

# Liberty Star Uranium & Metals Corp.: Gold Anomaly, Phase 1 for High Grade Metals & Other Prospects

By Dr. Allen Alper, PhD Economic Geology and Petrology, Columbia University, NYC|August 15, 2016

## Liberty Star Uranium & Metals Corp. trades as LBSR on the OTCBB & OTC Markets

Liberty Star is an exploration and mining development company located in Tucson, Arizona under the leadership of James A. Briscoe, a Registered Professional Geologist, CA & AZ, with decades of experience exploring and discovering mineral and ore bodies in Alaska, Arizona and California. Mr. Briscoe is a porphyry copper deposits expert and has worked closely with Liberty Star board director Dr. John Guilbert for over 50 years.

Dr. Guilbert is the co-developer of the Lowell – Guilbert porphyry copper model, which remains the widely acknowledged standard model describing the structure and shape of mineralization and alteration of porphyry coppers. Mr. Briscoe has also worked with other noted ore finders, ASARCO's (American Smelting and Refining) Chief Geologist Kenyon E. Richard and James Harold Courtright (Mining Hall of Fame members), as well as prolific porphyry copper ore finder J. David Lowell of the Lowell-Guilbert porphyry copper model.



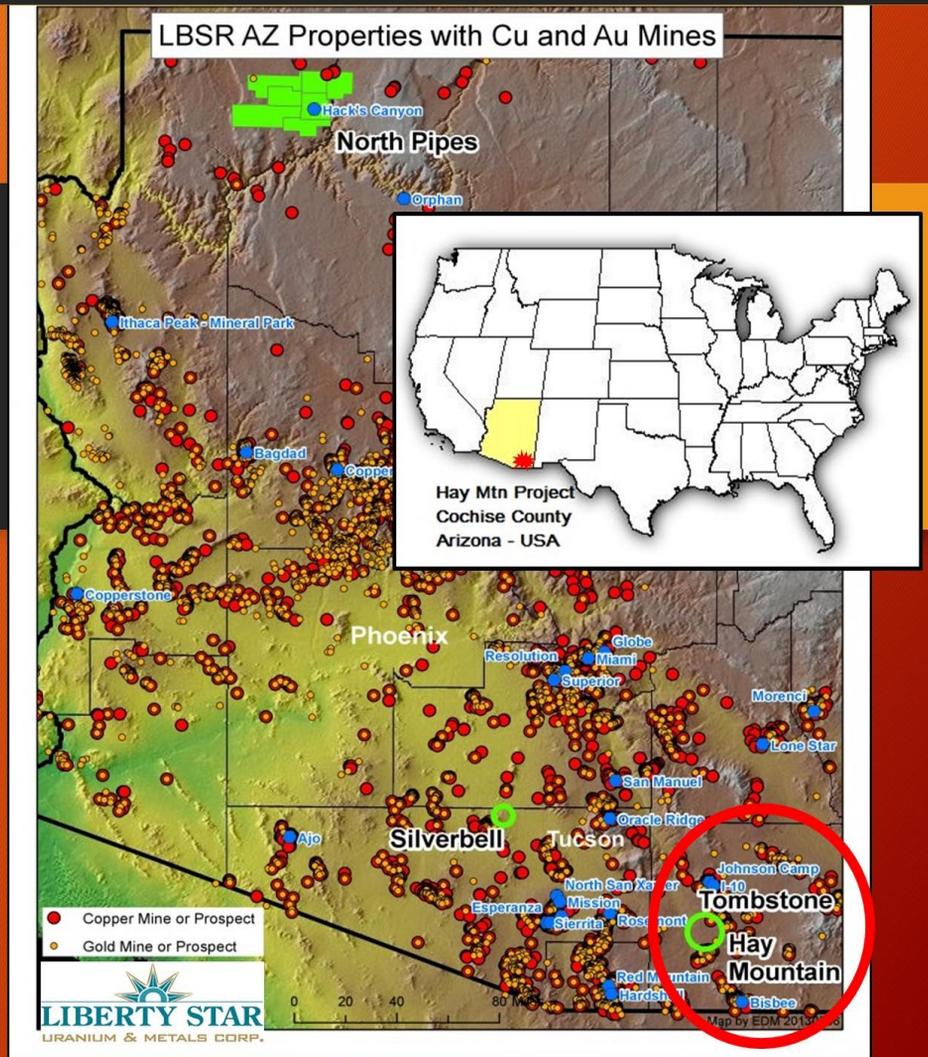
James A. Briscoe  
Professional Geologist, AZ CA  
CEO/Chief Geologist  
Liberty Star Uranium & Metals Corp.

