COMINCO LTD.

EXPLORATION

WESTERN DISTRICT

NTS: 94F 7E & 2E

ASSESSMENT REPORT

GEOLOGICAL AND GEOCHEMICAL REPORT

ON THE

GNOME GROUP

AKIE RIVER AREA

OMINECA MINING DIVISION

LATITUDE: 57°14'N

LONGITUDE: 124°33'W

PERIOD OF WORK: July 15 to August 25, 1981

part 1 of 2

23 OCTOBER 1981

V.M. KURAN

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COMINCO LTD.

EXPLORATION
NTS: 94F 7E & 2E

WESTERN DISTRICT
23 October 1981

LIST OF CLAIMS - GNOME GROUP

Claim No.	Record No.	No. of Units	Recording Date
Gnome 1	2238	9	October 30, 1979
Gnome 2	2239	6	October 30, 1979
Gnome 3	2240	16	October 30, 1979
Gnome 4	2241	9	October 30, 1979
Gnome 5	2242	20	October 30, 1979
Gnome 6	2243	20	October 30, 1979
Gnome 7	2244	6	October 30, 1979
Gnome 8	2245	9	October 30, 1979
Gnome 9	2246	20	October 30, 1979
Gnome 10	2247	9	October 30, 1979
Gnome 11	2248	4	October 30, 1979
Gnome 12	2249	20	October 30, 1979

COMINCO LTD.

EXPLORATION
NTS: 94F 7E & 2E

WESTERN DISTRICT
28 October 1981

ASSESSMENT REPORT

GEOLOGICAL AND GEOCHEMICAL REPORT

ON THE

GNOME GROUP

AKIE RIVER AREA

OMINECA MINING DIVISION

INTRODUCTION

Preliminary 1980 silt and soil sampling on the Gnome Group, totalling 148 units, outlined several coincident lead-barium, zinc-barium and lead-zinc-barium anomalies situated over the Devonian Gunsteel Formation. In 1981, Cominco Ltd. performed detailed work to determine the sources of these anomalies and to obtain a better geological understanding of the stratigraphy of the Gunsteel Formation which hosts the potentially economic lead-zinc deposits on the Cirque and Driftpile Creek properties.

Linecutting, detailed mapping, prospecting, trenching and grid soil sampling were performed during the period July 15 to August 25, 1981. Total expenditures for 1981 on this claim group are estimated to be $50,000.00.

Detailed geological mapping on a scale of 1:5,000 was conducted over three geochemically interesting areas within the claim group. A 1.6 kilometer northwest trending baseline was established 500 meters northeast of the original baseline cut in 1980 to provide better control for grid soil sampling. A total of 1,758 soils were taken from three detailed areas at 25 to 50 meter intervals along grid lines 100 meters apart. On L57S at station 1+00E, two trenches were excavated to expose a barite horizon. This horizon was subsequently mapped and sampled.

LOCATION AND ACCESS

The Gnome Claim Group is located south of the Akie River and 28 kilometers west of Sikanni Chief Lake on the Fort Ware map sheet, NTS 94F. The center of the claim group is located at latitude 57°14'N and longitude 124°33'W.

Field work on the Gnome Group was conducted using a helicopter based at Sikanni Chief Lake, 28 kilometers to the east. Logistical support was provided by float equipped aircraft based at Mackenzie, 233 kilometers to the south.

REGIONAL GEOLOGY

A northwest trending belt of Paleozoic basinal stratigraphy has been outlined by regional mapping programs conducted by the Geological Survey of Canada. This belt, located within the Rocky Mountain thrust and fold belt, is centered approximately 40 kilometers east of the Rocky Mountain Trench. The Paleozoic shales are continuous from the Ospika River, northwesterly through Kwadacha Wilderness Park, Gataga Lakes and Driftpile Creek to Watson Lake a distance of 400 kilometers. This belt is informally called the Kechika Trough which may represent a southeasterly extension of the Selwyn Basin.

GEOLOGY

Detailed geological mapping and section measuring has outlined a series of northwest trending anticlinal and synclinal Devonian 'black clastic' belts of the Gunsteel Formation separated by normal faults and west-dipping thrust faults. The Gunsteel Formation, has been subdivided into five lithological units and three baritic horizons favourable for lead-zinc deposition. Older Paleozoic strata on the claim group includes the Kechika Formation, Road River Formation and Silurian Siltstone Unit.

