

~~JPW~~ adkins

(203)

Item 10

Kennell Calif.

Mineral

Mineral Co.

Silver Dyke dist.

K-45

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REPORT  
OF  
E.W.BEDFORD.  
MINING AND METALLURGICAL ENGINEER.  
-o-o-00-o-o-

THE GENERAL TUNGSTEN CORPORATION  
EXAMINER GROUP

\*\*\*\*\*

Mina, Nevada.  
February Twentysecond.  
1930.

Messrs. Summerfield and Thompson,  
Mina, Mineral County, Nevada.

Gentlemen:-

In accordance with your instructions I have investigated the "Examiner Group" claims of the General Tungsten Corporation, and herewith, accompanied by suitable maps, is the resultant report of the examination made.

In the compilation of these data I have given consideration of contributory regional factors obtaining, and without which it is deemed a consistent solution of the property aspect could not have been arrived at.

I am indebted to the General Tungsten Corp'n through their having furnished me with original data relative to certain ore shipments, as also for the unquestioned results of samples by Messrs. W.H. Blackburn and C. Ynchausti, of the Treadwell Yukon Co., The files also disclosed numerous other sampling data; much of which I have ascertained is dependable, and as such have incorporated the same in the support of my estimations.

#### SUMMARY OF CONCLUSIONS

Tungsten properties of merit; through the final stabilization of price for the mineral, and the increasing demand; are deserving of the interest of mining investment. Of the several tungsten ores, scheelite is in particular favor among the consumers. [The present status of this commodity is influenced through our protective tariff, as also by depletion in the deposits of our foreign competitors. That no recession in price levels will ensue under the foregoing outlined conditions is deemed certain.]

The writer's wide experience in matters pertaining to examinations; development, and observation, throughout the western productive centers; gives him the knowledge that economic deposits of scheelite in the U.S. are relatively rare; there being few locales where these ores of tungsten have been noted. Severally the former extensive deposits have been depleted of their economic reserves, and but few remain for development; even under the price levels existing. The property investigated has potential resources probably exceeding any other known occurrence, and while there is not a dependence upon extensively disseminated low tenored ore bodies here, as in the contact-metamorphic deposits, there is the certainty that the development of high tenored segregations, or massive concentrations, of scheelite; which in view of the <sup>high value of the</sup> associated precious metals, will make for a profitable enterprise comparable with any ~~tungsten~~ <sup>any</sup> mining proposition of the past.

*every thought all previous metals  
will be of great value*

Salient features of the text of this report are hereunder summarized:-

- (a) The property is 13 miles by road and trail from Mina, Nevada. Completion of road may be accomplished at a minimum of expense. Water suitable of all requirements is possible of development at the property. A two and one half mile extension of a power line will serve all power uses the property operation may require. Topographic features make possible deep development through adits.
- (b) Ore from one small development has been mined from the property and shipped at a profit, ~~even though extremely disadvantageous conditions.~~ On the same vein-dyke structure, within one mile easterly, several tungsten operations have been carried on, the most notable having been that of the Atkins-Kroll Co., and the Wagner enterprises. Collectively they have produced in excess of \$2,500,000.00 within comparatively short periods of operation. At this time the Nevada-Massachusetts Co., have merged the properties, developed sensational ore at depth, and are at this writing about to start operations under a 75 ton day concentrator basis.
- (c) For the purposes of the initial development to be proposed there is now established a suitable operating camp at the property.
- (d) Structural and economic geologic features are ideally favorable. Extensive ore deposition along contact areas, both longitudinally and to great depth, is to be anticipated. The recently developed ore horizon at the Silver Dyke is at an elevation of approximately 5700 feet; which with the elevations at the Examiner group ranging to 7800 feet elevation indicated the reasonable

certainty of great depth. A deeply eroded canyon has made possible the exposed variance, and it is conceded the extensive segregations will occur along any horizon of the vein-dyke; thus giving expectation of many deposits predicated upon development of the lower adit proposed.

(e) Scheelite ore segregations at the surface of this property have silver and gold values in association; thus enhancing the economic aspect of any enterprise engaged in this development.

(f) Past development unquestionably has been performed within the mass of the vein-dyke structure, and away from logical ore zones at formation contacts. This is exceptionally well defined at, and through ore exposure within, the Tungsten Cut.

(g) The property has been extensively sampled with the end in mind of a silver and gold development. Past operators performed their work, as stated, away from the contact areas; therefore the values shown, while indicative of wide spread low tenored precious metal deposition, have not been representative of the true conditions, and therefore future prospective development, surface and underground, should be directed along the more favorable wall country. The procedure at Silver Dyke fully demonstrates the expectations and their methods will give guidance for this property development. When one considers that the vein-dyke structure is from 150 to 250 feet in width it cannot but be assumed that the contact areas are more important, especially as the Tungsten Cut has demonstrated the consistency in which ore will be determined at the walls.

(h) A comprehensive sampling, or an analysis of samples already taken, could be construed to an estimation of a vast tonnage of ore on this property. One competent engineer has committed himself to such an aspect, however such an estimation is subject to wide variance, and I should be more willing to await development of higher tenored segregations along the contacts, and upon which this report is based, before making any statement with respect to tonnage assurances; therefore:-

(i) A program of exploration is recommended that, if followed, should progressively open up increasing ore resources and soon indicate the advisability of development from a deep adit which will ultimately constitute a system of intermediate levels calculated to make possible the withdrawal of ores in volume equal to the requirements of a 200 ton day reduction plant. In fact the justification of the deep adit as for immediate consideration is indicated in the light of the extending Silver Dyke ore developments of the recent past.

