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Auditing Features of the Mining Industry

BY J. C. HOOKER

ECONOMICS OF THE BUSINESS

Mining, industrially, belongs to a special group of three. It is like agriculture and commercial fishing, in that it draws all of its raw material directly from Mother Nature, and unlike nearly all other businesses in its general analysis. In other words, there are two essential factors which distinguish mining from most other lines of modern industrial activity:

First, the greater risk or extra hazard always involved, and, Second, the outstanding fact that its uncertain life is fixed by that which nature has hidden in the ground and one is powerless to tell what or how much until some real development money is spent. Sometimes this returns a profit, but often only disappointment and no income—even with promising mineral deposits.

Hence, the peculiar hazards of prospecting, locating and operating mines frequently leave nothing for the investigator to audit, except accumulated expense, scrapped machinery and large deficits. However, development work on new prospects in American fields during the past sixty or seventy years has continued more or less steadily, and mineral production in the United States (including Alaska) amounted, approximately, to the huge sum of \$5,011,000,000 during 1917—more in value than the returns from any other single industry save railroads. But a miner who sells his silver or coal is also selling, at the same time, a part of his mine. An apparent net income for any operating period is not all true profit, but part profit and part return of capital. This points to what are now becoming more generally known as “wast-

ing assets"—exhibited by the gradual exhaustion of natural ore-bodies and virgin coal deposits, decreasing flow of oil wells and cut-over timber lands, and identified by the specific term of depletion. The other related term, depreciation of physical property (houses, furniture, machinery, vehicles, etc.), is common to all classes of industries. But depletion refers only to natural resources, and is usually calculated by the method known as the unit-cost (per ton, pound, ounce, etc.) basis, so as to spread the periodical allowances therefor over a number of years and finally return to the owner or the lessor the full amount of his true capitalized costs by the time his mine or other deposit is completely exhausted.

This item of depletion has been fitly described as "precisely like an account in a bank which is being wound up by a receiver" and does not carry with it the current idea of a continuing enterprise so often taken for granted in other industries like shoe manufacturing, wheat raising or a retail grocery—i. e., a fresh raw material supply for a coal mining plant or a copper mill cannot be drawn for a very extended period solely from one deposit or group of mines.

BUSINESS ORGANIZATION

There are usually three different phases of the mining industry, all necessary to bring the native ore or raw material down to anything like a finished-goods state. Occasionally all three processes are combined under one operating company, but more often under two or three separate organizations corresponding to the successive stages in the completed product. These distinct steps are:

- (1) Digging out or mining the raw material;
- (2) Crushing it with stamps or rollers into pulp or concentrates; then
- (3) Smelting this latter into the raw (blister) copper, unrefined silver, gold or other metal.

This last transitory product, in turn, is to be shipped long distances to refinery plants for a finishing process before it can be commercialized as salable goods.

These separate processes, then, necessitate a large organization, frequently with a small central or home office and larger ones cor-

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responding to two, three or four large branches or subsidiary forces, e. g.,

- (a) The mine office organization,
(with 500 to 2,500 employees) ;
- (b) The mill office organization,
(employing 50 to 500 people) ;
- (c) The smelter force,
(numbering 300 to 700 employees) ; and
- (d) If the main plant. or mine, is in an isolated position, it frequently happens that a necessary fourth group of employees constitutes the transportation force required to operate a branch railroad, from 3 to 100 miles in length.

This last is needed for hauling the raw ore or quartz to a separate and well-watered mill-site, to a trunk line railway or to the distant seaboard, and for bringing in all necessary men, material and supplies.

CHARACTERISTICS OF ITS LEGAL STATUS

The legal status of a mining property is infrequently that of a single individual or a partnership: in the majority of cases it is controlled and operated by a corporate management or a consolidation of two or more corporations organized under the more favorable laws of an adjoining or distant state or even of a foreign country.

