MAP No. 115 N15

ASSESSMENT REPORT [X]
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MINING DISTRICT: DAWSON
TYPE OF WORK: GEOLOGY

REPORT FILED UNDER: GOLDRAY MINES LTD

DATE PERFORMED: 1967
DATE FILED: JUNE 19, 1967

LOCATION LAT. 63°55' N
LOCATION LONG. 140° 45' W
AREA: SIXTYMILE RIVER

CLAIM NAME & NO.
JACK 1-8
CCL 1-8
CEL 1-8
Lobel 1-4, 25-48

VALUE $ N/A
WORK DONE BY: H. G. Harper
WORK DONE FOR: Sixtymile Mining Company
DATE TO GOOD STANDING
REMARKS: #14 PER

GOLDRAY MINES LIMITED

PROPERTY EXAMINATION

SIXTY MILE MINING COMPANY LIMITED

Willowdale, Ontario
June 19, 1967

H. Grant Harper, F.G.A.C., P.Eng.
Economic Geologist

092561

GOLDRAY MINES LIMITED

PROPERTY EXAMINATION

SIXTY MILE MINING COMPANY LIMITED

INTRODUCTION

This report summarizes observations made during an examination of a group of claims located south of Glacier Post Office (abandoned), Sixty Mile River Area, Yukon Territory. The property is owned by Sixty Mile Mining Company Limited. Because of ground conditions and time, the examination was limited to the Nos. 1, 2 and 3 showings, all of which are located in Block I (see Property).

JOURNAL

May 31 Flew to Edmonton. Met A.F. Tottrup, President, Sixty Mile Mining Company Limited, Mr. "Irish" Loughran, Assistant to the President, and Mr. Laverty, Personnel Manager.

June 1 Flew to Whitehorse, Yukon Territory. Met by C.P. Hughes, Legal Advisor to the Commissioner of the Yukon Territory.

June 2 In Whitehorse. Met Dr. Chris Findley, resident government geologist, mining recorder, etc. Flew to Dawson City. Met Ben Karlson who worked on Sixty Mile for Tottrup in 1966. Also met Mike Chefkoi and Louella E. Murray, prospectors, who found the Sixty Mile silver lead.

June 3 Bought camp and food supplies. Started D7 Cat on way. Four men: self, Chefkoi, Karlson and Cat Skinner Burkhard overnighted at Glacier Creek. Cat at Bedrock Creek.

June 4 Built rumble seat box for D7 Cat to hold supplies. Walked Cat to No. 3 showing. Erected camp. Evening - down the hill to Timberline and cut 80 pickets.

June 5 Cat and Chefkoi to No. 1 showing. Ploughed snow 10 feet deep all day. Harper and Karlson on Ronka survey and attempted geo-chem on No. 3 showing.

June 6 Cat stripping at No. 3 showing. Harper, Chefkoi and Karlson walked to No. 1 showing, 2 hours. No broadcasting so Ronka not working. Set up grid at No. 1. P.M. ran two-mile Ronka traverse from No. 1 to No. 3. Mapped No. 3 where massive galena uncovered.

June 7 Everyone to No. 1 showing. Uncovered some massive galena. Made Ronka Survey and mapped. Broke camp at 7 p.m. Moved men and equipment to Glacier Creek, arriving at 11 p.m.

June 8 To Dawson City. No Whitehorse plane until June 10. 'Phoned Axmith. Karlson to Mayo re Tobe Mines. 'Phoned L.I. Proctor, President, Casino Silver Mines Limited. He took me to Casino Silver property in his Cessna 180.

June 9 Examined Casino Silver property. Flew to Whitehorse in evening.

June 10 Visited New Imperial Mines Limited operations at Whitehorse. Drove to Carcross in afternoon and saw Arctic Explorations base.

June 11 Conferred with resident geologist and R.E. Hudson, counsel for vendors and a director of Sixty Mile Mining Company Limited. Flew to Edmonton.

June 12 Saw A.F. Tottrup in Edmonton. Flew to Toronto.

