Rock core extracted from the Point Pleasant Formation, Dayton, Ohio, is currently being analyzed for mineralogy in order to better understand paleoceanographic conditions during the Ordovician Period (~488 Mya). For these reasons we have examined a ~40 m long core taken form this region. It was removed from a depth of 155 m to 195 m below the surface. Visible and near-infrared (VNIR) reflectance spectroscopy was employed to non-destructively examine the mineral composition along the core. Sampling was performed at each centimeter along the core to give rise to ~4,000 data points. This is an overwhelming number of points to analyze by X-ray diffraction (XRD), therefore XRD was used on only 16 of these points to confirm the validity of VNIR reflectance spectroscopy.

The main focus of this presentation will be on the powder-XRD sample preparation, XRD phase identification, and the evaluation of the quantitative phase analysis (QPA) from several different methods. Sample preparation was carried out with the aid of a McCrone micronizing mill. All data was acquired on a Scintag X1 diffractometer utilizing Cu kα radiation. Raw data analysis, phase identification, QPA was performed with the aid Bruker’s DIFFRAC.EVA version 3.0 run from a windows XP platform. Quantitative phase analysis was further carried out with the use Dennis Eberl’s program Rock Jock and the Reitveld Refinement Method.