SPECIAL CHARACTERISTICS OF ACCOUNTING BOOKS USED

Unfortunately for the investigator's purpose, the accounting books of the average small mining company consist merely of the usual cashbook, an incomplete ledger for controlling and a few expense accounts and a cheque book. In coal companies a sales register and a coal customers' ledger are added to the above. Also at the home office of some operators will be found a general journal, with such additional corporate records as a minute book and stock register; but frequently a comprehensive voucher register is used in lieu of a journal and nearly all important transactions, especially those relating to disbursements, are handled by journalizing everything through this medium, while the cashbook takes care of the receipts.

From the time books and time cards the usual voluminous pay-

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roll is built up twice each month; thence its distributions of labor (and also the warehouse distribution of sales to employees, outside purchases and material) are expeditiously worked into the ledger, by means of the above-mentioned voucher register, with only two corresponding voucher entries. This register is provided for each separate month with a distinctive serial number indicating that month, so that entries for a later month can be easily carried along concurrently (under a method of consecutive odd and even numbers), without waiting for the close of the current month's record.

In a few instances, among the smaller mining companies and partnerships (as with many small modern oil operators), the cash-book, journal and voucher register are all combined in one columnar book (of the "Boston ledger" type), wherein all entries are made when the bills are paid. In preparing these vouchers, when the corresponding cheque is drawn separately, the voucher number is entered on the cheque stub and the cheque number on the face of the voucher; in other cases, a combination voucher cheque (perforated horizontally through its middle portion) is drawn and forwarded to the payee, who detaches the cheque, receipts the voucher portion of the document and returns it. All supporting data are then fastened to this receipted voucher, or its retained duplicate, and it then becomes a docket (or file-wrapper) for the protection of connected papers as well as a receipt to vouch for the payment.

Of course, among the larger operators, the auditor will usually find the standard cashbook, journal and ledger, together with all necessary subsidiary records—including accurate and exhaustive assay and metallurgical registers, from which can be verified the raw (or mine-run) output, mill products (or concentrates), metal contents of each car of ore, the fineness of each metal mined, minute details appertaining to the cost records of each separate deposit or mine, mill and smelter production and the sales of the finished products or equivalent shipments to refinery plants. Where labor payment is made by cheque and the payrolls contain many names (often listing as many as 2,000 and 2,400 persons monthly) the payroll cheque register should show accurately and in serial order all cheques issued during the month or other period covered; and its footings or totals must correctly balance against the total

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audited vouchers, plus the combined amounts of cancelled, spoiled and unclaimed pay cheques and all daily time cheques issued between the regular pay dates covered by the investigation.

MINING ASSETS

The assets of a mining concern differ from those of an ordinary business in that the principal item, generally representing the value of an ore deposit, coal bed, rock quarry, clay field, etc., is of a vanishing or wasting nature, directly dependent upon the life of the property, expressed in months or years required to extract all the raw material and reduce that asset to nothingness—hence the origin of annual depletion deductions or reserves out of current income to replace or redeem the initial capital assets costs as a purchase fund for a new mine or further raw supply.

False or excessive goodwill to cover up capital deficiency in regard to tangible assets, like mining leases donated or options on mining claims purchased, is frequently set up by mining concerns to inflate the debit side of their balance-sheets. These excessive values should be “unwatered” by the careful auditor.

Then again, the ownership value of a mining claim or patent right to mining land oftentimes hinges on keeping up certain stipulated assessment requirements, like compulsory physical improvements on the property each year, in order to retain the title. Otherwise, a lapse in the development work leaves the property open to claim jumpers and may entail a total loss to the first owner to the extent of all original costs plus any subsequent development expenditures.

Relatively speaking, principal mining capital assets possess a large contingent element, rather than a fixed and permanent status.

