

## Haman Cu-Au-Ag Project

The Haman Cu-Au-Ag project is situated in the south-eastern coastal region of South Korea. Based on historical drilling, the Mineral Resource Exploration Target is estimated as 7.55Mt @ 1.32g/t Au, 58g/t Ag & 2.04% Cu, with critical metals of gallium, cobalt and tungsten also present. The mineralization is identified as alkalic porphyry Cu-Au.

Korean Metals Exploration (“KME”) is proposing an initial 1,000 tonne per day Sustainable Mining with Drilling (SMD) and Continuous Vat Leach (CVL) milling operation for the Haman Project (330,000 tonnes per annum). Initial studies indicate a 1,000tpd operation will generate annual revenue of about US\$60M. All up mining, milling and administration Operating Costs are estimated to be <US\$100/t, generating annual pre-tax profit of about US\$33M. Capex is estimated to be about US\$50M.

### Corporate Summary

Korean Metals Exploration Pty Ltd has established a portfolio of polymetallic mineral projects in South Korea based on 25 years “in-country” operational exploration expertise. KME is a privately-owned Australian company with a 100% owned Korean subsidiary *Shin Han Mine Inc* (“Shin Han”), which holds the granted Mining Rights over its projects.

KME offers investors the unique opportunity to quickly convert drill-ready historical resources into JORC Mineral Resources at low exploration risk. KME is raising capital for check-infill drilling, establish JORC Mineral Resources, conduct metallurgical and engineering studies, and complete preliminary economic assessments on historical deposits in the Uiseong, Haman and Goseong projects. KME envisages sequentially advancing its projects into production with local domestic Offtake Agreements.

### Country Primer

South Korea is strategically located in the North Asia region and at the eastern gate of China’s “One Belt One Road” development zone. South Korea is a member of the *G12 Group* and a developed, high-income country (*GDP per capita* of US\$35,000) with the fourth largest economy in Asia and the eleventh largest globally.

South Korea ranks 5<sup>th</sup> in “ease of doing business” globally by the *World Bank (2019)*, has a *S&P Credit Rating* of AA Stable, is rated “Low Sovereign Risk” (*Veririsk Maplecroft, 2018*) and has *Free Trade Agreements* with Australia and Canada.

A highly-skilled workforce in a population of 51.4 million (2017) supports the country’s main industries of electronics, telecommunications, automobile, chemicals and steel production. South Korea is the largest global refiner and exporter of zinc, with major base metal refineries at Onsan and Seokpo.

Although the Korean peninsula is a mountainous landscape, an excellent infrastructure network of expressways, tunnels and elevated roads enable rapid commute between the major population centres.

### Historical Mining & Exploration Activities

The Haman mining district is situated approximately 300km southeast of Seoul and was the principal copper and cobalt producing region of South Korea up until the end of World War II and again during 1963-1975.

The Haman district formed part of the *Gaya Confederacy* during 52-532 AD and was the centre of an advanced intricate metal-working “Iron-Age” culture. The Cu-Ag-Ag deposits of Haman would have been important sources for these metals.

