Craigmont

824349

Report for Orell Mines Limited
on B.C. & M.K. groups
Adams Plateau
by
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SUMMARY

Two seasons of field work (1977 & 1978) have been completed on the B.C. and M.K. claim groups of Orell by Craigmont Mines Ltd. This work included laying out a grid and mapping roads and geology. This was followed by geophysical surveys, including E.M. 16 and magnetometer and by a geochemical survey. Maps were prepared for copper, zinc and lead. At the end of this work, during the first field season, seven holes were diamond drilled on each of the groups. In 1978 a loop survey was made on the M.K. group and five possible deep-seated sulphide occurrences were located. Two of these were drilled. On the B.C. group, an additional ten holes were drilled to explore known anomalies and mineralization.

This drilling totalled 686.2 m. on the M.K. and 1,606 m. on the B.C. properties, that is, a total of 2,289 m. or 7,500 feet. This, added to drilling done by Cominco, Giant Metallics and Orell, totals 4,807 m. or 15,750 feet. This is a large amount of drilling and has added a great deal of knowledge as to the type, extent, nature and grade of the mineralization on the two properties.

A large property payment was payable to Orell at the end of September and, for this reason and because of Craigmont's interest in a similar type of deposit, farther north in the North Thompson valley at which it was getting encouraging results, Craigmont decided against continuing the option on Orell's properties.

The results of Craigmont's work have been received and are discussed here.

In discussing results, particularly as to grade and tonnage, some results from Cominco's drilling and sampling in 1949 and Giant Metallic's drilling and sampling in 1966 and 1967 are used.

The two groups included are the B.C. group in the south (comprising claims Zinc 1/6 and B.C. 1/4, inclusive) and the M.K. group which comprises A1, A2, Fox 1/4, M.K. 1/4 and two Hiltec claims which are under agreement to option.

These are complex mineral zones with, in places, some copper, zinc and lead and, with the zinc, recoverable amounts of cadmium. Also, appreciable silver and some gold are present. In addition, magnetite is present in most of the zones. If a large enough tonnage of ore is developed and a fair-sized mill installed, the ground up magnetite may be sold to the large coal-washing plants in the Rocky Mountains.

GEOLOGY

Outcrops are sparse, generally, except where some trenching has been done. The claims are underlain by sedementary rocks (mostly argillaceous) and volcanic rock (mostly tuffaceous). Quartzite, chert, limestone, flows and agglomerates, are also present. The beds are mostly grey, light and dark colored and mostly are in thin beds, a few millimeters in thickness.

Interbedded with these, are zones in which magnetite and the sulphides pyrrhotite and pyrite are common and sphallerite, chalcopyrite and galena are less common. Some high-grade samples commonly contain substantial amounts of silver and some gold. With the ore minerals, are quartz, epidote, chlorite, garnet, calcite and zoisite, etc. These zones or beds appear to have formed intermittently while the sedementary-volcanic complex was accumulating. Probably the deposits were formed by exhalations from the volcanoes that contributed volcanic material to the sequence.

The high-grade zones with a high zinc and lead composition are less than 3 feet thick. Others, of lower grade, are about 11 feet thick and some are much wider. Judging from the continuity of geophysical anomalies, some of the occurrences are very long, especially on the B.C. group, where lengths of as much as 1,400 m. or 4,600 feet are seen.

These occurrences grade into the beds below and above and generally conform to the bedding. Judging from some geophysical anomalies, the mineral zones curve along strike and may do so down the dip. These changes in attitude may reflect variations in attitude of the bedding, caused by local deviations or rolls. Also, judging from the geophysical anomalies, high-grade mineral zones may be discontinous.

The beds of the sedementary-volcanic series strike east-northeastward and dip moderately to gently northwestward and so do the mineral beds. In a central part of the M.K. group, where the major mineral occurrences have been found, the bedding strikes more nearly westerly. This change in attitude may reflect a structural change that was conducive to mineral accumulation.