OTCBB: LBSR    OTCPK: LBSR



**LIBERTY STAR**  
URANIUM & METALS CORP.  
Combining Classic Mineral Exploration with  
State of the Art Technology

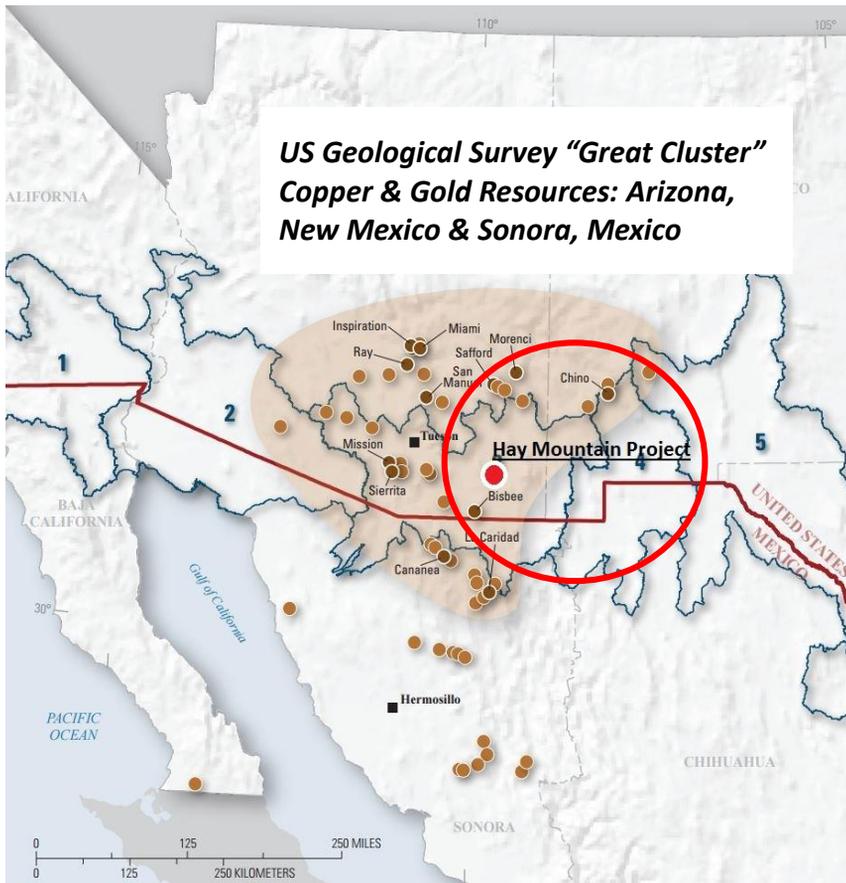
## THE HAY MOUNTAIN PROJECT



The Company's premier property, the Hay Mountain Project, is located in Cochise County, southeast Arizona. It is an important part of the 42 square mile Tombstone Super Project and Area of Mutual Interest. The Hay Mountain Project is a multi-target, multi-metal, variable depth exploration project for porphyry copper, gold, moly and multiple potential by product metals including lead, zinc, manganese, silver, uranium, thorium, and rare earth elements. Surface studies including "Boots on the Ground" (BOTG) geologic mapping and interpretation, geochemistry (rock, soil & vegetation), geophysics of two advanced types air-borne digital magnetics, ZTEM electromagnetics, and x-ray fluorescence analysis using the currently most advanced equipment. The interpretation of all this information and comparison with numerous existing adjacent ore bodies, and other ore bodies known on a worldwide basis, indicate the potential for discovery of a high grade and very large limestone replacement and porphyry hosted copper, gold, and moly ore body. It is of the same type as the nearby Bisbee deposit and other commercially important ore bodies throughout southeast Arizona and elsewhere. Liberty Star plans to engage in exploratory diamond core drilling as soon as possible. Visit the Liberty Star website: <http://www.libertystaruranium.com/>

**Dr. Allen Alper: The rising price of gold is making news again in a big way; tell us a little about gold mining in your part of the State (southeast Arizona).**

**Jim Briscoe:** "Our Hay Mountain Project is situated in a larger zone of copper and gold mining extending from northcentral Arizona, east into southwest New Mexico and south into northern Mexico. The US Geological Survey has recently characterized the area as the "Great Cluster" of Copper Resources. However, the geology of the Great Cluster includes gold among other metals. We have always characterized Hay Mountain and the Tombstone Super Project as exploration properties primarily for copper, gold, silver and moly. Thus, we have renamed the USGS area the 'Great Cluster of Copper and Gold Resources.'"



"The historic Bisbee mining district 15 miles south of Hay Mountain had a healthy gold combined with copper mining enterprise last century. The Copper Queen mine produced nearly 3 million ounces of gold (2,871,786 oz.). Morenci, the Pima Mine and Sierrita mine all report by-product gold from their copper operations. The Johnson Camp mine to the north, as well, is a gold producer. In fact, the Johnson camp started life as a silver and gold operation in the late 1800's. To the north east of Tucson in the Silver Bell Mountains, where I started working under Kenyon E. Richard and James Harold Courtright, gold was not a major player but has been the subject of continuing exploration. To the south of Bisbee in Sonora Mexico (we are about 20 miles north of the Mexican Border at Hay Mountain) gold mining is very healthy. "