PERSONNEL

During this examination I was most ably assisted by the following three men who cooperated in every way possible.

"Montreal" Mike Chefkoi, Dawson City. The prospector who discovered the silver lead vein at Sixty Mile.

Ben Karlson, Nanaimo, B.C. One of A.F. Tottrup's crew who worked on the property in 1966.

Frank Burkhard, Dawson City. D7 Catskinner.

These men are good workers and good companions.

PROPERTY AND LOCATION

The property consists of 60 mining claims having a total area of about 2700 acres. The claims comprise three separate, non-contiguous blocks. They are recorded on Mining Claim Plan 115-N-15 published by the Department of Northern Affairs and Natural Resources, Canada. The claims are described as follows:

Block I

Jack 1 to 4 incl. - 87526 to 87528 incl.	(4 claims)
CCL 1 to 8 incl. - 87020 to 87027 incl.	(8 claims)
CCL 1 to 8 incl. - 87004 to 87011 incl.	(8 claims)
CEL 1 to 8 incl. - 87012 to 87019 incl.	(8 claims)
Jack 5 to 8 incl. - 87654 to 87657 incl.	(4 claims)
	32 claims

Block II

Lou 25 to 40 incl. - 87065 to 87080 incl.	16 claims
Lou 41 to 48 incl. - 87089 to 87096 incl.	8 claims
	24 claims

Block III

Lou 1 to 4 incl. - 76540 to 76543 incl.	4 claims
Grand total	60 claims

The claim titles were not searched.

ACCESS

The property lies about 50 miles west of Dawson City and for exploration purposes, the access is not very difficult nor too expensive. The highway joining Dawson City and Chicken, Alaska, is an all weather, improved gravel road.

There are two turn-offs from the highway which lead to Glacier Creek (Sixty Mile) a distance of about 10 miles. Both roads are old, narrow and are not being maintained. At present, both are passable for light trucks. From Glacier Creek to Bedrock Creek a 5-mile bush road is scarcely passable for power wagons due to a short stretch through a badly drained side hill swamp. Three or four pipe culverts and two or three days' work with a truck and a front-end loader would make this road passable for power wagons.

There is no road from Bedrock Creek to the property, a distance of about six miles. From the cabin on Bedrock Creek, one travels down the creek bed to its confluence with 60 mile River. Following Sixty Mile River upstream for a few hundred feet one comes to a ford where the water seldom exceeds 3-1/2 feet in depth. (1/4 mile further upstream, the river is narrow with steep banks and could be easily bridged by a Bailey). From Sixty Mile the cat trail climbs vertically 1500 feet up a long ridge to the property. The only difficult to traverse part of this ridge lies below timber line. Here a 1/2 mile wide steep, moss-covered section would require a road building program with switchbacks to make it passable for a power wagon.

To reduce servicing and time costs during an exploration program I recommend that the bog holes between Glacier Creek and Bedrock Creek be made passable for a power wagon.

Should the property reach production, about 12 miles of new road, following high ground, would give ideal access from the main highway. The new road would not, in my opinion, be unduly costly or difficult to build.

TOPOGRAPHY, CLIMATE AND FACILITIES

The topography is rough but not rugged. The terrain is strewn with frost-heaved boulders which prevent jeep travel except on prepared road beds but the absence of timber and brush makes walking easy. Grades are between 10 and 15 percent. Adit entry is everywhere possible and practical, particularly near the known veins.

The climate is severe: the mean average temperature is below freezing. During the period of examination snow, sleet, hail and freezing rain fell over short periods of time but the weather was mostly pleasant. Exploration work can be carried out efficiently between May 15 and October 1, making due allowance for the 1500 ft. difference in elevation between the several showings. At the time of examination large remnant snowdrifts existed in sheltered areas on the north facing slope from 3500 ft. upwards. This elevation is also the rough timber line. Snow and ice were present in all the old trenches and pits.

