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The Shasta Epithermal Gold-Silver Deposit: From Exploration to Mining

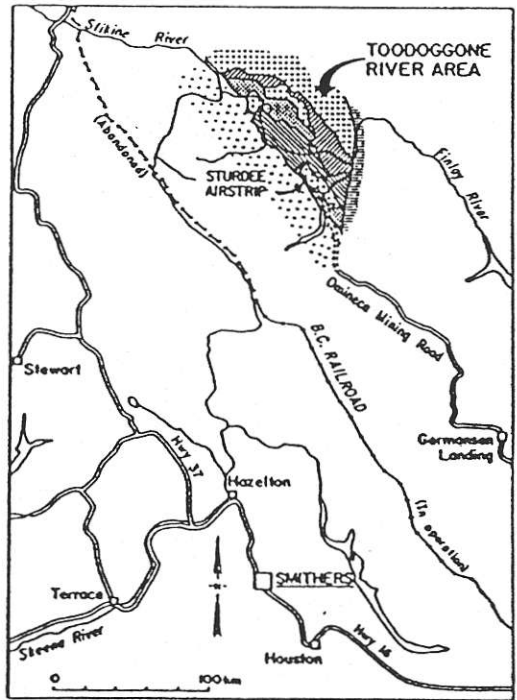
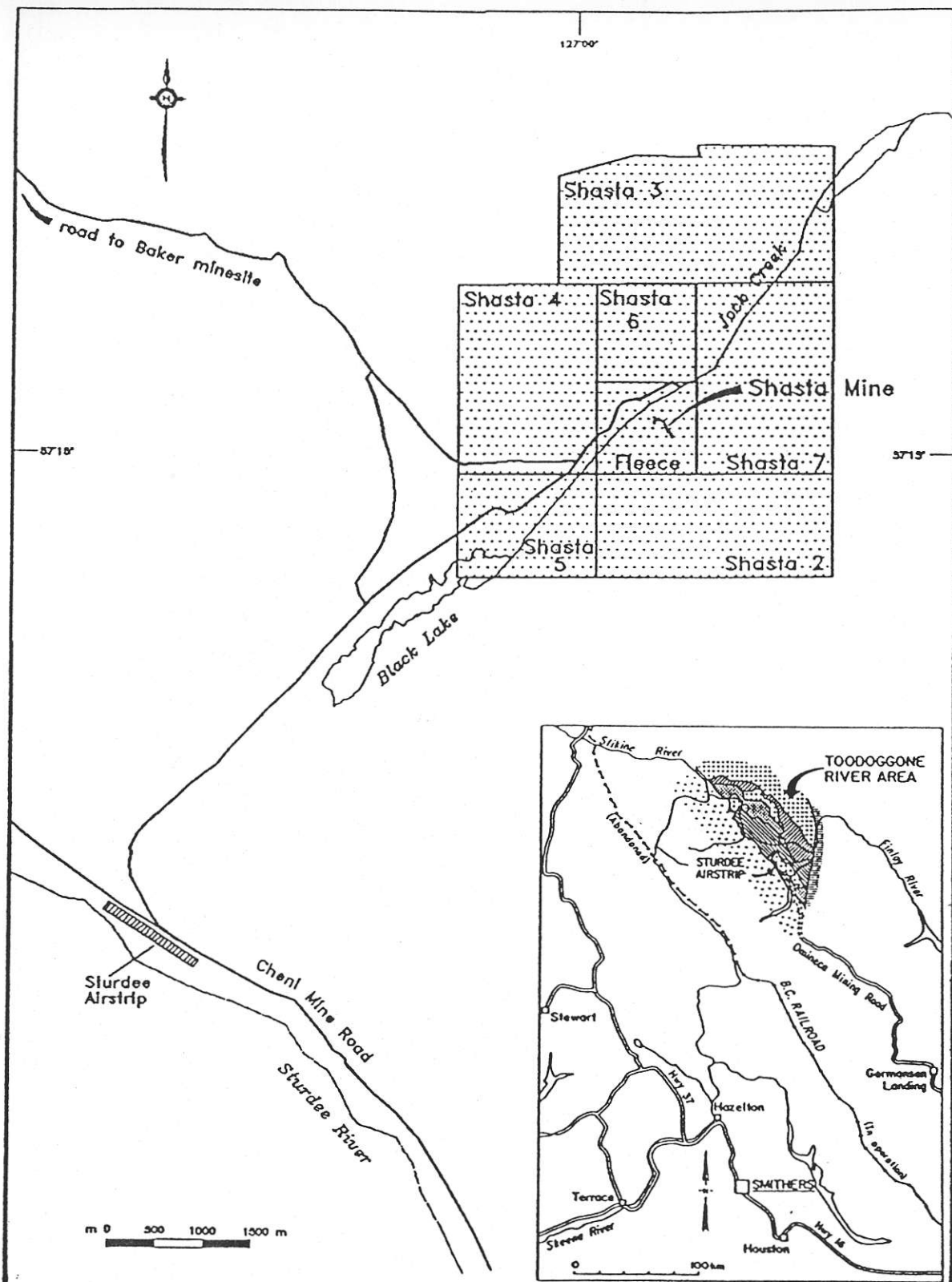
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The Shasta deposit is an epithermal vein-stockwork, gold-silver deposit located in the Toodoggone district of north-central British Columbia. The property is owned by International Shasta Resources Ltd. and is under option to Homestake Canada Ltd. Access to the property is by fixed-wing aircraft from Smithers, 275km to the south, or via the Omineca-Cheni Mine road from Fort St. James, 600 km. to the south. The Toodoggone region hosts several significant gold-silver deposits including the past producer Baker Mine (Chapelle deposit) and the currently producing Lawyers deposit.