Excerpted from Chap. 7 page 158 [USGS Circular 1380, United States – Mexican Borderlands – Facing tomorrow's Challenges through USGS science](#)

“In fact, Sonora Mexico is the largest gold producing state in Mexico. In 2012, the Mexico Geological Service reported three new important gold deposits in the north west of that state that are being worked on now. “

**Therefore, discovery of gold at Hay Mountain would be part of a continuum in the area. You show several maps on your website, libertystaruranium.com with the Hay Mountain gold anomaly. Your geochemical maps are from 2013 and the ZTEM maps are newer. Tell us how the gold anomaly was discovered.**

**Jim:** “1) Roger Newell PhD Dissertation Stanford-only copper, moly zinc, lead and silver.

2) Geochem 2003-2004 Shea Clark Smith, Metals Exploration Geochemistry, his consulting firm – analysis for more than 50 metallic elements including gold. 3) Recent Geochem 2011-2014 Rock Chip, Soil and Vegetation –Liberty Star under Clark Smith direction. 4) ZTEM 2013 with ongoing mapping 2014-2015-simply verifies the center of the ZTEM EM, and MAG anomalies which correspond to the gold-moly-copper anomaly thus defining the porphyry copper system. 5) Recent Niton work Fall-2015, identifies copper oxide, coming from chalcopyrite sulfide mineralization within one to two inches of the surface within and near the central zone of the porphyry system as defined by the above work totaling a two-mile stretch where there is outcrop, and approximately 1,800 analyses for 53 elements. The methodology cannot penetrate through soil or alluvial cover. I thus conclude that in fact the defined mineral body is coming to the surface in this area.

a. We conclude this may be a more shallow occurrence than we had previously concluded, but one that appears to go perhaps to 6,000 feet to the top of old (Precambrian) crystalline metamorphic rocks. The deep anomalies are derived from data gathered by the ZTEM magnetic and electromagnetic helicopter borne surveys.

b. Near surface gold and/or copper oxide: deposits may be present below thin alluvium and may be minable and leached by solvent extraction resulting in early production while developing the potentially giant porphyry at greater depth. We are permitting a small trench approximately 15 feet deep by 50 feet long in the area of the indicated gold center as an initial test of this possibility of reaching bedrock and of course, our Phase 1 drilling will test this possibility.