There are no facilities. A tent-tarp and heater stove were left set up at the No. 3 showing. Water is a problem. The area has a low precipitation and once all the snow is melted (end of July) it is difficult to find drinking water. Only snow water was reasonably available during this examination. During the run-off drill water is available high in the creeks but I doubt the practicality or even the possibility of building a reservoir-size dam for drill water on the high creeks at reasonable cost. The most practical approach is to time diamond drilling to coincide with the run-off period. Because of the porous character of the rocks and vein systems, it is probably impossible to re-cycle drill water.

The ground is permanently frozen. During the summer there is no thawing under the moss covered areas but non mossy areas thaw to a depth of 3 or 4 feet. Because of the permafrost it is essential that a bulldozer used for trenching be equipped with a ripper and spare teeth. During the

summer a trench bulldozed to permafrost can be expected to thaw an additional 3 to 6 inches in a 24-hour period. Bulldozer trenching should be timed to take every advantage of natural thawing for ripping permafrost is slow and expensive work.

Permafrost is widespread at Keno Hill and at the Casino Silver property. However the vein systems are not frozen. If the same conditions exist at Sixty Mile (and this may be the case) it will be most advantageous underground, for the old workings will provide a reservoir if not a source for industrial water.

Cassiar Asbestos Corporation Limited is bringing an asbestos property into production at Clinton Creek some 30 miles north of Sixty Mile. Access to both properties is via the same highway. A new townsite will be built and hydro and telephone services are being installed. These facilities will materially benefit any long range program at Sixty Mile.

The Sixty Mile property is located in grizzly bear country and personnel must take the appropriate precautions.

HISTORY AND DEVELOPMENT

The area was prospected by Mike Chefkoi and Louella E. Murray of Dawson City and Jeff Lerner of Whitehorse. This group established the presence of silver lead veining over a 50 square mile area and through a vertical distance of about 2500 feet. This was done by prospecting visually and geochemically. Claims were staked.

The prospecting group made a deal with a Mr. A. Moisey who introduced Mr. A.F. Tottrupp of Edmonton into the picture. More claims were staked and according to reports, some work, probably assessment work, was done.

Subsequently Mr. Moisey's interest in the property was apparently lost and Sixty Mile Mining Company Limited was formed by the prospecting group and Mr. Tottrupp to acquire all of the claims in the area.

During the summer of 1966 an attempt was made to high grade the Nos. 1 and 3 Veins. Altogether about 25 tons of material averaging 67% lead and 67 oz. silver was shipped to the smelter at Trail for a net return of $4,433.52. This work did not advance the exploration of the area and all exposed veins were covered up when mining was completed.

Insofar as I could enquire and observe, the property has never been subjected to an organized, planned exploration program. The work done to date has been elementary prospecting, high grading and the minimal requirements for assessment work filing.

GENERAL GEOLOGY

There are no pertinent general geological data available. This particular part of the Yukon is one of the few remaining section that have not been mapped in recent years, and I am informed by the resident geologist at Whitehorse that some preliminary work in the area will be done this summer and that for next year a full fledged mapping program is planned.

Most of the rocks in the area are strongly metamorphosed sediments and volcanics of either late Precambrian or early Cambrian age. There are patches and pendants of younger lavas. The intrusive rocks range up to Cretaceous in age.

By far the most abundant rock type seen was an acid mica schist or gneiss exhibiting fairly large feldspar blastoids. The rock is strongly metamorphosed and is probably derived from impure quartzites, arkoses and/or greywackes. No graphite was seen and none was reported by prospector Chefkoi.

A white coloured quartz feldspar porphyry was observed in contact with the No. 3 Vein. This rock is quite common in silver-lead areas and is present at Keno Hill and the Slocan.

Granitic intrusions and magnetite rich rocks are reported in the eastern Block of claims but these were not seen by the writer.

The important observation with respect to rocks is the apparent lack of argillaceous shales and slates which would reduce the usefulness of electromagnetic survey methods in searching for silver lead veins. Quite possibly graphite zones do exist on the property but, with a little experience, it should be possible to recognize their pattern on the electromagnetic plots.

