

W.A. NO.

NAME *Geological Data*

SUBJECT

ALBION - HAWK CK ZN

82N021-07

PROPERTY FILE

(82N/1E)

005184

INVESTIGATION OF THE MINERAL CLAIMS ON HAWK CREEK IN KOOTENAY  
PARK AND MINING OPERATIONS AT BASE METALS MINING CORPORATION  
IN YOHO PARK

MINERAL CLAIMS ON HAWK CREEK

This group consists of six (6) mineral claims, originally called the Albion Group, staked by Fred Jowett, and E. J. Morigeau in 1929. The Albion Mineral Claims are located on the northwest bank of Hawk Creek, and approximately two and one half miles east of the Banff-Windermere Highway. The claims were recorded at Windermere, and the Mining Recorder was not aware that the showings were in Kootenay National Park and, by the terms of the National Parks Act, were not open for staking. As soon as it was discovered that the showings were within the boundaries of the Kootenay National Park, the stakers were notified that they had no rights of ownership on the property, and no further work was done by the men staking the claims. Mr. J. D. Galloway later attempted to record these claims when he was manager of Base Metals Mining Corporation, but was not permitted to record them, and later, requests to work the deposit were refused.

In 1942, representation was made to the Minister of the Department of Mines and Resources by officials of the Base Metals Mining Corporation that there being a shortage of zinc, the high grade zinc showings at Hawk Creek should be brought into production as a war measure. It was then decided that the showings should be explored by the Department of Mines and Resources, and Dr. H. M. A. Rice was appointed to supervise the exploration by means of diamond drilling to determine the potential ore body on this property.

In August of 1942, Dr. H. M. A. Rice, of the Geological Survey, submitted a full report to the Director of Mines and Geology Branch, Department of Mines and Resources, Ottawa. As this report contains all pertinent information regarding this ore body, I shall not attempt to go into the geology and potentialities of the showings which have been reported by Dr. Rice, other than saying that through this diamond drilling program - approximately 8,000 tons of 25 per cent zinc were blocked out.

I discussed the whole problem with Mr. E. J. Gleason, Mine Manager, Base Metals Mining Corporation, who was most co-operative, and permitted me to examine all information he had been able to obtain regarding this zinc deposit.

From the experience that this Mining Company have obtained through their workings at the Monarch and Kicking Horse Mines, Mr. Gleason is of the opinion that it should be possible to find a great deal more ore than previously indicated by diamond drilling. He bases this opinion on the fact that this deposit is of the replacement type. This means that solutions percolating through the limestone have replaced the limestone depositing mineralized zones, and, from experience, it has been found that ore reserves in this type of deposit are difficult to determine, in that some portions of the limestone are replaced, while other portions have not been replaced by mineralization.

At the time of drilling, the ore concentrates had to be shipped to the United States, however, the picture has now changed, because since 1947, the smelter at Trail is handling customs zinc concentrates, which makes a difference in the price paid per ton of concentrate. Also, the present day prices of zinc far exceed the 1942 prices.

If permitted to mine this deposit of very high grade ore, the marginal ore at Base Metals Mining Corporation's property could be mined when mixed with the high grade ore, which would increase the present production at base Metals Mining Corporation. As in the past, strategic implications of the zinc shortage were emphasized by the mine management. The ore would have to be trucked a distance of fifty-five miles over Park highways to the concentrator at the Base Metals Mining Corporation's property, and no increase would be required for the present mill to concentrate the ore thus obtained.

I can see several factors that would impede the mining of this ore body, as listed below:

- (1) There never has been a properly located mineral claim on the showings. By this, I mean that the original staking was illegal, because it was within the boundaries of Kootenay National Park where, by the Parks Act, mineral claim staking is not allowed within National Parks.
- (2) According to Dr. Rice's report, the ore body is confined to a localized deposit of limestone, and he is of the opinion that the structure does not continue beyond the presently known limits. This may or may not be case, and is open to controversy.

- (3) Before any mining can be contemplated, mineral claims would have to be staked, and this would require a certain portion of land to be withdrawn from the confines of the National Parks. The notice of withdrawal would have to be published, and as soon as this is done, all prospectors would have to be allowed the opportunity to stake mineral claims which might lead to someone else staking these claims, which party might be incapable of developing the ore deposit. Therefore, it may be seen that it would be rather illogical to throw open a portion of the Park for mineral claim staking without the guarantee that the Base Metals Mining Corporation who now operate within the Park might not gain possession of the mineral claims. The only solution that I can see to this problem would be for the Government to mine the ore through the medium of the Base Metals Mining Corporation if the time comes that this zinc is required for industry.
- (4) I believe that a certain precedent would be set up if a portion of the Kootenay National Park were to be opened for mineral claim staking, and I could easily foresee that once this is done, a great clamor would be set up asking for the same privilege to be extended to other portions of the National Parks, not only for exploitation of mineral resources but oil companies would ask for the same consideration, as would the pulp and paper industry ask for timber berths, and, in other words, the National Parks would no longer be in existence.
- (5) There is at present, a shortage of zinc, but the Dominion Bureau of Statistics should be able to supply a complete table showing sources and potential supply of this metal that may be required for the immediate future for strategic reasons.

MINING OPERATIONS AT THE MONARCH AND KICKING HORSE MINES  
OPERATED BY BASE METALS MINING CORPORATION NEAR FIELD, B.C.  
a mine

In August, 1948, I made examination of this property, and submitted a very complete report on their operations. This report will be found on the National Parks' file Y-51-7. The report covered historical background of the mine, plant and equipment, production figures, geology of deposit, mining methods,

ore reserves, as well as, illustrations and appendices showing the operations at both mines. However, I shall make a very brief summary of this report, and indicate the present circumstances under which the request has been made for prospecting outside of the present lease boundaries.

The ore bodies lie on each side of the Kicking Horse Valley and consist of the East and West Monarch Mines in Mt. Stephen, south of the Valley, and the Kicking Horse Mine in Mt. Field, north of the Valley. The outcrops are approximately 1,000 ft. above the valley floor in almost vertical cliffs. The ore from the East Monarch Mine is trammed to the mill by means of an aerial cable tramway, gravity operated, so that, as one ore bucket descends with a full load, the other empty ore bucket is pulled up the inclined cableway. The same method is employed in tramping ore from the Kicking Horse Mine. The Monarch Mine consists of the East Monarch workings and the West Monarch workings. The latter have not been worked since re-opening the mine in 1947.

The ore is found overlying a black dolomite and is of the replacement type ore body, with the ore lenses in an echelon series. It has been found that with a replacement type of deposit it is literally impossible to block out ore reserves without conducting active mining operations in conjunction with development, and, often it would appear that the ore is pinching out - and when least expected, another ore body is often found.