(j) Metallurgical plans for the enterprise, if developed to that stage, should consider the beneficiation of the silver and gold ores in addition to the concentration of the scheelite. As hereinafter shown the values when occurring together are of such economic tenor that the precious metals should ~~not be ignored~~. *be given paramount place.*

(k) Estimating a 200 ton day basis for the metallurgical plant, when operating on absolute minimum tenored ores, this enterprise should gross approximately \$115,000.00 monthly, and return; after deducting all costs, inclusive of the maintenance of expanding development; approximately \$50,000.00 net for distribution.

In conclusion of the foregoing summary I should strongly advise the development policy as shall be laid out in detail later herein. The property is recommended to mining investment on its merit in relation to the conclusive evidences of potentially becoming one of the country's foremost producers of scheelite concentrate, and one of the outstanding

*low grade precious metal mines.*

The following detailed report reflecting the conditions found will serve purposes necessary to decisions with reference to the property. I should recommend following this report with any necessary surveying that will contribute to the formulation of a complete estimate of the finance outlay for the project.

#### LOCATION

The mining property considered is situate in the Gold Range Mining District, Mineral County, Nev. at an elevation averaging 7700 feet above sea level, as determined from elevations given by Hawthorne Topographic Sheet of the U.S. Geological Survey. The group is nine miles southwesterly from the town of Mina, and includes eight claims namely:- Examiner, Examiner Nos 1 to 5 inclusive, Examiner Annex and Examiner Extension; all being held by right of location and the annual compliance with Federal and State laws; title to the claims having been passed to the General Tungsten Corp'n by the locators.

#### HISTORY

I am advised the earliest work undertaken on the property followed the finding there of silver and gold ores by Bodie prospectors. The date of this work is somewhat vague, but it is assumed to have been done prior to 1875. Two shafts, now caved, were apparently each approximately fifty feet in depth. Some fair tenored ore remains on the dumps as indicative of their ore.

The next effort of record having been made on the property was that of a corporation known as the Tungsten and Gold Telluride Mining Co., it is assumed however that locators have held the premises sporadically up to the time of the above named corporation's activities. It appears that this company's operations were <sup>contemporaneous</sup> commensurate with the development of the then Atkins-Kroll, and the Wagner, properties now controlled by the Nevada-Massachusetts Co., (Please refer to property map) The Tungsten and Gold Telluride development was in the sinking of a shallow shaft; the starting of two adits which did not attain their objectives; and also numerous open cuts were trenched. With the recession of operations by the enterprises alluded to, the Tungsten and Gold Telluride Mining Co., ceased operations as well, and the holdings in turn were acquired by the present ownership.

The General Tungsten Co., has proceeded with a plan of development through adits; more carefully placed open cuts; and in the opening of one segregation of high tenored gold-silver-tungsten ore. The ore was mined, treated at a near by concentrator, and shipped; the gold and silver values having been lost in treatment. During the past two years the property has been examined and favorably reported for development by such eminent engineers as W.H. Blackburn and John W. Finch. Each engineer advised the same development scheme, and with which I concur, as later outlined, but principals in each case finally confined their attention to other properties without prejudice to the merit of this property.

The Atkins-Kroll tungsten enterprise, on the same vein-dyke system extending to the east of this property has a short production record exceeding \$2,000,000.00. Subsequent leasers there, and at the Wagner property, have also realized considerable production; the volume of which I was unable to ascertain.

At this time the Nevada-Massachusetts Co., has the two groups named, and a mining and concentrating enterprise is rapidly nearing completion. A new concentrator has replaced the old Wagner mill, and the property has been developed through a long adit which gives approximately 600 feet of depth below the outcrops. This work has demonstrated conclusively the great depth possible for this mineralization. The work now discloses 14 feet of scheelite ore containing in excess of 1.5%  $WO_3$  and this is indicative of conditions that may be found in the General Tungsten property at comparable horizons; which will give over 1500 feet of depth below the outcrop.

#### CONTRIBUTARY FACTORS

##### Topographic Features.

The claims occupy the crest of the Gold Range ridge. The flanking canyons are deep erosional serrations radiating in many directions. The most precipitous escarpment is noted at the northwesterly end of the property where, as the result of cross faulting the vein-dyke structure is exposed in a series of downward thrust segments. The flanking area to the northeast realines at a lesser degree of slope, and is not as deeply serrated. A long ridge, as a spur of the range, extends to the north for nearly four miles.

##### Supply sources.

The town of Mina, a division of the Southern Pacific Rail Road, (Mina-Hazen Branch) is the nearest supply point for such commodities as explosives, carbide, mercantile stocks, coal, fuel oil, timbers, etc., also is afforded, at this point, the facilities of telegraph, long distance, express, and post, offices. Labor is usually plentiful and may be employed on the basis of the Tonopah wage scale.

### Roads

The road in use at this time is routed via Silver Summit and Garfield Flat, and extends into one of the deep canyons leading to the property. This road is in good condition to within one mile, or less, of the camp, and from that point a pack animal trail is used. The present road routing is possible of being extended to the property, but at the expense of all side hill grading. Any enterprise developing the property will, if it is decided to carry out a development from the upper workings, find it necessary to complete this road. The final selection of a road is predicated upon a more carefully selected routing than I have had time to consider.

### Power.

A high tension power transmission line has been completed to the Nevada Massachussets property. The extension of this service would entail a construction not in excess of two miles in length for any power line calculated to serve all requirements. The area to be traversed by such an extension would not offer particularly difficult construction problems. The services of this power under the circumstances, are preferable to Diesel electric generation.