STRUCTURAL GEOLOGY

The general strike of the country rock seems to be northeast with a dip of about 45° to the southeast. However, the area is one of fold mountains and there are probably many local variations in strike and dip and these are undoubtedly more significant in terms of vein structures than are regional strikes and dips. Outcrops are sparse, and although one can probably map rock types accurately on the basis of frost heaved boulders the resulting map would be quite blank in terms of structural geology.

The No. 1 vein strikes N40E and dips south at 80° to 85°. The strike of the No. 3 vein has not been reliably established. It seems to strike about N60E but the electromagnetic results indicate N85E. The vein dips almost vertically.

No evidence of faults transverse to the veins was seen but it would be surprising indeed if none existed. Furthermore, a good exploration program would attempt to search for and define such structures.

ECONOMIC GEOLOGY

Silver-lead veins have been found in the Sixty Mile Area over an East-West distance of 7 miles, a North-South distance of 6 miles, and through a vertical distance of about 2500 feet. There is no way of knowing if this area (42 square miles) is the full areal extent of the silver lead veining, or if the discoveries made to date are the best of the silver lead veins to be found in the area. I contend that the Sixty Mile area can be regarded as a silver lead metallogenic region which, after exploration, may become a mining

camp comparable in many respects to the Keno Hill Camp, the Slocan Camp, or the Lardeau Camp.

In the Yukon there are several areas of silver lead veining similar to the Sixty Mile. According to my inquiries, including the resident geologist, all have been explored to some degree except the Sixty Mile. This one has not been explored because its discoveries are brand new.

The silver-lead ratio in the Keno Hill Camp is about 5.5 to 1. The silver-lead ratio at Sixty Mile and elsewhere in the Yukon seems to average about 1 to 1. The more productive veins of the Slocan Camp in British Columbia have a silver lead ratio of about 2 to 1. Thus by silver-lead vein standards, the Sixty Mile ore, even where rich, would not classify as a high grade ore. However the increasing price of silver may compensate for the 1 to 1 silver ratio.

The mineralogy of the Sixty Mile veins must be postulated. The only primary sulphide observed to date is galena. The secondary minerals identified are cerussite, anglesite, malachite, azurite, and scorodite. Minor gold values are present: the highest assay recorded being 0.16 oz. and this was probably a result of secondary enrichment. The smelter return recorded minor quantities of zinc, antimony, arsenic and gold.

It seems quite likely that zinc in the form of sphalerite exists in the unweathered portion of the veins and that this mineral, together with a much lower silver and cadmium content, may occur in economically interesting quantities. The expected gangue minerals are siderite, quartz and pyrite.

No opinion can be expressed on the copper-gold content of the Sixty Mile veins. Elsewhere in the Yukon, where no copper showed at the surface exposures of silver lead veins, significant values in copper and gold have been found underground.

A Ronka 16 electromagnetic traverse was made between the No. 1 and No. 3 showings. The traverse length was just under two miles and readings were

taken at 50 ft. intervals. Distances were paced and where readings were taken, the point was marked with a splash of red paint from a spray can. A single line traverse such as this is in no sense definitive with respect to conductors, but the variations in reading are suggestive of whether the rocks in the line of traverse are electromagnetically neutral or whether they appear to contain conductors. The rocks between the No. 1 and No. 3 showings appear to contain conductors. Prospector Chefkoi stated that he had obtained positive geochemical reactions in the vicinity of certain of the conductors located on the traverse and he pointed out some feeble attempts at bulldozing made along the inferred strike. At another location (1475 ft. North of No. 1 showing) where a particularly good conductor was located, Chefkoi hunted around and found a piece of scorodite float.

The general impression gained from the traverse is that between the No. 1 and No. 3 showings several zones of conductors (each zone being a few hundred feet wide) occur between much wider sections of relatively non conductive rock. Such a pattern would be consistent with that found in the better known silver-lead vein areas.