At the Mosquito King, the mineralization is predominantly lead, zinc, silver and on the B.C. group, the same metals are present and also copper.

The rocks and mineral beds are cut by dykes. These range from coarse, nearly granitic to fine and andesitic. Most of them strike northward and dip steeply.

GEOPHYSICS

The B.C. group (see Figure 1).
The map of magnetic anomalies is lively with positive anomalies generally south of negative ones. The values range from +40,000 gammas to -21,500 gammas. The anomalies tend to be somewhat irregular. Most of the positive ones are at known outcrops of magnetite and pyrrhotite and other sulphides.

They are in an arcuate-shaped belt that extends northwestward across the group. Most of them strike east-northeastward. They are fnom 200 to 1,000 m. long and about 50 m. wide.

Anomalies in the central part of the belt and some at the south of it, have not been explored by drill holes.

E.M. anomalies. These tend to be long and reular, though a few curve slightly. They range up to 1,400 m. long and are generally less than 100 m. wide. They are generally in the same belt as the magnetic anomalies and there is one in the southwest that is not related to magnetism. They tend to be north, that is, down dip from a positive magnetic anomaly and probably are caused by

good conductivity a short distance below the weathered outcrop of the mineral zones.

There are fewer E.M. anomalies than positive mag. anomalies, which suggests that there may be magnetic minerals exposed at the surface which are not close enough together to constitute a conductor.

The one that nearly coincides with a major mag. anomaly, is at a major magetite occurrence which has not been drilled. This also applies to several lesser ones.

The M.K. group

Magnetic anomalies. The map is very lively and comprises many long anomalies trending west-southwestward. Most of them are straight. Some are as much as 1,400 m. long and most are narrow (about 40m.). Some are as much as 100 m. and some negative ones are as much as 150 m. wide.

Most of the anomalies are in pairs with a long positive anomaly, north of which is a slightly shorter negative one. In a few places a negative anomaly is south of a positive one. Values range from +9,040 gammas to -7,538 gammas.

The trend is not everywhere the same as the exposures of mineralization which strike more nearly westerly.

E.M. anomalies. These are much less common than the mag. anomalies and are generally widely separated. They are mostly in the southwest.

On the A/1, A/2, two major anomalies correspond to the known mineralization. One northwest of these appears to be caused by the mineralization known as Ball Park. This one is significant because it extends for 400 m. which is about twice the length of good grade that has been indicated by drill holes 77(3) & (4) of Craigmont.

One on the Hiltec claims may be the extension of the Ball Park anomaly and another on these claims is the northeastward extension of the main anomaly on the A/1, A/2 claims. Both of these anomalies are probably caused by mineralization similar to that exposed at the main showings of the A/1, A/2 claims.

Another major anomaly extends northeasterly of the group Fox 1/4 and has been explored by only one hole of Craigmont near the southwest end of it. Others occur in central Fox 1/4, and on the west limit of M.K. 4 and near the west limit of M.K. 1. Several short ones occur on the M.K. 4 claims that appeared to be aligned with the main ones on the A/1, A/2.

Loop survey. Five anomalies were found, indicating possible massive sulphide mineralization at depths from 70 m. to 400 m. These five anomalies do not correspond closely to the E.M. and mag. anomalies.

Two of these anomalies, with possible sulphide occurrences at depths of about 70 m. and 200 to 250 m., were drilled, without intersecting any substantial bodies of mixed sulphides.

GEOCHEMISTRY

The B.C. group

Copper. The strongest anomalies are in the north central part of the group. These are irregular and broad and appear to possibly have had their shape modified by surface conditions. Most of the major ones have been drilled without coring significant copper mineralization.

A small one on the baseline is aligned with and appears to be caused by an extension of mineralization that causes a long important E.M. anomaly.

Lead. The strongest anomalies (up to 1,910 parts per million) are in the central and eastern part of the group. Their shape has been modified by surface factors and they appear to be elongated down slope to the east. The major anomalies have not been drilled.