### Wood and Water.

Scrub juniper cedar and nut pine both abound on the property. It is probable that sufficient resource is available to supply the requirements of domestic uses for a considerable time. This timber is not suitable to the uses of mining.

Present water supply is not obtainable on the property, but has been, in the past, packed from springs at the end of the road. That water for concentration purposes will be determined in the course of development of depth ore deposits is certain, and will be discussed later in this report.



### Camp.

There are several substantial houses on the property at this time. These have been used as boarding and bunk houses, office, etc., and such as there are will adequately accomodate up to fifteen men. Camp site is on the sunny exposure of the ridge, and it is unlikely that snow will give any difficulties. The ultimate operating camp, placed by any enterprise entering the property, will undoubtedly occupy a site near that suggested as for a proposed adit portal.

### Weather Conditions

Winter conditions are not such as will present difficulties other than normally encountered in the region. It is worthy of note that the Nevada-Massachussets milling plant, and their other efforts, have been carried out during the past winter and without difficulty. Any camp site built at the site of the adit portal to be proposed will not experience winter conditions materially differing from those found at Mina.

### GEOLOGIC FEATURES.

#### Superficial Aspect.

The surface features at this property may be generally stated as that of a considerable remnant of early andesite. Striking N 50° W, and along the crest of the ridge, is the outcrop of the ore bearing vein-dyke filling which averages approximately 200 feet in width. This feature is traceable for several miles and is one of the strongest rupture filled structures I have noted. Batholiths of grano-dioritic rocks here and there occupy positions along one, or the other, of the walls. The vein-dyke is undoubtedly a silicious excretion occupying what was once the brecciated zone of an extensive fault in the andesite and sub-formations. (The property group map will serve to denote the conditions) The andesite of the near region has been protected from erosional influences through the resistance afforded by the vein-dyke.

### Structural Aspect

A study of the silicious vein-dyke characterizes it as being a mass having been forced into the earlier rupture under extremely great pressure. The genesis of the silicious matter may be ascribed to segregation from the cooling masses of underlying granitic, or grano-dioritic, magmas; the plugs of which, as stated, occasionally are noted as accompanying the vein-dyke. At the Silver Dyke property where erosion has exposed the underlying formations the grano-diorite is noted as a feature of some magnitude. The silicious intrusive is well disseminated with inclusions of fragments common to all the formations through which the injection and rupture influences prevailed. These inclusions are predominantly the variously sized fragments of andesite; however fragments of limestone, entrained from the lower horizons, may also be observed. Silicification of the component wall rocks is also well developed, but apparently there is a well defined demarcation of this influence along the contacts.

### Economic Geology.

The presence of inclusions of highly altered limestone is indicative of great depth to the vein-dyke formation. This is further substantiated through the occurrence of more, or less, massive segregations of scheelite here, and also at the adjoining properties. It is conclusive that the calcium tungstate became a constituent of the vein-dyke mass through metamorphosis and consistent reactions between the molten silica and the limestone through which the silica passed upward in the course of the vein-dyke filling. No doubt the tungsten element was present in the intrusive silica, but the calcium was unquestionably derived from chemical reactions <sup>resulting</sup> ~~commensurate~~ <sup>from</sup> super-heated vapors, charged with tungsten, circulating within the contact area at the limestone horizon.

A correlation of the basal contact of the andesite would indicate the limestone horizon as lying from 1200 to 1600 feet below the outcrop of the vein-dyke at this property; however at the Silver Dyke property the limestone is in evidence as the north, or hanging, wall of the vein-dyke. Evidently there are variances in the dip of the vein-dyke structure, and these conditions are in direct relation to the position of the grano-diorite; which has come up on one side of the silicious mass at some points, and elsewhere on the other, i.e. at Silver Dyke the magmatic rocks lie to the South of the vein-dyke, and the dip is to the North, while at the Examiner Group whatever grano-diorite <sup>is</sup> as in evidence will be found to the north, and as such the superficial aspect of vein-dyke dip is to the south. There is no andesite in place at the Silver Dyke property; it having been eroded.

The form of the scheelite segregations opened to date is usually lenticular; this applying also at Silver Dyke; but sampling has shown a considerable dissemination throughout the silicious mass adjacent the contacts, but possibly of not economic importance. The position of the high grade segregations in the vein-dyke favors the contact wall areas; thus it would seem that due to the tendency of scheelite to cool prior to the more viscous silica; the scheelite would collect to itself as a segregation and as such be forced out to the walls, or against massive inclusion blocks of the andesite within the vein-dyke. Being under extreme pressure the crystalizing scheelite would be forced into any minor ruptures, or paralleling fractures, near the contact area. It may therefore be anticipated that numerous veinlets of scheelite will radiate from the more massive lenses that may be found on the property. These veinlets would be in particular conformity with the contact areas, whether the scheelite segregations were deposited against the component fissure walls, or

against the massive inclusions within the silicious mass.

It is anticipated that with greater depth, and near the limestone horizon, will be found the most favorable locale for massive scheelite deposits. It is also quite probable that the vein-dyke mass contains a considerable dissemination of tungsten as salt other than scheelite. In deposits of this type it would follow that much of the tungsten constituent would not have been afforded the opportunity of contact and reaction with calcium elements reasonably derived from the limestone series traversed. Grano-diorite magmas however carry a low percentage of lime, but probably not in sufficient quantity to have made possible the reactions that have combined to give genesis to the scheelite in the vein-dyke. Many of these tungsten salts, due to microscopic crystal, and mechanical combination in the silica, would not be apparent upon panning, but would respond to chemical analysis.