SPECIAL FEATURES ABOUT MINING LIABILITIES

Since the extra hazardous nature of all mining enterprises places them in a category distinct from undertakings of a more stabilized character, it would appear the part of wisdom and common business prudence to set aside from current earnings during each operating year certain voluntary reserves to safeguard and meet the ever-probable contingencies due to sudden accidents, mine explosions, underground fires, cave-ins and other mishaps

common to mining ventures. To avoid financial embarrassment in meeting the losses thus occasioned, contingent liability reserves should be built up, periodically, from net income, in amounts sufficient to provide for any emergency (with corresponding reserve funds on the assets side); but unfortunately this safe practice seems to date to have been the exception rather than the rule with the majority of mining corporations. This necessity is strongly emphasized by the fact that no insurance companies have yet been found willing to underwrite such enormous operating risks as attach to mines. This condition is illustrated in balance-sheet N under the sub-heading "mining balance-sheet."

If the parent mining company has subsidiaries which operate lumber mills, branch railways, power plants, coking plants, coal washers, steel plants, etc., as is frequently the case, careful search should be made for such liability obligations as notes payable transferred, guaranteed surety bonds of a subsidiary, speculative mining contracts when values are low, etc., where no entry appears and no contingent reserve has been set up. Such action or failure to make provision may readily be traced to the common human tendency to understate liabilities, rather than to overstate them or show the true status of all obligations.

Mention should be made here of the strict requirements of the present income-tax law (act of 1918) and supporting treasury regulations and decisions in regard to the allowable elements of invested capital for mining corporations; consequently, the closest scrutiny and most careful analysis of all capital liabilities become a prime duty of the auditor.

PROPRIETORSHIP ACCOUNTS OF MINES

Proprietorship accounts are not dissimilar from the same class of accounts in other industries, and, so long as an individual works a mine and keeps clear of bankruptcy, he can keep such accounts as he pleases. However, if no books at all are kept or if books are kept in an unintelligible manner, and an accounting is directed by the court, the presumption is against the negligent owner or operator.

In partnership mining properties, the usual capital account for each partner is maintained to take care of his proportional investments and withdrawals. There is, however, the special rule that

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while co-owners in mining ventures share profits and losses equally, unless there is a specific written agreement to the contrary, this same equity does not extend to property holdings.

MINING BALANCE-SHEETS

The special features of the balance-sheets—those important, necessary and illuminating mirrors of any industry's financial progress and present condition—can best be demonstrated not in word pictures but in actual examples. Inasmuch as the general mining industry, comprehensively speaking, covers numerous and varied classes—each identified with peculiar characteristic details and slightly variable methods of operation—it is manifestly impracticable to interpret or represent fully and in exhaustive detail all classes of mineral production within the narrow scope of this paper. Therefore, there are here presented only two specimen mining balance-sheets, each distinct from the other but illustrating the two most prominent class-groups of the business, viz., metals and coal. As the year 1913 represents a low ebb, graphically and financially, in the fuel class of mining operations, form M is here given as a fair average exhibit of a typical deficit in that class. Likewise, as 1917 represents the peak-high year for prices and quantity of production in the metals class, form N has been selected as an instructive exhibit of a metal corporation's very creditable surplus during that year.

FORM M		<i>THE X COAL MINING COMPANY</i>	
General Balance-sheet, December 31, 1913			
<i>Assets</i>		<i>Liabilities</i>	
Cash assets:		Current liabilities:	
In bank.....	\$386.00	Vouchers payable	\$6,233.00
Advances to employees.	168.00	Accounts payable	2,931.00
	\$554.00	Unpaid wages.	1,401.00
		Store cheques.	803.00
			\$11,468.00
Inventories:		Deferred or accrued liabilities:	
Coal	\$5,127.00	Taxes accrued	\$3,000.00
Store	417.00	Accrued interest	2,345.00
Explosives...	173.00	School funds (in trust) ..	282.00
Stable	68.00		5,627.00
	5,785.00		