At the present time the ore is almost worked out in the East Monarch Mine in the presently known ore bodies, however, a new ore body might be intersected at any time. When the West Monarch workings were abandoned prior to the closing down of the mine in 1935, a good grade of zinc was encountered in the most southerly face of the development drift (see attached plan), and, recent diamond drilling has indicated that there could be some ore remaining in the West Monarch Mine. In view of this, they are now driving a raise from the westerly workings of the East Monarch Mine, which will be driven a distance of 250 ft., then, the most south-easterly drift in the West Monarch workings will be driven a distance of 240 ft. to intersect the raise. This will give access to the West Monarch through the workings of the East Monarch. At the time of my visit, this raise had been advanced 120 ft. Briefly, there is very little ore coming from the present workings in the Monarch Mine, and until this raise and drift have

been driven, very little ore will be produced from the Monarch Mine.

Regarding the Kicking Horse Mine, there are two (2) ore bodies, No. 1 on the east and No. 4 on the west, at an elevation of approximately 250 ft. above the No. 1 ore body. The bulk of production is coming from both of these ore bodies in the Kicking Horse Mine, and is trucked from the ore bin to the concentrator on the south side of the valley. These two (2) ore bodies appear to line-up with the East and West Monarch Mine workings, and are dipping north-westerly at approximately 8 degrees in both mines.

The method of mining has been described at some length in my previous report, however, I will review this briefly. A development ore production drift is driven below the black dolomite - and not in the ore. Raises are driven from the production drift into the stopes above where the ore is produced. The ore, in turn, is slushed to these raises and the chutes below are pulled in the production drift. At the present time the production drifts have intersected the ore bodies, as may be seen from the fact that both the No. 1 and No. 4 ore bodies are dipping north-westerly at 8 degrees. Then, taking into consideration that an up-grade is required from the portal of the production drift, the ore is now found in the face of this production drift. At the Kicking Horse Mine they have no electrical power, and it would be most difficult for them to continue mining down the slope of the ore body, therefore, the mine management have decided to commence a new adit, the portal at the face of the cliff being approximately 300 ft. below the present lowest workings. This will enable them to get under the ore which has been located below the present production drift elevation at the intersection of the ore body. The adit will be driven between the two veins, and when it has been driven a distance equal to the present intersection of the upper production drift and ore bodies, box holes will be raised to the ore bodies. Until this new production drift has been driven, and unless a new ore body is found in the Monarch workings, the mill will, in all probability, close down for lack of ore. It will require approximately three (3) months to perform this development work, and it is primarily on account of this present condition that the mining company have requested the privilege to explore by means of diamond drilling an area east of the present lease.

As will be seen from the accompanying plan showing the location of the diamond drill holes, they intend to explore for additional ore by means

of one hole on the Mt. Field Mineral Claim and other holes outside of the present boundaries of the lease, because there is the possibility of locating an extension of the favourable host rock for further mineralized zone. Their geologists have many reasons to believe that the present structure has been folded and may be located by means of diamond drilling, as indicated on the plan. It will be noted that the collar of No. 2 diamond drill hole is located on the Yoho mineral claim, whereas, diamond drill hole No. 3 is located outside of the aforementioned mineral claim.


The company have grouped these claims, and the Yoho mineral claim is reported to be held in good standing by this company, although it is beyond the boundaries of the present lease. It is for this reason that the company have requested permission to explore beyond the boundaries of their lease by means of diamond drilling an area approximately 4,000 ft. easterly and 4,000 ft. northerly. There is a known mineralized zone near the location of diamond drill hole No. 3.

#### CONCLUSION

It is almost impossible to determine whether continued operation on an economical scale is possible with this type of ore body, however, it may be seen that the present picture at both mines is not too encouraging from a mining standpoint, and until the proposed production drift reaches the ore body in the Kicking Horse Mine the mill, in all probability, will close down. The company have requested permission to explore by means of diamond drilling an area immediately adjoining the boundaries of their lease on the Kicking Horse side of the valley. As the company hold the Yoho mineral claim in good standing, I can see no objection to the boundaries of the present lease being extended to include only the portions of those mineral claims outside of the present boundary. I am of the opinion that there are many obstacles in granting an area for exploration such as requested, primarily because most of this area is not staked, and a precedent would be set up by allowing them to explore on unstaked ground. Naturally, if they found anything in these holes they would want to commence mining operations to extract the ore, it would be contrary to British Columbia Quartz Mining Regulations to allow any mining outside the boundaries of a

mineral claim.

There is a technicality involved that should be clarified - this being that the terms of their lease read that they are allowed to conduct any mining operations within the boundaries of their lease, and there are portions within the boundaries of the lease that are not covered by mineral claims. I feel that this point should be clarified, whether or not they be allowed to conduct mining operations within the boundaries of the lease even though not covered by a mineral claim.



K. J. Christie,  
Chief Mining Inspector.

Ottawa, Ontario,  
13 April, 1951.



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Final Report  
on the  
HAWK CREEK SHOWINGS  
by  
H.M.A. Rice

Summary

PROPERTY FILE

As a result of the exploration at Hawk Creek it appears extremely improbable that there is enough ore reasonably accessible for the showings to be developed into a mine. There is, however, a possibility that some 3400 tons of good grade ore could be extracted and shipped by truck for treatment at the mill of the Base Metals Mining Corporation at Field without either much profit or loss.

Introduction

The showings that are the subject of this report are situated on the west side of Hawk Creek in Kootenay National Park, British Columbia. They are reached by half a mile of rough automobile road and a mile and a half of tractor road from a point on the Banff-Windermere highway 55 miles from Field and 24 miles from Castle Mountain, the nearest point on the Canadian Pacific Railway. They are on an elevation of about 5700 feet.

The hillside on which the showings are situated slopes down to Hawk Creek, some 700 or 800 feet vertically below, at 20 to 30 degrees. Nowhere within a considerable radius of the showings does it flatten out into a level spot large enough to locate even a tent camp. Such a camp would therefore have to be constructed on the sidehill.

PROPERTY FILE

The terrain is covered with jack pine, up to about 8 inches across the butt. These would be adequate for small mine timber. Wood for fuel is not plentiful.

There is no water actually on the showings. About 300 feet north and about 50 feet lower down a small seepage was discovered which, when opened up, proved barely sufficient for the diamond drill. A little over 1000 feet south of the showings and somewhat below them is the head of a small creek. A few hundred feet further down this creek increases in size and would then supply a small camp for preliminary development work. About half a mile north of the showings a good sized creek crosses the main trail up Hawk Creek and this would be ample for mining, milling and camp use.

