



MINFILE Detail Report
BC Geological Survey
Ministry of Energy, Mines and Petroleum Resources

Location/Identification

MINFILE Number: 092HSW016 **National Mineral Inventory Number:** 092H6 Ag1

Name(s): **TREASURE MOUNTAIN**
TREASURE MOUNTAIN MINE, SILVER CHIEF, SILVER KING, SILVER HILL, CASCADE, DORNBERG, H.W.,
H.W. SPLIT, C, RUBY, EAST, LOWER GOLD, MARY E, JK

Status: Past Producer **Mining Division:** New Westminster, Similkameen

Mining Method: Underground **Electoral District:** Fraser-Nicola

Regions: British Columbia **Resource District:** Cascades Natural Resource District

BCGS Map: 092H045

NTS Map: 092H06E **UTM Zone:** 10 (NAD 83)

Latitude: 49 24 58 N **Northing:** 5475521

Longitude: 121 03 42 W **Easting:** 640586

Elevation: 1448 metres

Location Accuracy: Within 500M

Comments: No. 2 level portal, 500 metres south of the summit of Treasure Mountain, 750 metres north of a small lake at the head of Amberty Creek, 27.5 kilometres east-northeast from the town of Hope (Minister of Mines Annual Report 1952, Figure 7).

Mineral Occurrence

Commodities: Silver, Lead, Zinc, Copper, Gold, Antimony

Minerals **Significant:** Sphalerite, Galena, Zinkenite, Tetrahedrite, Chalcopyrite, Argentite, Pyrargyrite, Bournonite, Silver

Significant Comments: Rare native silver in galena.

Associated: Quartz, Carbonate, Siderite, Pyrite, Arsenopyrite, Pyrrhotite, Magnetite, Hematite

Alteration: Carbonate, Chlorite

Alteration Comments: Alteration at dike-wallrock contacts with local manganese oxide enrichment.

Alteration Type: Carbonate, Chloritic

Deposit **Character:** Vein, Stockwork, Disseminated, Shear

Classification: Hydrothermal, Epigenetic

Type: I05: Polymetallic veins Ag-Pb-Zn+/-Au

Shape: Tabular **Modifier:** Fractured

Dimension: 305x304x1 metres

Comments: C vein.

Host Rock

Dominant Host Rock: Sedimentary

Stratigraphic Age	Group	Formation	Igneous/Metamorphic/Other
Cretaceous	Pasayten	Undefined Formation	-----
Jurassic	Ladner	Undefined Formation	-----
Unknown	-----	-----	Unnamed/Unknown Informal

Isotopic Age	Dating Method	Material Dated
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Lithology: Argillite, Arkose, Conglomerate, Feldspar Porphyry Dike

Geological Setting

Tectonic Belt: Coast Crystalline **Physiographic Area:** Cascade Mountains

Terrane: Methow, Quesnel

Inventory

Ore Zone: TREASURE MOUNTAIN
Category: Indicated
Quantity: 33,000 tonnes

Year: 2012
Report On: Y
NI 43-101: Y

Commodity	Grade
Silver	828.0 grams per tonne
Lead	4.16 per cent
Zinc	3.80 per cent

Comments: Calculated at a 311 gram per tonne Ag cut-off
Reference: Huldra Silver Inc. Technical Report June 7, 2012, www.sedar.com

Ore Zone: TREASURE MOUNTAIN
Category: Inferred
Quantity: 120,000 tonnes

Year: 2012
Report On: Y
NI 43-101: Y

Commodity	Grade
Silver	926.9 grams per tonne
Lead	2.79 per cent
Zinc	4.36 per cent

Comments: Calculated at a 311 gram per tonne Ag cut-off
Reference: Huldra Silver Inc. Technical Report June 7, 2012, www.sedar.com

Summary Production

		Metric	Imperial
	Mined:	1,510 tonnes	1,664 tons
	Milled:	1,283 tonnes	1,414 tons
Recovery	Silver	2,186,372 grams	70,293 ounces
	Gold	93 grams	3 ounces
	Lead	292,342 kilograms	644,504 pounds
	Zinc	64,582 kilograms	142,379 pounds

Capsule Geology

The Treasure Mountain region is underlain by northwest striking, moderate to steeply southwest dipping volcanic and sedimentary rocks of the Middle and Lower Jurassic Dewdney Creek Formation (Ladner Group) and Lower to Upper Cretaceous Pasayten Group, intruded by numerous dikes and sills. The Dewdney Creek Formation comprises volcanic rocks and a minor amount of sediments and consists of tuff, breccia and agglomerate with interbedded argillite and conglomerate. The Dewdney Creek Formation is considerably altered; pyrite is commonly present and many outcrops are rusty. The Pasayten Group includes predominant arkose, argillite and conglomerate. Locally, the two sequences are separated by a northwest striking, northeast dipping fault, but in large part are conformable.

