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BULLETIN OF THE UNIVERSITY OF UTAH

Volume 50 September, 1959 No. 18

Bulletin No. 101

of the

UTAH ENGINEERING EXPERIMENT STATION

MINERAL RESOURCES OF THE DELTA-MILFORD AREA

by

M. P. Nackowski

and

Enrique Levy

Salt Lake City, Utah

B U L L E T I N O F T H E U N I V E R S I T Y O F U T A H

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O F T H E
D E L T A - M I L F O R D A R E A

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MINERAL RESOURCES OF THE DELTA-MILFORD AREA

INTRODUCTION

Purpose and Scope

A survey of the mineral industry of the Delta-Milford area, Utah, was undertaken by the University of Utah Engineering Experiment Station in July, 1958. The principal purposes were to catalog mineral resources, summarize recent mineral production, and evaluate future mineral economic potential.

The study included review of published data, and preliminary field examinations of mineral districts and mineral deposits in the area during July, August, and September of 1958.

Economic and geologic data are presented for each mineral commodity that has been produced in the recent past or that has significant future economic possibilities. Distribution and brief descriptions of minor mineral commodities also are included.

Acknowledgements

Many individuals and organizations were helpful in compilation and presentation of these data. Published information has been used extensively. Particular appreciation is due Mr. Stephen Wilson, Mr. Richard Weed, Mr. Thorpe Waddingham, Mr. Neil Murdock, Mr. Phillip Elsey, Dr. Carl Christensen, and Dr. Armand Eardley among others for their help and interest.

Location and Size

The Delta-Milford area is in southwestern Utah. Most of Beaver and Millard Counties and the southern part of Juab County are included. The area embraced exceeds 9,221 square miles.

Transportation Facilities

The area is served by the main line of the Union Pacific Railroad and by surfaced national and state highways as well as by improved all-weather gravel roads, and unimproved roads.

Communities and Population

The principal communities are Delta and Fillmore in Millard County, and Milford and Beaver in Beaver County. Fillmore and Beaver are the county seats of their respective counties.

The 1950 census for Beaver County was 4,851. For Millard County the 1950 census was 9,365.

Annual Worker Payroll

Labor force data and employment for the years 1952 to 1958 in Beaver and Millard Counties are given on Table I and Table II respectively.

Personal income data for Beaver and Millard Counties are available for the year 1954. These data are shown in Table III for Beaver County and in Table IV for Millard County.

In Beaver County $53,494 was the payroll attributed to mining during 1954. In Millard County $157,881 was the annual worker payroll for mining.

TABLE I

LABOR FORCE DATA AND EMPLOYMENT IN BEAVER COUNTY

1952 - 1958

	1952	1953	1954	1955	1956	1957	1958
Total	1,850	1,820	1,770	1,780	1,830	1,770	1,720
Unemployed	120	140	160	150	160	110	160
Employed	1,730	1,680	1,610	1,630	1,670	1,660	1,560
Agriculture	640	640	660	650	650	640	610
Self-Employed	180	170	160	160	160	160	160
Non-Agriculture	910	870	790	820	860	860	790
Manufacturing	20	20	10	10	10	20	20
Mining	40	20	20	20	40	50	30
Construction	20	30	20	20	20	40	20
Transportation	380	340	290	290	270	250	220
Trade and Finance	140	160	150	150	180	190	200
Service	90	80	90	100	100	100	90
Government	220	220	210	230	240	210	210

SOURCE: Utah Department of Employment Security

SELECTED BIBLIOGRAPHY

Fluorspar

22. Bauer, Herman Louis Jr., 1952, Fluorspar deposits, north end of Spors Mountain, Thomas Range, Juab County, Utah: M.S. Thesis, Univ. of Utah.

23. Everett, Floyd and Wilson, S. R., 1950, Investigation of the J. B. fluorite deposit, Beaver County, Utah: U.S.B.M., R. I. 4726.

24. Everett, F. D., and Wilson, S. R., 1951, Investigation of the Cougar Spar fluorspar deposit, Beaver County, Utah: U.S.B.M., R. I. 4820.

25. Fitch, C. A., Quigley, James, and Barker, C. S., 1949, Utah's new mining district: Eng. and Min. Jour. v. 150.

26. Frey, Eugene, 1947, Blue Bell fluorite deposits, Beaver County, Utah: U.S.B.M., R. I. 4091.

27. Marsh, J. A. and Everett, F. D., 1945, A new domestic source of fluorspar in Utah: Eng. and Min. Jour., v. 146.

28. Thurston, W. R., Staats, M. H., Cox D. C., and others, 1954, Fluorspar deposits of Utah: U.S.G.S. Bull. 1005.

SELECTED BIBLIOGRAPHY

Iron

29. Crawford, Arthur L, and Buranek, Alfred M., 1945, The Martite iron deposits at Twin Peaks, Millard County, Utah: Utah Dept. of Publicity and Industrial Development, Circular 30.

30. Crawford, Arthur L, Buranek, Alfred M., 1957, Utah iron deposits, other than those of Iron and Washington Counties, Utah: Utah Geological and Mineralogical Sur., Circular 24.

31. Hansen, George H., 1941, A brief reconnaissance of the iron deposits of the Wah Wah Range, Iron Peak, Three Peaks, Cove Mountain, and Iron Mountain in southern Utah: Utah Dept. of Publicity and Industrial Development, Circ. 7.

SELECTED BIBLIOGRAPHY

Limestone and Dolomite

32. Buranek, Alfred M., 1945, Certain high quality limestones and dolomites of the Cricket Mountains, Millard County, Utah: Utah Dept. of Publicity and Industrial Development, Circular 32.

SELECTED BIBLIOGRAPHY

Manganese

33. Callaghan, Eugene, 1938, Manganese deposits of the Drum Mountains, Utah: Econ. Geol., v. 33, no. 5.

34. Callaghan, Eugene, and Thomas, H. E., 1939, Manganese in a thermal spring in west-central Utah: Econ. Geol, v. 34, no. 8.

35. Crittenden, Max D., 1951, Manganese deposits of western Utah: U.S.G.S. Bull. 979-A.

36. Harder, Edmund Cecil, 1910, Manganese deposits of the United States, U.S.G.S. Bull. 427.

37. King, W. H., 1947, Drum Mountain manganese project, Juab County, Utah: U.S.B.M., R. I. 3993.

38. Pardee, J. T., 1921, Deposits of manganese in Montana, Utah, Oregon, and Washington: U.S.G.S. Bull. 725-C.

39. Zimmerly, S. R., Vincent, J. D., and Schack, C. H., 1942, Concentration of manganese ores from the Drum Mountain District, Utah: U.S.B.M., R. I. 3606.