#### History of the project.

The showings were discovered by Fred Jowett, of Wilmer, B.C., in 1929 when he was employed by the Dominion Government to work on a waggon road being constructed up Hawk Creek. He later staked the showings and recorded the claims at Windermere. The Mining Recorder there was not aware that the showings were in Kootenay National Park and, by the terms of the Park Act, not open for staking. Jowett and his associates did some stripping on the deposit but when this was discovered further work was stopped by the authorities who pointed out that the staking was illegal and that Jowett and his associates had no rights of ownership over the property. No further work was done.

Claims were staked on the showings by Mr. J. D. Galloway when he was manager of Base Metals Mining Corporation but he was not permitted to record them

and later requests to be allowed to work the deposit were refused.

In the spring of 1942 representation was made to the Minister of Mines & Resources by officials of the Base Metals Mining Corporation that, as there was, on the authority, of the Metals Controller, a shortage in zinc, the zinc showings at Hawk Creek should be brought into production as a war measure. It was consequently decided that the showings should be explored by means of funds released from the War Appropriations Vote under the direction of the Director of the Mines & Geology Branch of the Department of Mines and Resources. For this purpose the Base Metals Mining Corporation were retained to carry out the organization and administration of the project while the writer, acting as representative of the Director, was to lay out the work to be done. The exploration was to be for the purpose of discovering whether a workable body of ore exists at Hawk Creek.

This has been carried out and it is felt that the exploration has now given sufficient data on which to decide the merits of the showings.

#### Description of the Showings

The original work consisted of one principal open-cut or area of stripping and a number of smaller open-cuts above and below it. In few of the open-cuts was there any rock in place and in only the main cut and the one immediately above it was any ore to be seen. It was later found out that the ore in the latter cut was a piece of float resting several feet above bed-rock. In the main open-cut was a showing of high-grade ore some 25 feet in horizontal extent across the face of the hillside by 15 feet horizontally out from the hill and with a vertical face of about 10 feet.

The ore consists of massive and disseminated, fine-grained sphalerite accompanied in most places by fine-grained pyrite. Galena occurs in occasional small patches but in most places it is absent, and nowhere is it an important constituent of the ore. Silver also occurs but in negligible amount.

The ore occurs in a series of thick-bedded, blue-gray limestone interbedded with which is a band of argillite 40 to 60 feet thick. These limestones, in the vicinity of the showings, are flat-lying or gently folded but have been subjected to an almost universal shearing having a strike of about 120 degrees and a dip of 40 to 60 degrees south-west. Near the ore this shearing is somewhat more intense than elsewhere and its influence on the deposition of the ore is clearly shown by the way in which bands of the latter follow the lines of shearing. This is so pronounced that it obscures the true direction of elongation of the ore. Superficially it appears as if the extension of the ore should be sought for downwards in the direction of the shearing whereas actually the ore has followed a band or bands of limestone underlying the bed of argillite mentioned. Narrow tongues or roots of ore extend downwards from the main ore-body in the direction of the shearing and the ore dies out laterally in both directions from the zone of maximum shearing. The ore is thus localized into a long, narrow shoot having a somewhat trough-like cross-section and extending along the line of intersection of the shearing and the limestone beds in question. Its shape can be seen in the cross-sections accompanying this report.

## Exploration

When the exploration was commenced a waggon road lead up the Hawk Creek valley from the Banff-Windermere highway to a point about 350 feet vertically below the showings. From here a good trail continued up the valley but did not get any nearer to the showings. The first half mile of this waggon road could easily be converted into a rough auto road and at that point was a good camp site on Hawk Creek. From there up, the road was steep, rough, and narrow and well up on the side-hill.

A camp was accordingly established at the end of the good stretch of road and that road improved until it was passible for a truck. Although this was far from the workings no means of transportation was readily available to establish camp further up. Later it became possible to borrow a tractor from the Parks Branch and, after improvement of the road and trail and the construction of a tractor road up to the workings, it was used to move the diamond drill in and out.

The first work consisted of stripping and open-cutting designed to check the writer's hypothesis that the ore followed the bedding of the limestone rather than the dip of the shearing. This type of work was hampered by the depth of the overburden which was up to 14 feet in places. Before much work had been done it was clear that this hypothesis was substantially correct but as yet no information was available as to the plunge of the ore-shoot into the hill. To establish this a short adit was driven to expose the bottom of the ore-shoot and, when this was found to be under the ore, its back was knocked out and a bench carried forward over it for a short distance. By this means the shoot was found to plunge at a low inclination into

the hill.

About all the information that could be gained practically on the surface had by now been obtained so a diamond drill was secured and five short vertical holes (section A) were drilled along the line of the main open-cut. The results of these holes bore out the picture previously formed and gave accurate information on which to base estimates of tonnage and grade. The ore-shoot was so small and irregular that closely spaced drill holes were essential to gain the desired information.

It was evident that the ore-shoot had probably extended up and to the left in section A and if so had been eroded away at this point. Both to test this and for additional information on the rest of the shoot a second line of four holes (section B) was drilled 40 feet up the hill along the line of strike from Section A. This proved the extension of the ore surmised and gave a complete cross-section of the ore-body.

By now it was apparent that the likelihood of proving up enough ore to justify even a small mill was remote but, as the ore was extremely high-grade, there did appear to be a possibility that a small tonnage of high-grade ore might be developed which could be mined and transported to the Base Metals mill at Field at a profit. It was therefore decided to drill another row of four holes (section C) 60 feet from section B giving a total length along the ore-shoot of 100 feet and to put in two inclined holes from the two center set-ups. Also if these holes were at all encouraging to drill a couple of holes 150 feet further up the hill (section E).

The six holes from section B were disappointing. No high grade ore was cut by the vertical holes and only the intersection of some good ore in one of the inclined holes justified the drilling of the two holes on section E. These two holes cut some good ore but it was clear that the size of the mineralized zone was diminishing and the grade generally also getting less. The following figures for the total areas (tons per foot along strike) and grades at each of the sections is illuminative. -

Section A.	45.5	Tons/ft.	@	24.5%	zinc	About half the section eroded away.	
"	B	62.0	"	"	@	30.1%	"
"	C	25.3	"	"	@	18.0%	"
"	D	21.7	"	"	@	23.1%	"
"	E	16.3	"	"	@	21.8%	"

Further drilling for such a small ore shoot did not seem practical and it was also felt that enough information had been gained to enable a decision to be reached. This opinion was shared by Mr. Botterill, the Manager of the Base Metals Mining Corporation at Field.

#### Ore Reserves

Three methods of treating the ore were considered;

1. Mining high grade ore and shipping it direct to the smelter. The large amount of pyrite in the ore is believed to eliminate this possibility and it has not been considered further.