No. 1 Vein - Claims CCL 5 & 6

In 1966 this vein was exposed continuously for a length of around 200 ft. The vein occurs on a north facing side hill near the bottom of a 6 to 10 ft. high vertical face. In order to expose the vein, the permanently frozen overburden on the north wall was drilled, blasted, and pushed away by a bulldozer. No sketches were made of the vein from which some 15 tons of massive galena was mined. Upon completion of the mining, muck from the north wall was pushed over the vein, and from the south wall, a small rock slide was pushed down over the muck, making a total cover over the vein of between 5 and 10 ft., all of which froze solid last winter.

At the time of examination, the No. 1 vein area was covered with snow to a depth of 10 feet. The bulldozer, with Chefkoi as a guide, spent a full day ploughing snow and loose rock from the showing area. The area was left to thaw for 36 hours. After a further 1/2 day ripping and bulldozing on the No. 1 vein, neither Chefkoi nor Karlson was able to pinpoint the vein location so as to allow the bulldozer to concentrate on the best spot to locate the vein.

On the second afternoon and due to about equal parts of luck and Ronka 16 surveying, the vein was located and exposed for a total length of about 20 feet. Of the 20 feet, about 6 feet contained massive galena, and the remaining footage was muck-filled having been mined out in 1966. Thawing ground muddied the exposure and a truly detailed examination of the vein and walls was impossible.

The vein is 12 to 15 inches wide and has a mica schist for both walls. It strikes about N40E and seems to dip vertically to steeply south. The walls are sheared and here the mica schist forms a poor gossan. Massive galena 12" wide was seen. 18" of massive galena is reported from the mined out section. A sample of fairly clean galena assayed 75.2% lead and 79.0 oz. of silver. Chefkoi and Karlson report that massive galena occurs continuously over a length of about 150 ft. Its width varies from about 18" to zero and probably averages about 3 or 4 inches. At both ends the vein peters out. 50 ft. east of the high grade exposure, a packsack drill hole put down in 1965 at 60° intersected about 1 foot (not a true width) of massive galena. 400 to 500 ft. west of the showing and approximately along strike, Chefkoi found galena float.

Chefkoi reports that a narrow auxiliary vein angles into the No. 1 vein west of the mined out section. The EM results seem to corroborate his statement.

A small Ronka 16 electromagnetic survey was made over the showing area for a strike length of 450 feet. A N40E base line was set up, and paced lines were run every 50 ft. Readings were taken at 25 ft. intervals. The pacing cannot be very accurate because of the steep snow-covered slope.

The Ronka 16 results are most impressive. Of the 10 lines run, only 1 line produced unintelligible results. All other lines showed at least one well defined crossover and in several instances these coincided precisely with the location of the No. 1 Vein which was located AFTER the survey was made. From the results I conclude that the No. 1 Vein is a continuous conductor and does carry narrow widths of massive galena for a length of over 150 feet.

The Ronka 16 results on the vein extension are best described as scattered and these scattered crossovers are probably indicative of other vein echelons.

In my opinion the No. 1 Vein is a single echelon belonging to a series of echelons which constitute a fairly broad zone (300 ft. plus) of shearing movement. The sheared zone probably has a very long strike length and to date, lead values occur, intermittently, over a strike length approaching 1000 ft.

No. 2 Zone - Claims CCL 7 & 8

The zone lies in a small North-south oriented saddle about 200 ft. long and the same in width. Three bulldozer trenches about 5 ft. deep located near the south end of the saddle failed to reach bedrock. At the time of examination the trenches were full of water and ice but the muck piles showed minor evidence of gossan and of scorodite. No positive vein material has been located in place.

No work was done in the showing area except for a short Ronka 16 traverse. This indicated that the best crossover lies near the north end of the saddle, about 100 ft. across the strike from where trenches are located.

The Ronka traverse between Nos. 1 and 3 showings indicated that the No. 2 showing occurs within a broad area of above normal conductivity. In my opinion the general area warrants exploration.

No. 3 Zone - Claim Jack 2

The zone occurs on a north facing promontory which would allow adit entry onto the No. 3 zone by means of a drift. Immediately north of the promontory is a saddle, almost identical to the one at No. 2 showing, and one may speculate that this saddle contains a major shear structure.

