MWH Geo-Surveys International Inc.

Comparison of UAV-borne and Helicopter-borne Gamma Ray Spectroscopy

In July 2022, MWH Geo-Surveys conducted a 3-day experimental UAV Gamma Ray Spectroscopy survey at a property in northern Nevada at the request of a mining exploration company. The test survey was conducted in rugged mountainous terrain. The purpose of this survey was to compare the quality and resolution of the Georadis D230A UAV mounted gamma ray spectrometer with data previously collected through a conventional helicopter-mounted spectrometer.

The spectrometer configuration used was a dual crystal 2inch x 2inch (volume: 104cm^3) BGO detector mounted underneath a heavy lift UAV. The survey was flown at 20m AGL height with a line spacing of 50m and a nominal speed of 5m/s. Data was processed by MWH and presented as; total count, Thorium concentration (ppm), Uranium concentration (ppm), and Potassium concentration (%).

Data comparison maps below show a good correlation between the UAV collected data and the helicopter collected data. Total count values of the UAV detector are significantly lower which is expected due to the significantly smaller detector volume. K, U, and Th concentration values are slightly higher in the UAV data, possibly due to the lower flight height. The UAV maps also show a higher level of detail in all four data sets possibly due to the closer terrain follow height and the slow flight speed.

Figure 1: UAV mounted gamma ray spectrometer

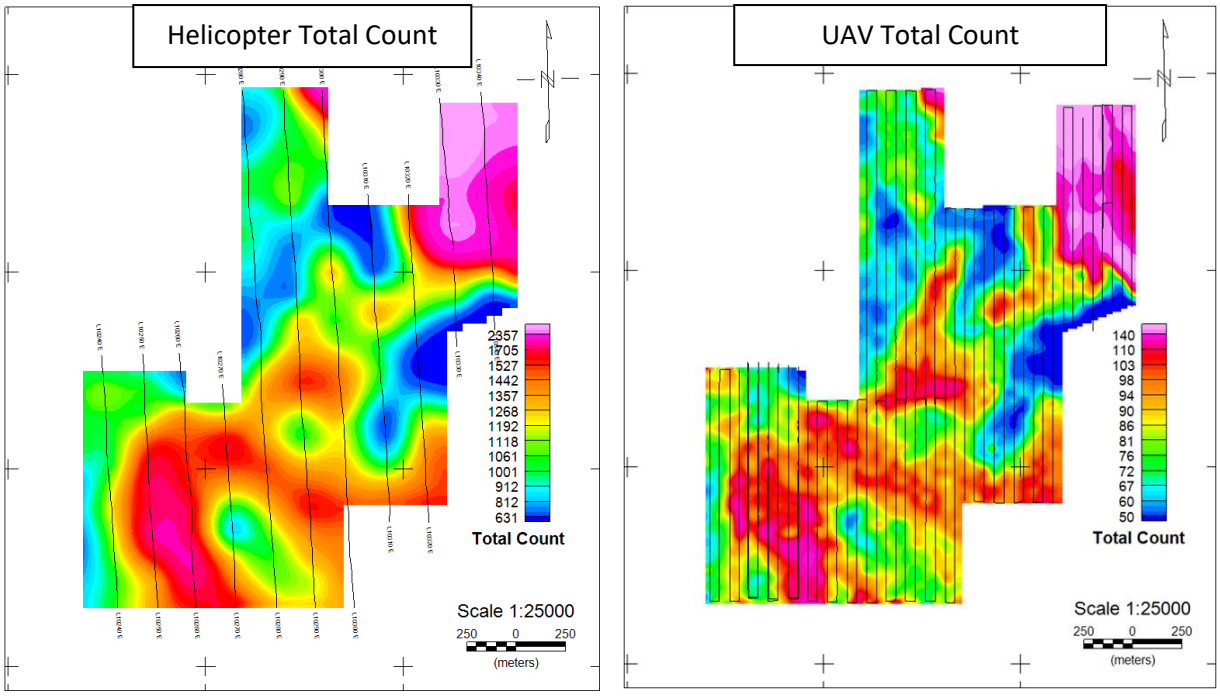

Figure 2: Total counts: Helicopter (left), UAV (right) – despite stronger signal on heliciopter sensor, there is a good correlation