It may be reasonably anticipated that at some favored points in the limestone horizon; and at their contacts with such alterative agencies as the silicious, and grano-dioritic, magmas; and their effusions of hot vapors; there will be found, if explored, the seat of an extensive contact-metamorphic scheelite deposit; the type common to the Pilot Range east of Mina, and where erosion has obliterated the former superimposing pyroclastic rocks. Whether, or not, such a contact deposit would be accompanied by any great degree of contemporary contact-metamorphic minerals such as garnet, tourmaline, epidote, etc., cannot be forecasted, but it is probable, and I should suggest some exploratory development with such a deposit in mind. The adit receiving comment later herein would become the most feasible level from which to make such a determination.

Gold and silver values accompanying the silicious vein-dyke have unquestionably had their genesis within the magmatic formations. Such values have been found to some degree throughout the vein filled area, but deposition has been more favorable at, or near wall contacts; being particularly rich when occurring with the scheelite segregations.

That extensive leaching of former silver values has taken place is evident in that the silver observed occurs as a sulphide remnant in matrices of altered formation near the walls. It ensues that a major part of the primary silver values have been dissolved and thereafter entrained with descending ground solutions, and are deposited as secondary silver sulphide at some lower horizon where conditions of reprecipitation are favorable to such action. I have noted specimens of extremely high grade silver ore from the Tungsten Cut; the appearance of which indicates it having reposed in an impervious gouge along the wall. and that the gouge was sufficiently dense that ground solutions would have been excluded from attacking the mineral. Less impervious material would certainly have given up its silver content.

Gold values, or any concentrate that may carry gold, are not visible upon panning, even when carrying up to four ounces of the metal per ton. Early operators, for that reason, concluded that the values were in the nature of a telluride; however I should question that opinion; being more convinced the gold values are colloidal, inasmuch as there is a remarkable resemblance between the local gold ores, and those of a deposit of that nature south of Beatty, Nev. There are no apparent telluride indications here.

### DEVELOPMENT.

In a discussion of development on the property it becomes advisable that your frequent reference to the maps be made. In describing the various openings I have also included sample data pertaining specifically to that work, and in addition I have commented as broadly as is necessary to the material before you.

#### Southeast Adit.

This adit has been driven from the southerly hillside of the property. Primarily the objective was that of cross-cutting the vein-dyke; however that part of the work was abandoned prior to having reached the wall. From this cross-cut a drift has been extended along a fracture plane of one of numerous minor faults to be found in the vein-dyke. The operators were of the opinion that this plane was the wall; however it is some distance within the silicified area. The work was in an effort to drive beneath one of the important surface ore exposures, and at this writing has been extended sufficiently for that purpose; however it now becomes necessary, due to the dip of the wall contact, to cross-cut south, and at right angles to the present drift before encountering the contact wall along which the ores will more logically be found. I should further advise the gradual turning to the left in continuing the drift. The conditions found in the cross-cut first mentioned will give guidance as to where the actual contact wall may be encountered in drifting progress. Due to the known conditions of the ore favoring the wall areas it is recommended that drifting in future be along the wall, and that the drifting of this adit be continued to a point beneath the Walsh Shaft, or further as may be determined. Having in mind this program is purely prospective I should also advise that occasional cross-cuts be driven northerly



to intersect the foot wall contact where some drifting should also be carried out for the purpose of demonstrating conditions. I should remind you that little, if any, work has been performed toward indicating conditions of the north wall of the vein-dyke. Supplementing the drifting proposed I should advise the sinking of winzes, at favorably tenored ore lenses, such efforts being for the determination of mineralized extent to ore deposits found, and also it may be found that certain deposits are more widespread at horizons other than at the actual adit level. Raises at these points would effect the same ends and should be made. This would be particularly important in planning for ventilation, and if ore were followed to the surface the work would serve double purposes. It is often noted that ore deposits of this nature do not mineralize vertically, but "rake" in one systematic direction. I am advised that the Silver Dyke ores rake to the East, and it is probable that ores at this property will be found to conform to such a system.

The above work is outlined for the purposes of preliminary development; however I am wholly confident that it will be a duplication of effort, inasmuch as the adit later outlined will follow the same trend at depth, and the results of that work will make available ore deposits that may be summarily treated in the proposed concentrator. Further investigation may lead to abandoning any development plans from the Southeast Adit, but the decision should be weighed carefully prior to undertaking the deeper adit.

As stated the adit, and cross-cut, were driven wholly within the silicious area, and as such there is found that samples taken here carry negative results in gold and silver. No estimation of tungsten values was made. Follows Mr. Blackburn's results:-

- No 23. 7.0 ft in cross-cut from adit. Extends from face back. Values. Gold Trace Silver 0.15 oz.
- No 22. 6.0 ft. Taken in first stub cross-cut in drift. Values. Gold Trace Silver 0.30 oz.
- No 23 3.5 ft Taken across back of drift at distance of 15 ft in from No 22. Values. Gold Trace Silver 0.40 oz.

I should not suggest further sampling in the adit until the work has been progressed sufficiently that the true wall section has been exposed.

### Tungsten Cut

This cut is made along the contact wall at the surface 110 ft higher than the Southeast Adit level. A cross-cut approach was made in the andesite wall country south of the cut, and this work exposed numerous silicious veinlets in the andesite. The General Tungsten Corp'n developed a considerable tonnage of scheelite ore at this opening, of which approximately 297 tons were mined and treated in a concentrator at Silver Dyke. ( Now the rehabilitated mill of the Nevada-Massachusetts Co., ) No effort was made to recover the gold and silver values in the ore treated. The tailing from the mill assayed \$19.00 gold and silver values per ton with only a trace of scheelite.