SELECTED BIBLIOGRAPHY

Sulfur

40. Butler, B. S., and others, 1920, Ore deposits of Utah: U.S. Geol. Sur., Prof. Paper 111.

41. Day, David T., 1883-1884, Sulphur: U. S. Geol. Surv., Mineral Resources.

42. Day, William C., 1886, Sulphur, mineral resources of the United States: U.S.G.S.

43. DuFaur, A. Faber, 1887, The sulphur deposits of southern Utah: Eng. and Min. Jour., v. 44, no. 25.

44. Lee, W. T., 1907, The Cove Creek sulphur beds, Utah: U. S. Geol. Sur. Bull. 315.

45. Lewis, Robert S., and Varley, Thomas, 1919, The mineral industry of Utah: Utah University Bull. 10, No. 11, (Utah Engineering Station, Dept. Metallurgical Research Bull. 12).

46. Ridgway, Robert H., 1930, Sulphur, general information: U.S.B.M., I.C. 6329.

47. Russel, Israel C., 1883, Sulphur deposits in Utah and Nevada: Eng. and Min. Jour., v. 35, no. 3.

48. Thompson, R. B., 1937, Utah sulphur industries: Compass, 17, Microfilm.

49. Wideman, F. L., 1957, A reconnaissance of sulfur resources in Wyoming, Colorado, Utah, New Mexico, and Arizona: U.S.B.M., I. C. 7770.

SELECTED BIBLIOGRAPHY

Tungsten

50. Crawford, Arthur L., and Buranek, Alfred M., 1945, Tungsten deposits of the Mineral Range, Beaver County, Utah: Univ. of Utah, Dept. of Mining and Metallurgical Research, Bull. 25, v. 36, no. 15.

51. Earll, Fred Nelson, 1957, Geology--central Mineral Range, Beaver County, Utah: Univ. of Utah, Dept. of Geology, Ph.D. Thesis.

52. Gehman, Harry Merrill, Jr., 1958, Notch Peak Intrusive, Millard County, Utah: Geol. and Min. Sur., Bull. 62.

53. Hobbs, S. W., 1945, Tungsten deposits in Beaver County, Utah: Geol. Sur. Bull. 945-D.

54. Kerr, P. F., 1946, Tungsten mineralization in the United States, Geol. Soc. America, Memoir 15.

55. King, William H. and Wilson, Stephen R., 1949, Investigation of tungsten deposits at Cupric Mine Property, Beaver County, Utah: Bur. of Mines, R. I. 4590.

56. Miese, Homer C., 1957, Geology of the northern Mineral Range, Beaver and Millard Counties, Utah: Univ. of Utah, Dept. of Geol., Thesis.

57. Wheeler, Harry E., and Steele, Grant, 1951, Cambrian sequence of the House Range, Utah: Guidebook to the Geology of Utah, no. 8, Intermountain Assoc. of Petroleum Geologists, Utah Geol. and Mineralogical Survey.

SELECTED BIBLIOGRAPHY

Perlite

58. Anderson, Floyd G., and others, 1956, Composition of perlite, U.S.B.M., R.I. 5199.

59. Cochran, K. L., 1951, Union Pacific Railroad Company perlite resources, Meadow Valley wash area, Clark and Lincoln Counties, Nevada, Beaver, and Millard Counties, Utah.

60. Jaster, Marion C., 1956, Perlite Resources of the United States: U.S.G.S., Bull. 1027-I.

61. King, E. G., Todd, S. S., and Kelley, K. K., 1948, Perlite: Thermal data and energy required for expansion: U.S.B.M. R. I. 4394.

62. North, O. S. and Marks, A. L., 1953, Perlite: Mineral Yearbook.

63. Taylor, C. W., 1951, Processing perlite ore for expansion: Rock Products, v. 54.

SELECTED BIBLIOGRAPHY

Pozzolan

64. Blanks, Robert F., 1950, The Use of portland pozzolan cement by the Bureau of Reclamation: Proceedings of the American Concrete Institute, v. 46.

65. Davis, Raymond E., 1950, Use of pozzolans in concrete: Proceedings of the American Concrete Institute, v. 46.

66. Davis, Raymond E., A Review of pozzolanic materials and their use in concrete: Special technical publication no. 99, American Society for Testing Materials.

67. McMillan, F. R., and Powers, T. C., 1938, Classification of admixtures as to pozzolanic effect by means of compressive strength of concrete: Proceedings of the American Concrete Institute, v. 34.

68. Mielenz, R. C., and others, 1951, Natural pozzolans for concrete: Econ. Geol., v. 46, no. 3.

69. Nordmeyer, Rudy L., 1954, Pozzolans--their properties and manufacture: Ceramic Bull., v. 33, no. 10.

70. Timms, Albert G. and Griebe, William E., 1957, Use of fly ash in concrete: Public Roads, v. 29, no. 6.

71. Pozzolans: Utah Committee on Industrial and Employment Planning, 1958.

72. Pozzolan for Glen Canyon Dam and Powerplant: Invitation, Bid, and Award Schedule, General Provisions and Special Conditions, Invitation No. DS 5053, U. S. Bureau of Reclamation, 1958.

SELECTED BIBLIOGRAPHY

Pumice

73. Utah's Mining Industry, 1959, by Utah Mining Association.

SELECTED BIBLIOGRAPHY

Minor Commodities

74. Crawford, Arthur L., and Buranek, A. M., 1942, Tremolite deposits of the Mineral Range, Millard County, Utah: Utah Dept. of Publicity and Industrial Development, Circular 2.

75. Boutwell, John M., 1904, Gypsum deposits in Utah: U. S. Geol. Sur., Bull. 233.

76. Gilbert, G. K., 1890, Lake Bonneville: U. S. Geol. Sur., Monograph I.

77. Lewis, Robert S., and Varley, Thomas, the Mineral Industry of Utah: Utah Univ. Bull. 10, no. 11.

78. Stone, Ralph W., and others, 1920, Gypsum deposits of the United States: U. S. Geol. Sur., Bull. 697.

TABLE II

LABOR FORCE DATA AND EMPLOYMENT IN MILLARD COUNTY

1952 - 1958

	1952	1953	1954	1955	1956	1957	1958
Total	3,720	3,620	3,600	3,710	3,700	3,590	3,540
Unemployed	100	90	110	90	100	90	120
Employed	3,620	3,530	3,490	3,620	3,600	3,500	3,420
Agriculture	2,000	2,010	2,020	2,030	2,020	2,000	1,980
Self-Employed	320	310	290	300	300	300	300
Non-Agriculture	1,300	1,210	1,180	1,290	1,280	1,200	1,140
Manufacturing	60	60	60	60	50	40	40
Mining	50	40	50	80	80	60	40
Construction	70	40	20	40	30	40	40
Transportation	300	270	240	250	250	230	210
Trade and Finance	360	360	360	380	370	370	360
Service	110	100	110	120	120	120	130
Government	350	340	340	360	380	340	320