Chefkoi found galena float on the promontory and dug a small pit which exposed massive galena about 14 inches wide. In 1966 the pit was bulldozed open and some 14 tons of massive galena was mined. Two other trenches were bulldozed on the presumed strike. These failed to reach bedrock and in my opinion are not on the strike of the zone.

A At the end of the 1966 season the mined out pit and the exposed portions of the No. 3 vein were covered with about 2 ft. of overburden. During this examination the No. 3 trench excepting the pit was reopened with about 2 hours of bulldozer work. The exposures of galena made were, according to Chefkoi, better than that which was showing in 1966.

Massive galena, a measured 3 ft. in width, was exposed to the east of the vein section mined last year. On each side of the massive galena was from 3 to 6 inches of cerussite and anglesite. The massive galena was exposed for a strike length of 25 ft. although the exposure at the east limit was poor and the massive galena was definitely narrower. The massive galena assayed 80.4% lead and 88.8 oz. of silver. On the south wall of the massive galena lay 4-1/2 ft. of quartz feldspar porphyry. Part of this may be vein material but I think it is mostly intrusive rock. South of the intrusive lay 12 inches of massive galena which assayed 73.6% lead and 56.6 oz. of silver. This lense faded out to the east after a distance of 6 to 7 ft. Strong gossans, several

feet wide occur on both walls of the vein and nowhere can fresh wall rock be seen.

Two bulldozer trenches were started along strike on each side of the pit containing the massive galena. Neither reached bedrock due to the permafrost. Both encountered the gossans mentioned above and in the western trench a minor and unimportant quantity of galena was found.

Chefkoi found galena float 175 ft. east and downslope from the massive galena exposed in the trench.

A Ronka 16 electromagnetic survey of the area was made. A grid was set up for control. This was done before the vein was uncovered and unfortunately the grid used was not well suited for exploring the No. 3 Vein. Also, the radio station used (Hawaii) does not provide the best coupling for the No. 3 Vein, but we were not aware of these facts before the survey was made.

The Ronka 16 survey results are still quite good. The massive galena section of the vein was located within a few feet although this could be done almost as well through visual inspection. It is my opinion that on the No. 3 zone the gossan zones on each wall of the vein are stronger conductors than the massive galena and it was to these gossans that the Ronka 16 reacted. The strike indicated by the Ronka is quite different from the strike of the massive galena. This explains why last year's bulldozed trenches were not located on what I presume to be the strike of the No. 3 Zone, namely N85E.

The Ronka 16 results are remarkably consistent for a strike length of 175 ft. To the west, the conductors are offset, perhaps echeloned, and this coincides with Chefkoi's report that the vein peters out to the west. To the east, the Ronka results become unintelligible because of water running down the bulldozer road. Beyond this there is again a suggestion of an echeloned structure.

Veins 4, 5, 6, 7, 8 etc.

None of these veins were examined. These trenches were all sunk on float and geochemical anomalies and non reached bedrock. Almost invariably goassans are reported and some of these carry low values in lead and silver. Some of the trenches could be seen at a distance and all were filled with ice and snow.

AEROMAGNETICS

The Sixty Mile area is covered by aeromagnetic sheet 4268G, 1" = 1 mile.

The map indicates some pronounced variations in magnetic intensity which I find difficult to explain or interpret. At the No. 3 showing the magnetic intensity is moderate. The No. 1 showing lies on the north flank of a strongly magnetic zone which trends East-West more or less along the high ground. One wonders if elevation is the cause of the anomaly. At the same time magnetite, apparently associated with pegmatite dikes, is found on the No. 3 claim block within the area of same magnetic high.

EXPLORATION TECHNIQUES

The Sixty Mile area has a very short prospecting season and is located on high ground in a permafrost area. Therefore a proper exploration program, to be successful, must go "with the country and climate" and take every advantage of favourable natural conditions. The following points should be considered.

1. Each showing area should be explored as a separate entity and worked from a movable, on-site camp to avoid excessive travel time between showings. Drinking water can be a major problem during preliminary work.
2. Pickets for grid control must be imported.