Zinc. The anomalies are mostly in a broad belt that extends northwest in the northeastern and central part of the group. Most of these are elongated in an east-northeast direction and presumably are related to mineralization conformable with the bedrock structure. Others appear to strike more nearly eastward, down the slope and probably have been modified by surface drainage.

The anomaly with the highest values (830 ppm.) has been drilled without intersecting sphalerite mineralization. Most of the moderate anomalies have been drilled, though not where the geochemical values are highest, without encountering much sphalerite.

A zinc occurrence in argillites in upper China Creek, for some reason causes no anomaly. However, towards the northeast, along the presumed strike of the occurrence, two small zinc anomalies extend from near the presumed strike directly down the slope. The general area is slightly anomalous for lead. In addition, an E.M. anomaly extends far to the northeast. This includes that section of the occurrence that (as shown by three diamond drill holes 12, 14 and Ex 1) is indicated to contain zinc ore. This leads to the belief that the occurrence continues for the length of the E.M. anomaly far to the northeast. This is beyond the point so far explored by drill holes and the possibility of finding more of this mineralization is good. Its extension of lower grade has been intersected by holes 15 and 17 of Craigmont. Holes 13 and 16 appear to be southwest of the ore body.

This absence of a zinc anomaly over a zinc occurrence is evidence that, in this area, even slight zinc anomalies may be worth investigating.

This E.M. anomaly (associated with zinc mineralization) is near the upper contact of a rhyolite group as mapped by Craigmont. Towards the northeast, the E.M. anomaly crosses this contact and appears to be caused by something within the rhyolite. This suggests that the occurrence started to form while the rhyolite was accumulating and may have continued to form after all the rhyolite had accumulated.

GENERAL

Exploration of geochemical anomalies alone has been disappointing. They may have been caused partly by fairly recent disturbance of the soil by bull-dozers or by float not in place. On the other hand, drilling of geophysical

anomalies has resulted in intersecting mineralization even if it is of low grade. It appears that the geophysical anomalies are caused by mineralization in place. Some of these anomalies are very long and they have not all been explored, especially at the most favorable sections such as where the geophysical response is greatest or where geochemical anomaly suggests that one or more of the ore sulphides may be present.

DESCRIPTION OF ZONES

The B.C. group

These are numbered by letter, starting in the north.

A. This is a geophysical anomaly that has been drilled. However, most of the core is dyke rock and information is incomplete. Non-dyke core contains some sulphides. This anomaly needs to be drilled from a point further east.

B. This is a magnetic anomaly with geochemistry. Hole #3 is drilled west of the anomaly. A hole needs to be drilled farther east where the anomaly is wider.

C. This is a E.M. anomaly and part of a mag. anomaly. It has been drilled by holes 6, 9 and 11 of Craigmont and 10 and 11 of Giant Metallics. #6 cored 1.5m. that ran 1.65% Cu;; .44% zinc; .04 oz per ton gold and .58 oz per ton silver. 0.165 %
#9 cored 5.7m. that ran .23% zinc and within this there may be high-grade sections. Another section across one meter, ran .41% Cu and .015 oz gold per ton. In 10 and 11 of Giant Metallics, an average of two intersections cored 13.8 feet of .28% Cu that was not assayed for zinc, gold or silver. This zone has a very long geophysical anomaly and may contain a very large tonnage.

D. This is a geochemical anomaly and Craigmont hole #2 did not intersect any zone.

E. This causes a geophysical anomaly which was explored by Craigmont's holes #7 and #8. #7 was mostly in dyke. #8 cored several sections with minor copper and zinc. This needs to be drilled further east, near the widest part of the anomaly.

F. This causes a mag. anomaly that has not been drilled.

G. This causes a high E.M. and high mag. anomaly and sulphides are exposed and it has not been drilled.

H. This causes a long, strong E.M. anomaly and a magnetic one. It has been explored by B.C. #1 which cored numerous sections with copper and zinc. It needs to be explored towards the northeast, near the E.M. maximum.