What the geoscientific work tells us: We are dealing with a porphyry system like numerous others in the USGS ‘Great Cluster,’ but very much larger than most or all. Driving this porphyry system is a large intrusive known as a pluton or batholith of granitic composition. This mass was once molten but now a solidified mass. We identified this particular pluton by the obvious signature indicated during airborne magnetometer surveys about 40 years ago and recent ZTEM analysis, which includes digital three-dimensional magnetometry. This one is approximately 40 square miles. We have slides showing the ZTEM data on our website. We know it is in the copper age range of this area of about 63 million years old. The geochemical anomaly is centered on the pluton, again typical of copper porphyry deposits in the area, and throughout the world.”

**Now you need to find if this anomaly is something more in terms of making a discovery and finding out if it is viable. Will you be able to do that during Phase 1 drilling?**

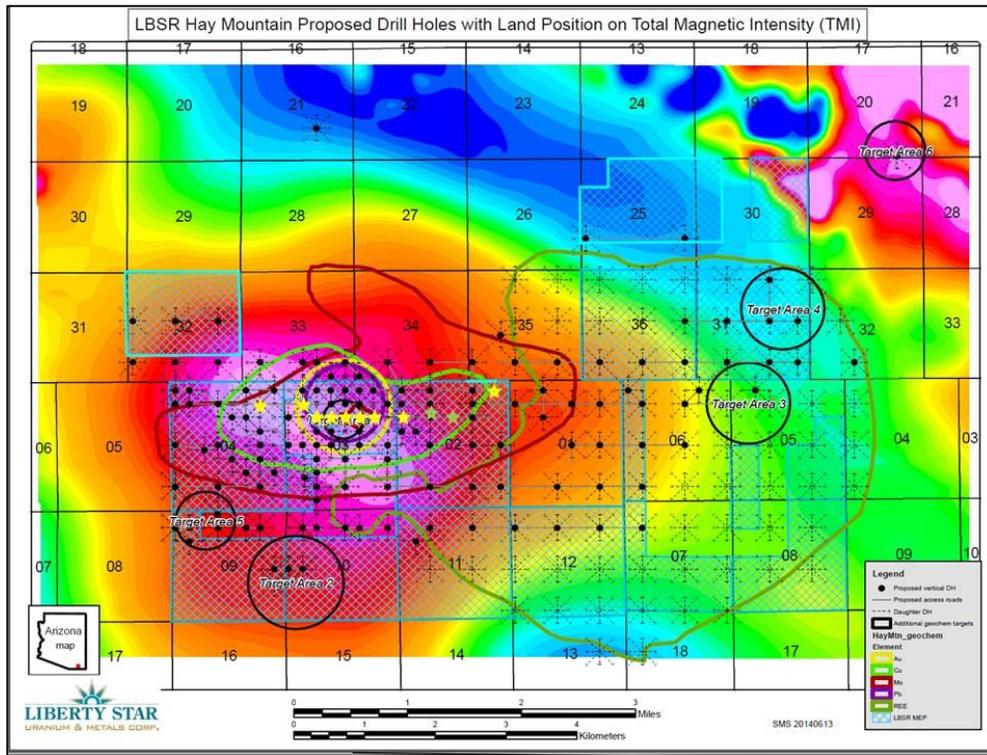
**Jim:** “Yes, we have designed the test to do so. Phase 1 of the drilling plan (totaling approximately 20 thousand feet) at Hay Mountain, is structured in such a way that we will be able to make some accurate measurements about the presence of copper, gold and moly and other metals (assaying for 50+ elements) at various depths and locations. We are ready to commence Phase 1 in terms of having targets picked out and having our paperwork in order.”

