Mr. Libby! Silverton, Ore
6/19/40

Trying to get this in evening mail.
Confidential

[illegible]

Lead ore
[illegible]
11.00 per [illegible]
[illegible]

Penalties on Zinc
over 5%
[illegible] over 6%
pay freight [illegible] lead
14.00

SOURCE OF ORE a group of somewhat over a hundred claims, several of which are highly developed, with 400,000 tons of good quality ore blocked out and many times that amount in reasonable prospect. Excellent prospects for location and development of many other claims in this highly mineralized district.

THE CUSTOM MILL under seperate management buys ore on contract from mine operators, paying a sliding scale according to metallic values contained and current market prices for metals. The ore is milled and treated by selective flotation to produce two main concentrates--a lead concentrate which also contains appreciable values in gold, silver, and copper; and a zinc concentrate in which the zinc is the only value until such time as the main metallurgical plant is in operatiob, when the sulphur content may be turned to value. An iron concentrate will also be produced which will be of no value until the sulphur recovery plant is in operation, whereupon it's relatively small gold content can be realized as value as well as the large sulphur content of this concentrate.

THE PROCESS USED is standard practice throughout the world wherever complex sulphides are encountered. The ore is ground to a thin mud in a ball mill, and the valuable minerals floated out of this mud one at a time by the addition of suitable chemicals in special flotation machines. During the first months of operation, these concentrates will be sold and shipped as such to already existing smelters in neighboring states. The initial capacity of the ore mill will be 100 tons per day, and will be built up to 300 tons daily within a short time. The mill should net about $2.50 per ton of ore treated, more if the prices of metals continue to rise. At capacity this means an income of $750 per day is quite possible which would add up to about $250,000 in one year of capacity operation. This is in excess of the total capitalization as now planned.

THE ELECTRO*METALLURGICAL PLANT will utilize processes particularly adapted to Pacific Northwest economic conditions, also found in Norway and Finland, where hydro-electric power is abundant and cheap and nearby pulp andpaper mills require large quantities of sulphur products. The zinc concentrate is roasted, driving off the sulphur as gas. This gas is concentrated and liquefied under pressure, permitting it's storage and shipment to point of use in paper making. The roasted concentrate is leached of zinc by circulating acid which in turn is made to give up this same zinc in pure form by action of electrical current much the same as in electroplating. The acid keeps regenerating and little is lost. The remainder after leaching may be added to roasted iron concentrate and smlted for the lead and precious metals it contains. Plants of this nature are in successful operation at Great Falls, Mont., Kellogg, Ida., Trail, B.C. and in many foreign countries.

THE MARKET for products of thisoperation are first, for concentrates; lead concentrate can go either to Selby, Calif., or to International Utah, where they are sold as articles of commerce at market

prices. The zinc concentrate can be marketed advantageously at Great Falls, or Amarillo, Texas. Upon Completion ofthe Electro-Metallurgical Plant, nearly the entire production of zinc metal can be marketed at premium prices here in the west, and the rest exported from our ports to foreign countries at market prices. In addition the sulphur content will be turned to account by having a roasting plant nearby the huge local pulp and paper industry, this factor being the greatest single advantage favoring the establishment of local treatment and smelting of our concentrates. The development of Bonneville Power is another tremendous advantage in our favor.

CAPITALIZATION of the Edlon Custom Ore Milling Company is planned at $200,000.00 and is being marketed in terms of percentage ownership of the company. Upon completion of the corporate structure, the percentages of ownership will be translated into shares of common stock. This form of organization makes for simplicity, and avoids having more than one type of ownership of the physical assets of the company.

THE EDLON ELECTRO-METALLURGICAL COMPANY is to be organized along similar lines with $1,000,000.00 of capital stock when the primary purpose of The Edlon Custom Ore Milling Co.--namely the development of an adequate supply of concentrates--has been accomplished.

THE FUTURE cannot be treated in the factual tone of the preceeding paragraphs, but careful surveys of all economic factors indicate the development of a major metallurgical industry out of this initial operation. We have conditions similar to those existing in Scandanavia before the recent war--abundant minerals, cold water, electrical power adjacent to large pulp and paper mills and centers of industrial population. The recent dislocation of similar industries in Scandanavia and elsewhere greatly favors it's establishment here, as does the recent development of hydro-electric power. Metal prices are rising and everything points to firm markets in the future.

A LONGER LOOK at the future indicates the development of many related industries as this one take s firm root and assists the general industrial development of The Pacific Northwest. Our ores contain small quantities of many other values which can be turned to account as need is found for them. The related industries of Iron, Steel, Alloys, and heavy chemicals must wait the development of local supplies of the very things we will be producing. Our agricultural soils will soon require increasing amounts of ferilizers opening new markets for our by-products. The Pacific Northwest is going to become industrialized. Industry always begets more industry, and we confidently expect ours to greatly accelerate the pace of development here.