Mineralization is hosted by dacitic feldspar-quartz crystal tuffs and flows of the Jurassic Toodoggone Formation. Faults and fractures are the dominant structural features of the area, and controlled the emplacement of mineralization. Known and inferred faults form a diamond-shaped pattern concordant with a regional, northwest trending right-lateral, and normal, fault-shear system. The dominant trends for mineralized structures are north-northwest and west north-west. Dip directions are variable, ranging from moderate westerly to steep easterly inclinations. Mineralization occurs as narrow tabular to curvilinear quartz-calcite breccia zones within an area of variable alteration and stockwork veining up to 100m. wide. Correlation between ore grade sections within these broad alteration/stockwork zones has proved to be the most significant exploration problem. Gold and silver occur in native form, and as electrum and argentite, and are associated with the sphalerite, galena and minor chalcopyrite. Silver to gold ratios are variable, but typically are in the order of 60:1. Gangue minerals include quartz, calcite, potassium feldspar, clay, chlorite, hematite and minor barite. Arsenic, antimony and mercury are not enriched within the mineralization or alteration zones.

Exploration has consisted of geologic mapping, geochemical soil and rock sampling, VLF-R geophysical surveying, backhoe trenching, and 18,319m of exploration diamond drilling. A limited amount of delineation drilling, on 15m centres, was completed in 1989, in order to test the reliability of information obtained from the 25 and 50m drill spacing used to explore the main zones. Ten mineralized structures have been discovered to date, with the main ones being the JM, Creek and Rainier. Current geological reserves (including material removed by mining) from these three zones are 1.7 million tonnes of 4.7 g/t Aueq. at a 2 g/t Aueq. cut-off, or 500,000 tonnes of 8.7 g/t Aueq. at a 5 g/t Aueq. cut-off. Gold equivalent (Aueq.) is calculated at Au + Ag/70.