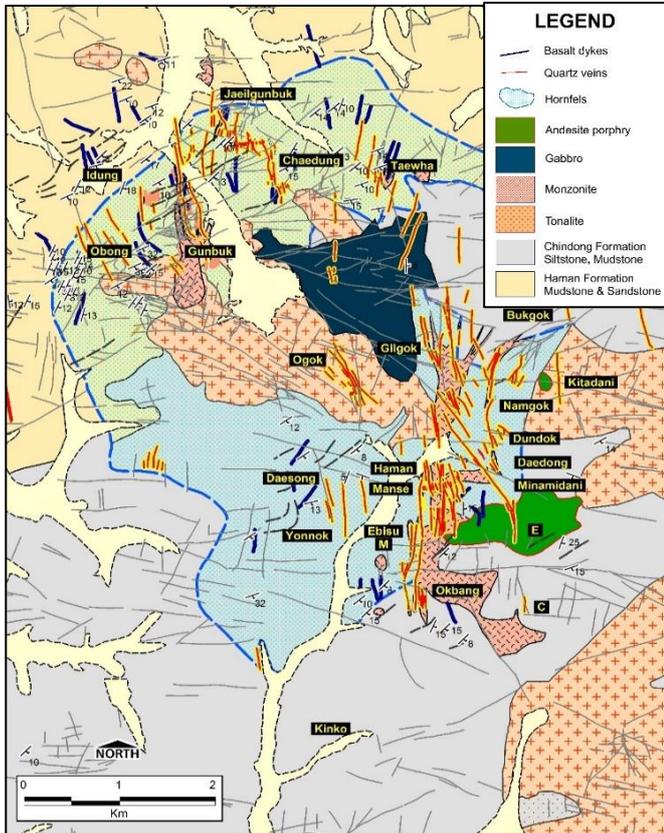
Historical exploration by the *Korean Mining Promotion Corporation* during 1963-1980 included airborne VLF-EM



magnetometer surveys, ground Self-Potential geophysical surveys, soil geochemical surveys and several drilling campaigns.

A total of 93 diamond drill holes (20,076m core) were drilled. Economic widths and grades of Cu-Au-Ag mineralization was intersected in 33 drill holes. Translation of drill logs indicates there are wide intervals of veinlet and disseminated sulphide mineralization surrounding the high-grade veins, but this was never assayed.

There has been no modern exploration conducted on the Haman project since 1980.



## Geology

The Haman mining district lies within the Jinju Sub-basin of the Gyeongsang Basin. The Gyeongsang Basin developed as a back-arc volcano-sedimentary basin during the Cretaceous, coinciding with the initiation of migration of the Japan-Kamchatka volcanic arc from the continental margin of Eurasia. The Gyeongsang Basin was likely adjacent to Kyushu Island, when “Slab Tear” occurred, followed by gradual “Trench Retreat” of the Japanese Islands after 100Ma.

Local geology is dominated by the Hayang Group, composed of siltstone, mudstones, evaporite beds and eolian (wind-blown) “red bed” sandstones of the Haman and Jindong Formations. Deposition into a shallow lacustrine-playa lake occurred under prevailing semi-arid climatic conditions.

A sub-alkaline intrusive complex has intruded the Haman and Jindong Formations, comprising gabbro, tonalite and late monzonite. The tonalite and monzonite are classified as adakites and were dated at 110Ma. Hornfelsing and silicification (“chert”) of the sediments extends out to 1km from intrusive contacts. Andesitic porphyry (Jusasan Andesite) caps ridges and likely formed a contemporaneous volcanic environment.

## Geophysics

A helicopter-borne regional VLF-EM magnetometer survey was conducted by *Sanders Geophysics Limited* (Canada) during 1975 and the data purchased and reprocessed by KME.

Intense “bull’s-eye” magnetic anomalies at Gunbuk and Gilgok correspond to monzonite porphyry intrusions. North-south trending magnetic “ridges” or “tails” correspond to monzonite dykes and mineralized vein structures. Magnetic lows at Idung and Taewha are hosted in Haman Formation and clearly highlight the tonalite intrusion contact. EM anomalies also coincide with this contact zone.