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Accounts receivable.....	\$6,247.00	Reserve for depreciation..	\$18,000.00
Deferred assets:		Capital:	
Unexpired insurance..	\$104.00	Capital stock..	100,000.00
Accrued royalty	130.00	Less unsold...	27,500.00
	234.00		72,500.00
Fixed assets:			
Plant & fixtures	\$39,077.00		
Less depreciation	20,605.00		
	\$18,472.00		
Mines*	12,250.00		
Surface land, (real estate)	50,000.00	80,722.00	
Deficit (operating).....	14,053.00		
	\$107,595.00		\$107,595.00

FORM N

BIG Z METALS MINING CORPORATION

Balance-sheet, December 31, 1917

Assets

Current (or liquid) assets:			
Cash at X office.....	\$132,390.00		
Cash at Y office.....	6,552.00		
Call funds in New York office..	460,014.00	\$598,956.00	
	\$55,671.00		
Accounts receivable	3,100.00	52,571.00	
Less reserve for doubtful accts.			
Contingent fund (contra).....		1,029,408.00	\$1,680,935.00
		389,416.00	
Inventories:			
Mine and mill supplies.....	\$120,900.00		
Office supplies	5,078.00		
Bullion in transit.....	216,312.00		
Ore on hand.....	11,544.00		
Concentrates on hand.....	35,582.00		

* This represents an old mining property practically depleted, with plant, buildings and machinery ready for scrapping. It also illustrates the point of non-impairment of invested capital by an operating deficit, hence not shown as a deduction from capital liabilities.

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Deferred assets:			
Employees building loans.....	\$31,212.00		
Advanced insurance (unexpired)	3,000.00		
Accrued interest (unpaid).....	18,889.00		\$53,101.00
<hr/>			
Fixed assets:			
Mining claim "patents".....		124,318.00	
Mines (operating).....	\$3,100,260.00		
Less reserve for depletion.....	760,058.00	2,340,202.00	
<hr/>			
Mill and plant (12/31/16).....	\$1,877,008.00		
Construction added on new smelter during year.....	1,589,089.00		
<hr/>			
	\$3,466,097.00		
Less depreciation (1917).....	675,644.00	2,790,453.00	5,254,973.00
<hr/>			
Total assets.....			\$7,378,425.00

LIABILITIES AND CAPITAL

Current liabilities:			
Mine drafts payable.....	\$58,847.00		
Pay cheques outstanding.....	83,588.00		
Vouchers payable	43,029.00	\$185,464.00	
<hr/>			
Contingent liabilities:			
Unpaid damage suit against new smelter process	\$1,018,914.00		
Reserve for accidents.....	114,000.00	1,132,914.00	
<hr/>			
Fixed liabilities:			
Funded debt (bonds).....	\$50,000.00		
Mortgage payable	110,000.00	160,000.00	
<hr/>			
Capital and surplus:			
Capital stock	\$3,270,000.00		
Less unissued	115,000.00		
<hr/>			
Total outstanding... ..	\$3,155,000.00		
Surplus (12/31/16).....	1,741,947.00		
Net profits for 1917.....	1,003,100.00	5,900,047.00	
<hr/>			
Total liabilities and capital.....			\$7,378,425.00

SPECIAL FEATURES OF MINE EXPENSE

Best results are found in plants where accuracy, clearness, simplicity and applicability are the prime elements of the system. While many features of a comprehensive mining cost plan are in

common use in different fields and in different groups of mines in the same field, yet no iron-clad uniform system is strictly applicable to all cases in the same class of mining nor in all classes of mineral production. A careful analysis of the particular demands to be met should furnish the guiding motif of the system installed, and the accountant, manager and his engineering staff should be found coöperating to work out the details of that system.