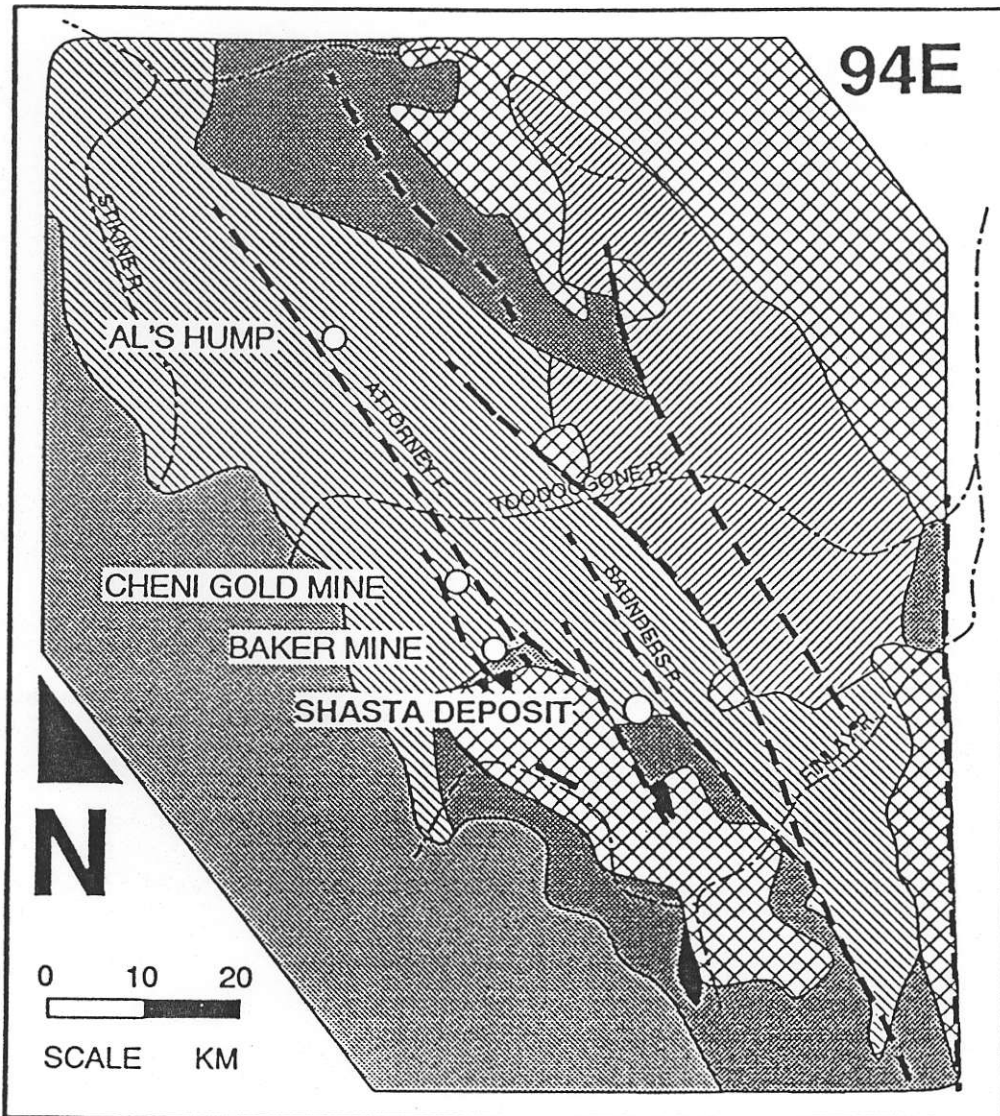
In 1989 International Shasta negotiated a concession to mine 115,000 tonnes from two areas on the JM and Creek Zones. Initial development consisted of two small open pits, however mining soon switched to an underground shrinkage stope operation on the JM Zone because of severe dilution problems. 455m of underground drifting has been completed, mainly on the 1300m and 1260, levels, and currently a small high grade area is being developed as a blast-hole stope. Underground production grades typically exceed



<p>HOMESTAKE</p> <p>MINING (CANADA) LIMITED</p> <p>SHASTA PROJECT, B.C.</p> <p>LOCATION MAP</p>			
<p>DRAWN</p> <p>Revised _____</p>	<p>DATE</p> <p>10/89</p>	<p>HTS</p> <p>94E</p>	<p>FIG. 1.1</p>