SOURCE: Utah Department of Employment Security

TABLE III

PERSONAL INCOME IN BEAVER COUNTY

Personal Income	6,768,304
Wage and salary disbursements	2,728,555
Farms	220,972
Mining	53,494
Bituminous & other soft coal mining	0
Crude petroleum and natural gas	707
Mining and quarrying, except fuel	52,787
Contract construction	40,785
Manufacturing	36,381
Wholesale and retail trade	292,926
Finance, insurance and real estate	39,366
Banking & other finance	39,366
Insurance & real estate	0
Transportation	976,288
Railroads	970,272
Highway freight and warehousing	6,016
Other transportation	0
Communications and public utilities	200,319
Telephone, telegraph & other communications	106,546
Electric, gas & other public utilities	93,773
Services	230,361
Hotels & lodging places	14,071
Personal services and private households	1,200
Business and repair services	0
Amusement & recreation	11,975
Professional, social, and related services	203,115
Government	637,663
Federal, civilian	187,613
Federal, Military	0
State and local	450,050
Other industries	0
Other labor income	34,950
Proprietors' income	3,121,221
Farm	2,487,011
Non farm	634,210
Property income	508,051
Transfer payments	495,527
Less: Personal contributions for social insurance	84,000

SOURCE: Personal Income in Utah Counties, 1954, Bureau of Economic and Business Research, University of Utah

TABLE IV

PERSONAL INCOME IN MILLARD COUNTY

Personal income	11,653,407
Wage and salary disbursements	4,235,074
Farms	606,807
Mining	157,881
Bituminous & other soft coal mining	0
Crude petroleum and natural gas	0
Mining and quarrying, except fuel	157,881
Contract construction	73,590
Manufacturing	130,774
Wholesale and retail trade	846,847
Finance, insurance, and real estate	48,724
Banking & other finance	46,766
Insurance & real estate	1,958
Transportation	994,544
Railroads	992,304
Highway freight and warehousing	2,240
Other transportation	0
Communications and public utilities	65,815
Telephone, telegraph & other communications	64,656
Electric, gas & other public utilities	1,159
Services	147,317
Hotels & other lodging places	14,463
Personal services and private households	22,560
Business & repair services	245
Amusement & recreation	17,882
Professional, social, and related services	92,167
Government	1,129,802
Federal, civilian	307,317
Federal, military	0
State and local	822,485
Other industries	32,973
Other labor income	67,570
Proprietors' income	5,764,882
Farm	4,757,399
Nonfarm	1,007,483
Property income	998,593
Transfer payments	717,608
Less: Personal contributions for social insurance	130,320

SOURCE: Personal Income in Utah Counties, 1954, Bureau of Economics & Business Research, University of Utah

Income from Production

Agricultural products and mineral commodities contribute most significantly to the production income of the Delta-Milford area.

Data are available for income from agriculture for Beaver and Millard Counties for the years 1949 and 1954. These data are listed on Table V. In Millard County income from all agricultural products in 1954 totaled $8,255,690. The income in Beaver County from all agricultural products totaled $2,320,837.

Annual income from mineral production for the period 1953 to 1957 in Utah and in the Delta-Milford area is given on Table VI. Average annual prices for mineral commodities for the same period are listed on Table VII. For the year 1954 the income from mineral production for Millard County and the southern part of Juab County totaled $43,073. For Beaver County the total was $28,524.

Annual value of each mineral commodity produced is given for the years 1953 to 1957. On Table VIII are presented these data for Beaver County. Similar data for southern Juab County are compiled on Table IX and for Millard County on Table X.

TABLE V

INCOME FROM AGRICULTURE FOR 1949 AND 1954

IN BEAVER AND MILLARD COUNTIES

	Millard		Beaver	
	1949	1954	1949	1954
All Products	$7,967,586	$8,225,690	$2,139,097	$2,320,837
All Crops	3,738,399	4,057,379	865,726	1,030,305
Field Crops	3,734,895	4,047,667	864,354	1,029,286
Vegetables	1,340	2,165	744	560
Fruits & Nuts	2,164	7,297	628	459
Specialties		250		
All Livestock & Livestock Products	4,227,507	4,167,507	1,273,374	1,290,452
Dairy Products	318,160	429,157	517,026	613,887
Poultry and Products	1,126,487	2,977,921	23,350	58,687
Other	2,782,860	2,977,921	732,995	617,878
Forest Products	1,680	1,110		80

SOURCE: Census of Agriculture, 1954, U. S. Department of Commerce
Bureau of the Census

I. C. 7497

APRIL 1949

UNITED STATES
DEPARTMENT OF THE INTERIOR
J. A. KRUG, SECRETARY

BUREAU OF MINES
JAMES BOYD, DIRECTOR

INFORMATION CIRCULAR

MINING PRACTICES AT THE HARRINGTON-HICKORY MINE BEAVER COUNTY, UTAH

BY

PAUL T. ALLSMAN

I. C. 7497,
April 1949.

INFORMATION CIRCULAR

UNITED STATES DEPARTMENT OF THE INTERIOR - BUREAU OF MINES

MINING PRACTICES AT THE HARRINGTON-HICKORY MINE, BEAVER COUNTY, UTAH[1/]

By Paul T. Allsman[2/]

CONTENTS

INTRODUCTION, SUMMARY, AND ACKNOWLEDGMENTS

This paper describes metal-mining practices at the Harrington-Hickory lead-silver-zinc mine at Milford, Beaver County, Utah. The operations of the Harrington-Hickory incorporate a number of features that should prove of interest and value to other operators of small mines. These features include employee participation in profits, a well-laid-out electrical system, adequate financing, a well-balanced equipment and supply inventory, a well-organized system of bookkeeping, adequate roads, and good management. As crude ore is shipped directly to smelters and mills in the Salt Lake Valley, close attention is paid to see that the ore is segregated by classes and treated where it can bring the greatest net return.

A combination of these features has resulted in maintaining relatively low costs, considering the grade and size of ore shoots at a time, during and following the war, when equipment, supplies, and labor were costly and difficult to obtain. The period covered in this report includes two war years and two years following, from April 1, 1944 to June 30, 1947.

1/ The Bureau of Mines will welcome reprinting of this paper, provided the following footnote acknowledgment is used: "Reprinted from Bureau of Mines Information Circular 7497."

2/ Chief, Salt Lake City Branch, Mining Division, U. S. Bureau of Mines.

The following sections describe the situation and physical features; briefly relate early and recent history; and include recent production tabulations. The geology and deposits are described; development and stoping methods are outlined, including costs; power distribution is explained; and equipment and surface plant are mentioned. Labor relations are explained in detail, and a copy of the contract is included in the appendix.

The author is indebted to James D. Williams, lessee and operator of the property, for making these data available.