A laboratory certificate of Tungsten Products Co., sampled and assayed by their Mr. Cooper Shapley gave results as under:-

- |              |   |                       |          |
|--------------|---|-----------------------|----------|
| Sample No 1. | Dump ore sample. Taken from seven small holes dug in Tungsten Cut dump. Representing about 100 tons | 5.5% WO <sub>3</sub>  | \$90.75  |
| Sample No 2. | East side open cut. Taken over 40 inches near bottom of cut with high grade eliminated              | 9.25% WO <sub>3</sub> | \$152.62 |
| Sample No 3. | High grade ore gathered from dump and center of vein 40 lb sample.                                  | 51.0% WO <sub>3</sub> | \$841.50 |
| Sample No 4. | Pieces of high grade on dump marked "Not best ore"  | 18.0% WO <sub>3</sub> | \$297.00 |

Values per ton are based upon present quotations of \$16.50 per unit of 20 lbs.

The foregoing indicates the tenor of the ore



mined from this cut. Indicative of the <sup>gold</sup> silver values associated with the scheelite is the following.

- |   |                          |
|---|--------------------------|
| No 1. Outcrop of vein   | Au. 0.96 oz Ag. 23.2 oz. |
| No 2. Silver ore taken from scheelite vein in cut where silver predominates                           | Au. 0.12 oz Ag. 53.2 oz  |
| No 3 An average sample of dump material from Tungsten Cut. Carried WO <sub>3</sub> percentage of 7.47 | Au. 0.14 oz Ag. 15.5 oz. |

The following results of Mr. W.H. Blackburn's sampling is tabulated. These samples were all taken in the Tungsten Cut.

- |  |   |
|--|---|
| No 20. From hole in north wall of cut, and across 4.0 ft.                                    | Au. Trace. Ag 0.60 oz. WO <sub>3</sub> 0.08%  |
| No 25. Taken across 3.0 ft in cut after ore removed.   | Au. 0.27 oz Ag 34.53 oz WO <sub>3</sub> 6.59% |
| No 27. Taken across 3.0 ft in cut about 5.0 ft W. of No 25. Largely in hanging wall andesite | Au. 0.27 oz Ag 15.8 oz WO <sub>3</sub> 0.7%   |

Mr. C. Ynchausti sampling for the same interests as Mr. Blackburn sampled the absolute wall of this stope, and follows his results:-

- |  |  |
|--|--|
| No 35. Across 2.0 ft of wall against andesite.     | Au 0.02oz Ag 33.38 oz WO <sub>3</sub> 0.76%  |
| No 36 Across 2.0 ft of south wall of tungsten cut. | Au 1.67 oz Ag 39.13 oz WO <sub>3</sub> 1.05% |

Mr. John W. Finch, a prominent Colorado engineer sampling in this cut received comparable results with those of other engineers, but unfortunately his results, as presented to the General Tungsten Corp'n, show only collective values. Since the sampling there has been a lowering in the price for silver, but a material increase in that of scheelite; therefore I should estimate his results as being low in view of present conditions.

- |   |         |
|---|---------|
| No 42. Across tungsten cut at entry                                       | \$20.34 |
| No 47. Across 2.0 ft near W end of cut after scheelite mined              | \$51.28 |
| No 48. Across 5.0 ft at extreme W end of cut                              | \$39.54 |
| No 50. East end of cut near shaft.  | \$22.56 |
| No 58. Average of dump from cut.<br>(Corresponds to Shapley's No 1 above) | \$86.26 |

Settlement sheet in the files of General Tungsten Corp'n indicates the concentrate from the ore mined from this cut amounted to 11.51 tons, or 783.831 units worth then \$11.00 per unit. The concentrate carried 68.10% WO<sub>3</sub> and had a gross value of \$8622214. The shipment netted, after deductions, \$7851.46 Complete analysis of the concentrate indicates no interfering elements. I assume these settlement sheets and umpire results are open to the inspection of any interested person.

The ore deposit mined from the Tungsten Cut is representative of other lenses that are probable of being encountered in furthering any degree of development along the wall areas of the vein-dyke, and at almost any horizon.

Following are the results of Mr. Ynchausti's trenching and samples taken on the property. Many of these samples were taken at points in the vein-dyke away from the andesite contact, and the results are significant of the wide dissemination of some degree of value throughout.

- ✓ No 1. Location in Trench No 1. 66 ft east of Tungsten cut. Sample across 10 ft on right side of trench near bottom. Au Trace Ag Trace WO<sub>3</sub> 0.24%
- ✓ No 2. Location in Trench No 1 as a 10 ft continuance of No 1 sample Au Trace Ag Trace WO<sub>3</sub> 0.23%
- No 3 Location in Trench No 1 as a continuance for 10ft from No 2. Au Trace Ag Trace WO<sub>3</sub> 0.43%
- No 4. Location in Trench No 2. 150 ft W. of Tungsten Cut Sample across 4.0 ft Au Trace. Ag 0.35 oz WO<sub>3</sub> 0.17%
- No 5. Location in Trench No 2. as 10 ft continuation of No 4. Au 0.10 oz Ag 0.63 oz WO<sub>3</sub> 0.17%
- No 6. Location Trench No 2. A 10 ft continuation of No 5. Au 0.10 oz Ag 0.30 oz WO<sub>3</sub> 0.12%
- No 7. Location in Trench No 2. Continuation of No 6. across 10 ft. Au Trace Ag Trace WO<sub>3</sub> 0.07%
- No 8. Location Trench No 2. Continuation of No 7. across 10 ft. Au Trace Ag 0.05 oz WO<sub>3</sub> 0.11%
- No 9. Location in Trench No 3 200 ft W. of Tungsten cut. Across 10 ft. Au Trace Ag Trace WO<sub>3</sub> 0.31%
- No 10. Location in Trench No 3 as a continuance of No 9. Across 10 ft. Au 0.10 Ag 8.0 oz WO<sub>3</sub> 0.30%