2. By installing a 50 tons mill and shipping concentrates only. For this purpose an estimate of the minimum grade that could be used was 15% with a cut off of 10%. (These figures were reached in conference with Mr. Botterill and must be considered as tentative). A rough estimate of the minimum tonnage necessary to write

off the capital investment came to \$30,000 or \$40,000. No where near this tonnage has been blocked out nor is it likely that it could be developed by any reasonable amount of work. This proposal was therefore not considered further than to calculate the tonnage of this grade of ore blocked out.

3. By mining high-grade ore and shipping it by truck for treatment in the mill of the Base Metals Mining Corporation at Field. The minimum grade at which such an operation could be profitably conducted was estimated to be 22% zinc with a cut off of about 20%. Ore of this grade is designated below as shipping ore.

Owing to the closeness of the drilling and the reasonably clear picture of the shape of the ore-shoot the following tonnages may be considered reasonably accurate.

Block between sections A and B, length 40 feet.

Shipping ore	1208 tons	@ 36.7% zinc
Milling ore	944 "	@ 16.2% "
Total ore	2152 "	@ 27.7% "

Block between sections B and C, length 60 feet.

Shipping ore	960 tons	@ 36.0% zinc
Milling ore	1659 tons	@ 21.3% "
Total ore	2619 tons	@ 26.7% "

Block between sections C and D, length 40 feet.

Shipping ore	106 tons	@ 35.1% Zinc
Milling ore	834 "	@ 18.5% "
Total ore	940 "	@ 20.4% "

Block between sections D and E, length 110 feet.

Shipping ore	1111 tons	@ 27.5% zinc
Milling ore	979 tons	@ 17.5% "
Total ore	2090 tons	@ 22.8% "



Total tonnage for a length of 250 feet, surface to section E.

Shipping ore	3385 tons @ 33.4% zinc
Milling ore	4416 " @ 18.8% "
Total ore	7801 " @ 25.2% "

Consideration of Values

The following calculations were made together with Mr. Botterill and most of the cost figures were supplied by him; they are purely tentative.

Capital Structure

	\$
Power plant, compressor etc.....	2500
Slusher, etc.....	1500
Two rock drills.....	1200
Mine cars.....	300
Blacksmith equipment, sharpeners, etc.....	<u>2000</u>
Total mining and equipment-----	\$ 7500
Road to property-----	3400
Housing, and general camp buildings-----	4100
Ore bunkers-----	<u>500</u>
Total-----	15500
For contingencies, 10%-----	<u>1550</u>
Total outlay-----	17050
Less salvage value of equipment-----	<u>3050</u>
Net capital outlay-----	14000

Operating costs

Mining costs-----	3.25 \$/ton
Hauling to Field-----	3.75 " "
Milling-----	<u>2.40 " "</u>
Total direct costs-----	9.40 " "
Write-off per ton on capital structure-----	<u>4.14</u>
Total cost per ton.....	13.54
Total cost of extraction & milling of shipping ore-----	\$45,833

Recoverable values

Percent of recoverable zinc in ore 33.4x85 ---	28.4%
Recoverable zinc per ton-----	567.8 lbs.
Total recoverable zinc in shipping ore. 1,922,000 lbs.	
Net value of zinc per lb after smelter deductions etc. -	2.71¢
Total value of zinc ore blocked out for selective mining ----	<u>\$52,086</u>
Profit-----	\$6,253

It is again pointed out that these figures are purely tentative but it does seem that a small amount of ore could be extracted in this way without much profit or loss. It must be made clear that no allowance is made for further development, the plan being to work along the ore from the surface down, scraping the ore up the incline. The cost of driving a development level below the ore would be prohibitive. This method could not be used for over 250 feet from the surface. Furthermore the expense of the preliminary development and exploration already incurred has not been charged against the project. Also it must be borne in mind that there is a lean spot in the ore around section C and it may prove difficult to find ore to follow down through this section. The whole thing is also contingent on the ore being suitable for treatment in the Base Metal's mill.

Respectfully submitted,

(Sgd.) H.M.A. Rice

Aug. 15, 1942.  
Ashcroft, B.C.

COPY/LAF

R E P O R T

on

HAWK CREEK PROPERTY

Kootenay National Park, B. C.

82N/1E  
82N-21

GEOLOGY:

## PROPERTY FILE

The orebody is a replacement deposit in limestone. In the limestone two types have been recognized which appear to be distinct beds; a massive limestone and a fragmental limestone. The ore appears to favour the massive limestone. Overlying the orebody from 5 to 15 feet is a finely bedded shaly argillite varying from 40 to 50 feet thick. Above the shaly argillite is a massive limestone containing finely disseminated pyrite.

The beds immediately surrounding the orebody are lying flat with minor undulations in their attitude. There is a regional shearing striking N.27° W. and dipping 50° to 55° to the southwest. In some places, particularly along the strike of the orebody, brecciation accompanies the shearing. Along shear planes in the argillites thrust movements can be recognized which in the aggregate might measure considerable thrust movement across the shear zone. In this regard it is interesting to note that 400 feet east of the showing the shale has a northerly strike and a vertical attitude. This could be due to faulting movement but would require further work to prove this.

The control of the oreshoot appears to be the intersection of the shearing with the overlying shaly argillite. Although the ore does not extend to the

shale in every case the sulphide mineralization does. In the shale are narrow beds of limestone which have been replaced by ore sulphides. These appear to be lenticular interbeds.

The ore consists essentially of a yellowish brown sphalerite with pyrite, a little galena and white calcite. The upper contact of the orebody is saucer shaped with a width of approximately 66 feet. The lower contact is irregular with projections extending down the dip of the shearing. In most of the sections there is one main root extending down from the body which can be traced from section to section.

HAWK CREEK PROPERTY

WORK PERFORMED:

On August 10th the preliminary programme of surface and diamond drilling was completed. Seventeen holes in all were drilled totalling approximately 1650 feet. This explored the orebody for a length of 250 feet along the strike. The holes drilled gave five sections across the orebody. Five vertical holes were drilled in the first section. Four vertical holes were drilled in the second row 40 feet along the strike from the first section. The third section, 100 feet from the first section, was drilled by four vertical holes. Two angle holes were drilled at minus 60° into the hill from the centre two holes of section three, giving the section as shown in section four. Two hundred and fifty feet from section one two long vertical holes were drilled to outline the orebody at section five. Any further exploration by diamond drilling becomes too costly due to the increased length of drill holes necessary to penetrate the flat lying orebody from points further up the steep hill slope.