SITUATION AND PHYSICAL FEATURES

The Harrington-Hickory mine is situated 5 miles west of Milford, in Beaver County, Utah, near the north end of the Star Range, on the east side, at an altitude of 5,600 feet. It is reached from Milford by a graveled road running directly west from the loading ramps on the Union Pacific Railroad to the mine.

Milford is well situated for obtaining mining equipment and supplies from distribution centers, as it is on the main line of the Union Pacific Railroad, 207 miles south of Salt Lake City and 578 miles northeast of Los Angeles.

The Star Range is one of many north-south trending ranges in the Desert Province. The climate generally is hot and dry in summer and, although cold in winter, snows seldom hamper trucking operations.

The little timber needed for mining must be shipped in, as none is available in the desert ranges. Water generally is scarce for surface operations. However, as the Harrington-Hickory is opened to below the permanent water table, it is ample.

EARLY HISTORY AND PRODUCTION

The Harrington-Hickory mine is one of the oldest in the Star mining district and was probably first operated during 1872-1875, when rich lead-silver ore was extracted. High-grade silver ore was mined at the surface, as evidenced by numerous shallow cuts. During 1900 the property was acquired by the Majestic Mines Co., which operated it until about 1912.

This company mined ore from the Harrington fissure to the 500-foot, or permanent water level. The Gomer shaft was sunk to below the 600-foot level, and some crosscutting was done toward the ore-bearing fissure. Water encountered below the 500-foot level eventually forced a stoppage of mining.

The property was acquired by Ezra Barton, George Miller, and associates at Beaver, Utah, by purchase at a tax sale in 1933 under the name of the New Majestic Mining Co. The mine was under lease after 1933, when some mining and development was done.

Records of early production are incomplete on mining to 1910. From 1910 to the time the present operation began, it has been estimated that 7,500 tons of ore containing 22 percent lead and 18 ounces of silver per ton was mined. A partial record of shipments after 1933 showed 14 lots aggregating 548 tons and containing 21 percent lead, 18.1 ounces of silver per ton, 45.5 percent insoluble, and 7.6 percent iron.

RECENT HISTORY AND PRODUCTION

James D. Williams, the present operator, obtained a 10-year lease with option to purchase the Harrington-Hickory property in June 1943. A $5,000 rehabilitation loan was obtained from the Reconstruction Finance Corporation in August 1943. Equipment and supplies were purchased, a mining crew of known ability was assembled, and rehabilitation began on September 5, 1943.

The 5 miles of road from Milford to the mine was repaired, a hoist house and change room were erected, a small hoist was installed, and the shaft was repaired. The 500-level station was then cleaned up, a 440-volt, 3-phase power line, and a 100-horsepower, submersible, 8-stage pump were installed in the shaft, and unwatering below the 500 level was begun. While unwatering was progressing, light circuits were installed and track was relaid to the working places on the 500 level.

All exposures were sampled, and two promising ore shoots were selected, from each of which a carload shipment was mined by hand mining. As a result of the sampling and carload shipments, an additional $6,000 development loan was granted by the R. F. C. in November 1943, and a $30,000 mining loan was granted in December 1943. These loans provided funds for completely equipping the mine for full-scale operation.

The following tables give the production of ore by classes from April 1, 1944, to June 30, 1947.

TABLE 1. - Production of ore from Harrington-Hickory mine, by classes of ore, April 1, 1944 to June 30, 1947[1/]

	Siliceous ore to Garfield plant	Oxide lead-silver to Murray plant	Oxide lead-zinc to Tooele plant[2/]		Sulfide lead-zinc to Midvale mill	Total
			+10 percent zinc	-10 percent zinc		
Tons	250.08	3,085.68	2,971.04	1,589.36	1,408.73	9,304.89
Gross value..	2,411.21	65,339.85	153,394.14	42,417.95	92,790.85	357,354.00
Value per ton	9.64	21.18	51.63	26.69	66.58	38.40

1/ Value of ore based on market value of metals at time of settlement and premium payments by M. R. C. are not included.

2/ No zinc payed for by smelter if settlement assay is less than 10 percent zinc.

TABLE 2. - Production of metals from the Harrington-Hickory mine, by years, April 1, 1944 to June 30, 1947

	Year				Total
	1944	1945	1946	1947	
Tons	1,318	3,070	3,798	1,118	9,304
Silver (ounces)	7,191	28,723	28,992	6,444	71,350
Lead (pounds)	232,519	777,625	954,208	213,104	2,177,456
Zinc (pounds)1/	122,049	530,056	521,408	266,931	1,440,444

1/ Includes only zinc paid for by smelter.

DESCRIPTION OF THE DEPOSITS

The rock formation in the Harrington-Hickory and vicinity are thin-bedded calcareous shales with interbedded limestones and lenses of quartzite, named by Butler3/ the Harrington formation. The general strike of the sedimentary beds is N. 10° to 15° E., and the dip is about 35° to 40° E.

The ore deposits, classified by Butler as replacement fissure deposits, are in the form of irregular pipes at the intersection of parallel fissures with a massive limestone member that is physically and chemically favorable to replacement. The strike of the fissures is N. 60° to 65° E., and the dips are 75° to 80° N. Development and mining has been conducted on two fissures - the Adelia and the Harrington.

The ore shoots comprise oxides of lead and zinc carrying silver and some copper to the depth of the permanent water table near the 500-foot level of the mine. Below this level the ore metals are sulfides, comprising galena, sphalerite, and chalcopyrite. The shoots so far mined are greatly enlarged at the water level and immediately above, and where mined below the water level are somewhat larger than normal in section.

The ore is high-grade throughout, and most of it has been shipped for direct smelting. Some of the richest ore has come from the sulfide zone below the 500-foot level.

A promising fissure, named the Copper fissure, south of those that have been mined is being explored. High-grade silver-copper ore has been mined from this fissure from the surface, and early shipments are reported to have assayed upwards of 500 ounces silver per ton. Samples taken at the start of present development in the surface cuts show an average of 35.6 ounces silver per ton across 5 feet of width.

DEVELOPMENT

Prior to the present operation, the Harrington-Hickory has been developed by three shafts - the Gomer shaft, 604 feet in depth; the Adelia shaft, 396

3/ Butler, B. S., Geology and Ore Deposits of the San Francisco and Adjacent Districts, Utah: U. S. Geol. Surv. Prof. Paper 80, 1913, 194 pp. Butler, B. S., Loughlin, G. F., Heikes, V. C., and others, The Ore Deposits of Utah: U. S. Geol. Surv. Prof. Paper 111, 1920, 504 pp.