3. All conditions and experience suggest that the area will respond to exploration by Ronka 16 electromagnetic and geochemical survey techniques. Normal Ronka surveying should be done on lines 100 ft. apart with stations at 50 ft. intervals. Over showing areas 50 ft. lines and 25 ft. readings are recommended.

4. Geochemical samples should be collected at 50 ft. intervals on lines 100 ft. apart and tested in the field for total cold extractables so as to have preliminary geochemical results available. Favourable samples can be sent to a laboratory for more exact analysis. At Keno Hill, R.W. Boyle (G.S.C. Bulletin 111, p. 224) states "The results of analyses of residual soils along a series of traverses across known mineralized vein faults indicates that in the vicinity of these structures, the silver, lead, zinc, antimony, arsenic, and manganese contents of the soil rise several times above the background giving broad anomalies with strong contrasts. Where lead deposits are present the anomalies are particularly marked and metal values tens and in places hundreds, of times greater than background were obtained." Similar results can be expected at Sixty Mile.

5. Areas of light overburden should be bulldozed in July and August when natural thawing is well advanced. Although the bulldozer must be equipped with a ripper, maximum efficiency will be obtained if the 'dozing is rotated so as to take advantage of natural thawing.

6. Late May and June is the best time for diamond drilling insofar as water supplies are concerned. It is doubtful if sizeable water reservoirs can be built economically and it is doubtful if ground conditions will permit the re-cycling of drill water.

7. Gossan Zones are not nessarily indicative of vein material in the Sixty Mile area. Gossans may be checked and proved to be weathered vein material by assaying for lead and silver.

8. Air photograph interpretation, particularly considering the 1/2 mile scale of the only photos available, is not an effective exploration technique. It probably is suited as a guide to prospecting.

9. Geological mapping, because of the impossibility of collecting structural data, will be ineffective during exploration. However it should be done at the same time as diamond drilling for the two techniques will complement each other.

10. The Sixty Mile area can be explored on surface between May 15 and October 1, depending in part on the altitude of the area being worked. An effective exploration program would have to encompass two and possibly three field seasons.

COST ESTIMATES

The writer has had no experience operating in the Yukon and the following estimates must be judged accordingly. The estimate below should keep a two-man crew in the field for ten weeks, setting up grid systems, Ronka 16 surveying and soil sampling.

Capital Costs

Camp & Equipment	$1,500.	
Surveying & Geochemical equip.	7,000.	$ 8,500.
Operating Costs - Field		
Labour	$4,000.	
Travel	1,000.	
Radio communication	500.	
Food	1,500.	
Truck rental	1,000	
Bulldozer services, camp move-in	2,000	10,000
	C/F	$18,500.

B/F		$18,500
Operation Costs - Technical		
Laboratory tests	$5,000.	
Geological supervision	2,500.	7,500.
Trenching by bulldozer		1,000.
Contingencies		3,000.
		$30,000.

CONCLUSIONS AND RECOMMENDATIONS

1.- Sufficiently widespread silver lead mineralization in vein fault systems is indicated to classify the Sixty Mile area as a metallogenic area from which silver and lead and probably zinc can be won in substantial quantities.

2.- The Sixty Mile area has been prospected but never explored and in my opinion it warrants exploration.

3.- Several vein fault structures carrying silver lead have been found and partly exposed by pits and trenches. These are probably ordinary echelons within a broader and stronger echeloned and braided sheer structure. The mineralized echelons can be expected to repeat themselves along strike and down dip in a crude but fairly predictable fashion.

4.- Preliminary exploration such as soil sampling, electromagnetic surveying, trenching and diamond drilling can be carried out only between May 15 and October 1. Therefore any exploration program must extend over a period of two or three years.

5.- The 1500 ft. elevation difference within the claim area will influence where and when exploration can start.

6.- The areas already held by Sixty Mile Mining Company Limited cover most of the ground above the timber and brush line. These areas have the lightest overburden and are the easiest to explore. There is ample room for more staking.

My report is respectfully submitted.