KECHIKA FORMATION (Unit ϵO_K)

The Kechika Formation, Upper Cambrian to Lower Ordovician in age, occurs along the western boundary of the Gnome Claim Group as a westerly dipping panel thrust over Middle to Upper Ordovician, Silurian and Devonian strata. The Kechika Formation outcrops as resistant, grey-brown-weathering, thin to medium-bedded, grey, calcareous to limy, nodular shale.

ROAD RIVER FORMATION (Units O_V, O_{SH}, UO_{SH}, S_{LS})

The eastern margin of the claim group is bordered by Unit O_V, a discontinuous, orange to pale green-weathering, grey to pale green, variably calcareous tuff of Lower Ordovician age. Unit O_V has been thrust over a moderately resistant, blue-grey platy weathering, thin-bedded, graptolitic, basinal, black shales of Upper Ordovician age, Unit UO_{SH} (contains the graptolites Dicranograptus and Orthograptus). This unit is overlain by moderately resistant, grey to tan-weathering, medium to thick-bedded, black limestone of Silurian age, Unit S_{LS}.

On the western margin of the claim group, Units O_V and UO_{SH} are not present in the stratigraphic section. Unit O_{SH}, a recessive, black to rusty platy weathering, thin-bedded, graphitic basinal shale package of Ordovician age is unconformably overlain by Unit S_{LS}.

SILURIAN SILTSTONE (UNIT S_{SL})

Throughout the claim group, the Silurian Siltstone, Unit S_{SL}, unconformably overlies Unit S_{LS}. Unit S_{SL} is a distinctive buff brown to tan weathering, bioturbated, medium to thick-bedded, dolomitic, grey siltstone containing pyrite nodules up to two centimeters in diameter.

TABLE I

TABLE OF GEOLOGICAL FORMATIONS

AGE	UNIT	DESCRIPTION
DEVONIAN	D_{SA}	RESISTANT, BLUE-GREY TO PALE GREEN BLOCKY WEATHERING, THIN TO MEDIUM-BEDDED, THINLY LAMINATED AMMONITE BEARING, SILICEOUS, BLACK MUDSTONE INTERBEDDED WITH THIN-BEDDED, SILICEOUS, BLACK SHALE
	D_{BA3}	RESISTANT, RUSTY BROWN-WEATHERING, THIN-BEDDED, SILICEOUS, BLACK MUDSTONE; CONTAINS BLEBBY TO LAMINATED BARITE AND MINOR PYRITE
	D_{NO}	CLIFF FORMING, BLUE-GREY TO BUFF BROWN-WEATHERING, THIN TO MEDIUM-BEDDED, COARSELY LAMINATED, SILICEOUS, BLACK MUDSTONE AND SHALE
	D_{BA2}	RESISTANT, GREY-WEATHERING, MEDIUM TO THICK-BEDDED, CHERTY, BLACK MUDSTONE; CONTAINS LAMINATED BLEBBY BARITE AND MINOR DISSEMINATED PYRITE
	D_{PY}	RESISTANT, GREY TO RUSTY BROWN-WEATHERING, MEDIUM TO THICK-BEDDED, SILICEOUS, BLACK MUDSTONE; CONTAINS DISSEMINATED TO BLEBBY PYRITE AND MINOR BLEBBY BARITE
	D_{GT}	RESISTANT, GREY, WEATHERING, THIN TO MEDIUM-BEDDED GREY SILTSTONE INTERBEDDED WITH A GREY TO ORANGE-WEATHERING, MEDIUM-BEDDED GRIT
	D_{SH}	RECESSIVE, RUSTY BROWN TO BLUE-BLACK PLATY WEATHERING, SILICEOUS, BLACK SHALE
	D_{CH}	RESISTANT, BLUE-GREY TO PALE GREEN-WEATHERING, THIN TO MEDIUM-BEDDED, CHERTY, BLACK MUDSTONE
	D_{BA1}	MODERATELY RESISTANT, RUSTY BROWN-WEATHERING, THIN-BEDDED, LAMINATED, BLEBBY BARITE
	D_{SS}	CLIFF FORMING, RUSTY BROWN TO BROWNISH ORANGE-WEATHERING, THIN TO MEDIUM-BEDDED, SILICEOUS, BLACK SHALE; OCCASIONALLY TALCY; CONTAINS GREY TO BUFF BROWN WISPY LAMINATIONS AND MINOR BEDS OF ORANGE-WEATHERING SILTSTONE UP TO 1M THICK
	UNCONFORMITY	
	D_{LS}	MODERATELY RESISTANT, GREY BLOCKY WEATHERING, MEDIUM-BEDDED, GREYISH-BLACK LIMESTONE; CONTAINS CRINOID RICH DEBRIS FLOWS
	UNCONFORMITY	
SILURIAN	S_{SL}	CLIFF FORMING, BUFF BROWN TO ORANGE PLATY TO BLOCKY WEATHERING, THIN TO THICK-BEDDED, DOLOMITIC, GREY SILTSTONE
	UNCONFORMITY	
	S_{LS}	ROAD RIVER FORMATION MODERATELY RESISTANT, GREY TO TAN-WEATHERING, MEDIUM TO THICK-BEDDED, FINE GRAINED BLACK LIMESTONE
ORDOVICIAN	O_{SH}	MODERATELY RESISTANT, BLUE-GREY PLATY WEATHERING, THIN-BEDDED, GRAPTOLITIC, BLACK SHALE; CONTAINS DICRANOGRAPTUS AND ORTHOGRAPTUS (UO_{SH}) AND RECESSIVE, BLACK TO RUSTY PLATY WEATHERING, THIN-BEDDED, GRAPHITIC BLACK SHALE
	UNCONFORMITY	
	O_V	RESISTANT, ORANGE TO PALE GREEN-WEATHERING, GREY TO PALE GREEN TUFF; VARIABLY CALCAREOUS
CAMBRIAN-ORDOVICIAN	EO_K	KECHIKA FORMATION RESISTANT, GREY-BROWN-WEAHTERING, THIN TO MEDIUM BEDDED, GREY CALCAREOUS TO LIMY NODULAR SHALE