- No 11. Taken in Trench No 3 starting 7.0 ft ahead of No 10. Across 10 ft  
Au 0.20 Ag 0.79 WO<sub>3</sub> 0.12%
- No 12. Taken in Trench No 3. as a continuance for 10 ft from No 11. Au 0.10 oz Ag 0.25 oz WO<sub>3</sub> 0.08%
- No 13. Taken in Trench No 3. as a continuance for 10 ft from No 12. Trace in all values.
- No 14. Taken in Trench No 3. as a continuation of No 13 for 10 ft. Au Trace Ag Trace WO<sub>3</sub> 0.08%
- No 15. Location Thompson Trench approximately 950 ft W. of Tungsten Cut. Across 2.6 ft  
Au 0.8 oz Ag Trace WO<sub>3</sub> 0.25%

Trench No 4 Above Southeast Adit at surface.

- No 16. Across 8 ft Au Trace Ag trace WO<sub>3</sub> 0.02%
- No 17. Across 8 ft as continuation No 16  
Au 0.20 oz Ag 0.05 oz WO<sub>3</sub> Trace.
- No 18. Across 10 ft as continuation No 17.  
Au Trace Ag Trace WO<sub>3</sub> Trace.

Note: Above samples correspond somewhat with Mr. Blackburn's samples taken in adit.

Trench No 5. 300 ft W. of Tungsten Cut.

- No 19. Across first 10 ft. Au 0.30 Ag 1.19 WO<sub>3</sub> 0.44 %
- No 20. Across second 10 ft. Au Trace Ag Trace WO<sub>3</sub> 0.06%
- No 21. Across third 10 ft. Au 0.10 Ag 0.08 WO<sub>3</sub> 0.01%
- No 22. Across fourth 10 ft. Au 0.10 Ag Trace WO<sub>3</sub> Trace.
- No 23. Across fifth 10 ft. Au Trace Ag Trace WO<sub>3</sub> 0.79%

Trench No 6 Ynchausti's notes state that the trench did not cut quartz in this trench except in one place. Samples Nos 24 to 28 inclusive were taken here, and save for No 28 returned negative values. No 28 was taken across 5.0 ft and gave results of 1.10 oz Au with a trace of WO<sub>3</sub>

The foregoing samples are valuable only for the reason that they indicate the widespread WO<sub>3</sub> values claimed. Any engineer making a study of the conditions at the Tungsten Cut in comparison with Ynchausti's trenching into the mass of the vein-dyke cannot but be led to believe the work should have been confined to more numerous and shorter trenches actually deepened across the contact zone between the vein-dyke and the andesite. In fact Mr. Ynchausti took some samples in the Tungsten cut which should have convinced him that his work should have been performed as above outlined. It is nevertheless worthy of note that some wide widths in the vein-dyke mass carry economic deposits of scheelite.

Continuing a description of the development

we have:-

#### Robbins Shaft

This is a prospect shaft located about 250 ft N.W. of the Tungsten Cut. Unfortunately the work was performed too far back into the vein-dyke mass, and sample results, while comparable with those taken elsewhere away from the contact areas, are low. There is 1.0 ft of ore, according to Mr. Finch that returns total values of \$45.15 per ton. Mr Blackburn's samples here are as under:-

No 18. Across 5.7 ft at W. Edge of cut. Au 0.11 oz Ag 14.09 oz.

No 17. Across 2.0 ft in cut Au 0.01 oz Ag 13.69 oz.

No 16. Across 5.0 ft in approach to cut  
is not ore. Au Trace Ag 2.82 oz.

In relation to the above the only comment I should make is that the presence of the higher silver values is indicative of the possibility of fair tungsten values, for which this cut was not sampled, I should advise taking samples for WO<sub>3</sub> inasmuch as this point may be regional to a massive inclusion block of andesite, under which circumstance the scheelite might be determined as a segregation.

#### Bodie Shafts

As previously alluded to these workings were opened many years past, and little is known of their history. Specimens of silver ore may be picked up on the dumps. In a cut near by Mr. Blackburn, across 10.0 ft received returns of 6.11 oz Au. Trenching here is advisable.

#### Walsh Shaft

This work, I believe, was performed by the Tungsten and Gold Telluride Mining Co., The shaft is an incline 50 ft in depth, but was not entered due to the unsafe condition found. Mr Blackburn's results are hereunder given:-

No 8. Across 4.0 ft in cut near shaft Au Trace Ag 3.80 oz  
 No 11. Across 3.8 ft in cut at shaft Au 0.065 Ag 7.24 oz  
 No 12 Across 4.5 ft in cut at shaft Au 0.35 Ag 15.55 oz  
 No 7. A general sample of shaft dump Au Trace Ag 4.80 oz.  
 Mr Finch at this point gave one result of \$6.40 across 6.0 ft.

#### Northwest Adit

This adit was driven in the vein for a distance of 365 ft. At one point there is a cross-cut driven south toward the hanging-wall contact, but has not intersected the wall. All this work, as in the case of all else except the Tungsten Cut, has been driven wholly within the vein-dyke. I should advise, inasmuch as tungsten values are shown in this cross-cut from the adit, that some additional work be done here toward driving to the absolute contact and then drifting west, as a quartering shear plane would be intersected along the wall. Mr Blackburn's sample results are as under:-

No 4. Across 9.5 ft Au trace Ag 2.10 oz WO<sub>3</sub> 0.21%  
 No 5. Across 10.5 ft Au 0.10 oz Ag 0.10 oz WO<sub>3</sub> 0.32%  
 No 6. Across 10.5 ft Au Trace Ag 0.10 oz WO<sub>3</sub> 0.52%

Mr Finch does not indicate having taken samples at this point.