“The map shows the proposed drill holes as stars on the anomaly map and a map of the geophysical profiles (cross sections) with the projected holes superimposed on them along with the geochemistry. After completion of the drilling, we will know the direction to take the program. We should see a near surface presence that will increase with the intersection of more favorable host sediments, we know are below; as are known in great detail at Bisbee and other porphyry copper deposits in the “Great Cluster.” The test holes are permitted to a depth of 2,000 feet, but greater depth may be required, or conversely we may drill more shallow holes in selected areas or a combination of depths. We anticipate beginning to define both a large open pit ore body and possibly one or more deep underground minable ore bodies. ZTEM mapping has been very promising in terms of seeing indicators of a deep-seated mineral presence. We conclude gold will be a part of the picture as it has so frequently been throughout the ‘Great Cluster’ area.”

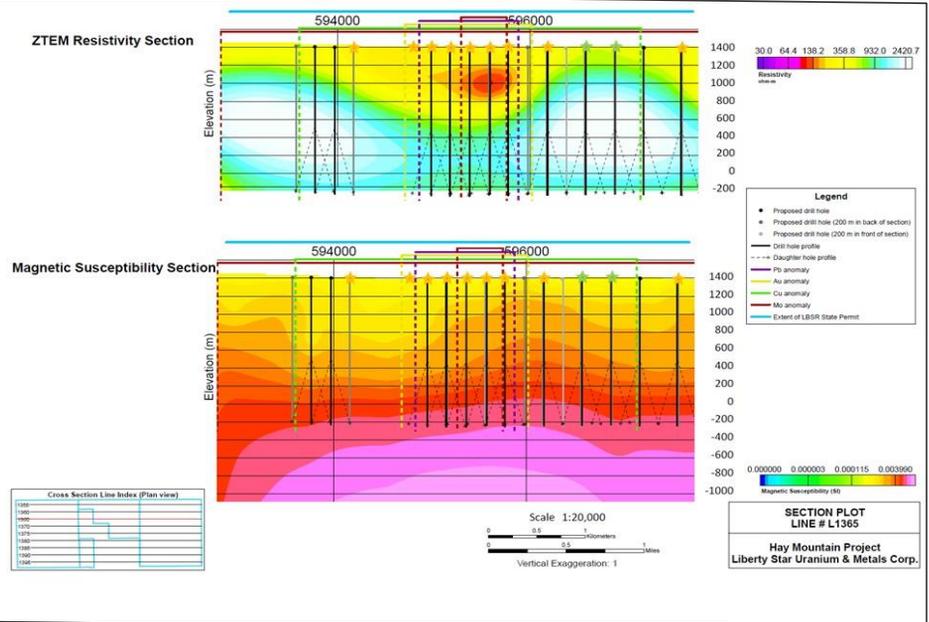
## ZTEM IMAGES

[Click to view enlarged images on our website](#)

Surface mag reflecting pluton at depth with drill targets (indicated by stars), and crossing the geochem contour lines east to west [October 2015]



Cross section on top is EM, Cross section on bottom is 3D Mag to depth. Mag hi reflects pluton [October 2015]



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**Let's talk about grades. You indicate you are thinking you will see sufficiently high grades for a near surface program for copper and byproduct gold, moly and maybe other metals. How did you come to that conclusion?**

**Jim:** "Other projects in the region. Specifically, the nearby Bisbee District reported copper values of from 5% to 30% copper replacement bodies in limestone when it was first opened, as reported by Dr. F. L. Ransome in 1905 in his USGS Professional Paper on the Bisbee mining district. XRF (X-Ray fluorescence) analysis of the gossan copper veinlets at Hay Mountain are in this range and look like outcrops at the entrance to the Copper Queen- Copper Prince mines, at Bisbee. Similar grades in altered and replaced limestones are common throughout Arizona."