DEVONIAN LIMESTONE (Unit D_{LS})

Unit D_{LS} unconformably overlies Unit S_{SL}. It is a moderately resistant, grey blocky weathering, medium-bedded, greyish-black limestone which contains crinoid rich debris flows. Unit D_{LS} is referred to as the Dunedin Formation which is time coincident with the Aikie River Shales. Although Unit D_{LS} is usually a cliff former on a regional scale, it is only one to two meters thick on the Gnome Group.

GUNSTEEL FORMATION (Unit D_{SA})

The Gunsteel Formation, Unit D_{SA}, consists of resistant blue-grey to pale green blocky weathering, thin to medium-bedded, thinly laminated, ammonite bearing siliceous, black mudstones interbedded with thin-bedded, siliceous, black shales unconformably overlying Unit D_{LS}. Within this broad classification, five distinct units have been differentiated including three baritic horizons.

Unit D_{SS}

Towards the base of the Gunsteel Formation, Unit D_{SS} occurs as a 30m thick section of brown-orange-weathering, thin to medium-bedded, siliceous, black shale. This unit is occasionally talcy and exhibits distinctive grey to buff brown wispy laminations and minor beds of orange weathering siltstone up to one meter thick.

Unit D_{CH}

Directly overlying Unit D_{SS}, Unit D_{CH} occurs as a 20 m thick section of resistant blue-grey to pale green-weathering, thin to medium-bedded, cherty, black mudstone. A 2 to 10 centimeter thick blebby barite horizon, D_{BA1}, occurs within Unit D_{CH}.

Unit D_{SH}

Unit D_{SH}, occurs as a 35 meter thick section of recessive, rusty brown to blue-black platy weathering, siliceous, black shale overlying Unit D_{CH}.

Unit D_{GT}

In the north central portion of the Gnome claim group, Unit D_{GT} occurs as a 100 meter thick section of grey-weathering, thin to medium-bedded, grey siltstone interbedded with a grey to orange-weathering, medium-bedded grit. The discontinuous nature of Unit D_{GT} towards the south of the claim group and the coarser grain size indicates a shallow water environment for the source of the sediment for Unit D_{GT} from a distal source outside the shale basin towards the north.

Unit D_{NO}

Overlying Unit D_{GT}, Unit D_{NO} occurs as a 50 meter thick section of cliff forming, blue grey to buff brown-weathering, thin to medium-bedded, coarsely laminated, siliceous, black mudstone and shale. Unit D_{NO} contains a 3.5 meter thick barite horizon, D_{BA2}, and a 10 meter thick pyrite horizon, D_{py}. Horizon D_{BA2} contains laminated to blebby barite

and minor disseminated pyrite in a resistant, grey-weathering, medium to thick-bedded, cherty, black mudstone. Horizon D_{PY} contains disseminated to blebby pyrite and minor blebby barite in grey to rusty brown-weathering, medium to thick bedded, siliceous, black mudstone.