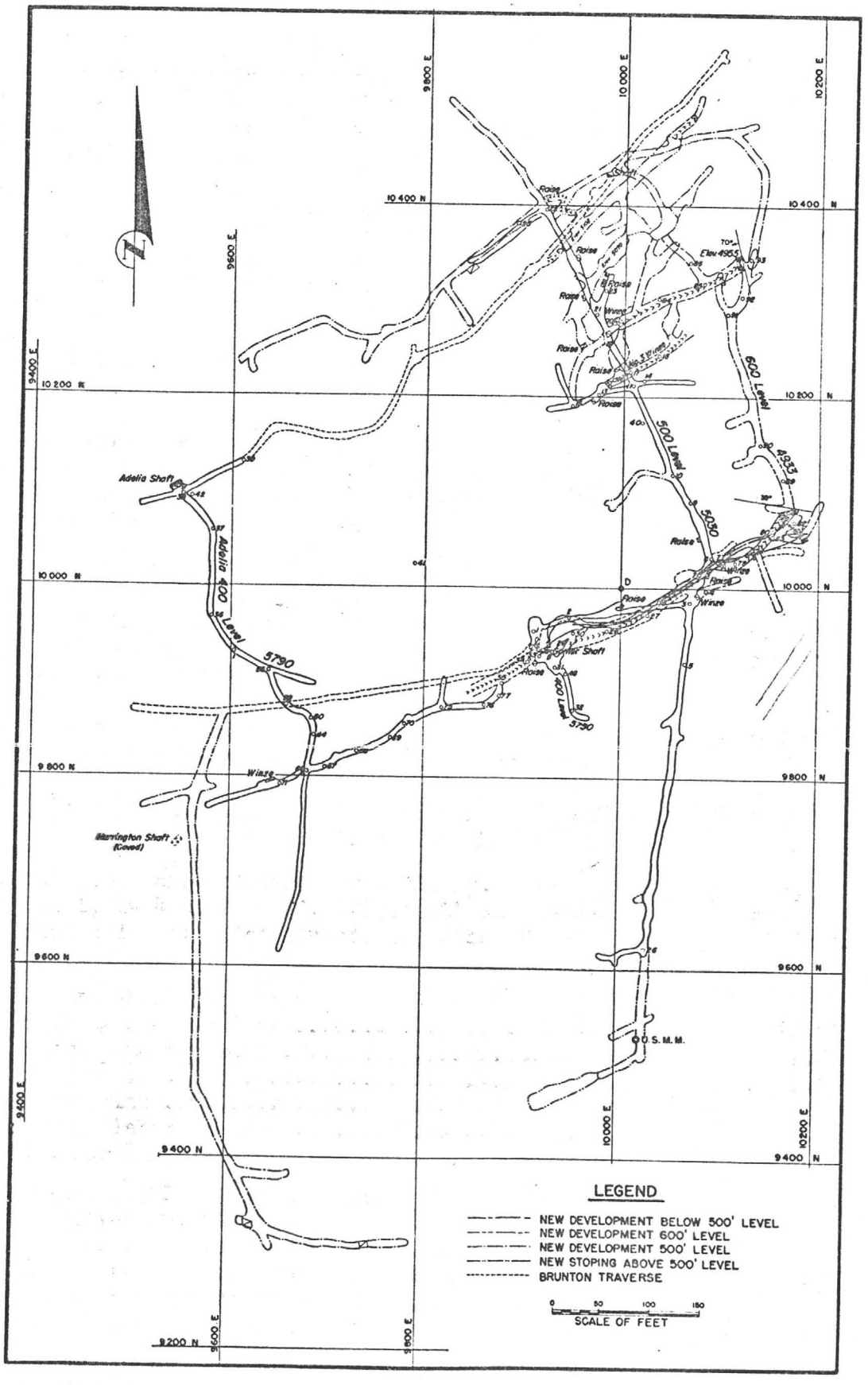

Figure 1. - Plan of Harrington-Hickory mine, showing new development and stopes.

feet in depth; and an inclined shaft. The Gomer shaft, which is the one being used at present, is a vertical, two-compartment, timbered shaft in excellent condition. When the present operation began, there were about 3,000 feet of drifts and crosscuts on various levels.

Since 1944, 2,409 feet of crosscutting and drifting has been completed for exploration and development of ore. Some inclined raises and winzes have been excavated, mostly in connection with stope preparation and ore extraction. The development and stoping done by the present operator is shown on figure 1.

All drifts and crosscuts are run 5 by 7 feet in cross section, and no timbering has been required, except to support chutes.

Generally, a 15-hole round comprising five rows of three holes each is required to break the ground. Three-inch, drifters, 1-1/8-inch, hollow-round, lugged drill steel and detachable bits are used for drilling. Forty percent gelatin dynamite is used for blasting.

All drifting and crosscutting is done on a contract by two miners at $7 a foot. The operator furnishes everything but labor. The contractor delivers the broken rock to the cage at the shaft, where it is hoisted at company expense. A normal cycle of operation comprises drilling, blasting, mucking, and tramming, one round per shift by two men.

The details of costs in units of labor, power, and supplies per foot of development are given in the following table.

TABLE 3. - Details of costs, in units of labor, power, and supplies, per foot of development - crosscutting and drfiting

Total feet, crosscutting and drifting, 2,409. Period covered, April 1, 1944 to June 30, 1947. All untimbered. Rock, limestone, and silicified limestone. Size of excavation, 5 by 7 feet.

			Cost per foot
A.	Labor (man-hours per foot):		
	Drilling and blasting	2.50	$2.91
	Mucking and tramming	2.50	2.91
	Hoisting	1.25	1.45
	Supervision	.62	.73
	Total labor	6.87	8.00
	Feet per 8-hour hour shift	3.2	
B.	Power and supplies (per foot):		
	Explosives (pounds per foot)	11	2.00
	Power (kw.-hr. per foot)	95	1.80
	Other supplies (cost per foot)	2.25	2.25
	Total power and supplies		6.05
	Total labor, power, and supplies		14.05
C.	Labor (percent of total cost)		56.9
	Power (percent of total cost)		12.8
	Supplies (percent of total cost)		30.3

STOPING

The stoping done by the present operator is shown on figure 1.

Except for the enlarged zone above the 500-foot level, the ore shoots are fairly regular pipes striking N. 60° to 65° E. and dipping about 35° NE. The ore has been stoped from a few feet to about 25 feet on the strike of the beds and up to 15 feet normal to the bedding. Within a zone roughly 50 feet above the 500-foot level to about 50 feet below the 500-foot level, the ore shoots have enlarged and formed irregular bodies up to 150 feet on the strike and 25 to 30 feet normal to the bedding. Below the 500 level in the primary zone, ore shoots maintain the pipelike shape found above the enlarged zone, having an average cross section of about 15 by 25 feet.

An open-stope method of mining has been used throughout. Occasional casual pillars have been left in the enlarged zone. Most stopes are steep enough to permit ore to flow by gravity, except in the enlarged zone, where irregularities make it necessary to use scrapers powered by an electric hoist.