#### West Adit.

This is a short adit near the west end of the property. Mr Blackburn obtained a sample here carrying 52.96 oz silver per ton across 4.0 ft. Some further development is advisable here as the present work only is little more than a facing up for the adit

Numerous other samples were taken by the gentlemen alluded to, but the necessity of incorporating the results herein is not indicated due to their having been taken at unimportant points within the vein-dyke mass. The wall contact areas of the property are generally obscured by the repose of detrital material, and I assume this is the reason that former operators have not given this,

their greatest possibility, more prospecting attention. It is regrettable that Mr. Blackburn was more interested in silver possibilities than in the scheelite, otherwise he might have had more of his samples tested for the latter. I should not take any samples on this property unless those taken could be obtained consistently along the superficial contact between the vein-dyke and the andesite. To gain such samples it would be necessary to make the trenches sufficiently deep to certainly disclose the contact conditions. Such a sampling would uniformly be of higher tenor for all the values contained, and would be constructively determining ore at logical sites.

#### COMMENT ON TONNAGE.

Due to the nature, and form, of economic ore deposition at this property any estimation of tonnage would be possible of wide latitudes. As has been pointed out, the former operators, and the sampling of engineers, indicates a quest for precious values. Those few samples taken for the determination of tungsten values along the contact area were taken at, or near, the Tungsten Cut and as such indicate the possibilities of wall country exploration rather than the carrying out of such work as has been done in the past. Lack of overburden at the Tungsten Cut facilitated the opening of that deposit; which has proven of considerable extent. Contact areas between the vein-dyke and andesite will aggregate in excess of 6000 ft that are not, at this writing, prospected even by the most meager of open cuts. Successful results of exploration here is contingent wholly upon driving on, or in close proximity to the wall contacts.

For purposes of this report no strictly individual economic status will be given the gold and silver values; however the factor of these values will be studied in relation to their economic influence upon a tungsten enterprise. If, as is anticipated, the beneficiation of the precious values

of the precious values occurring with the scheelite ores will result in a revenue comparable with the total costs of mining and treatment of all ores; then it would obviously ensue that the production of scheelite concentrate would be accomplished under a profit basis not usually appreciated at other of the tungsten production enterprises. Your attention is directed to the fact that an ore carrying a gold value averaging from \$3.00 to \$4.00 per ton, with a 10 oz silver content, even at present low prices for the metal, could be mined and treated at a profit over all costs inclusive of the production of scheelite concentrate. That ore of greater average value occurs with the scheelite deposits is evident, not only at the Tungsten Cut, but at the new ore deposit opened at the Silver Dyke.

Development of a series of lenses, such as that already having been opened, would determine a <sup>mineral</sup> [Tungsten] resource extending to the justification of plans for milling in large capacity. Contributory to such an enterprise would be the following of a development program hereunder outlined:-

First contemplations are in the completion of the drifting, together with the cross-cuts, raises, winzes, etc., as has been outlined for development extending the Southeast Adit. If it is decided to carry out such development I again caution that the work be along the contact walls. Consistent with the results of this development, when completed, being the anticipated determination of a series of lenticular (scheelite) <sup>but</sup> deposits along the horizon of the work outlined; I should then recommend the investigation, and preliminary investigations, necessary to deep development at this property.

Prefacing my comment in respect to deep development I am constrained to point out the disadvantages of a shaft. These are self evident as to excessive

initial expense; excessive ore transportation expense through hoisting; the certainty of ultimate expensive pumping requirements; the necessity of camp and plant at higher altitudes and more distant location with respect to transportation of supplies; and finally the necessity of awaiting deep development and pumping prior to an assurance of water supply for the proposed milling enterprise. The foregoing, and other, disadvantages require no further comment.

An adit; driven from a site selected with consideration of greatest depth to be attained with the least distance driven to bring the development beneath the ore; brings one to the conclusion that the Garfield Flat slope of the Gold Range ridge would best suit the purposes. In favor of such a consideration is the assurance that water would be developed in driving the adit, and at not a great distance from the portal; being evidenced by the occurrence of several live springs in the immediate vicinity of such a site. More important is the possibility of driving along the strike of the vein-dyke under which condition the ores of all known values are possible of being encountered, and likely just as quickly, and with less expense, than if my upper level development plan be followed. Any desired depth penalized only by extra length of adit is possible, but it is my opinion that the adit should be driven in the limestone just beneath the basal contact of the overlying andesite. Without definitely checking I should say that the total length of such an adit would be approximately 4000 feet in making available the greatest amount of ore. The depth below the outcrop would be 1800 feet. As stated there are possibilities of opening ore at many places along the course of the development.



Under the site of this adit may be selected sites for plant and camp. Weather conditions would be equal to those obtaining at Mina.

The logical development under an adit proposition would be in extending the drift beneath as much as possible of the resources now indicated along the vein-dyke outcrop. At some suitable point in the adit, preferably adjacent to one of the ore deposits, a raise should be made with the idea of labor entry and ore handling. Ultimately the raise should be extended through to the surface, either through following ore trends, or as a deliberate raise for ventilation. Methods of ore handling are subject to determination consistent with ore deposition found. This probably will be in over head stoping from intermediate levels; thus ultimately a considerable resource of ore would be developed from a series of several intermediate levels of development. The foregoing comment is superficial to an extensive examination of the situation from the results of surveys; actual selection of a portal site; etc., From results specifically obtained there can be set up a complete preliminary estimate of costs upon which the entire development may be based.