A short resume of our process in acquiring information relative to the production and marketing of Sulphur Dioxide (liquified) Use and missuse of SO_2 in the paper industry.

While trying to learn or develop a process for the recovery of the metalic values in the Lead, Zinc Sulphide ores from the property on the Santiam, under the existing conditions (power cost, Transportation, and the possible damage to the surrounding territory by the Sulphur content.) we learned that there had been considerable work done towards the reclamation of this sulphur and the processing of it in various forms, such as Sulphuric acid, Sulphur dioxide, Elemental sulphur and etc., and that there seemed to be a market in the Pacific Northwest for some three to five tons per day of sulphur dioxide liquified, and a rather large market for elemental sulphur.
It developed as further research was done that the Great Western Chemical Co. of Pittsburg, Calif. (Dow Chemical Co.) was supplying the most of the users of Sulphur Dioxide in this territory by shipments in drums containing from 25 lbs. to 2000 lbs. each SO_2 and the price being paid was approx. 5 cents per lb. FOB their plant plus freight also plus Breight back on the emply drum, wih this knowledge we decided that we surely could get a fair portion of the business here and started making inquiries among the various useres, whom we found to be very much interested in obtaining a source of supply near at home, enable them to save the large freight cost and not forcing them to buy and stock such large quantities.

To offset the good news, we were told that the paper industry bought thousands of tons per year of pure sulphur and burned it to produce their own SO_2 as any of the ulphde ores n his country contained so much impurities hatitwas impossibleto use he resulng Sulphurous acid in the processingoof paper.

In an endeavor to find the truth of these statements we contaced many persons, some could and dd help us n our search very much while others supplied us with more partial truths and missinformation, but from the whole we were finaly able to glean some facts and from the facts in hand contamt other people who were able and willing to aid, whether from a desire to be of real help to the industry or from their ability to receive pay for the infomation they supplied we will never know.

Two field men from large Eastern Chemical people finely set us on the right tract by tests of gasses and checks of processes, showing us how the impurities contained in the ores did prevent the paper industry from using the local ores and also showing us how to remove the same impuritiesbefore delivering the SO_2 to the users; This information proving extremely simple in itsentirety but well worth the small cost.

With the above information in hand and addresses of various persons from whom we might receive additional information madeavailable we now wrote tomany places and from the resulting replys the following processes and datum has been set up.

FIRST:

That the process developed by Schroeder and Haenish British Patents #2621 in 1883; #6404 and 6405 in 1885 and the modern equipment now on the market have liquid sulphur dioxide a cheap article, manufactured on a large scale, and has rendered it possible to employ this substance for many purposes for which formerly only the ordinary impure gaseous SO_2 was available.

This process was first taken up by the firm of Wilhelm Grille at their Zinc-works at Hamborn, Renish Prussia, where, in 1885, an experimental

factory was erected, turning out about 1200 lbs. liquid sulphur dioxide per day. The gases, testing 6 percent SO_2 were taken from a novel king of blende-roasting furnace. In 1886 four such furnaces were combined with a larger plant for 8 tons liquid sulphur dioxide per day. Very soon after similar factories were erected at Lipineand at Chropaczow in Upper Silseia, and abut 1899 ānother at BoundBrook, N.J., U.S.A. In 1899 a factory in Silesia produced 1266 tons liquid SO_2 by the above process from Zinc-blende gases: The production of the other works is not known. Thecost price is supposed to be L2 per ton.

In 1934 Imperial Chemical Industries, Ltd., of England patented a process for the production of 100 percent sulphur dioxide liquid from the weak SO_2 gases by the use of a sblution of basic aluminum sulfate (British Patent 419,068). A plant with capacity of 50 tons per day of liquid sulphur dioxide was built in Finland, and has been in commercial operation since 1936.

The Boliden Gruvaktiebolag has developed a process (Swedish patent 84,978) for the direct reduction of weak sulphur dioxide from smelter gases, and this process has been operated for several years at their plant in Sweden, with a production up to 70 tons of sulphur per day.

The Lurgi Chenie has built aplant in Germany with a capacity of 5 tons per day of sulphur dioxide liquid and one in France with a capacity of 30 tons per day. (I & E C May 10, 1939)

The more recent plants include theone at Trail B.C. producing some 250,000 tons of sulphur productsyearly: the Comstock-Wescott, plant at Niagara Falls 100 tons sulphur per day from Sulphides and many others.

BASIS OF OPERATION

This calculation is based upon average assays for the whole body of ore now blocked out at the mines. This ore will assay as a whole 10% zinc, 10% iron, 3% lead, ½% copper, .02 oz/ton gold, 1.76 oz/ton silver. Recoveries are figured 95% with the exception of copper which is figured 90%, which isquite conservative under modern practice.