The dikes and sills range from diorite to gabbro in composition and strike west in the Dewdney Creek Formation and west-northwest in the Pasayten Group. The intrusive bodies are generally altered (chlorite-carbonate) and range from a few centimetres to 9.1 metres wide. They are from a few metres up to 304 metres long, pinch out abruptly and are veined near their margins by irregular veinlets of quartz. Many of the dikes and sills are about 1.5 metres wide and less than 61 metres long. The largest sill is about 1.2 kilometres long and as much as 213 metres wide and is hosted in the Dewdney Creek Formation.

A major fault, the Treasure Mountain fault, strikes 080 degrees, dips 30 to 65 degrees south and is traceable for 2.3 kilometres across all lithologies. It has both a strike-slip and dip-slip component and offsets both sequences. A feldspar porphyry dike generally occupies a central position in the fault zone, dividing it into footwall and hangingwall sections, but in places the dike is on one wall of the fault or the other. The walls of the dike are sheared and is as much as 21 metres wide in the east but narrows toward the west; for most of its length it is between 3 and 6 metres wide. The dike is altered (chlorite-carbonate) at wallrock contacts, and is widest in the east where it approaches a granitic intrusion.

Several other faults with similar attitudes also occur. Two faults cross the southwest part of the region and strike east and dip steeply south, but one splay of one fault dips north. The more northerly of these two faults, the Indiana fault, hosts the Blue Bell (092HSW020) and possibly the Indiana (092HSW022) and Summit (092HSW023) occurrences. The southern fault, the Queen Bess fault, hosts the Queen Bess (092HSW021) occurrence. These two faults diverge to the west from the Treasure Mountain fault and contain subparallel splays separated by shattered rock. The Queen Bess fault splits into two branches that diverge toward the west.

Mineralization in the Treasure Mountain occurrence area is hosted in the Treasure Mountain fault and in and near subsidiary faults, and comprise one or more quartz-carbonate veins or stringers that branch, split and coalesce and vary considerably in width and attitude. The lodes consist of up to several sulphide-rich stringers or veins, together with quartz-carbonate vein material concentrated in pockets and disseminated in wallrock. Typically, very little quartz-carbonate gangue is present. The veins, for the most part, are less than 0.6 metre wide and generally consist of a central massive section with veinlets and disseminated mineralization distributed outwards into the wallrock. Veins can range from centimetres to over 3 metres in width and extend for only a few metres to over 300 metres in length. Numerous stringers occur and are centimetres wide and continue for only a few metres. The multiplicity of veins and associated mineralization is irregular. Locally, an aggregate width of mineralized veins or stringers separated by gouge and broken wallrock can reach 3.04 metres. The fault zone wallrock itself is mineralized and locally manganese oxide enriched.

The Treasure Mountain mine is predominantly underlain by northwest striking, southwest dipping Pasayten Group arkose, argillite and minor conglomerate. The Treasure Mountain fault cuts through all lithologies and hosts a feldspar porphyry dike which divides the fault into hangingwall and footwall sections. The dike is 0.6 to 1.2 metres wide for the most part but ranges to 6 metres. Mineralized quartz-carbonate veining is found on the footwall and hangingwall of the dike and are presently called the "dike" veins. Historically the "dike" veins have been explored and developed by three levels of which the second level produced practically all the millfeed. Unmined ore shoots are reported to be present in the existing mine levels. Recent underground drilling outlined a new ore shoot on Level 1 grading 722.96 grams per tonne silver, 4.33 per cent lead and 4.69 per cent zinc over a length of 32 metres and a width of 1.2 metres. Indicated reserves increased by 3047 tonnes and inferred reserves by 7619 tonnes (George Cross News Letter No.239, 1989).

To the east, the "dike" veins split away and form two distinct hangingwall veins, the H.W. vein and the H.W. Split vein (Assessment Report 11947). A recently discovered vein, the C vein, occurs east along strike of these veins and is not related to the feldspar porphyry dike. The C vein branches or splits along its strike and coalesces with other veins. A second, narrow silver-rich vein parallels the C vein to the south. The controlling Treasure Mountain fault zone crosses and cuts off the C vein in the east and swings sharply to the south. The feldspar porphyry dike which generally occupies a central position within the Treasure Mountain fault zone can wander, particularly into the hangingwall and does so in the eastern portion of the C vein where the vein terminates against the dike. The fault zone and dike swings sharply to the south at this point. The upper No. 1 crosscut level, the No. 2 level and a new intermediate level 1A have been extended underground to intersect the C vein and development has progressed along it. The south dipping (70 degrees) C veins have been explored on four horizons; surface, level 1, level 1A and level 2 for a total downdip depth of 305 metres. The strike length has been tested along 304 metres. The C vein zone width averages 1 metre but varies from centimetres wide to 2.59 metres. Indicated reserves are reported as 132,436 tonnes grading 867.28 grams per tonne silver and 10 per cent combined lead- zinc (George Cross News Letter No.170, 1989).

