Weathering and storage of forensic soil samples may make a critical difference when it comes to solving a crime. Improper collection or storage procedures can affect the testing results and provide poor or even misleading data to the investigation. It is first important to collect samples with clean tools and then to place them in the proper storage containers. It is best to store dry samples at room temperature. If wet samples are collected it is best that they are promptly either dried or frozen and stored away from sunlight or damp conditions due to the potential for mold or bacteria growth to contaminate results. For this experiment, Fourier transform infrared spectroscopy (FTIR), oxidation-reduction potential (ORP), and soil settling rate techniques are used to compare the results for samples stored under both ideal and sub-optimal storage conditions.