Chutes are installed on the level where the ore is accumulated. While ore is being drawn into 16-cubic foot ore cars, a second car is spotted back of it, and waste is sorted from the ore and discarded to the second car. The records show that one car of waste is sorted for each 3.4 cars of clean ore. Loaded cars are trammed to the shaft station and caged to surface, where the hoistman dumps the ore into one of four 60-ton bins, depending on the grade and class of ore.

Wet stopers are used for drilling in stopes. No set system of drilling round is used, but holes are pointed and spaced to break the ore according to the best judgment of the miner.

The following table is a summary of costs in units of labor, power, and supplies per ton of ore hoisted in 1946 for development and stoping.

TABLE 4. - Summary of costs in units of labor, power, and supplies per ton of ore hoisted

Total ore hoisted 3,798 tons. Period covered, 1946.

	Development	Stoping	Total
A. Labor (man-hours per ton):			
Drilling and blasting	0.770	0.496	1.266
Mucking and tramming	.770	1.487	2.257
Hoisting	.385	.496	.881
Supervision	.192	.496	.688
Total labor underground	2.117	2.975	5.092
Average tons per man shift	3.78	2.69	1.57
Labor percent of total cost	10.0	63.8	73.8

TABLE 4. - Summary of costs in units of labor, power, and supplies per ton of ore hoisted (Cont'd.)

	Development	Stoping	Total
B. Power and supplies:			
Explosives (pounds per ton)	4.28	1.82	6.10
Total power (kw.-hr. per ton)	43.90	29.40	73.20
1. Air compression and lights	8.78	5.85	14.62
2. Hoisting	2.92	1.95	4.88
3. Pumping	32.20	21.60	53.80
Other supplies in percent of total supplies and power	17.5	8.1	25.6
Supplies and power percent of total cost	9.9	7.1	17.0
C. Percent of total cost	20.1	70.7	90.8

POWER DISTRIBUTION

Power is obtained from the Telluride Power Co. line extending from Milford to the mine, where it is fed to a bank comprising three 75 kv.-a., 5,000 to 480 volt transformer. The average cost of power has been $0.0189 per kw.-hr. Power is conducted to the mine through the Gomer shaft by a 440-volt, 3-phase circuit. Three-phase, 440-volt, submarine cable is installed from the shaft to working places to run the tugger hoists for scrapping. Transformers furnish 110-volt electric power throughout the mine for lighting.

The mine is at the end of a rather long transmission line, and frequent interruptions have caused the loss of considerable time in working below water level. Because of this uncertainty, operations below water cannot be resumed until a more reliable source of power for pumping is obtained.

AIR COMPRESSION AND DISTRIBUTION

Compressed air is furnished by a 420-cubic foot, 2-stage, air-cooled, 75-horsepower air compressor. It is distributed to the mine by a 3-inch air line through the shaft and 2-inch lines through main drifts. One-inch air lines conduct air to the face of stopes and development headings. One air receiver is installed at the surface and two others are installed close to principal working places for efficiency.

EQUIPMENT AND SURFACE PLANT

Following is a list of the major equipment in use at the Harrington-Hickory mine.

1 - Air compressor, 420-cubic foot, 2-stage, air cooled, 75 h.p.
1 - Hoist, single drum, 50 h.p. with automatic thruster brake and Lilly control.
3 - Transformers, 75 kv.-a., 5,000 to 480 volt.
1 - Arc welder, 20 h.p., 300 amp.

1 - Station pump, 125 h.p., 2-stage rated at 600 gpm. at 500-foot head.
1 - Turbine pump, 20 h.p. rated at 700 gpm. at 100 feet.
2 - Tugger hoists, 7-1/2 h.p. electric.
1 - Tugger, 3 h.p., air.
2 - Drifters, 3-inch, wet.
5 - Stopers, 2-3/4-inch, rotating, wet.
4 - Jackhammers, 2-3/4-inch, wet.
12 - Ore cars, 16-cubic foot.
4 - Ore bins, 60 tons capacity.
1 - Small booster blower.
3 - Air receivers.

Surface buildings, all of wood frame construction, comprise the following:

1 blacksmith shop, 14 by 18 feet
1 warehouse, 20 by 24 feet
1 change room, 24 by 28 feet
1 compressor house, 14 by 20 feet
1 hoist house, 12 by 16 feet

The property is completely equipped with small tools, and a complete inventory of replacement parts for all equipment is maintained in the warehouse. An adequate reserve of all needed supplies, such as explosives, is also maintained.

DISTRIBUTION OF SMELTER RETURNS

All the ore mined has been shipped to smelters in the Salt Lake Valley. All was direct smelting ore except 1,408.73 tons, which was milled at Midvale before smelting.

A great amount of study has been given to smelter schedules and classifying the ore at the mine in order to obtain the most favorable smelter rates. Oxide zinc ore is separated from lead-silver ore, and the resulting high-grade zinc is shipped to a zinc-fuming plant. Sulfide lead-zinc is kept separate from oxidized lead-zinc and oxide zinc ores.

The following table shows, by years, the distribution of the gross value of the ore before premium additions, by percent, from April 1, 1944, to June 30, 1947.

TABLE 5. - Distribution of smelter returns

	Year			
	1944	1945	1946	1947
Metal deductions	50.3	48.8	46.1	53.0
Treatment charges	24.2	13.1	24.7	17.0
Freight and hauling	10.6	8.2	7.0	5.5
Sampling and assaying	2.7	1.4	2.7	2.0
Royalty	1.4	2.9	2.0	2.3
Net f.o.b. mine bin	10.8	25.6	17.5	20.2
	100.0	100.0	100.0	100.0

LABOR RELATIONS AND CONTRACTS

At the beginning of each calendar year all employees meet with the operator to settle conditions under which they will work during the year. All present, including the manager, have one vote on all issues except rate of labor payments. A simple majority vote on other issues settles them for the year. The following conditions are discussed and settled.

1. The time and duration of holidays.
2. Amount to be paid on footage contracts in development.
3. Terms of the ore-production contracts.
4. Wage scale when employee is not covered under a contract.
5. Block or blocks to be worked are assigned to individuals or groups.
6. The program of development is outlined.
7. General needs and suggestions for improving working efficiency such as new equipment and special supplies.

In the past, all development has been done on contract at $7 a foot where the company furnishes everything but labor. The contractor delivers the waste to the shaft station, where it is hoisted by the company.

The most important feature of the success of labor relations is the "Ore Production Contract," which is reproduced in the appendix. The results of the methods of employee payments are shown in the following table, which covers the year 1946 and is typical.

TABLE 6. - Contract payment distribution

	Ore production contracts		Development contracts	
	Shifts worked by individual	Average earnings per shift	Shifts worked by individual	Average earnings per shift
	290	$26.40	304	$11.75
	292	26.20	307	10.35
	250	18.45	212	9.85
	290	14.15	182	10.90
Total and average	1,411	19.87	1,005	10.77

Average per shift all contracts = 2,416 shifts, $16.08.