ORE OUTLINED BY DIAMOND DRILLING:

Section No.	<u>Selective Mining Ore</u>		<u>Milling Ore</u>	
	<u>Tons per foot of Cross Section</u>	<u>% Zinc</u>	<u>Tons per foot of Cross Section</u>	<u>% Zinc</u>
1	17.1	38.5	44.9	24.2
2	42.7	34.	62.0	28.5
3	None		25	17.3
4	6.9	35.	23	22.8
5	13.0	23.5	16.3	23.3

TONNAGES BETWEEN SECTIONS:

<u>Ore Block</u>	<u>Selective Mining</u>	<u>Milling</u>
No. 1 to No. 2	1196 tons at 35.3%	2138 tons at 26.6%
No. 1 to No. 3	2477 tons at 34.7%	4748 tons at 26%
No. 1 to No. 4	2577 tons at 34.7%	5708 tons at 25%
No. 1 to No. 5	3677 tons at 32.5%	7864 tons at 24.4%

The final tonnages as shown for the 250-foot length drilled is as follows:

7864 tons at 24.4% - milling grade

3677 tons at 32.5% - shipping grade

Now of this 7864 tons at 24.4%, 4187 tons average 17.0% Zinc and 3677 tons average 32.5% Zinc.

The cost of mining, shipping and milling this 4187 tons at 17.0% Zinc would be greater than the net return on the Zinc.

Of the 3677 tons of shipping grade ore averaging 32.5% Zinc, 2477 tons are in one block as intersected in the first two sections while the remaining 1200 tons are separated by the first block by at least 50 feet of low grade ore. This additional development would increase the cost of mining this second block considerably.

CONCLUSION:

The tonnage as outlined by the recent diamond drilling does not justify the expense of installing a mining and milling plant at the property. The closest point to which ore could be shipped is the mill at Base Metals Mining Corporation at Field, B. C. This means trucking the higher grade ore a distance of 55 miles. To do this it would be necessary to build a gravelled surface road to permit heavy trucks to haul ore from the main highway to the mine -- a distance of over 2 miles. Portable compressors and mining machinery would have to be installed at the mine site. Permanent camps would have to be built for the men near the workings.

From the 3677 tons of higher grade shipping ore available, 2,029,704 lbs. of zinc could be recovered, assuming an 85% recovery.

The tonnage of ore is small and the total zinc recoverable not important enough to justify the expenditures involved.

(signed) W. L. Brown

WLB:L

W. L. BROWN

14th Aug., 1942.

White Prints Accompanying Dr. W. L. Brown's Report  
on  
HAWK CREEK CLAIMS, 14th AUG., 1942.

Longitudinal Section

Plan

Plan and D.D. Sections No. 1 and No. 2

D. D. Sections No. 1 and No. 2

D. D. Section No. 3

D. D. Section No. 4 - D

D. D. Section No. 5 - E

D. D. Section through holes 12 and 13

D. D. Section through holes 14 and 15



## PROPERTY FILE

82N/1E  
82N-21ALBION GROUP

Report by A. M. Richmond, Assistant Resident Engineer  
1930 Annual Report of Minister of Mines, B. C.

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During the construction of a trail in Kootenay National Park, one of the men, F. W. Jowett by name, discovered a boulder of lead-zinc float. This discovery he buried and on completion of the trail returned with his partner, Ed. Morigeau, of Athalmer, and after a short search the two men discovered lead-zinc mineralization in place about 600 feet up the hill from the place where the float had first been found. Six full claims, ALBION NO. 1 to ALBION NO. 6, inclusive, were staked and recorded at Wilmer, subject to the approval of the Federal Parks Board. The claims, located  $1\frac{1}{2}$  miles east of the Banff-Windermere highway on the north side of Hawk creek, are best reached by 24 miles of motoring south over the highway from Castle Mountain, a small station on the main line of the Canadian Pacific Railway, near the Alberta-British Columbia boundary.

When the showings were examined in August, 1930, but a limited amount of surface-trenching had indicated a width of 12 to 14 feet of zinc-lead replacement mineralization in grey limestone. The general strike of the limestone and banded shale country-rock formation is N.25° to 30°W. and with a dip of 40° to 60° to the south-west. Two open-cuts which are indicated in the detailed sketch with this report had disclosed neither wall of the mineralization, but gave the impression rather that a width of 20 to 25 feet of good zinc ore might readily be disclosed by a trench joining the two cuts. Subsequently this work was accomplished and the continuity of width in the ore demonstrated. This latter work, which is all shown in the sketch-map, has also indicated the probable presence of faulting to the north of the main showings. The early heavy fall of snow in October prevented necessary trenching to the south-east of the best open-cuts and due to this cause the small crew of men was withdrawn for the winter months.

PROPERTY FILE

ALBION GROUP

A few samples were taken and are given here to indicate the grade of mineralization and widths. Channel sample No. 1, over a width of 72 inches in the upper open-cut, assayed as follows: Gold, 0.05 oz. to the ton; silver, 1.6 oz. to the ton; lead, 4.3 per cent; zinc, 30.6 per cent. A check sample over a width of 96 inches in the same open-cut taken by an independent and reliable engineer assayed: Lead, 9.2 per cent.; zinc, 28.9 per cent. Sample No. 3 taken across 72 inches in the lower and adjacent open-cut, assayed: Lead, 0.5 per cent.; zinc, 36 per cent. Sample No. 4, taken by Resident Engineer B. T. O'Grady across a width of 72 inches in the same open-cut, assayed: Gold, trace; silver, 2.1 oz. to the ton; lead, 0.45 per cent.; zinc, 46.4 per cent. The subsequent trenching between the two open-cuts mentioned has disclosed ore of equally good grade.

The predominant mineral, zinc-blende, has a resinous lustre, varies from dark brown to amber in color, and occurs in almost cryptocrystalline form in the limestone. The galena is found in small aggregates scattered through the zinc.

In its present state the showings are of considerable merit (with an increased market value for zinc) and would warrant the expenditure of an appreciable amount of money for further surface-trenching, diamond-drilling, etc., if permission for this work can be obtained from the Dominion Parks Board. This discovery is also extremely interesting from a wider viewpoint, in that the area between Hawk creek and the MONARCH at Field is at once brought into mind as a possible area for the finding of further mineralization of this type. The rocks of the two camps are of somewhat similar characteristics and a glance at Map 142A, which accompanies the Geological Survey of Canada report on the "Field Map-area," Memoir No. 55, by J. A. Allan, would indicate a zone of interesting prospecting possibilities.

Following the examination in August several parties became interested and the property was finally secured under option and bond by an Eastern Canadian mining company which is already interested in this section of British Columbia. A small crew of men was employed and the results of the work accomplished, before snowfall are shown in full on the accompanying map, kindly furnished by the operator's geologist.

January 14, 1942

PROPERTY FILE

82N/1E  
82N-21

REPORT ON HAWK CREEK MINERAL DEPOSIT

REPORT BY: John D. Galloway

January 15th, 1942

INTRODUCTION

The Hawk Creek Mineral Deposit was discovered by Fred W. Jowett in 1929, and later the Albion group of six claims were located covering it. A small amount of open cut work was done, assessments recorded to 1932 and the claim records allowed to lapse.