I. This causes a long E.M. anomaly, with mag. and geochem. anomalies at the northeast end. This has been explored by G. M. #9 which ran .2% Cu across 10.8 feet and .005 oz per ton gold across 4 feet. It is also exposed in eight trenches near G. M. #9 and possibly at the road to the northeast, running .49% Cu across 12 feet. These results average .21% Cu across 7.68 feet. These were not assayed for other metals. This zone may also contain a very large tonnage.

J. This causes a long E.M. anomaly and a short mag. anomaly and, possibly associated with it, are lead and zinc anomalies in the northeast. It has not been explored by a drill hole.

K. This causes a long E.M. anomaly and a slight mag. anomaly. This occurrence is discussed above. A substantial tonnage has been indicated by holes #12 and #14 and Ex 1. It may continue much farther to the northeast and possibly also to the southwest.

L. This causes a strong lead and weak zinc anomaly and it may be related to an extension of a mag. anomaly. It has not been drilled.
M. This causes an E.M. anomaly 700 m. long, which aligned with weak zinc and copper anomalies. It has not been drilled.

RESERVES INDICATED	Tons	Cu%	Pb%	Zn%	Ag oz per ton		
Mosquito King	9,600	-	4.0	4.4	1.9		
Sunset	2,320	-	3.71	4.74	1.16		
Sunset S. E.	4,750	-	3.96	7.0	2.5		
Ball Park	25,000	-	1.77	2.66	2.36		
Total	41,670	-	2.67	3.68	2.2		
						Au oz/ton	Cd%
Zinc	163,000	.19	.53	2.43	1.45	.001	.024
Total	204,670	about .2	1.00	2.72	1.60	-	-

RESERVES POSSIBLE

Zone "C"	300,000)	about .2 Cu plus
" "I"	359,000)	possible other metals

VALUE

Discounting current prices in U.S. funds (by 40% to allow for smelter charges and losses) and converting to Canadian funds, gives values for five metals as shown here:

Metal	Grade as %	lbs.	Price	Value
Cu	.2	4	@ 93-37 = 4 @ 56 =	2.24
Pb	1.00	20	@ 42-17 = 20@ 25 =	5.00
Zn	2.72	54.4	@ 38-15 = 54.4@ 23=12	2.50
Cd	.025	.5	@ 2.50-1.00 = .5 @ 1.50 =	.75
Ag	1.6 oz	1.6	@ 7.25-2.80 =1.6 @ 4.45 =	7.12
				27.61

	Oz Au		Value
Au	.001		.25
Mag.	10% = 200 lbs @ 1¢ =		2.00
			2.25

Assays of high-grade pulp samples from 1978 drilling yielded cadmium assays that ran slightly less than 1% of zinc assays.

Without the magnetite, this is of ore grade if sufficient tonnage can be found to permit building of mill of a fair size. The possibility of finding more

ore at the Zinc and Ball Park showings, is very good. The possibility of changing the possible ore to indicated ore and of finding additional values is also good. In addition, more ore may be found in several undrilled anomalies.

GENERAL

The E.M. anomalies are long and straight and are generally conformable to the general trend of the nearby rocks and it may be concluded that they are caused by bodies of mineralization that conduct electricity well and that are substantially different from the underlying and overlying beds. At each point where they have been drilled, each body contains abundant magnetite and pyrrhotite and, with these are generally sphalerite and galena and chalcopyrite and they also carry some silver and gold.

The strongest indication of where, along the length, it is most useful to explore, can be where the anomaly is strongest or where a geochemical anomaly associated with the E.M. anomaly, indicates some of the ore sulphides may be present.

A longitudinal profile was constructed along a plane at right angles to holes 10 and 11 of Giant Metallics and holes 6, 9 and 11 of Craigmont. The anomaly caused by the zone explored curves and probably the zone does also, so the profile is not exactly along the plane of the body. For this reason, the intersections of mineralization in the core are not aligned as in a continuous body.