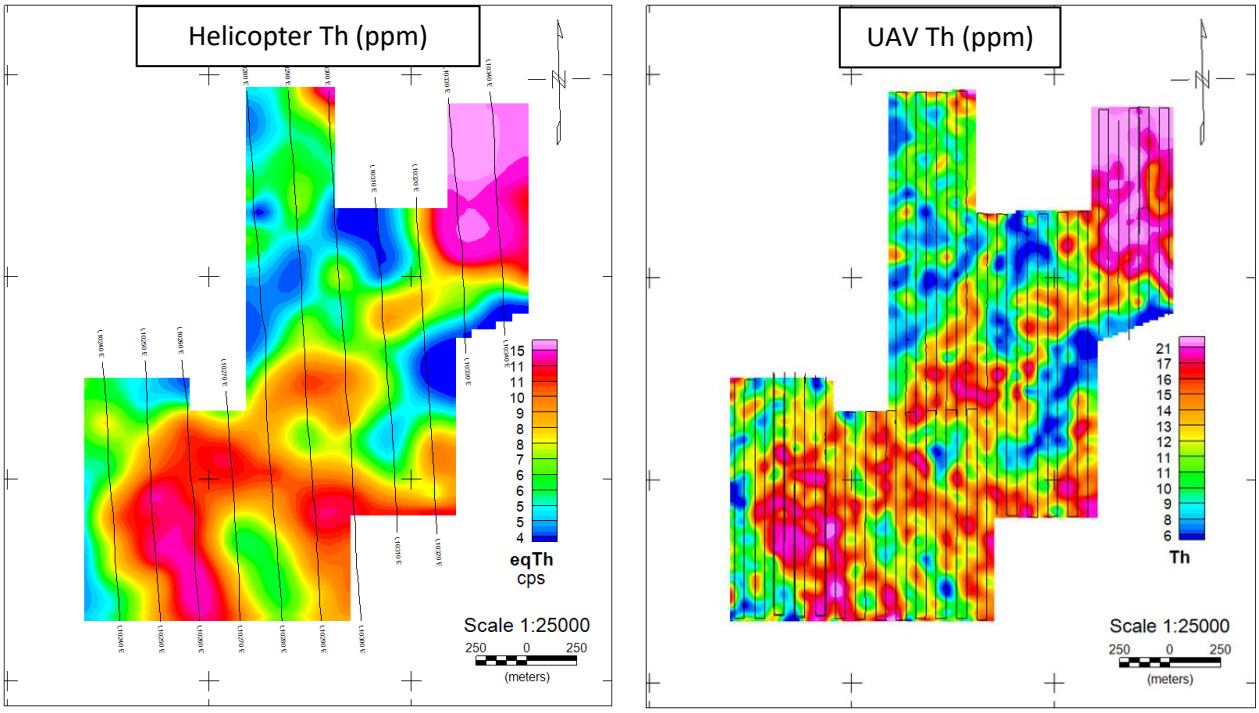

Figure 3: Equivalent Thorium concentration: Helicopter (left), UAV (right) – good match, the UAV shows slightly higher concenration but also looks bit noisy possibly UAV sensor being close to the ground