Because the operation is comparatively small and ore shipments are intermittent, it has been found to be more economical to contract for the hauling of ore to the railroad by local trucking companies rather than to maintain standby equipment and personnel to do this work.

SUMMARY OF COSTS

The following table gives the cost of mining and includes all development and ore-production cost up to delivery of ore to bins at surface and waste to surface dumps.

TABLE 7. - Summary of costs

Harrington-Hickory mine, period 1946.
Tons of ore hoisted, 3,798.
Method of mining, open stope.

	Per ton		
	Development	Stoping	Total
Labor:			
Drilling and blasting	$0.75	$2.63	$3.38
Mucking and tramming	.75	7.87	8.62
Hoisting	.29	.94	1.23
Supervision	.18	.95	1.13
Total labor	1.97	12.39	14.36
Power and supplies:			
Explosives	.68	.29	.97
Power	.83	.56	1.39
Other supplies	.58	.27	.85
Total power and supplies	2.09	1.12	3.21
Total labor, power, and supplies	4.06	13.51	17.57
Depreciation			1.20
Insurance			.58
Total indirect cost			1.78
Total direct and indirect cost			19.35

APPENDIX

ORE PRODUCTION CONTRACT

THIS AGREEMENT, made and entered into this _____ day of _____, 194__, by and between (_____) of the Town of Milford, Beaver County, State of Utah, party of the first part, and_____ of the same place, party of the second part, WITNESSETH:

WHEREAS, party of the first part is in possession of certain mining claims in the North Star Mining District of Beaver County, Utah, known as the Harrington-Hickory Mine, under lease and option to purchase, with the full right to extract ores therefrom; and

WHEREAS, party of the first part has secured certain financing from the Reconstruction Finance Corporation, under a certain operational agreement, and is operating said mine subject to the provisions of said agreement and the rules and regulations of RFC; and

WHEREAS, party of the first part is desirous of having ores extracted from said mine by party of the second part under the arrangement and upon the terms and conditions following; and

WHEREAS, party of the second part is willing to extract ores from said mine under the said arrangement and upon the terms and conditions following:

NOW, THEREFORE, for and in consideration of the premises and of the mutual promises of said parties made one to the other, said parties to hereby agree as follows, to-wit:

1. That second party shall work in and extract ores from a certain block of ground between the _____ and _____ levels of what is commonly called _____, and consisting of a block of ground approximately ____ ft. wide, _____ ft. thick and _____ ft. long, having the center point of said _____ as shown on R. F. C. maps, as reference point.

2. That this contract shall be effective and in force (unless sooner terminated through forfeiture as more particularly set out herein-after), for a period of _____ from and after the date, hereof; and thereafter shall remain in force and effect until cancelled by either party upon thirty days' written notice upon the other party.

3. That second party shall commence work upon said ground on or before the _____ day of _____, 194_, and thereafter do and perform not less than _____ of labor each calendar month during the life of this agreement;

4. That second party shall do all work upon said premises with due regard to the safety, development and preservation of the said ground being worked and the mine in which said ground is situated, all as a workable mine, and to securely and properly timber all openings and workings from which earth and ore is being removed, where timbering shall be necessary and proper in accordance with good mining.

5. That the first party or his duly authorized agents shall have the right at any time and all reasonable times to enter upon the ground described in this agreement and any and all parts thereof for the purpose of inspection and examination.

6. That the second party shall keep at all times the drifts, shafts, tunnels and other workings being worked by him thoroughly drained and clear of loose rock and rubbish, unless so prevented by extraordinary casualty.

7. Second party shall comply with the laws of the United States and the State of Utah with respect to working mining ground herein described and the employment of labor thereon.

8. That second party shall keep any and all mining machinery and equipment and personal property of the first party being used by him, in a state of good repair, reasonable wear and tear excepted, and shall not commit waste, or use same negligently or in such a manner as to permit undue waste or deterioration thereon.

9. That first party agrees to furnish to and for the use of second party, necessary air, hoisting machines, steel, bits, hoses, small tools, cars, powder, fuse, caps and carbide, timber, assays, and such other miscellaneous mining equipment and services as are reasonably necessary to pursue the work herein contemplated; and that second party shall furnish all labor in the work of exploiting said ground and extracting ore therefrom.

10. It is understood and agreed by and between the parties hereto that in complying with the provisions of paragraph 9 hereof, said first party shall not be called upon nor be required to furnish mining equipment, tools and timber not available upon said mining property and/or in use elsewhere in said mine; and shall not be called upon nor required to furnish powder, fuse, caps and carbide when the same is not available for purchase by him; and it is further understood and agreed that in the event of any breakdown of machinery necessary to provide air and hoisting, or in the event of electrical failure, first party shall not be considered responsible therefor and shall not be liable to second party for any damages whatsoever, unless breakdown and/or failures be caused through his intentional misconduct or through his gross negligence.

11. That the profits from the production of ores extracted by second party shall be divided as follows:

(a) There shall be deducted from the net amount received from the smelter and/or mill to which ores are sent, plus net bonus or bonuses and/or subsidy payments received from the Metals Reserve Company, all items of expense incurred in the production of said ores, (excluding mine manager or superintendent's salary, office expense, traveling expense, personal property taxes and capital additions), and any balance remaining shall belong one-half to first party and one-half to second party;

(b) Items of expense and deductible before said division, shall include social security levies, unemployment insurance or payments, workman's compensation insurance premiums and mine occupation tax.

(c) All hoisting costs and air generation costs are to be charged as expenses at the rate of One Dollar ($1.00) per ton on all ore and/or waste hoisted out of the mine and produced from said block of ground. Other expenses shall be _____ on each ton of ore produced from said block of ground.

12. That second party shall not purchase any supplies whatsoever on account of or charged to first party; and in the event second party shall make any purchases whatsoever in connection with his mining operations as herein set forth, the same shall be in his name and borne entirely by him.

13. That said second party does hereby certify and declare that he is well acquainted with and has read the operational agreement between first party and the RFC and the rules and regulations under which he is operating said mine, and he agrees to be fully bound thereby insofar as the same may effect or in anywise be connected with his work and operations, and it is expressly agreed that this contract is subject and subordinate to such RFC operational agreement, and all rules and regulations in connection therewith.

14. It is further agreed by and between the parties hereto that in the event of any dispute or controversy concerning any of the provisions of this contract or construction of same, or any rights, privileges or obligations thereunder, to submit such dispute or controversy to the Supervising Engineer of the RFC; and his decision thereon shall be accepted by both parties hereto as final.