Most of the zones contain appreciable magnetite. If the indicated tonnage can be considerably increased so that afair-sized plant can be built, the recovery of magnetite becomes of importance. In ore dressing, the crushed ore, presumably, will travel over a magnetized belt that will separate magnetic fragments from non-magnetic. This probably will be done as early as possible in the flow sheet in order to reduce the tonnage of feed that is handled in further stages.

The magnetic product, which would comprise mostly magnetite, could be ground finer if necessary and cleaned and then probably would be suitable for sale to the large coal-cleaning plants in the Rockies. These use finely-ground magnetite as a heavy media in which coal and associated shale, etc. are separated. The coal floats in the the heavy media and the shale, etc. sinks.

The gold and silver content is attributed to small amounts of chalcopyrite, galena and, possibly, sphalerite and pyrite in the sample. This encourages belief that, in the long zones, sections may exist in which ore sulphides are present in large enough amounts to constitute ore. Such sections probably contain appreciable gold and silver. One such section was cored by Craigmont in D.D.H. #6 in 1977. This ran .165% Cu, .44% Zn, .04 oz Au and .58 oz Ag across a width of 1.5 m. Such sections may be sought in the strongest and widest sections of the E.M. anomalies and, possibly, also where a geochem. anomaly suggests the presence of ore sulphides.

Some of the surface samples assayed as much as .49 Cu across 12 feet. Some sphalerite and galena may also have been present. However, Giant Metallics was exploring when lead and zinc were selling at comparatively low prices and their samples were not generally assayed for these or precious metals.

Prices have changed appreciably and relatively since that period. Copper prices are now about 45% greater, whereas current lead and zinc prices are about 250% greater and silver and gold have increased about 400% and 700%.

From Craigmont's results it can be seen that the zince content is equal to or greater than the copper content. To the extent that this is generally true, the zinc content of many of the unassayed sections cored by Giant Metallics, may be appreciable. The sphalerite in the cores tends to be not obvious and, for this reason, is not noted.

The cadmium content was not determined at the time of drilling. Recently pulps from high zinc samples were run for cadmium and it was found to be high - almost 1% of the zinc. An ore that runs 2.5% zinc, runs almost .025% Cd, which is almost ½ lb. per ton, which is probably recoverable.

CONCLUSIONS

Two areas have been explored and numerous mineral zones have been partly delineated by geology, geophysics, geochemistry and by drill holes. The results are tabulated above. The grade is of interest and, potentially, a large tonnage may be found.

Prices for metals have advanced considerably since work by Giant Metallics was done in 1967.

Some of the more prominent geophysical and geochemical anomalies have not been drilled.

Increases in tonnage are probable at the Ball Park and Zinc showings, where significant anomalies extend beyond limits so far drilled. It is likely that, if other sulphides are present in some of the possible ore, the value may be raised to as much as that now estimated for the indicated ore. Additional drill intersections could raise its category to that of indicated ore.

Long anomalies need to be drilled at several points along their length in order to find sections that may be of ore grade.

The positive magnetic anomalies are generally south of the E.M. anomalies and are probably close to the surface expression of the mineral zones. This surface expression is further away from the collar of the drill holes than the E.M. anomaly and, in some holes, the zone may not have been intersected.

The anomalies are generally long and the tonnages may prove to be much greater than calculated now. Also, some of the anomalies have not been drilled and the possibility of finding ore at some of them is good.

The occurrences are flanked by mineralization of lower grade. If a large tonnage becomes indicated, the cut-off figure can be lowered and some of the marginal material may be reclassified as ore and the indicated tonnage, accordingly, increased.

If some of the showings on the M.K. ground do not extend to great depth, they may be mined by surface stripping.

RECOMMENDATIONS

A. Surface:

1) Sampling of zones on B.C. claims that were not sampled by Giant Metallics.
2) Trenching of the strongest E.M. anomalies where no exposures exist.

B. Drilling:

1) Holes where there is a good chance of confirming known mineralization or by drilling a strong geophysical anomaly.
2) a. Holes that will explore known zones which have not been assayed for all metals of significance.
   b. Holes that will explore weaker geophysical anomalies and those that will explore geochemical anomalies that have not been confirmed by geophysical anomalies.