In 1932 the property was owned by Fred W. Jowett and J. E. Barbour, each having an undivided one-half interest. Before stopping recording assessments, the owners filed an affidavit, a copy of which is attached to this report. This was to the effect, that as they were not permitted to work the claims, their title was sound without recording assessment work.

LOCATION

The property is situated  $2\frac{1}{2}$  miles north-easterly from the Banff-Windermere Highway on the south side of Hawk creek. A rough wagon-road extends to within 1,000 feet of the showings and thence by trail. The elevation of the main showing is 5,710 feet, or 1,000 feet above the highway at Hawk Creek. A good motor road could easily, at low expense, be built into the property; it would be all bulldozer construction.

Hawk Creek, at the highway, is 23 miles from Castle Mountain station on the C. P. Railway and the junction of the Banff-Windermere and Banff-Golden highways.

The showings on the property lie on a 20-degree slope and are covered with three to four feet of overburden. The country is timbered with a fairly heavy growth of small pine and spruce. Above the showings the slope rises to 45 degrees and below the ground is steeper. Hawk Creek is a fair-sized stream and it is probable that some power could be developed on it.

GEOLOGICAL FEATURES

The formation is entirely limestone of varying degrees of purity. In part it is crystalline and in places some bands are sandy. The whole formation is altered to some extent but not dolomitised.

PROPERTY FILE

REPORT ON HAWK CREEK MINERAL DEPOSIT

BY: John D. Galloway

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Bedding is not definite in the rock exposures. A certain amount of quartz float indicates quartz stringers in the formation but none were seen in place. Some small calcite stringers occur in the limestone and disseminated pyrite crystals occur in places.

The nature of the ore occurrence is not clear at present, until more opening up is done. Apparently there is fissuring or shearing along N24°W lines and ore occurs by replacement in the limestone alongside these fissures. This fissuring may follow along the bedding planes as the dip to the south-west varies from 65° to 30°. At the surface the fissures show considerable limonite from oxidation of pyrite.

DEVELOPMENT

Development has been by a half dozen open cuts. The principal showing is confined to one large open cut, with one cut above showing three feet of ore. All other cuts above and below show no ore but as they are filled up to some extent with dirt, work is required to properly examine them.

The main open cut shows bands of ore and waste across a total width of 39 feet of which 15 feet is waste. 12 feet west of this, the intervening distance being dirt filled, another band of ore commences but is only exposed for one foot in width. Below this main cut (downhill) stripping shows the ore to apparently peter out, no ore occurring at 60 feet below the main showing.

I think the nature of the occurrence will prove to be recurring lenses of ore along the strike of the shearing. Failure to find ore in the very limited amount of open cutting done does not necessarily mean that the main open cut is the only place that ore will be found. Some change in character of limestone walls in different bands might make some parts more readily replaceable by ore solutions than others.

VALUES

Four samples were taken of the portion of the large cut which would represent the probable width mined. The results follow:-

PROPERTY FILE

REPORT ON HAWK CREEK MINERAL DEPOSIT

BY: John D. Galloway

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	No. 1901	No. 1902	No. 1903	No. 1904	
WEST	3'	4'	4'	6'	EAST
	28.4% Zn 0.8% Pb	2.4% Zn 0.3% Pb	17.2% Zn 0.5% Pb	27.8% Zn 2.6% Pb	

The weighted average is 1.25% Pb and 19.4 % Zn, which at our prices has a net value of \$7.67. More ore occurs in the cut to the east but with intervening bands of waste. This sampling shows 17 feet width of 20% ore.

One sample across 3 feet in the cut lying above the large open cut assayed 1.5% lead and 37.1% zinc. A greater width occurs but is covered up by the sides of the cut caving in.

PLAN OF WORK

It is impossible to say at this stage how much development would be done. To begin with, it would be prospecting and exploration, to be followed by diamond-drilling from the surface, and later underground driving and raising.

To begin with I would put on eight men with a foreman, establish tent camp at nearest water, ten minute walk from the showings, and figure on one to two months work with this crew. With miscellaneous costs of transportation, etc. this would approximate \$2,000 per month. Diamond-drilling would probably cost \$1.50 per foot, with a minimum contract of 2,000 feet. This would total \$3,000.

Depending on results the initial program would run from \$2,000 to \$7,000. After that a much heavier investment would be necessary.

REPORT ON HAWK CREEK MINERAL DEPOSIT

BY: John D. Galloway

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From the main road the truck can go in one mile. To the tent camp site is a further one and a half miles of rough road. If horses were available, supplies would be taken in by pack-horse, otherwise by back packing for the preliminary prospecting. Tents, etc. in storage at Campbell Storage would supply most of the outfit required.

A truck road from the highway to the property would cost \$2,500 if a bulldozer were available, possibly by rental from the Government. This road would not be undertaken until at least a month's prospecting work was completed.

The Hawk Creek slope is a southern exposure with no snowslides in the area, no steep bluffs, or any handicaps to mining. Plenty of mine timber is available. If an operation eventuated, a suitable camp site could be found near Hawk Creek. Hydro power on Hawk Creek could probably be developed for six months in the year.

The area is not of scenic interest and the claims are two or three miles from the eastern boundary of Kootenay National Park.

CONCLUSION

I consider that the one important outcrop of zinc ore thoroughly justifies a prospecting campaign to learn the nature and extent of the mineralisation. It would seem quite possible that there is a wide zone of shearing or sheeting with ore making at favorable places.

A preliminary expenditure of \$10,000 is recommended, followed by whatever program is justified from development results.

It is apparent that development would have to indicate a minimum tonnage of at least 250,000 tons of 15% zinc ore (or equivalent in combined lead and zinc) before the expense of power plant, mining plant and mill could be considered. Fifteen per cent average zinc ore would give but little net profit, but a higher grade may be realised.

REPORT ON HAWK CREEK MINERAL DEPOSIT

BY: John D. Galloway

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The property is recommended for development if permission to operate can be secured.

"JOHN D. GALLOWAY"

G.C.L.H.

82N1E 82N-21

Haw Creek Zone

August 15<sup>th</sup> / 1952  
Scale on Plan

Upper Cross Trench

DDH # 3 to # 2 = 20-1

Measuring from DD 3 toward SW.

Trench strikes approx 65°

34 - 48 - Covered

34 - 24 - Gossan - limonitic brown color  
has crusts in places of Zinc Carb  
- one remnant of residual heavy

10'

320/40 SW galena 2" thick

foliation in gossan

Through gossan in some residual  
beds or places of <sup>crystalline</sup> quartzite  
Footwall section of gossan i.e. 25-29  
appears much rather than HW.