TOODOGGONE REGIONAL GEOLOGY

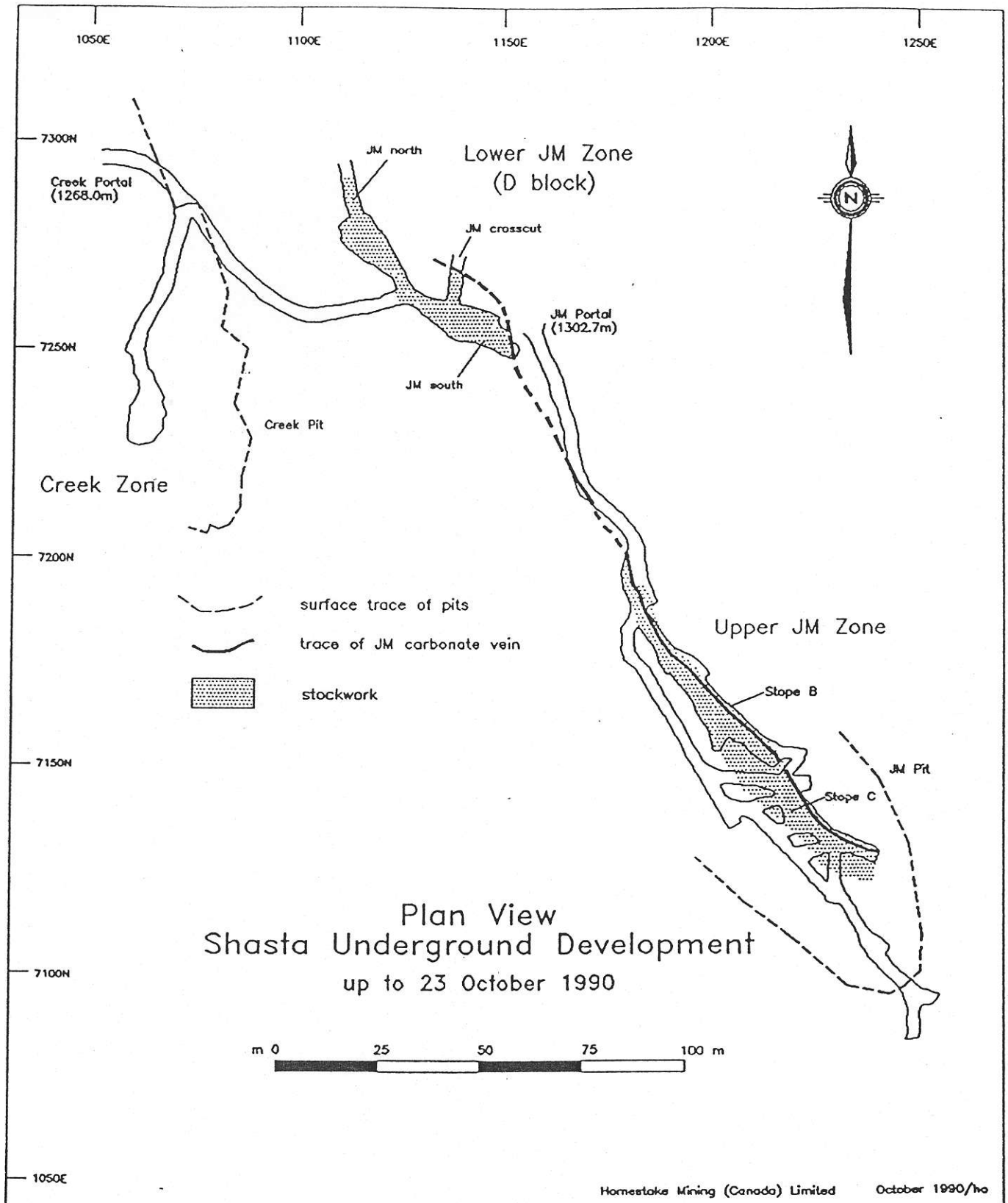
94E



LEGEND

CRET - TERTIARY		SUSTUT GROUP CLASTICS			
U TRI - L JURASSIC		OMINECA INTRUSIONS			
L-M JURASSIC		HAZELTON GROUP VOLCANICS			
		TOODOGGONE VOLCANICS			
TRIASSIC		STUHINI GROUP VOLCANICS			
PERMIAN		ASITKA GROUP LIMESTONE			
	AIRSTRIP		FAULT		RIVER

by P. Thiersch after Vulimuri et al. 1986.



grades estimated from drilling and have emphasized the difficulties involved in estimating reserves based on wide spaced drilling. Since September 1989, a total of 82,000 tons has been processed through the refurbished Baker Mine mill, at a rate of approximately 170 tons per day. Average gold and silver grades are 5.35 g/t Au and 315.4 g/t Ag, however grades have been slightly higher in the past four months, averaging 6.16 g/t Au and 515.5 g/t Ag. Milling consists of the preparation of a sulphide flotation concentrate, and subsequent cyanide leach. Flotation recoveries average 93.2% for gold and 90.4% for silver. Gold and silver are produced as dore bars