#### PRELIMINARY METALLURGICAL CONSIDERATIONS

The properties of this ore containing gold, silver and scheelite, with the economic phases of the precious metals; suggests the requirement of a reduction plant designed to recover all values present. The precious metals are amenable to either cyanidation, or flotation, processes; it being the opinion of the writer that cyanidation will lend its properties more favorably to the beneficiation of these ores. The scheelite; due to its gravity, and the remarkable absence here of interfering elements; is subject to simple table concentration after

proper classification between sands and slimes. In this relation there is indicated an exhaustively systematic series of mill tests upon the ores for the purposes of determining milling requirements for the precious values. It should be definitely determined beyond my statement above whether cyanidation or flotation will best serve the purposes. An important consideration will be in the determination of sequence in treating the ores. Without benefit of metallurgical testing I would advance the suggestion that the finally developed flowsheet of any milling plant for these ores will substantially be as under:- (1) Stage crushing (2) Coarse grinding through some medium such as ball mills. (3) Classification and return of oversize to ball mills. (4) Classification of table heads between sands and slimes. (5) Concentration by suitable number of tables. (6) Concentrator tailing after being dewatered is passed to cyanidation. (7) Scheelite concentrate is dried, sacked, and shipped. The foregoing completes an outline of the treatment necessary to the recovery of scheelite. A cyanide plant generally would be as under:- (1) Dewatered concentrator plant tailing is passed to fine grinding medium such as tube mills; which are in closed circuit with a classifier (2) Slimed overflow from classifier is passed to Dorr thickener. (4) Thickened pulp is passed to agitation in series. (5) After agitation the pulp is passed to a series of other thickeners, all of which serve to alternately thicken and dilute the pulp. (6) Pulp from last thickener is passed to filter where solution is drawn from same; the pulp being finally washed (7) Pulp discharged from filter is passed to waste as tailing. The above shows progress of pulp. Cyanide solutions pass counter-currently against the pulp, becoming progressively richer, and finally at the first thickener are decanted to clarification, and with the addition of zinc dust are pumped to precipitation presses. The barren solution returns to the plant for

re-use. Precipitated values are melted, refined to bullion, and shipped. Cyanide solution is introduced at the tube mill; however it might be found advisable to concentrate in cyanide solution, under which condition there would be no material change in plans, or flowsheet.

#### ECONOMIC PHASES.

I should conservatively estimate; if predicated upon the following out of the development mentioned; there will be an ultimate resource <sup>Gold, silver &</sup> of tungsten ores, and ~~associated~~ <sup>associated</sup> precious metals, extending to a tonnage justifying consideration of a plant having a minimum capacity of 200 tons daily. It must be pointed out that a considerable development from the lower adit must be accomplished prior to a definite consideration of a plant of this capacity, inasmuch as the production of ore for such a plant will require numerous points from which it may be withdrawn.

I have prepared a tentative schedule of costs attending production on the 200 ton day basis. The values actually recovered, after metallurgical losses, are given as of the following basis:-

Recovered WO <sub>3</sub>	0.80% per ton or	\$13.10 at	\$16.50 per unit.
" Au	0.20 oz " " "	4.15 at	20.67 per oz.
" Ag	10.00 oz " " "	44.70 at	.47 " "
Gross values recovered per ton milled		\$21.95	

Inasmuch as the scheelite deposits are possible of carrying a much higher value, and furthermore the associated precious metals are known to be of higher tenor in all the scheelite segregations thus far noted; then it would seem that the foregoing per ton basis would be conservative. I am allowing however for the mining of these segregations as completely as values exist. It is likely a plant would average 26 days monthly operation at capacity, therefore;

200 tons daily
26 days monthly
5200 tons monthly.
\$21.95 per ton recovered
\$114,140.00 monthly gross revenue from operations.

In any calculation of per ton costs to be charged against production at this property one must necessarily consider a development program being maintained in conjunction with the mining of ore. I have set forth hereunder an estimate of costs as will likely apply at this property operation:-

Development.	Includes labor, supplies, power, explosives, insurance, timbers, track and pipe, repairs, and misc.	\$0.56 per ton
Ore Mining.	Includes same as above	2.41 " "
Tramming and Ore Handling.	Includes labor, supplies, insurance, repairs, and misc.	0.17 " "
Crushing	Includes labor, power, repairs, supplies, insurance, and misc.	0.08 " "
Prorata of tungsten concentration.	Includes, labor, power, repairs, supplies, insurance, and misc.	0.64 " "
Prorata of cyanide plant.	Includes same as above	1.05 " "
Administration	Includes superintendent's and bosses salaries, office expense, automobile expense, and all other misc. contingent expense	0.60 " "
Freight, Marketing, and Transportation.	Includes all expense under items stated.	0.47 " "
Depreciation is given at.		0.60 " "
Total estimated per ton charges		<u>\$6.58</u>

Monthly total expense is indicated under the following equation:-

200 tons daily X \$6.58 per ton X 30 days monthly is \$49,480.00

Therefore the estimate:-

Gross revenue from operations	\$114,140.00
Less operations expense	49,480.00
Net for distribution	<u>\$64,660.00 monthly.</u>

In conclusion of this report I have no hesitancy in stating that the potentialities of the property; especially if studied in comparison with the developments of the Nevada-Massachussets enterprise at Silver Dyke; are very apparent, and I strongly recommend the development of the Examiner Group to the ends of early production.

Respectfully submitted,

*E. W. Bedford*  
Mining and Metallurgical Engineer.