C. Sampling:

Sampling and assaying the cores for any possible extension of zones for all metals of significance.

The lower end of the E.M. anomaly on the zinc showing is at about 1,220 m. which is at about 4,000 feet on a steep, east-facing slope. The upper showing on the A claims is at 1,750 m. which is at about 5,750 feet on a flat-topped knoll. It is expected that the snow will be gone at the lower level by mid June, which is much earlier than it will be at the upper level.

DRILL PROGRAM

First Stage

1) Zinc zone (K). At least three widely-spaced holes along strike, toward the northeast extension of the zone. If these recover mineralization of commercial or near commercial grade that at least three other holes be drilled to explore the zone at depth.
   3 @ 45 m. = 135 m.; 3 @ 50 m. = 150 m.; Total 285 m.

2)	(J) Central 2@ 45 m.		90
3)	(I) At southwest end, near pb high, 2 @ 45 m.		90
4)	(I) At northeast, near geochem anomalies & mag. high and surface showings. 2 @ 45 m.		90
5)	(H) Toward northeast end. 2 @ 45 m .		90
6)	(G) Toward northeast end at highest intensity.	2@ 45 m.	90
7)	(C) " " " " " "	2@ 45 m.	90
			825

Some of the holes may need to be deepened if the zones dip more steeply than anticipated.

Second Stage

1) Mag high between D.D.H. 4 & 9, away from dyke. 2 @ 30m.	60 m.
2) " " north of B.C. 1. 2 @ 30m.	60
3) E.M. and mag. high, middle of Fox 1/4. 1 @ 40m.	40
4) Ball Park. 1 @ 20m.	20
5) E.M. anomaly in the southwest of Hiltec. 1 @ 25m.	25
6) On Al, E.M. anomaly west of M.K. central. 1 @ 30m.	30
7) Hiltec, E.M. anomaly in southeast. 1 @ 30m.	30
8) Northeast part of E.M. anomaly on Fox 1/4. 1 @ 30m.	30
9) Zinc anomaly in south part of north half of B.C. 2. 1 @ 30m.	30
10) Copper high, west of Craigmont #3. 1 @ 30m.	30
11) Mag. high near southwest corner of M.K. 1. 1 @ 30m.	30
12) Mag. high in north of M.K. 1. 1 @ 30m.	30
13) Two zinc highs in south of M.K. 4 which may be extension of M.K. central zone. 2 @ 30m.	60
14) Zinc high near west boundary of Fox 1/4. 1 @ 30m.	30
15) Zinc lead high at northeast corner of Hiltec. 1@ 30m.	30
16) Lead high on base line at 9,450 m. east. It may be near a mag. high. 1 @ 30	30
	565 m.

Total both stages is 825m. + 565m. = 1,390m.

Additional drilling may be needed of any target with encouraging results.

Checking geochemical anomalies on Lichen can be done by geologist while drill is being moved. Sampling Scotch Creek silts for geochemistry can be done by local crew.

The number of drill targets is large and they require a large amount of drilling. The estimate used here of $35.00 a meter is about the same as that paid by Craigmont. If a contract near this price can be obtained, the same size of core is recommended. A large number of short holes is recommended and a fair proportion of time will be spent, moving and setting up.

Stage 1	
Mobilization	$ 2,000
Drilling 825m.@ $35	28,800
Geologist, 2 months	3,600
Truck	1,500
Board	1,000
Assaying	2,000
Consulting	1,000
Travel	500
Demobilization	1,000
	$41,400

Stage 2	
Drilling 565m.@ $35	$19,600
Geologist, 2 months	3,600
Truck	1,500
Board	1,000
Assaying	2,000
Consulting	2,000
Travel	1,000
	$30,700

Sampling silts in Scotch Creek, etc.	2,000
Assaying	1,000
Report	500
	3,500
Bulldozing geophysical anomalies	2,400
Total	$78,000

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