## Mineralization & Alteration

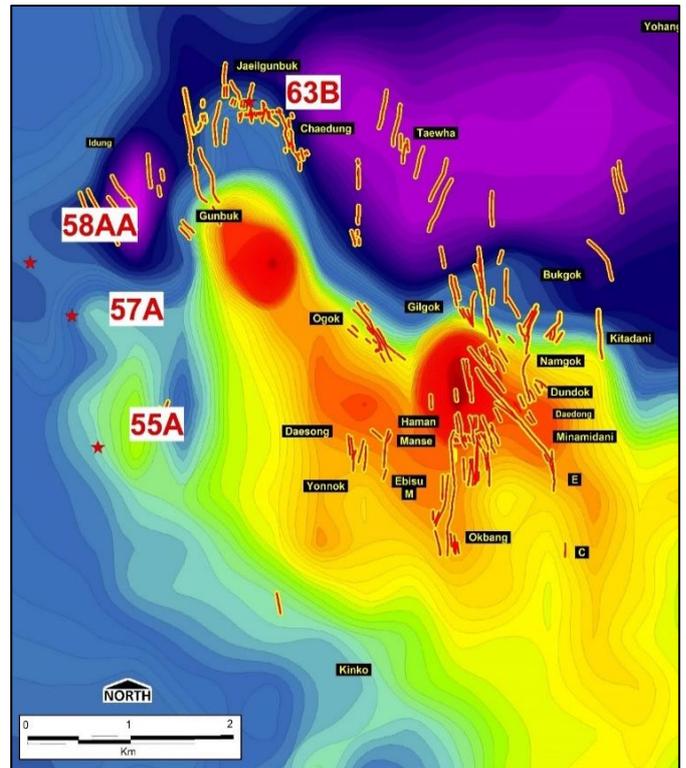
Numerous NNW striking sheeted quartz-carbonate-Fe Oxide-tourmaline-sulphide Cu-Au-Ag ± Ga-Co-W veins, breccias and stockworks are present at Haman. The veins are closely associated with tilted, “pencil”-shaped, monzonite porphyry dykes. Mineralization was dated at 84Ma (Pb-isotopes).

The veins are 0.3-9.0m wide structures with fissure-filling, massive, brecciated and banded quartz, accompanied by variable sulphides, Fe-oxides, tourmaline and carbonates.

The sulphide-rich core consists of chalcopyrite, pyrite, subordinate pyrrhotite and arsenopyrite, with lesser wolframite, galena, sphalerite, molybdenite, native bismuth and electrum. Silver occurs in electrum, hessite, or matildite (Ag-Bi sulphosalt) and significant grades of critical metals of gallium, cobalt and tungsten are also present. The content and distribution of magnetite/hematite (Fe-oxides) and wolframite/scheelite likely reflects the oxidation-redox state of the hydrothermal fluids. Copper was transported as a chloride complex and better Au-Cu grades tend to be associated with magnetite.

The mineralization and alteration styles at Haman is classified as alkalic porphyry Cu-Au. Alteration assemblages recognised at Haman include:

- Central “Calcic Potassic” assemblage (albite, biotite, magnetite, k-feldspar) observed at Oguk, Gilgok,
- “Inner Potassic” assemblage (magnetite-actinolite-tourmaline) and magnetite-pyroxene skarn.
- Outer halo of propylitic assemblage (epidote-chlorite-hematite-carbonate), tremolite skarn and hornfels.
- Upper argillic assemblage (hematite and illite-smectite clays) observed at Oguk, Gilgok-Bukgok-Namgok.



### Mineral Resource Targets

Using the available KMPC historical data, *Senlac Geological Services Pty Ltd* (2018) estimated the preliminary Mineral Resources tabulated below. The combined Inferred Mineral Resources of the Haman project is 7.55Mt @ 1.32g/t Au, 58g/t Ag & 2.04% Cu.

Contained metals are 320,300 ounces gold, 14.2 million ounces silver and 154,000 tonnes copper (340Mlbs). The insitu value (using *August 2017 metal prices*) is about US\$1.64 Billion (US\$218/t), equivalent to 1.3 million ounces gold.