Sulphides constitute the greater part of the vein matter, and gangue minerals are present in minor amounts. Sphalerite is the most abundant, followed by galena, pyrite, arsenopyrite, tetrahedrite, pyrrhotite and chalcopyrite. Mineralogical examinations show that zinkenite is present in important amounts. Bournonite is also identified. Magnetite has been reported in drill core along with hematite near dike contacts. Rare native silver and argentite is present in galena. Pyrrargyrite and argentite have also been documented in underground diamond-drill core intersections (George Cross News Letter No.152, 1988). The gangue mineralogy consists of milky and glassy quartz and light-coloured carbonate. Some of the carbonate may be manganiferous siderite. Cavities in the lodes are common and are narrow (less than 3 centimetres wide). Generally they are lined with sulphide crystals and quartz crystals.

The East zone, located 762 metres east of the mine, contains indicated reserves of 11,792 tonnes grading 1052.39 grams per tonne silver, 12.27 per cent lead and 0.82 per cent zinc (George Cross News Letter No.239, 1989).

The Ruby zone, where high grade pyrrargyrite mineralization was discovered in trenches 3200 metres east-southeast from the C vein, contains inferred reserves of 9071 tonnes grading 534.76 grams per tonne silver (George Cross News Letter No.170, 1989).

Trenching tested a possible eastern continuation of the C vein zone near Troll Lake, about 175 metres northeast of the C vein termination against the feldspar porphyry dike. A north trending, narrow shear zone (Troll Lake), centimetres wide, yielded assays of 3428 grams per tonne silver (McDougall, 1987).

A gold-bearing shear zone was also exposed by trenching 800 metres southeast of the C vein zone. This zone, the Lower Gold, contains mineralization apparently paralleling the feldspar porphyry dike. A grab sample assayed 4.79 grams per tonne gold and 308.52 grams per tonne silver (McDougall, 1987).

The JK vein, first identified in 2010, is located approximately 290 metres east of the Ruby (East) zone and comprises an outcrop of massive galena.

The vein has been traced to the east for a further 150 metres where it is obscured by overburden. The vein material has a white porcelaneous appearance with minor amounts of sphalerite and occurs in weathered arkosic rocks. No associated dike has been encountered.

In 1988, a 362 tonne bulk surface sample of selected high-grade ore from the C vein was processed and yielded a weighted average grade of 3438.28 grams per tonne silver, 32.7 per cent lead and 6.8 per cent zinc (Northern Miner - August 29, 1988).

Combined (probable, possible and inferred) reserves for the Treasure Mountain property are 160,000 tonnes grading 850 grams per tonne silver, 4 per cent lead and 5 per cent zinc; average grade of ore at a cut-off grade of 500 grams per tonne equivalent silver (Property File - Prospectus, Huldra Silver Inc., 1988).

Past and present work comprises extensive surface and underground development. The main Treasure Mountain vein system has been explored over a vertical distance of 295 metres by surface trenches and approximately 2,742 metres of underground workings, including at least three adit portals (No. 2, No. 3 and No. 4), 2,194 metres of drifts and crosscuts and 548 metres of raises.

Mineral occurrences in and near Treasure Mountain were first recognized in 1892 with several galena veins being prospected in subsequent years, including the Silver Chief, Mary E and Whynot 3 occurrences, all of which later became part of the Treasure Mountain mine.

During 1929 through 1934, milling operations processed approximately 1148 tonnes yielding 904.14 kilograms of silver, 170,664 kilograms of lead and 39,771 kilograms of zinc.

In 1950, Silver Hill Mines Ltd. constructed a 45.4 tonne per day mill that is reported to have been in place until at least 1956 but no production has been recorded.

Magnus Bratlien acquired parts of the Treasure Mountain property in 1979, formed Huldra Silver Inc. in 1980, and subsequently added other claims to achieve the present configuration. Huldra then conducted soil surveys and EM 16-VLF electromagnetic surveys, followed in 1981 by 510 metres of diamond drilling and in 1983, 783.6 metres of diamond drilling.

