done using the Olympus Delta Premium DP6000-CC XRF with Dual Beam Mining Plus Calibration and Soil Environmental Analysis Package (Waltham, MA), having the capability to measure quantity in parts per million (ppm) of 32 elements, including heavy metals such as aluminum, along with soil nutrients like potassium and phosphorous. On two sampling dates and using *ex situ* sampling protocol, soil was collected from inside each of the four certified organic high tunnels, from a grassy area outside high tunnel complex and from the perimeter of adjacent parking lot. Using XRF analysis, significant differences in concentrations of potassium, phosphorous, titanium, manganese, rubidium, and aluminum were found in the organic soils of the high tunnels on the second sampling date, though comparatively increased concentrations did not exceed normal ranges or present safety hazards. These results are attributed to the trucking in of non-uniform urban soils upon establishment of the high tunnel complex in the fall of 2012. In future XRF evaluations for comparisons between elemental concentrations of soils in different land use practice, more sampling dates using *in situ* analysis would be necessary to construct baseline quantities that could then be monitored for changes within and between each system over time.