LEAD CONCENTRATE, 14.25 tons dry weight produced from 300 tons of ore, which is 15.85 tons shipping weight with 10% moisture. This concentrate assays (dry Weight) 60% lead, 915% copper, .339 oz/ton gold, 35.15 oz/ton silver.

LEAD--300 tons x 2000 lb/ton x 3% x 95% Recovery - 17,100 lb recovered.
Deduct 1½ units and pay for 90% of balance at New York Price less 1.5625¢/lb. or 3.4375¢/lb.

one ton pb conc contains 1200 lbs lead
deduct 1½ units 30
1170 lbs settlement lead

1170 lb X 90% X 3.4375¢ gives $36.15 per ton of concentrate (ore)
$36.15 X 14.25 tons gives $515.00 Received for lead from 300 tons

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COPPER--300 tons X 2000 lb/ton X .5% X 90% = 2700 lb copper recovered deduct 15 lb/ton and pay for balance at New York. Price less 5.0625¢/lb, or 6.4375¢/lb.

One ton pb conc contains 189.5 lbs copper
15.0
174.5 lbs settlement copper

174.5 lbs X 6.4375¢/lb gives $11.20 per ton of lead concentrate
$11.20 X 14.25 tons = $159.50 Rec'd for copper in 300 tons ore.

GOLD--pay for 91% of assay at $35 per oz.
300 tons X .02 oz/ton X 95% recovery = 5.7 oz recovered.
5.7 oz X 91% X $35 = $181.50 Rect for gold in 300 tons ore

SILVER--Pay for 95% at mint price now 70¢/oz.
300 tons X 1.76 oz/ton X 95% recovery = 501 ozs recovered.
501 oz X 95% X $.70 = $33.25 Recd for Silver in 300 tons ore.

TREATMENT CHARGE 22¢/dry ton plus sulphur penalty $2.50/dry ton or $2.72 per dry ton. $2.72 X 14.25 tons = $38.75.
Freight to Selby $5.60/wet ton, truck to rail $2.50/wet ton total transportation $8.10/wet ton. $8.10 X 15.85 = $115.20

Received for lead	$515.00
Received for Copper	159.50
Received for Gold	181.50
Received for Silver	33.25
	889.25
Treatment charge	38.75
	850.50
Freight and Truck	115.20
Net check to Edlon Custom Ore Milling Company	735.30

Page 2 dealing with zinc concentrate and iron concentrate.

These concentrates shipped by truck to Silverton plant which pays ½ market price for zinc content of zinc concentrate and 1¢/lb for iron content in the iron concentrate as well as the transportation.

Zinc concentrate from 300 tons ore assays 60% zinc dry weight.
47.50 tons dry produced which is 52.75 tons plus 10% moisture.
Zinc concentrate contains 57,000 lb zinc metal and 28,000 lb Sulphur

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Iron Concentrate assays 45% iron dry weight and 51% Sulphur
63.4 tons dry produced which is 70.5 tons plus 10% moisture.
contains 57,000 lb iron metal and 65,100 lbs Sulphur.

ZINC ROASTING AND LEACHING, 95% recoveries of both zinc and sulphur.
57,000 X 95% = 61,900 lbs sulphur recovered =123,800 lb SO_2 or
61.9 tons sulphur dioxide from iron concentrate (Note, sulphur takes a weight of oxygen equal to itself to become SO_2)

TOTAL MARKET PRODUCTS FROM ZINC & IRON CONCENTRATE

54,100 lb zinc metal @ 7⅜¢/lb	$4190.00
89.5 tons sulphur dioxide @ $30/ton	2685.00
Gross Revenue	6875.00

The iron concentrate will contain small amounts of gold which can be economically recovered by cyanidization. Any residual precious metals in the zinc concentrate will automatically be saved in a subsequent process applied to the residues for utilization of them in connection with lead blast furnace operation.

FLOATATION MILL--Receives from Selby for lead etc	$735.00
From Silverton for zn plus fe	2154.00
Total revenue (freight & truck paid)	2889.00

ORE COSTS PAID TO MINE For Lead	$213.50
For Copper	77.60
For Gold	90.75
For Silver	16.62
For Zinc	946.00
For Iron	85.50
Total Ore Costs	$1429.97

Daily Revenue	$2889.00	METALLURGICAL PLANT	
Daily ore Cost	1429.97	Gross Revenues	$6875.00
	1459.03	Concentrate Cost	2462.00
Milling cost	375.00		4413.00
Net Revenue/day	1084.03	Major costs	1480.00
		Semi-net revenue	2933.00

Allowance has been made for labor cost in roundnumbers $1000 per day in metallurgical plant. Power 10,000 K.W. $480/day.