It is believed that the outlined cost schedule, illustrated in the three tables and notes given below, very fairly covers the elastic practices of most going concerns in the mining industry of the United States to-day. As a general rule, there is very little advertising expense incurred, and no indemnity insurance against operating accidents like mine fires, explosions and flooding can be secured. Then besides those expense items common to other industries—like general, office, superintendence, taxes, interest, repairs, workmen's compensation insurance, etc.—the following special cost segregations are in use by many mining companies:

TABLE A

COST ACCOUNTS

Special expense items—Mining operations

Mining (*)	Milling	Smelting
Engineering	Steam plant	Sampling (or laboratory)
Breaking ore	Pumping	Boiler-house
Timbering	Electric power & light	Power-house
Hoisting	Rolls or stamps (coarse crushing)	Ore and coke delivery
Tramming (or haulage)	Regrinding	Roasting
Sorting and loading	Screens and elevators	Pumping
Mine cars and rails	Tables and vanners	Mud-mill (lining for converters)
Track laying	Conveyors	Crane (overhead)
Pumping (or drainage)	Laboratory	Loading bullion
Ventilation (fans, etc.)	Teaming (stable exp.)	Hauling slag
Lighting	Machinists	Briquetting (or molding)
Assaying and sampling	Blacksmiths	Lighting
Surveying	Electricians	Electrical shop expense
Change-house	Carpenters	Tramming (or hauling)
Saw-mill	Cooling pond	Belt conveyors
Warehouse (mat. and sup.)	Tailings expense	Cooling pond
Explosives (blasting)		

(*) For slight variations to cover coal mining expense see next table (B).

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TABLE B

Items of coal mining expense	
1. Mine office	10. Haulage and hoisting
2. Superintendence	11. Dumping and tallying
3. Engineering	12. Preparation (sulphur and slate picking, etc.)
4. Mining	13. Loading in railroad cars (including yard expense)
a. hand	14. Power*
b. machine	15. Repairs (buildings and structures)
5. Timbering	16. Miscellaneous (or sundries)†
6. Deadwork	
7. Tracklaying	
8. Drainage	
9. Ventilation (blowers and fans)	

* The power utilized in operating screens, crushers, elevators, conveyors, picking tables, loading booms, etc., and material and labor charges for repairs to all such equipment are commonly classed under the heading of "preparation" of coal for the market. The item of power is further distributable to machine mining, haulage and hoisting, drainage (pumping) and ventilation (fans).

† If a washer is operated, its cost and operation should stand as a separate entity.

The same is true of a coking plant.

TABLE C

Daily labor and production report*

Date....., 191...

	Total 3 shifts		Total 3 shifts
Surface		Underground	
a. Office force		a. Mine foreman	
b. Mining engineering		b. Shift bosses	
c. Mill foreman		c. Miners—machine	
d. Smelter superint'dt		" hand	
e. Master mechanic		d. Muckers	
f. Machinists		e. Timbermen	
g. Electricians		f. Nippers	
etc.		g. Shaftmen	
		h. Trammers	
		etc.	
i. Total men.....		i. Total men.....	
		j. Product per man.....	
k. Total number of men employed.....			

*As a check upon the timekeeper's daily reports, from which the payroll is prepared, surface foremen and underground shift bosses are required to take each man's time as they make their rounds, and submit independent reports to the superintendent, for the purpose of verifying the bi-weekly or monthly totals shown on the payrolls.

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- 1. Product per man.....
 - Number of cars trammed.....
 - Number of tons hoisted.....
 - Etc.
 - Total product per month.....days.....
 - Average daily product for month.....
 - Number cars shipped from stock pile.....
- m. Tons of ore (or coal) hoisted.....
 - Etc., etc.

..... Timekeeper.