### Inferred Mineral Resources and Exploration Targets – Haman Project<sup>1</sup>

Mine / Deposit	Tonnes (t)	Grade AuEq (g/t)	Grade Au (g/t)	Grade Ag (g/t)	Grade Cu (%)
Gunbuk	2,996,675	7.73	1.89	59	3.27
Oguk	436,535	15.29	7.59	20	4.77
Gilgok	620,194	2.73	0.86	10	1.12
Bukgok-Namgok	1,027,381	0.95	0.25	7	0.39
Dundok	243,787	N/A	N/A	N/A	N/A
M Vein	949,781	0.77	N/A	N/A	0.49
Manse	404,250	11.13	N/A	577	2.26
Ebisu-Haman	868,003	2.20	0.24	11	1.17
<b>TOTALS</b>	<b>7,546,556</b>	<b>5.27</b>	<b>1.32</b>	<b>58</b>	<b>2.04</b>

#### NOTES:

AuEq calculated using August 2017 metal prices of:  
 Au = US\$1284/oz  
 Ag = US\$16.94/oz  
 Cu = US\$2.93/lb.

N/A = No Assay. Gold and Silver were not routinely assayed. No grade is assumed, but significant grades can be expected based on unsampled mineralised veins recorded in drill logs.

### Exploration Targets

In addition to the high-grade Cu-Au-Ag resource targets tabulated above, bulk-tonnage sheeted stockwork and disseminated alkalic porphyry Cu-Au style Exploration Targets have been identified from translation of historical

drill logs at Gunbuk South, Jaeilgunbuk, Oguk, Gilgok, and Ebisu. These Exploration Targets have supporting coincidental magnetic “bullseye” and Self Potential “negative conductor” geophysical anomalies. The exploration potential could be very significant.

### Sustainable Mining with Drilling

KME is proposing an initial 1,000 tonne per day Sustainable Mining with Drilling (SMD) operation for the Haman Project (330,000 tonnes per annum). SMD is an innovative and new mining technology which uses conventional Pile Top RCD drills to extract ore from steeply-dipping narrow veins.

Each stabilizer is fitted with skid-arms, which expand out to fit tight against the drill hole wall.



The Pile Top RCDs are manufactured in Korea and can be fitted with drill bits of 1.0-4.5m diameter. The Reverse Circulation drilling method (RCD) is used with airlift in water to lift the -2mm drill cuttings as a slurry to surface.

Dilution is minimized using customized Ground Penetrating Radar (GPR) technology to “see the vein” and Directional Steering Tools are used to keep the Drill Bit aligned on the vein structure. The Waste:Ore ratio is expected to be <1:1.

The Drill Bit can be fitted with specialized Cutters designed to match rock hardness and strength. The “Weight on Bit” and “Penetration Rate” can be varied by adjusting rotation speed and adding lead weights to the Bottom Hole Assembly.



The cuttings slurry can be fed directly via pipeline into pre-concentration plant, or the mill, without the need for any primary crushing. Online analysis and ore sorter methods can be used to increase the ROM feed grade into the mill.

Pile Top RCDs are capable of drilling holes down to >200m depth, with inclinations from vertical to -70°. The drill string components are of modular design and suitable for any depth and hole diameter up to 4.5 metres. Drilling depth is increased by simply adding 3m drill pipe runs.

No personnel or equipment are underground making the operation very safe.

A Pile Top RCD fitted with a 2-metre diameter drill bit is typically capable of excavating about 7 tonnes per hour (0.85m/hr). The Operating Costs of SMD is estimated to be about 50% of conventional underground mining methods.

Stabilizers are added every 3 runs to add stability to the drilling process and maintain hole azimuth and inclination.

Pile Top RCDs offer the flexibility to select high-grade zones within vein structures to help establish the mining operation and achieve rapid payback. SMD also enables optimal blending of ROM feed from other drill sites and deposits.

<sup>1</sup> Cautionary Statement: These Mineral Resources were estimated by *Senlac Geological Services Pty Ltd* (2016). The data is Historical and so does not comply with current NI-43-101 or 2012 JORC Code reporting requirements.

### Milling Operation

An integrated automated 1,000tpd milling operation is envisaged for Haman project, sequentially involving Gravity Concentration and Dense Media Separation followed by Continuous Vat Leach to electrowin gold-silver dore and recover a high-grade covellite copper concentrate.