H. G. Harper

Willowdale, Ontario
June 19, 1967

H. Grant Harper, F.G.A.C., P.Eng.
Economic Geologist

CERTIFICATE

I, HUGH GRANT HARPER, of Metropolitan Toronto, in the Province of Ontario, certify as follows with respect to my reporte entitled GOLDRAY MINES LIMITED, PROPERTY EXAMINATION, SIXTY MILE MINING COMPANY LIMITED, June 19, 1967:

1. I am a practising economic geologist carrying on business as

H. Grant Harper, P.Eng.,
314 Hendon Avenue,
Willowdale, Ontario.

2. I graduated from the University of Toronto with the degree of B.A.Sc. 1950 and M.A.Sc., 1951 and have been engaged in my profession for over ten years. I am a Fellow of the Geological Association of Canada, a Member of the Ontario Association of Professional Engineers registered in the Mining Branch, a Member of the Canadian Institute of Mining and Metallurgy, and a Member of the Board of Trade of Metropolitan Toronto.

3. I have no direct or indirect interest, nor do I expect to receive any, in the properties and securities of Sixty Mile Mining Company Limited.

I own a 10% interest in a group of 54 mining claims located in Township 163 and 168, Sault Ste. Marie Mining Division, Ontario, which are held by Goldray Mines Limited. I have no other direct or indirect interest in the properties or securities of Goldray Mines Limited.

4. I made a personal examination of the properties herein reported between June 4th and June 8th 1967. Details of this examination are outlined in the body of my report.

092561

H. G. Harper

Willowdale, Ontario.
June 19, 1967

H. Grant Harper, F.G.A.C., P.Eng.
Economic Geologist

X-RAY ASSAY LABORATORIES LIMITED

45 LESMILL ROAD - DON MILLS, ONTARIO - TELEPHONE 445-5755

Certificate of Analysis

NO. 9410

TO. Mr. Murray Axmith
202 - 220 Bay Street
Toronto, Ontario

RECEIVED June 15, 1967 INVOICE NO. 958

SAMPLE(S) OF Rock SUBMITTED TO US SHOW RESULTS AS FOLLOWS:

Sample No.	% Pb	Ag oz/ton	
A-3851	80.4	88.8	no 3 x 3½'
52	73.6	56.6	no 3 - 12" taile
53	75.2	79.0	no 3 - 12"

c.c. Mr. H. Grant Harper

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X-RAY ASSAY LABORATORIES LIMITED

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Examination of an Ore Sample from

60 Mile District, Yukon

The following report is a mineralogical description and discussion of a sample of ore from 60 Mile district, Yukon, presented by Erland Bengts of Tottrup and Associates, Mineralogical Description.

With the use of X-ray diffraction and the reflecting microscope it was found that the ore is formed of galena (PbS), anglesite ($PbSO_4$), covellite (CuS), and stromeyerite (AgCuS). The two main minerals are galena and anglesite. The anglesite forms veins along the cleavage planes of the galena, indicating that the anglesite was formed by replacement of the galena. It is also significant that the galena does not enclose any of the other minerals. Covellite is the next most abundant mineral and is found only in the anglesite, either having a rectangular or irregular shape. There appears to be two varieties of covellite. A normal covellite, which is indigo blue in air and turns violet under oil immersion and a 'special' covellite which is pale blue in air and remains blue under oil immersion. The stromeyerite is the least abundant mineral and was identified on the basis of its ability to light etch and mineral association. It is always surrounded by covellite and generally by the 'special' covellite which in turn is surrounded by normal covellite. The fact that the 'special' covellite occurs with the stromeyerite suggests that its unusual optical properties are due to the presence of

silver in solid solution in the covellite.

Discussion

The textural evidence suggests that the ore was formed by supergene processes. The restriction of the covellite and stromeyerite to the anglesite (oxidation product of the galena) indicates that these minerals were formed later than the galena. X-ray spectrochemical analysis of the pure galena showed that some silver is present in the galena. Comparison with the altered material showed that there is as much silver in the pure galena as there is in the altered material. Silver is thus present in the galena, stromeyerite, and possibly in the 'special' covellite.

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