In addition to the more or less standardized expense elements listed above, the following special points should be noted:

- (1) In coal mining the maximum work time is 300 days—with a liberal average of 210 days—and the cost per ton varies accordingly. But at most large metal mines operations shut down only on Christmas day, and occasionally on the fourth of July; and there the usual operating rule is 24 hours a day, in three 8-hour shifts.
- (2) The mining operator is entitled to a greater margin of profit on account of the peculiar hazard not present in other industries. In the event of heavy floods, washouts or mine-fires, the extra expense of recovering the mine or flooded workings should be shown as a special and separate charge to operations. If experienced foresight has provided an accident reserve for such a contingency, as before-mentioned in this paper, such special charges can be met without embarrassment.
- (3) Another cost element is the ever-changing values of coal properties, due largely to fluctuating demands for fuel, which vary directly with seasonal temperatures and industrial activity, besides slighter variations traceable to obsolescence of certain classes of mining equipment and conservative or non-conservative mining methods in different coal fields.
- (4) Coal operators mine their most valuable coal deposits first, but copper men do the opposite when prices are high, and thus leave their high-grade ore reserves for the dull seasons.

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- (5) Mining costs, then, may be briefly summarized as follows:
- a. Primary cost = actual expenses of operating, excepting interest and payments on borrowed capital.
Here metals and coal follow the same general expense schedules, with special increments for metals due to necessary treatment of the concentrates and bullion by smelting and refining processes to bring them to a finished marketable state. An interesting comparative estimate, between the two general classes of mining operations, may be gathered from the table on page 254—though, unfortunately, statistical figures showing costs per pound, ounce, ton, etc., are not available, nor, in fact, existent for purposes of comparison at the present day:
 - b. Secondary cost = charges for depreciation, plus depletion, plus interest on investment and capital, plus taxes, plus risk, plus shipping and selling expense, plus reasonable profit.
 - c. Primary plus secondary = selling price, in both instances.

SPECIAL CHARACTERISTICS OF MINING INCOME

Mining income, in the case of raw blister copper or bar gold and silver, are mainly derived from sales of what should be termed unfinished (instead of finished) products, since this semi-raw material must yet go to the refineries to be converted into merchantable goods.

Then, in addition to actual receipts from sales of silver, copper, gold, lead, zinc, iron, coal, phosphate, platinum, sulphur pyrites, tin, cobalt, clay, etc. taken from underground workings, there are considerable profits from the company stores commissary and boarding-house operations, cottage and ground rentals to employees, sales of safety lamps, candles, black powder, fuses and other explosives, water rentals, power and light rentals to associated companies and neighbors or town sites, and very frequently from surface farming operations and timber sales on surplus land not in actual use for mining purposes, plant buildings, and mill or smelter sites. In one instance the writer knows of a 200-acre potato farm bringing in good revenue from extra surface acreage

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THE COMPARATIVE PRIMARY COST ELEMENTS IN METAL AND COAL OPERATIONS

No.	Mining		Milling or preparation		Refining
	Metals	Coal	Metals	Coal *	
1.	Administrative	Administrative	Steam plant		
2.	Superintendence	Superintendence	Pumping		
3.	Surveying	Engineering	Rolls or stamps	Crushers	
4.	Breaking ore,	Mining,	Regrinding		
	a. hand	a. hand		Sulphur & slate picking	
	b. machine	b. machine			
5.	Timbering	Timbering	Screens and elevator	Screening	
6.	Hoisting	Haulage and hoisting	Jigs (concentrating)	Spiralizers	
7.	Tramming	(see No. 6)	Tables and vanners	Picking tables	
8.	Sorting and loading	Dumping and tallying	Conveyors	Conveyors	
9.	Mine cars and rails	(see No. 6)	Laboratory charges	(Stables)	
10.	Tracklaying	Tracklaying	Teaming		
11.	Pumping	Drainage	Machinists		
12.	Ventilating	Ventilation	Blacksmiths	Smithing	
13.		Deadwork	Electricians	Electrical	
14.	Lighting	(see No. 15)	Carpenters	Carpenter shop	
15.		Power	Coke		
16.	Explosives	(sub-account)	Cooling pond	(Waste disposal)	
17.	Assaying		Tailings expenses	Loading booms	
18.	Saw-mill	(sub-account)			
19.	Warehouse	Materials & Supplies			
20.	Repairs	Repairs			
21.	Incidentals	Sundries			

Applicable to metals—but partly correlated to washery process for coal.