26 - 20

Grey crystalline limestone - a  
few veins and stringers of white  
hem calcite. a little sparse  
sphalerite

4'

### PROPERTY FILE

20 - 11 9' - Covered

11 - 0

Massive Sphalerite repl. mineralization  
Zone averaging 50+% Sphalerite  
Minor pyrite and minor occasional  
pods of massive galena - usually 2" or  
so in diam.

11'

In places residual lenses of dolomite  
sparsely mineralized and cut by white  
veins & stringers of calcite which  
contain coarse brown sphalerite.

toward 65°

0 - 5 1/2

Same as 0-11 making zone  
16 1/2' long. This zone extends  
toward 135° where trench crosses

5 1/2'

5 1/2 - 10

Covered

10 - 16

Well mineralized - like main ore  
zone. Zone cuts out irregularly  
+ 50% sph & galena

6'



# PROPERTY FILE

against fine gr. grey limestone ~~or~~ F.W.

Here foliation 3ln 325 / 55-60 SW.

16-17½ Fine grained grey ls. - essentially barren

17½ - 24 Mineralized zone in limestone -

Fine gr. grey limestone with streaks & vugs of sph. and py. along foliation would average 5-10% Zn.

At 23-24 = 1 foot of vein calcite with coarse x-limed texture - mineralized with x-limed sphal darker in color than usual in rept

24 - end of trench - Caved

DDH pit no. 9 - pit caved

DDH pit no 8 - pit mostly caved has 12" of schistose Slaty grey limestone assumed in place cl 335 / vert.

DDH pit No 7. - measuring SW from DDH 6 it is 10.5 to 14' SW. to cover exposed width of massive banded ore consisting of interbanded sphalerite py. & galena  
Runs + 40% Zn.

DDH pit no 6. - 3' of highly friable silvery to reddish slate.  
Clear 320 / 45 SW  
Bedding - horizontal.

# PROPERTY FILE

DDH # 11 pit } Cased  
 # 14a 5 " }

# 10 } Peculiar porous grey to br limy  
 # 12 & 13 } It looks like Calc tufa or  
 } leached ls? - in place?

In steps above this line of  
 pits the ls is sheared at 330/50 SW  
 and has similar appearance to pits  
 only fresher i.e. rock = sheared ls

# 17 Step of limestone - fine gr. st. line  
 ls. with widely spaced thin  
 Calcite stringers along foliation  
 direction which here is poorly  
 developed foliat 320/60 SW

Arg. 11.1c  
 step to  
 SW. Light grey to brownish Argill  
 clay 340/vert  
 Bed = Horizontal

N.B. In main ore zone the mineralization  
 appears to be related to the coarse st. line  
 dolomitic limestone and dies out when fine  
 grained ls is present see sample # 7

Core shaft in good condition. DD. core  
 all there and well marked - complete  
 ore sections are missing, presumably  
 taken for samples for assay.

82N/115  
82N-21

DEPT. OF MINES
REC'D MAR 19 1954
SUBJECT .....
FILE .....
REFERRED TO .....

March 14<sup>th</sup> '54

PROPERTY FILE

4322

Dear Mat,

In writing the enclosed report on Hawk Creek I was in some doubt as to how much was required. The general purpose of the report, as I understand it, is to show that the results of the 1942 exploration by Wartanus Metals Board were inconclusive and that the deposit still has considerable merit as a potential mine. The principal points supporting this view are —

1. The shear zone is much wider than the zone of mineralization
2. Favourable <sup>lithology</sup> appears to be the principal control for ore deposition — this was not investigated fully.
3. The drilling did not delimit the full lateral extent of the deposit nor its lateral length
4. The estimation of proven tonnage was very pessimistic to say the least

All these points I have mentioned but there is one more that I did not discuss which you might like to see included, i.e. the lack of exploration beyond the immediate vicinity of the known zone. Some evidence can be produced to show that this was a serious blunder on the part of WMT, e.g. about 20' or so above the main pit exposing the ore zone there is a second cut which exposes a 3' chunk of high grade ore. Rice in his report blithely states that this was found to be a piece of float and shows it <sup>(in his sections)</sup> resting on argillite overlying the ore zone. If it is part of the same ore zone, how it gets pushed up the hillside I would not know — neither does Rice, apparently, because he does not offer any comment! I believe this relationship is highly suggestive of a second zone lying above the first where another favourable hill is intersected by the shear zone. It could be as much as 2000 feet above the first zone.

# PROPERTY FILE

and still be exposed.

Apart from exploration of the shear zone up and down the hillside at all points where it intersects likely looking limestone beds, there is still another set that was overlooked. Bedding or rather lithology is known to be the principal factor controlling deposition. This fact was appreciated by Rice early in the exploration yet no effort was made to investigate the lateral extensions of the favourable host rock within the shear zone. The possibility of other bodies occurring within the same stratigraphic horizon was therefore not tested.

I do not want to push these points too much as it would require stepping on Rice's toes more than ~~is~~ is probably required. However, if you want these points can be incorporated.

I have not described the surface trenches (now largely caved) as it would require reproducing Rice's diagrams. Furthermore, I could not describe them all as I did not have time to examine them all during my brief visit (2 hrs) to the property.

Actually, other than what I have written or mentioned in this letter, I have nothing more to add in the way of facts or interpretations. Anything else would have to be revamped from Rice's report. I am enclosing his report together with his maps and sections. I am also enclosing my field notes which I believe are quite understandable when studied in conjunction with Rice's plan.

Hope this is sufficient,

Yours sincerely,  
Gerry.



82N11E  
82N-2

P. ①

PROPERTY FILE

Hawk Creek - one calculations.

Section A to B 40'

73.2 x 20	@ 14.5	1464	→	28480
102.3 x 20	@ 21.8	2046	→	44650
		<u>3510</u>		<u>73,130</u>

20.8%

Section B to C 60'

102.3 x 30	@ 21.8	3069		66850
148.3 x 30	@ 10.2	5949		60650
		<u>9018</u>		<u>127,500</u>

→ 14.2%

Section C to D 40'

199.3 x 20	@ 10.2	3966		40400
65.2 x 20	@ 11.0	1304		14344
		<u>5270</u>		<u>54,744</u>

→ 10.4%

Section D to E 110

65.2 x 55	@ 11.0	3586		39446
78.4 x 55	@ 9.6	4312		41350
		<u>7898</u>		<u>80796</u>

→ 10.2%

Beyond E 50'

78.4 x 50	@ 9.6			37,620
			= 3920 tons @ 9.6	

(2)

# PROPERTY TILL

A to B	3510	tons	@	20.8	=	73,130
B to C	4018	tons	@	14.2	=	127,500
C to D	5270	tons	@	10.4	=	54,844
D to E	7898	tons	@	10.2	=	80,796
<u>Beyond E</u>	<u>39.20</u>	tons	@	9.6	=	<u>37,620</u>
<b>TOTAL =</b>	<b>29,616</b>	tons	@	<u>12.6</u>		<b>373,890</b>

82N/1-  
82N-21

March 17<sup>th</sup> '54

DEPT. OF MINES

REC'D MAR 19 1954

SUBJECT .....

