The development of robust dating methods (Cosmogenic Dating & Variance Microanalysis (VMAL)) allows for a more accurate determination of the Ice Springs Volcanic Field (ISVF) in the Black Rock Desert, Utah. ISVF is hypothesized to be a compound polygenetic volcano due to multiple overlapping volcanic flows. This study aims to determine the flows' emplacement sequence and ages in order to place the ISVF in geologic and volcanic history. The study focuses on the Miter/Crescent volcano, which is dated at 660 ± 170 kyr for the Miter/Terrace boundary (CD-02) and 1Ma or younger (Condie and Barsky, 1972), respectively. New ages of 9.4 ± 1.3 to 11.3 ± 1.5 kyr for the Miter/Terrace boundary (CD-02) were found using new techniques. These ages are much older than previous estimates, but still consistent with the geologic history of the BRD. New ages are also supported by a case study focused on the Miter/Crescent boundary. Eight samples from the Miter and Crescent flows were collected for geochemical analysis. A total of 30 samples from the Miter/Terraces were collected, and the VML samples in the Black Rock Desert (BRD) were also collected for comparison. These samples were analyzed at the Purdue PRIME lab for XRF and the College of Wooster. Powders were analyzed using different methods, including Raman, Fluorescence (XF), and cosmogenic dating. This study used XRF, Fluorescence, and cosmogenic dating to determine the flows' ages and emplacement sequence. The results support a new boundary between the Miter and Crescent flows, which is dated to ~11.1 ± 1.4 kyr. This new boundary is consistent with a volcanic pulse at ~11.1 kyr. Varnish layers from the surface of a Miter flow sample agree with these new ages, supporting the hypothesis of a single eruption event at ~11.1 kyr. The new information about the ages of ISVF flows and its multiple boundaries supports the hypothesis that ISVF is a compound polygenetic volcano, placing it in the Nemeth and Kereszturi (2015) classification.