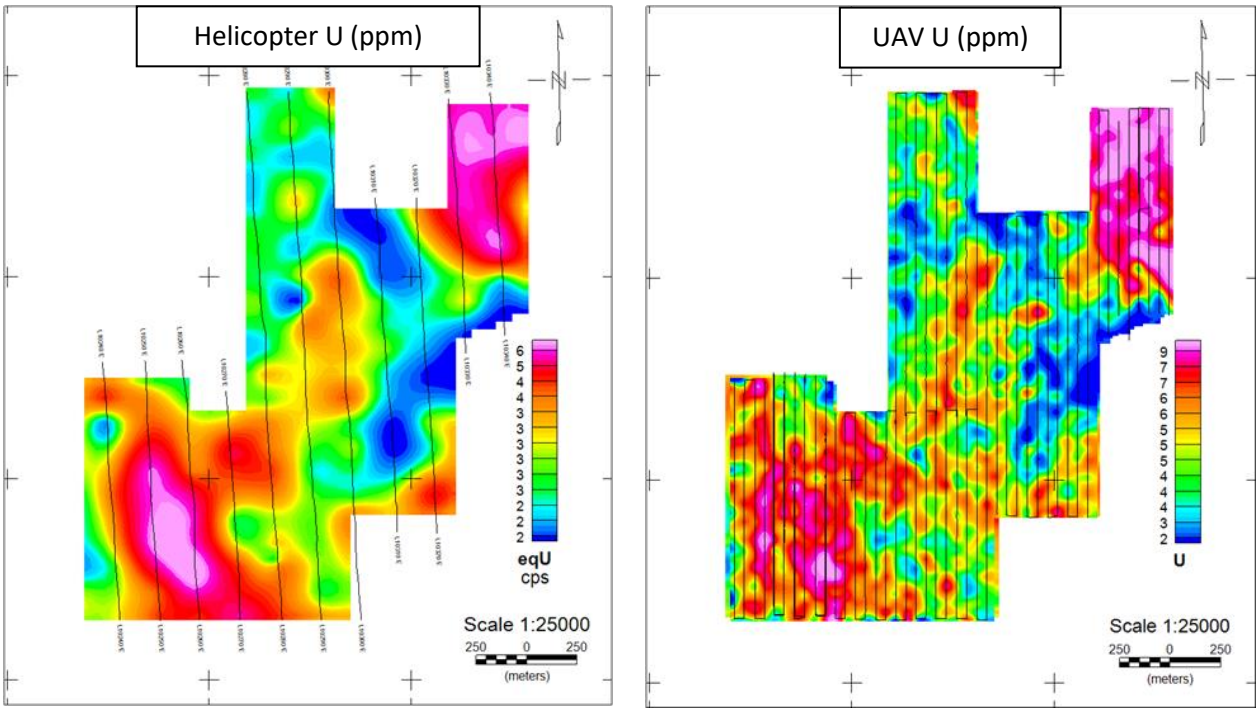

Figure 4: Equivalent Uranium concentration: Helicopter (left), UAV (right) – good match, the helicopter and UAV shows similar U concentration with UAV being detailed possibly UAV sensor being close to the ground

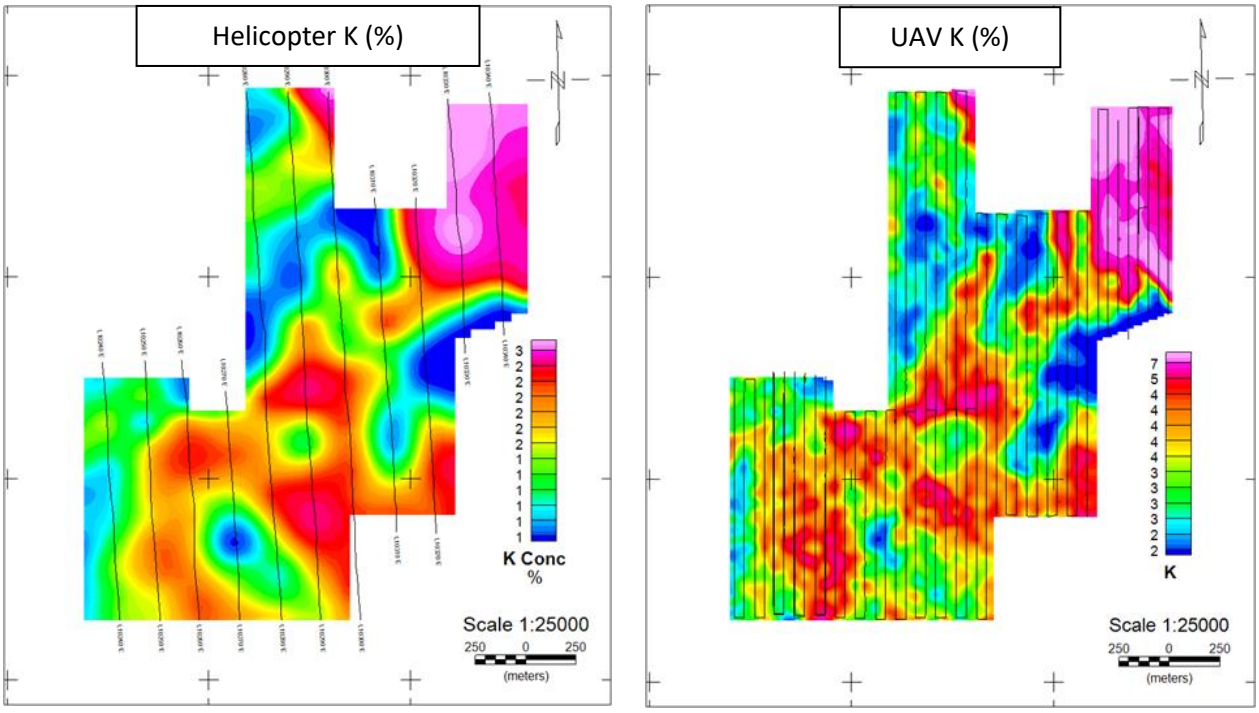

Figure 5: Equivalent Potassium Uranium concentration: Helicopter (left), UAV (right) – good match, the UAV is more detailed and showing higher concetration possibly UAV sensor being close to the ground