**Liberty Star has other Arizona projects and you have mentioned uranium and gold properties elsewhere in the southwest on the Liberty Star website. Can we have a quick summary?**

- 1. The East Silver Bell Porphyry Copper Project (ESB)** is located in Pima County, northwest of Tucson, Arizona within the Silver Bell Mining District. Asarco Mining operates three open-pit mines and a solvent extraction plant (SXEW) about 4 ½ miles west of the ESB property. The Company maintains claims covering a previously unrecognized porphyry copper center, which has been identified by drilling and shows chalcocite enrichment mineralization like that of the Oxide, El Tiro, and North Silver Bell mines operated by ASARCO . The claims currently are within the Ironwood Forest National Monument, established after the claims were staked and have been maintained each year. We are in ongoing low-level conversations regarding this mineral body.
- 2. The exploration-stage North Pipes Super Project** is located in Mohave County, northwest Arizona near the Utah border on the Arizona Strip. The Arizona Geological Survey concurs with our extensive work and notes the Arizona Strip is rich in uranium bearing breccia pipes. While uranium is the most commercially important metal, the pipes contain numerous other metals including copper, silver, vanadium, molybdenum, cobalt and nickel. Exploration at North Pipes is for high-grade uranium ore bodies that can be mined economically by underground methods. This may be one of the largest and highest-grade uranium resources in the world. After a moratorium in mining by the Obama administration, eleven claims have been retained over what geophysically appears to be a very large pipe or perhaps a triple breccia pipe.
- 3. While Hay Mountain is our dominant pursuit now, we have two addition property blocks within the Tombstone Super Project.** The Walnut Creek and Tombstone South projects occupy other geologic structures, suggesting porphyry copper and precious metal targets. Further study and potential drilling programs are recommended for both in professional technical reports issued in 2011.
- 4. There are as many as seven properties for high-grade gold and silver in Nevada and Arizona that we are looking at, and others in California that we know about.** These were producing mines that are dormant and have been since the WW II era Gold Closing Act. These mines closed even as they were producing and still could yield billions in gold and silver, especially given the advances in mining technology. These may be relatively quick- to- production projects."

5. The Arizona Strip and the larger Colorado Plateau host high-grade uranium deposits. Our North Pipes are in northwest Arizona and across the border in southwest Utah are numerous shallow uranium targets. We are working with a venture partner possibly to develop a low cost quick turnaround program. Utah is a mining friendly state where this type of program could work.
6. Lithium – currently the “flavor of the day” metal exploration primarily due to Elon Musk’s Tesla Motors and recently combined Solar City, which uses a newly designed lithium-ion battery. This appears to be groundbreaking technology, and a giant plant is under construction north of Reno, Nevada with Phase 1 of 6 reportedly at completion and battery manufacture underway. We hope this progress continues, and is ultimately successful, as it will be game changing for the USA and the world. Now the whole lithium mine production paradigm seems to be hanging on this success. There are several other battery designs using other metals such as vanadium and others. We have target areas for brine based lithium occurrence but we want to bide our time on this rush. When we talk about the Tesla cars, other vehicles, competitive brands, and solar electric generation, one thing is certain. They will all use amazing amounts of copper, particularly the high performance cars, as Tesla’s models, to move high horse power electricity from the batteries to the powerful electric motors that drive the wheels that drive the vehicles. We will be very happy to supply the copper and ancillary metals that will be necessary to drive these high performance vehicles. As these vehicles replace gasoline and diesel engines, we can be sure the price of copper will move upward to supply the vast needs of this previously unpredicted new type of vehicle, and new use of copper. “

Date & Time: Fri Sep 11 15:06:11 MST 2015

Altitude: 4593ft

Azimuth/Bearing: 152° S28E 2702mils (True)

Elevation Angle: -08.5°

Horizon Angle: +01.3°

Zoom: 1X

## Jim Briscoe with maps and XRF analyzer at Hay Mountain



<http://www.libertystaruranium.com>

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