BARITE HORIZON D_{BA3}

On L57S at station 1+00E, two trenches expose the barite horizon D_{BA3}, a 2 to 9 meter thick section of blebby to laminated barite and minor pyrite, in a resistant, rusty brown-weathering, thin-bedded, siliceous, black mudstone. Stratigraphyically, horizon D_{BA3} occurs above Unit D_{NO}.

STRUCTURE

Major northeast-southwest compressional forces have resulted in intensive folding and faulting on the Gnome Claim Group. The major synclinal and anticlinal folds are separated by west-dipping thrust faults and normal faults. Generally, the style of the folding is isoclinal with fold axes plunging gently to the northwest and fold axial planes striking northwest. Axial planes of folds along the northeast margin of the Gnome Claim Group are overturned to the southwest while axial planes of folds along the southwest margin of the property have axial planes overturned to the northeast.

GEOCHEMISTRY

During the period July 15 to August 15, 1981 approximately 51 stream silt, 1,758 soil, 1 heavy mineral and 66 rock samples were collected on the Gnome Claim Group. Within the Gnome Group, three areas were chosen for detailed grid soil sampling at 25 to 50 meter intervals along grid lines spaced by 100 meters.

Soil samples were collected from the "B" horizon using picks or mattocks. All samples were packaged in kraft sample bags and sent to the Cominco Laboratory at 1486 East Pender Street, Vancouver, B.C. The soil and silt samples are dried; sieved to -80 mesh, weighed to half a gram, digested in perchloric acid and analysed by atomic absorption for lead and zinc. Soil and silt samples analysed for barium were quantitatively determined by X-Ray fluorescence. Rock samples are crushed, milled and then pulped to -200 mesh and analysed by the same method as the silt and soil samples. All sample pulps from the Gnome Group are stored at the Cominco Laboratory in Vancouver.

Area 1

Area 1 extends from line 50S to 67S between stations 4+00E and 6+00W. Detailed grid sampling was carried out on the high zinc-barium response to the 1980 sampling in the area of the L59S gossan and the high barium response on lines 63S through 75S between stations 0+00 and 4+50W to try to outline specific high lead-zinc anomalies.

The barite-zinc anomaly near the L59S gossan was enhanced, but no associated high lead anomalies were found. An outcrop of blebby barite occurs above the gossan, but no mineralized float containing zinc was found.

The extensive barite response in the south half of Area 1 was enhanced by the 1981 sampling, but no lead values greater than 55 ppm were found associated with the barium.

Area 2

Area 2 extends from Line 21S to 36S between stations 2+00E and 5+00W. In 1980, grid sampling outlined two small areas of lead-barium response. The 1981 detailed sampling confirmed the existence of these anomalies and showed a slight increase in the area covered by them. One of these areas has been shown to have a zinc response slightly displaced downhill from it. Detailed prospecting did not find any lead-zinc float in the area.

Area 3

Area 3 extends from Line 2N to 20S between stations 5+00E and 10+00E. In 1980, grid sampling outlined a small area of lead-barium response on Line 1S 8+00E and an extensive zinc response on Lines 4S through Line 20S between stations 5+00E and 9+00E.

The lead-barium response was repeated and enhanced in the 1981 sampling, but detailed mapping showed that the underlying rocks were Silurian in age. Prospecting did not explain the extensive zinc anomaly and sampling showed that there was a slightly displaced barium anomaly to it.

CONCLUSIONS

Detailed geological mapping has outlined five mapable units within the broad classification of the Gunsteel Formation, Unit D_{SA}. Three barite horizons were recognized in the Gunsteel Formation, of which D_{BA2} in Unit D_{NO} appears to be the most interesting. It consists of 13.5 m of barite and pyrite and is probably the most favourable horizon on the Gnome Property for a stratiform barite-sulphide occurrence such as those at the Driftpile, Cirque and Elf properties.

The barium response in Area 1 is high with only a few separated, small areas of zinc response and no significant lead responses situated over the Gunsteel Formation. In Area 2, detailed grid soil sampling has outlined a lead-barium anomaly associated with a slightly displaced zinc anomaly. These anomalies are situated over stratigraphy which is only slightly above the down plunge extension of the 13.5 meter D_{BA2} barite-pyrite horizon. A lead-barium anomaly situated over Silurian Siltstone and a large barium-zinc anomaly situated over Unit D_{SA} were outlined in Area 3.