Applicable to *metals* only. See table A.

*All items in this column generally classified under the one term "preparation" in coal operations.

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along a well-watered stream adjoining the mill and smelter plant of a successful copper operation in northern Arizona.

PROFIT AND LOSS STATEMENT

None of the features of a mining company's profit and loss statement needs special stress or particular emphasis, excepting the item "reserve for depletion," which is usually made up of successive monthly allowances set aside against the final extinguishment of the mineral deposits and is a proper deduction from the net profit figures in determining correct additions to surplus from the year's operations. See the following example:

"Y" COPPER COMPANY	
Profit and loss statement, December 31, 1918	
Metal sales:	
From copper produced.....	\$1,330,440.00
" silver "	5,495.00
" gold "	20,279.00
	<hr/>
	\$1,356,214.00
Less cost of production:	
Total mining expense.....	\$640,872.00
" milling charges.....	302,016.00
" smelter charges (or fees).....	115,100.00
	<hr/>
Total production charges.....	1,057,988.00
	<hr/>
Gross operating profit.....	\$298,226.00
Add other income:	
Royalties	\$17,500.00
Rents	5,210.00
Powder sales, etc.....	2,300.00
Store accounts	5,200.00
Farming and timber sales.....	6,007.00
	<hr/>
Total profit	36,217.00
	<hr/>
	\$334,443.00
Less other deductions:	
Interest, exchange, etc.....	\$18,900.00
Taxes (local and federal).....	14,001.00
Experimental expense	19,791.00

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Legal (organization) expense	\$4,129.00	
Transfer (to smelter) expense, or freight outstanding	6,141.00	\$62,962.00
Net profit		\$271,481.00
Less reserve for:		
Depreciation for 1918.....	\$62,533.00	
Depletion for 1918.....	71,082.00	133,615.00
Profit and loss (to surplus).....		\$137,866.00

JOURNAL ENTRIES

Journal entries for typical mining transactions may be appropriately illustrated by the following examples:

A. If a mining corporation is formed with a capital stock of \$400,000. and the entire amount is issued in exchange for one developed mine and options on other mining claims adjoining the main property, and agreement is made to return or donate to the corporation \$150,000. face value of this stock, for working capital purposes, the entries would appear as follows:

(1)	Lone Tree mine.....	\$250,000.00	
	Other mining claims (options).....	150,000.00	
	To capital stock		\$400,000.00
(2)	Treasury stock	\$150,000.00	
	To donations (working capital).....		\$150,000.00

Then,

(3)	Cash.....	\$70,000.00	
	Donations (working capital).....	30,000.00	
	To treasury stock.....		\$100,000.00
	(Representing sale of 1,000 shares of common capital stock returned to the treasury and sold at \$70.00 a share.)		

Later,

(4)	Stripping and development	\$35,000.00	
	Sinking shaft No. 1.....	10,750.00	
	Engineering surveys	7,250.00	
	Saw-mill installation	11,480.00	
	Tipple construction	1,520.00	
	Mine railway trackage	4,000.00	
	To cash		\$70,000.00

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The above development charges would later be capitalized, by spreading them over several fiscal periods, as soon as operations had progressed sufficiently to furnish increased earnings for that purpose.

B. To provide for the gradual extinguishment or exhaustion of the coal deposit (or ore body) out of current income during each year while actual tonnage is being mined, the following is applicable :

(1) Depletion (1/12 monthly, or year 1919).....	\$19,152.00	
To reserve for depletion		\$19,152.00
(This is based on unit-cost [en bloc] output of mine during the year, say 840,000 tons of coal at .0228c. per ton.)		