The grade and density of the Pile Top RCD Cuttings slurry can be monitored in Real Time by On-Line Analysers (*Elemision & Gekko Olga*). Gravity Concentration of the <1mm stream is expected to recover gravity recoverable gold and tungsten (*Gekko InLine Pressure jig and Falcon Concentrator*). Dense Media Separation (*Sepron Condor*) can be used on the <2mm-1mm stream to concentrate sulphides. New Sorter technologies could be included and magnetic sorters could potentially be used to recover a magnetite concentrate.

These fully-automated pre-concentration technologies effectively "Up-Grade" the mill feed and enable the early rejection of waste to minimize dilution. Rejected waste can be returned immediately to the RCD hole void as backfill.

The pre-concentrated sulphides are ground in a ball mill and then fed into the 50tph Continuous Vat Leach (CVL) plant (*Innovat Mineral Process Solutions*).

### Environmental Best Practice

KME has identified several mining and processing technologies to help achieve environmental best practice.

No tailings dams are required on site, as CVL tailings and waste are returned back into the void left by the previous drill hole. Settling of waste is facilitated by the 'columnar settling' effect of the void and further enhanced by clarifiers. De-toxified paste tailings from the mill is environmentally safe and can be pumped as paste backfill into the hole void.

SMD eliminates the need for Primary Crushing. No personnel or equipment are underground making the operation very safe and reducing energy consumption. SMD is quiet and does not generate dust, reducing emissions.

### Project Infrastructure

Site infrastructure is excellent, with National Grid power, sealed road access and water available. The town of Gaya (population 63,435) lies 9km to the NE and has all modern services and amenities.

Haman county government is seeking to attract new projects to support the local economy, which is based mainly on agriculture, logging and some heavy industry. The Haman

### Conceptual Financial Analysis

KME desk-top conceptual financial studies were conducted on a 330,000tpa SMD mining and CVL milling operation for the Haman Project. Studies indicate a 1,000tpd operation will generate annual revenue of about US\$60M. Operating Costs of mining, milling and administration are estimated to be <US\$100/t, generating a pre-tax profit of about US\$33M. Capex (incl working capital) is estimated to be about US\$50M.

South Korea has a Corporate Tax rate of 10-22% and VAT of 10%. There are no Royalties on minerals.

The CVL consists of ROM feed hoppers and belt conveyors, two large rectangular tank/vats, freshwater tank, reagent tank, head tank, rotating bucket wheel excavator, discharge hopper, wash-filter screens, and a discharge conveyor/paste pipeline (depicted below). The CVL is a low cost, compact-sized plant, simple to operate at low operating cost.

Glycine leaching of fine-ground chalcopyrite concentrates is enhanced using mildly-elevated temperature (50-60°C), and alkaline pre-oxidation. Solar cells mounted on the CVL Plant roof to a solar-heating system, heat the water and glycine, backed up by gas heating system during winter.



Rehabilitation of each SMD drill site can commence rapidly once the drill moves onto the next site.

Water is continuously re-cycled in both the Pile Top RCD mining and CVL milling processes.

The CVL Leach solutions are contained within vats to ensure minimal risk of leakage or accidental discharge. The CVL plant can use glycine amino acid, a non-toxic, readily available, low-cost lixiviant that can be easily re-cycled. Energy consumption of the CVL is very low (water pumps).

Both SMD and CVL are very eco-friendly mining and milling methods and are expected to be well-accepted by the local community and government agencies.

project is expected to generate about 80 new direct jobs, as well as offer several supporting-services contracts for local business.

Major base metal refineries are located at Onsan, about 60km to the east of Haman and easily accessible by Expressway. A cobalt refinery is located at Chinju, only 17km to the northwest. KME envisages negotiating Offtake Agreements with these refineries.

Under the *Foreign Investment Act* ("FIPA"), the First 3-5 years of Income are Tax-Free and the next 2 years is 50% Exempt. Losses can be Carried Forward for up to 10 years. There are also Tax Credits on Job Creation. Under FIPA, there is guaranteed repatriation of approved capital.