Report by: V.M. Kuran
V.M. Kuran, Geologist

Endorsed by: A.B. Mawer
A.B. Mawer, Senior Geologist

VMK/skg
Distribution
Mining Recorder (2)
Western District (1)

Approved for Release by:
G. Harden, Manager
Exploration,
Western District

REFERENCES

Cecile, M.P. and Norford, B.S. (1979): Basin to Platform Transition, Lower Paleozoic Strata of Ware and Trutch Map-Areas, Northeastern British Columbia, in Current Research, Part A, Geol. Surv. Canada, Paper 79-1A, Report 36.

Pride, K.R. (1980): Geological and Geochemical Report on the Gnome Group, B.C. Ministry of Energy, Mines & Pet. Res., Assessment Report.

Taylor, G.C., Cecile, M.P., Jefferson, C.W. and Norford, B.S. (1979): Stratigraphy of the Ware (East Half) Map-Area in Current Research Part A, Geol. Surv. Canada, Paper 79-1A, Report 37.

APPENDIX "A"

STATEMENT OF EXPENDITURES

GNOME CLAIM GROUP

July 14 to August 25, 1981

SALARIES AND WAGES

K.R. Pride	4 days @ $180/day	720.00
A.L. MacGregor	5 days @ $170/day	850.00
V. Kuran	40 days @ $130/day	5,200.00
B. Gregoire	40 days @ $100/day	4,000.00
J. Weir	5 days @ $130/day	650.00
F. Jay	14 days @ $ 85/day	1,190.00
G. Ross	14 days @ $ 80/day	1,120.00
S. Seminutin	14 days @ $ 80/day	1,120.00
		$14,850.00

GEOCHEMICAL ANALYSES

Soil and Silt Samples - 1800	$6.75/sample	12,150.00

FIELD EQUIPMENT AND SUPPLIES

1,390.00

CAMP MAINTENANCE

151 man days @ $30/man day	4,530.00

TRANSPORTATION

Helicopter	30 hr @ $365/hr	10.950.00
Helicopter fuel	3,000 liters @ 0.80/liter	2,400.00
Fixed Wing		500.00
		$13,850.00

REPORT WRITING, RESEARCH, DRAFTING

K.R. Pride	2 days @ $180/day	360.00
V. Kuran	14 days @ $130/day	1,820.00
P. McFeely	7 days @ $150/day	1,050.00
		$ 3,230.00

TOTAL EXPENDITURES:	$50,000.00

APPENDIX "B"

IN THE MATTER OF A GEOLOGICAL AND
GEOCHEMICAL PROGRAM PERFORMED ON THE
GNOME CLAIM GROUP
AIKIE RIVER AREA
OMINECA MINING DIVISION
BRITISH COLUMBIA

A F F I D A V I T

I, V.M. KURAN, OF THE CITY OF VANCOUVER, IN THE PROVINCE OF BRITISH COLUMBIA, HEREBY DECLARE:-

1) THAT I am employed as a geologist by Cominco Ltd., and, as such, have a personal knowledge of the facts to which I hereinafter depose;

2) THAT annexed hereto and marked as APPENDIX "A" to this report is a true copy of expenditures incurred in connection with a geological and geochemical program on the Gnome Claim Group;

3) THAT the said expenditures were incurred between the 15th day of July and the 25th day of August 1981 for the purpose of performing geological and geochemical exploration on the Gnome Claim Group.

Signed: V.M. Kuran
V.M. Kuran, Geologist

APPENDIX "C"

STATEMENT OF QUALIFICATIONS

I, V.M. KURAN, GEOLOGIST, WITH BUSINESS ADDRESS AT 700-409 GRANVILLE STREET, VANCOUVER, BRITISH COLUMBIA AND RESIDENTIAL ADDRESS AT 1742 PENDRELL STREET, VANCOUVER, BRITISH, COLUMBIA, HEREBY CERTIFY:-

1) THAT I am a graduate in Geological Sciences with a B.Sc. (Hons.) in 1980 from the University of British Columbia;

2) THAT from 1980 to the present I have been employed by Cominco Ltd. as a geologist and have been actively engaged in mineral exploration in British Columbia and Mexico;

3) THAT I personally participated in the field work on the Gnome Claim Group and have interpreted all the data resulting from this work.

Signed: V.M Kuran
V.M. Kuran, Geologist