

# Remote Sensing

High-quality data on mineral potential in the Leland Lakes area in northeast and Clear Hills region of northwest Alberta was obtained from satellite imagery. The satellite imagery will help detect surface rock exposures with the potential to host a variety of commercially valuable minerals. A report on the key findings in the Leland Lakes area is available for download, and work is underway at the nearby Andrew Lake location. These reports will aid in informing future fieldwork by qualified geoscientists.

The high-resolution imagery was taken by a constellation of specialized satellites. The satellites are equipped with instruments to record light in the visible, near infrared, and short-wave infrared wavelengths. Each mineral has a unique signature based on specific light wavelength absorption and

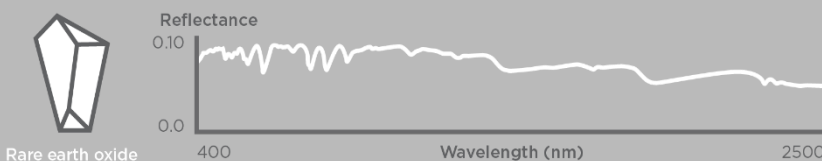
reflection, allowing geologists to identify them. (Like the leaves on a tree that appear green to the human eye because leaves reflect light with a green wavelength.)

AGS geologists gathered data from areas in Alberta with favourable potential for critical minerals, such as the area around Leland Lakes in northeast Alberta near the Saskatchewan and Northwest Territories boundaries. This region is a potential source of minerals, including uranium and rare-earth elements. Data was also gathered for Clear Hills north of Grande Prairie, where a known iron deposit exists; this will help delineate surface occurrences of iron. Data from high-resolution imagery can be used in conjunction with other geophysical and geological data to aid in mineral exploration.

## Highlights

Satellite imagery helps provide information about the vegetation and geology on the land surface, and it is especially helpful to collect data in remote and hard to access locations.

Instruments record light in the visible, near infrared, and short-wave infrared wavelengths. Each mineral has a unique signature based on specific light wavelength absorption and reflection, allowing geologists to identify them.

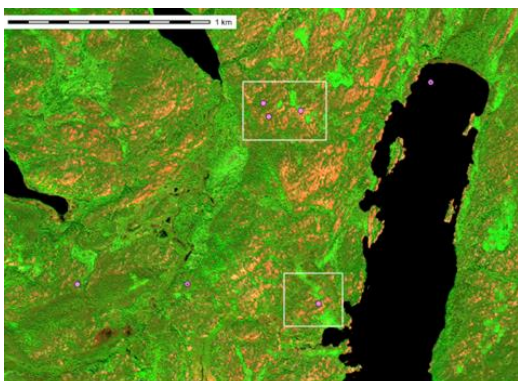
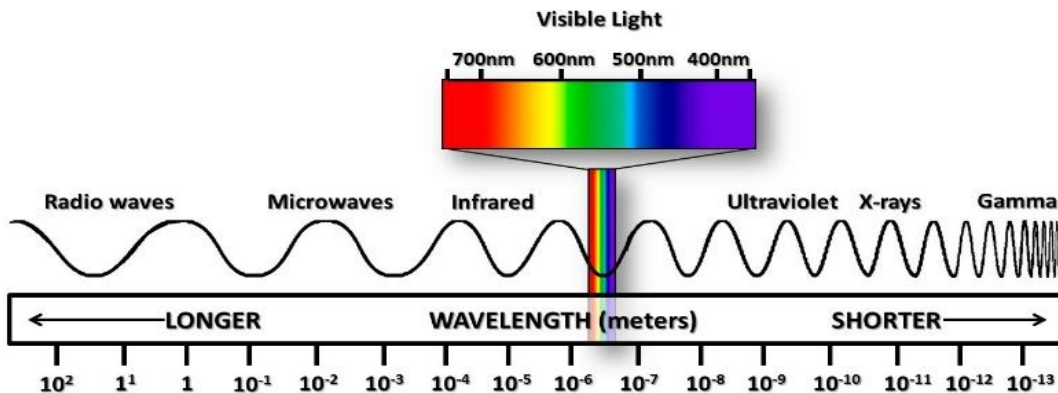


Clear Hills data

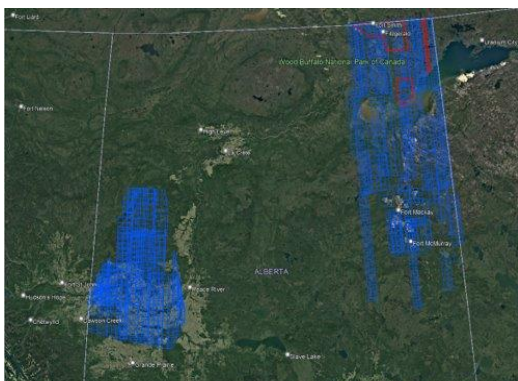


Leland Lakes Area data

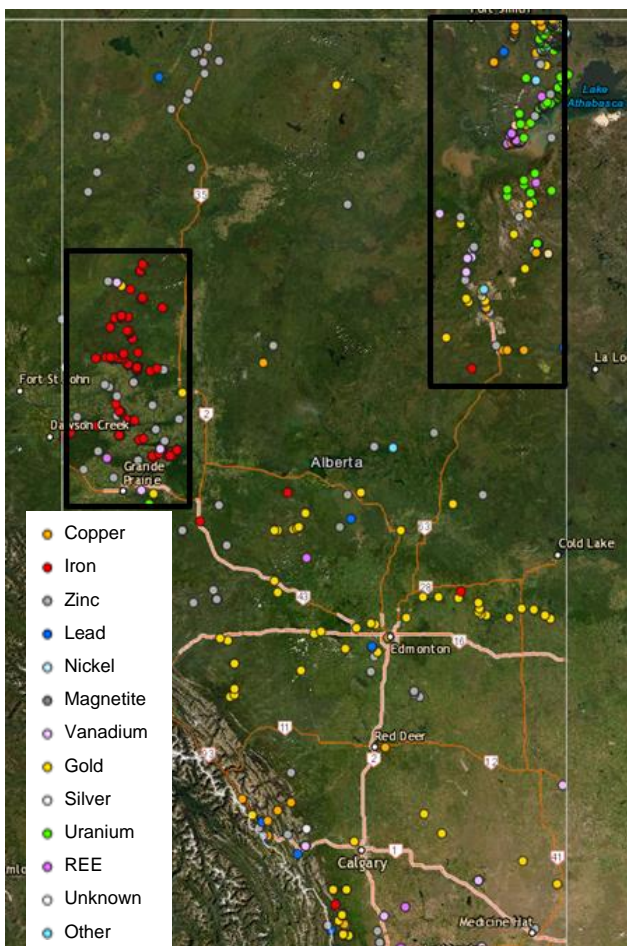
# High-resolution satellite imagery collected from northeast and west-central Alberta.



Recent exploration area (2005–2007) east of Bayonet Lake (not shown), with high uranium concentrations associated with pegmatites and yellow chloride staining.



Areas where high-resolution satellite imagery was collected in 2021 (blue) and 2022 (red).



Areas for satellite imagery (black) were selected based on the metallic mineral occurrences (e.g., uranium, rare earth elements, and iron).