The No. 1 Level adit was re-opened in 1986 and a 43-metre length of vein was sampled in the old workings. Major work programs were directed to the mine in the period 1987 through 1989. Levels 2 and 3, with final lengths 392 and 632 metres respectively, were driven and Levels 1 and 4 were extended. Raises were excavated to provide information concerning continuity of mineralization and, where they passed between levels, to provide additional access and ventilation. The C vein was sampled in detail by James Laird of Laird Exploration Ltd. and in 1987 became the site from which approximately 362 tonnes of raw and partially sorted "ore" were taken and shipped to smelters yielding 1266 kilograms of silver, 120,190 kilograms of lead and 24,460 kilograms of zinc. Underground work on the property ceased in 1989.

In the period from 1990 to 2006, to maintain the mineral tenures in good standing, Huldra Silver Inc. completed several small work programs, including soil surveys, some trenching, three surface and one underground drill programs.

In July 2007, in response to the recommendations of AMEC Earth & Environmental, Huldra Silver Inc. re-opened Levels 1 and 2 of the mine for the purpose of re-sampling the main vein and acquiring materials for metallurgical test work. Seventy-eight rock samples were taken from sulphide-rich mineralization exposed in the underground workings (Assessment Report 30429).

In 2008, the Hangingwall vein, above Level 3, was reported to contain an indicated resource of 38114 tonnes grading 1120 grams per tonne silver, 8.95 per cent lead and 5.09 per cent zinc with an additional inferred resource of 50990 tonnes grading 1014 grams per tonne silver, 3.20 per cent lead and 4.90 per cent zinc (Beaton, A. J. (2009-01-27): Treasure Mountain Mining and Reclamation Plan – Treasure Mountain Mine).

In 2010, the "Ruby" zone was renamed the East zone and a program of trenching and 15 diamond drill holes were completed on the zone. Drilling yielded up to 13736 and 6393 grams per tonne silver, 60.05 and 74.41 per cent lead, 2.49 and 1.22 per cent zinc over 0.07 and 0.08 metre in holes 8 and 9, respectively (Ostensoe, E. (2011-06-15): Technical Report, Project Update – Treasure Mountain Property). Drilling at a site 190 metres to the east, referred to as the "East Zone Extension" yielded up to 256 grams per tonne silver, 0.79 per cent lead and 10.01 per cent zinc over 0.6 metre in hole 16 (Ostensoe, E. (2011-06-15): Technical Report, Project Update – Treasure Mountain Property).

In 2011, Huldra Silver Inc. completed 51 diamond drill holes over a total of 5,073 metres on the main mine development, to further define resources on the upper 150 metres of the mine. Highlights from the results included drillhole TM11-48, which intercepted 4,347 grams per tonne silver, 49.94 per cent lead and 17.55 per cent zinc over a 0.24-metre interval (Northern Miner, February 14, 2012).

In the same year, a 10,000-tonne underground bulk sample program was conducted on the property. The samples from the seventh lift of the stope included amounts of 2918.3 grams per tonne silver, 24.2 per cent lead and 3.8 per cent zinc over a 1.47-metre interval (Northern Miner, February 28, 2012).

In 2012, Huldra Silver Inc. released an updated technical report on the Treasure Mountain property which reported Indicated resources of 33,000

tonnes grading 828.0 grams per tonne Ag, 4.16 per cent Pb and 3.80 per cent Zn and Inferred resources of 120,000 tonnes grading 926.9 grams per tonne Ag, 2.79 per cent Pb and 4.36 per cent Zn (Huldra Silver Inc. Technical Report June 7, 2012, www.sedar.com).

Huldra Silver Inc. started an underground drilling program in late March, 2013, and a total of 1,923 metres of HQ-size diamond drillcore from 21 drillholes have been completed. Preliminary results include 825.5 grams per tonne silver, 6.74 per cent lead and 9.43 per cent zinc over 1.12 metres true width in hole TMUD13-1 (Stockwatch May 16, 2013).

Treasure Mountain declared commercial production in March 2013 (Exploration and Mining in British Columbia 2013).

Huldra Silver Inc. put Treasure Mountain on care and maintenance June 25, 2013 due to market conditions, no production information is available (Huldra Silver Inc. press release June 26, 2013).

In May 2015 Huldra Silver Inc. changed its name to Nicola Mining Inc. (Nicola Mining Inc. press release May 29, 2015).

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Date Coded: 1985/07/24 **Coded By:** BC Geological Survey (BCGS) **Field Check:** N
Date Revised: 2020/06/11 **Revised By:** Karl A. Flower (KAF) **Field Check:** N