FILE .....

REFERRED TO .....

4322

Dear Mat,

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1. The shear zone is much wider than the zone of mineralization
2. Favourable <sup>lithology</sup> appears to be the principal control for ore deposition — this was not investigated fully.
3. The drilling did not delimit the full lateral extent of the deposit nor its total length
4. The estimation of proven tonnage was very pessimistic to say the least

All these points I have mentioned but there is one more that I did not discuss which you might like to see included, i.e. the lack of exploration beyond the immediate vicinity of the known zone. Some evidence can be produced to show that this was a serious blunder on the part of WMT, e.g. about 20' or so above the main But exposing the ore zone there is a second cut which exposes a 3' chunk of high grade ore. Rice in his report blithely states that this was found to be a piece of float and shows it <sup>(in his sections)</sup> resting on argillite overlying the ore zone. If it is part of the same ore zone, how it gets pushed up the hillside I would not know — neither does Rice, apparently, because he does not offer any comment. I believe this relationship is highly suggestive of a second zone lying above the first where another favourable bed is intersected by the shear zone. It could be as much as 2000 feet above the first zone



and still be exposed.

Apart from exploration of the shear zone up and down the hillside at all points where it intersects likely looking limestone beds, there is still another bet that was overlooked. Bedding or rather lithology is known to be the principal factor controlling deposition. This fact was appreciated by Rice early in the exploration yet no effort was made to investigate the lateral extensions of the favourable host rock within the shear zone. The possibility of other bodies occurring within the same stratigraphic horizon was therefore not tested.

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I have not described the surface trenches (now largely caved) as it would require reproducing Rice's diagrams. Furthermore, I could not describe them all as I did not have time to examine them all during my brief visit (2 hrs) to the property.

Actually, other than what I have written or mentioned in this letter, I have nothing more to add in the way of facts or interpretations. Anything else would have to be revamped from Rice's report. I am enclosing his report together with his maps and sections. I am also enclosing my field notes which I believe are quite understandable when studied in conjunction with Rice's plan.

Hope this is sufficient,

Yours sincerely,  
Gerry.

82N116

82N-2

P. ①

### Hawk Creek - ore calculations.

Section A to B 40'

73.2 x 20	@ 19.5	1464	→	28480
102.3 x 20	@ 21.8	2046	→	44650
		<u>3510</u>		<u>73,130</u>

Section B to C 60'

20.8%

102.3 x 30	@ 21.8	3069		66850
148.3 x 30	@ 10.2	5949		60650
		<u>9018</u>		<u>127,500</u>

→ 14.2%

Section C to D 40'

147.3 x 20	@ 10.2	3966		40400
65.2 x 20	@ 11.0	1304		14344
		<u>5270</u>		<u>54,744</u>

→ 10.4%

Section D to E 110

65.2 x 55	@ 11.0	3586		39446
78.4 x 55	@ 9.6	4312		41350
		<u>7898</u>		<u>80796</u>

→ 10.2%

Beyond E 50'

78.4 x 50	@ 9.6			37,820
			=	3920 tons @ 9.6

A to B	3510	tons	@	20.8	=	73,130
B to C	4018	tons	@	14.2	=	127,500
C to D	5270	tons	@	10.4	=	54,844
D to E	7898	tons	@	10.2	=	80,796
<u>Beyond E</u>	<u>39.20</u>	tons	@	9.6	=	<u>37,620</u>
TOTAL =	29,616	tons	@	<u>12.6</u>		373,790

Hawk Creek Zinc

August 15<sup>th</sup> / 1952

Upper Cross Trench

DDH # 3 to # 2 = 20'

Measuring from DD 3 to toward SW.

Trench strikes approx 65°

### PROPERTY FILE

34 - 48 - covered

34 - 24 - Gossan - limonitic brown color has crusts in places of zinc carb - one nodules of residual heavy

10'

320/40 SW galena 2" thick

foliation in gossan through gossan as some residual beds in places of grey <sup>crystalline</sup> limestone Footwall section of gossan is 25-29' appears much better than HW.

26 - 20

Grey crystalline limestone - a few veins and stringers of white heavy calcite, a little sparse sphalerite

4'

20 - " 0' - covered

11 - 0

Massive Sphalerite repl. mineralization zone averaging 50% Sphalerite Minor pyrite and minor occasional beds of massive galena - usually 2" or so in diam.

11'

In places residual lenses of dolomite sparsely mineralized and cut by white veins - stringers of calcite which contain coarse brown sphalerite.

toward 65°

0 - 5 1/2 Same as 0-11 making zone

16 1/2' long. This zone extends toward 155° where trench exposure

5 1/2'

5 1/2 - 10 Covered

against fine gr grey limestone ore FW.

Here foliation strike 325 / 55-60 SW.

16-17 1/2 Fine grained grey ls. - essentially barren

17 1/2 - 24 Mineralized zone in limestone -

fine gr. grey limestone with streaks & vugs of sph. and pyr along foliation would average 5-10% Zn.

At 23-24 = 1 foot of vein calcite with coarse x-limed texture - mineralized with x-limed sphal darker in color than usual in rept

24 - end of trench - covered

DDH pit no. 9 - pit covered

DDH pit no. 8 - pit mostly covered has

12" of schistose slaty grey limestone assumed in place cl. 335 / vert.

DDH pit no 7. - measuring SW from DDH 6

it is 10.5 to 14' SW to cover exposed width of massive banded ore consisting of interbedded sphalerite pyr & galena Runs + 40% Zn.

DDH pit no 6. - 3' of highly fissile silvery to reddish slate.

Clear 320 / 45 SW

Bedding - horizontal.

274 # 11 pit } Cased  
# 14 & 15 .. }

# 10 } Peculiar porous grey to br lumpy  
# 12 & 13 } rK looks like Calc tufa or  
leached ls? - in place?

In oteps above this line of  
pits the ls is sheared at 330/50 SW  
and has similar appearance to pits  
only fresher i.e. rock = sheared ls

# 17 Otep of limestone - fine gr. xtl line  
ls. with widely spaced thin  
calcite stringers along foliation  
direction which here is poorly  
developed foliate 320/60 SW

Argillite  
Otep to  
SW.

Light grey to brownish Argill  
clean 340/vert  
Bed = Horizontal

N.B. In main ore zone the mineralization  
appears to be related to the coarse xtl line  
dolomitic limestone and dies out when fine  
grained ls is present see sample # 7

Core short in good condition. DD. core  
all there and well marked - complete  
ore sections are missing, presumably  
taken for samples for assay.