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MARKET CIRCULATION

Based on the treatment of 100 tons mine run ore, of average assay as nearly as can be determined at present of the whole body of ore in all claims in the group. The first several years of operation may draw upon considerably richer ore if necessary. This calculation sheet assumes selective flotation, with shipment of the lead concentrate to International, Utah at their regularly published schedule, subject to modification in our favor for the consideration of a long-term contract, and shipment of zinc concentrate to Great Falls, Montana under a hypothetical schedule. (As no buyer of zinc concentrates ever publishes a standard schedule, we've used one which is merely representative of company policy.) We have definite assurance that this representative schedule is subject to modification in our favor in exchange for a long-term contract.

PERTINENT ASSAYS

	Pb	Zn	Cu	Au	Ag	
				oz.	oz.	
Ore	3%	10%	.5%	.021	1.76	
Lead Concentrate	60%		10%	.135	35.2	Dry Weight Assay
Zinc Concentrate		60%				Dry Weight Assay

BASIS OF RECOVERY

100 : 9.75

	Pb	Zn	Cu	Au	Ag
In Lead Concentrate	95%		90%	95%	95%
In Zinc Concentrate		95%			

100 : 6.8

4.75 Tons LEAD CONCENTRATE Prod. from 100 tons ore

6000 lb. Lead at 95% Recovery gives 5700 lb. lead recovered in 4.75 Tons of concentrate, or 834 lb./ton of concentrate from which 30 lb., or 1½ units must be deducted, and payment for the balance, less 10% accepted at New York Market less 1.5626¢/lb. Gross receipts for lead content on this basis.....$183.80

6.8?

.7 oz. Au at 95% recovery gives .665 oz. recovered, or .135 oz/ton .665 times 91% times $35/oz. gives payment for gold .....$ 21.10

176 oz. Ag at 95% recovery gives 167 oz. recovered, or 35.2 oz/ton 167 times 95% times .70 gives payment for silver.....$111.00

1000 lb. Copper at 95% recovery gives 950 lb. copper recovered or 200 lb/ton of concentrate. 185 lb/ton settlement at 6.1875¢/lb. Gross receipts from copper on this basis.....$ 54.50

Total Gross Receipts from 4.75 Tons Concentrate.....$370.30
Total smelter and transportation charges.....$ 62.94
Net Check to Edlon Custom Ore Milling Company.....$308.36

Zinc Concentrates assaying 60% Dry Weight Zinc, 30% Sulphur 10% iron and insolubles, with no appreciable values of Gold, Silver, or Copper. Treatment charges based on dry weight, shipping charges on 10% moisture added. 15.85 tons dry weight of concentrates produced from 100 tons ore, which is 17.25 tons containing 10% moisture.

To figure value of one ton, dry weight, at Anaconda Schedule, discount zinc content 20%, accept payment for balance at St. Louis Market ($.0614/lb.) subtract present treatment charge of $23.50/ton dry weight, and freight and truckage on 17.25 tons wet weight.

1200 lb. times 80% times .0614 gives	$58.90/ton
Treatment charge	23.50
	35.40

19000 lb. times 80% times .0614 gives	$932.50/15.85 tons
Treatment Charge on 15.85 tons	371.20
Freight & Truck on 17.25 tons	215.50
Net Check to Edlon Company	345.80

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Receipts from Lead Concentrate, (page 1)	$308.36
Receipts from Zinc Concentrate above	345.80
Total receipts at mill, freight & Truck Paid	654.16
Payments to mining companies for ore	429.55
Net gross profit Edlon Custom Ore milling Co.	224.61
Estimated Milling cost (Colorado Sch. of Mines)	130.00
Net Profit	94.61

Oregon Section
AMERICAN INSTITUTE OF MINING & METALLURGICAL ENGINEERS
702 Woodlark Building
Portland, Oregon

A Section get-together and dinner will be held Saturday June 8th at Ireland's up-stairs dining room of Lloyd's Golf Course Club House, 718 NE 12th Avenue, Portland. The meeting is for Earl Nixon, who will leave shortly for South America, and we want to say au revoir and wish him the best of luck. There will be no formal program; Earl will speak of iron and steel prospects in Peru, and he will probably have some pictures. Come if you possibly can.

Time: 6:00 p.m. sharp.

Price of dinner: $1.00.

Please indicate on enclosed postal card as promptly as possible whether or not you will be present.

S. H. Williston, Chairman
F. W. Libbey, Secretary

Miller cost producing Slab Zn.

$113.02 per ton basis 6.75 ℔ Zn

Silverton "costs" on 54,100 lbs Zn or 27 tons

would be $3051

Seem to be figured at $1480

Investment $40000 per daily ton

Slab Zn -

Long tons 5 at $24 a ton