Later, when the mine is practically worked out or down to a salvage basis, the final adjustments for residual values would appear thus, leaving the restored capital sum free as purchase money for a new mine or location :

(2) Profit and loss.....	\$3,750.00	
To mine (coal pillars, etc).....		\$2,620.00
Plant and machinery (scrap, estimated).....		1,130.00

SPECIAL AUDITING POINTS TO BE CONSIDERED IN MINING ENGAGEMENTS

(a) Careful attention should be paid to any lump charges carried to capital accounts in order to uncover any operating expense items—such as mine administration salaries, electrical repairs, removal of slate, maintenance of mine cars, timbering, depreciation of rails, assaying, explosives, etc.—that may have been included in the development or plant investment figures.

(b) Adequate reserves for depreciation of all physical assets about the plant should be set up, and if no provision for depletion of wasting assets, such as ore bodies, coal deposits, standing timber, etc., has been made, the auditor should invite particular attention to this omission, and explain the basis for this desirable and permissible reserve from income in regular, periodical instalments.

(c) As miners are generally paid on the basis of tons of coal or other mineral actually mined, the production for a given period should be easily verified, if the auditor first satisfies himself as

to the correctness of inventories at beginning and end of period. Both sales of output and miners' wages can be checked in this manner.

(d) In the case of many iron and coal properties the raw material is mined from leased land, for which royalties are paid at an agreed rate per ton, fixed in the original lease or contract, and extending often over a period of seven to thirty or more years. These royalties should always be verified from the lease and production records, rather than from receipted vouchers on file, as there is oftentimes ample opportunity for fraud or collusion in securing local receipts for voucher payments. When minimum royalties must be paid, whether production covers the outlay or not, the balance of the payment is often treated as a deferred charge, such as "royalties in advance," until the yearly tonnage output again exceeds the minimum. Then this deferred account may be cleared by successive charges to operating expense.

(e) Many mine and smelter payrolls are voluminous, and, in some instances, there are excellent internal checks from time cards and other time-keeping records, but in the main the correctness of each payroll can only be verified by the manner of its preparation and payment—preferably passing through the hands of three or more persons before actual payments are made by cheque. The average payroll provides deduction columns for such items as powder sales, safety lamps, cottage and water rents, board, commissary and store accounts; and the auditor should carefully examine these various accounts to see that proper credits have been entered therein for the corresponding totals of the payroll columns. In payroll allowances most copper companies and some silver and gold companies base their wage rates on a graduated daily scale, per 8-hour shift, plus a flat 10 cents (or more) daily bonus to all grades of employees, or a 15% to 40% straight monthly bonus based on the average price of the raw metal in the New York market for the preceding month. But coal miners are usually paid on the prevailing price for lump, screened or mine-run ton of output.

(f) Unless accurate and careful assay and metallurgical records are kept at the plant, as frequently happens, one will find no thorough check on the production of some copper, silver and other metal mines, since it usually varies with the fineness of each

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ton of output. If the raw ore or quartz is shipped elsewhere for milling and smelting, or is sold outright to a customs smelter, careful sampling and assay records are immediately made on receipt of car-load lots; and, in the event of disputes or disagreements as to the metal contents of the ore or concentrates, an independent umpire (always an experienced inspector) is employed to decide the issues and his judgment is final for both parties in regard to the financial settlement sheets. These record sheets should always be scrutinized.

(g) Usually the superintendent's reports to the main office, as to expenditures, are such as to permit a proper and correct analysis by an auditor, but some mining concerns are extremely secretive about their records and financial affairs and are prone to disallow inspection by either government or other agents.

CONCLUSION

As a final suggestion, all accountants should urgently recommend uniformity of accounting practice in all classes of mining operations, with evident benefit both to the owners and management of such enterprises and to the accounting profession. It is noted, with keen interest, that this lack of uniformity in mine accounting is particularly emphasized by Wade Kurtz, in his excellent paper appearing in the January, 1920, issue of *THE JOURNAL OF ACCOUNTANCY*.