15. It is further agreed, understood and declared by both parties hereto that the first party does not control or direct the work herein provided to be done by second party, and that second party is free from control or direction over the performance of the work, or any work which he may choose to do by virtue of and in and under this agreement, excepting that such work must be done in a good and minerlike manner, and as otherwise specifically provided in this agreement.

16. That all ores shall be shipped in the name of the first party, but that second party shall be entitled to a full, true and correct copy of each and every settlement, together with a full, true and correct accounting of expenditures, charges and settlements; and that settlement shall be made by first party to second party as follows:

Concerning all monies received by first party as the proceeds from the sale of ores and/or bonuses and/or subsidy payments up to the last day of the month and being payments to which second party is entitled as such payments are hereinbefore more particularly defined, first party shall requisition the RFC. on or before the tenth day of the following month, and first party shall pay over such monies to second party within five days after his receipt of approval of such requisition. Provided, however, that in the event of termination of this agreement for any cause whatever, first party may retain from the final settlement due second party a reasonable sum of money to cover the prorated portion of the mine occupation tax on the ore produced by second party, until such time as said tax has been determined, and then to pay same promptly. It is understood and agreed that when this pro-rated amount has been paid, first party will promptly refund to second party any excess amount that may have been withheld.

17. It is hereby understood and agreed that should second party fail, refuse or neglect to do the minimum work herein required, or cause same to be done, or fail, refuse or neglect to perform any one or more of the additional covenants contained in this instrument upon his part to be performed, then said first party may at his option declare this agreement terminated and cancelled without notice, and the same shall thereupon immediately terminate, and in such event and upon being advised by first party, or in event of a termination as provided in paragraph 2 hereof, second party agrees to immediately deliver up to said first party the peaceable possession of the premises herein described and every part thereof; provided, however, second party shall be entitled to remove ore already broken as of the date of termination of this contract, in the event he shall elect to remove same as quickly as it may reasonably be done.

18. It is further understood and agreed that second party shall not have any right of assignment hereunder, unless by consent of the first party first had and obtained in writing; and while this agreement shall be binding upon and shall inure to the benefit of the heirs, administrators, executors or assigns of the first party herein, it shall not inure to the benefit of the heirs, administrators, executors, successors or assigns of the second party, excepting to the extent of settlements for money due second party on account of ore by him produced and shipped.

19. It is further understood and agreed that this agreement shall not be hereafter modified by parol, but shall be considered as modified only in the event such modifications are in writing and subscribed to by both parties hereto.

IN WITNESS WHEREOF, the parties hereunto have set their hands the day and the year in this agreement first above written.

_____

Party of the First Part.

_____

_____

Party of the Second Part.

Witness:

_____

ORE PRODUCTION CONTRACT SETTLEMENT

(Owner)
Harrington-Hickory Mine
Milford, Utah

Date _____

Contract Owner _____ No. _____ Contract Location _____

ORE PRODUCTION EXPENSES:

Period Covered _____ to _____

Hoisting and Air	
Pumping	
Tramming	
Insurance, etc.	
Steel and Bits	
Warehouse Supplies	
Explosives, Fuse, Caps	
Timber	
Assaying	
Equipment Rental	
Miscellaneous	
Total Expenses	

OPERATING ADVANCES:

Period Covered _____ to _____

Labor Furnished	
Cash Advanced	
Transportation	
Insurance, etc.	
Miscellaneous	
Total Advances	

Contract Lot No.	
Date Shipped	
Railroad Car No.	
Mine Lot No.	
Date of Settlement	
Wet Weight, Tons	
Dry Weight, Tons	
Net Smelter Payment	
Premiums:	
Net "A"	
Net "B"	
Total Payments	
Less Expenses	
Balance	
Contract Pmt. ____ %	
Less Advances	
Net Due Contract	
Less Assignments	
Adjustments	
Net Payment	

Paid _____ Check No. _____

See Settlement Sheet from Smelter/Mill attached hereto and made a part hereof.

SPEED MEMO

misc 58

To Mr. Richard Moore | At Arizona Bureau of Mines, University of Arizona

Subject The Copper World Mine | Date 4 June 1971

Dear Dick:

Enclosed is the Geological and Geophysical Report on the Copper World Mine by Jack Silman. Thank you very much for the use of it and I am herewith returning it via Jim Fouts, who is a part-time employee of Essex and also a student at the U.

Very truly yours,

PLEASE REPLY TO → Signed | At Tucson, Arizona

PLEASE ACKNOWLEDGE RECEIPT.

Date | Signed

SENDER'S COPY

No. 431398

RECEIPT FOR CERTIFIED MAIL—30¢ (plus postage)

SENT TO
MR. HARRY E. COPPIN

STREET AND NO.
6504 WEST 44th PLACE

P.O., STATE AND ZIP CODE
WHEAT RIDGE COLO 80033

POSTMARK OR DATE

TUCSON, AZ KINO STA.
JUN 11 1971

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RETURN RECEIPT SERVICES	1. **Shows to whom and date delivered**	15¢
	With delivery to addressee only	65¢
	2. **Shows to whom, date and where delivered**	35¢
	With delivery to addressee only	85¢
DELIVER TO ADDRESSEE ONLY		50¢
SPECIAL DELIVERY (2 pounds or less)		45¢

POD Form 3800
July 1969

**NO INSURANCE COVERAGE PROVIDED—
NOT FOR INTERNATIONAL MAIL**

(See other side)

☆ GPO : 1969 O—358-312

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2. If you do not want this receipt postmarked, stick the gummed stub on the left portion of the address side of the article, detach and retain the receipt, and mail the article.
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5. Save this receipt and present it if you make inquiry.

11 June 1971

Via Certified Mail
Return Receipt Requested

Mr. Harry E. Coppin
6504 West 44th Place
Wheat Ridge, Colorado 80033

Dear Mr. Coppin:

We have reviewed the data you sent us and are herewith returning the information.

The present workload of our group will not permit us to get to Colorado this summer unless something more attractive economically turns up.

Thank you for sending Essex the data for review. We will certainly contact you if we decide to do anything in your area in the future.

Very truly yours,

ESSEX INTERNATIONAL, INC.

E. Grover Heinrichs
Asst. Manager of Exploration

EGH:jbg
Enclosure: (1) Data on
Central Colorado
Copper Belt

file

May 3, 1971

Mr. Harry E. Coppin
6504 W. 44th Place
Wheat Ridge, Colo. 80033

Dear Mr. Coppin:

Thank you for your letter of April 27, 1971.

Enclosed is a form which we use in order to get as much information as possible on a property prior to a field trip.

If you could fill this out and return in as detailed a fashion as possible it will help us considerably in our preliminary examination work.

We are very busy, and scheduling a trip in the near future will somewhat depend on how enthusiastic we can get on the area after receiving your detailed information.

Very truly yours,

ESSEX INTERNATIONAL, INC.

E. Grover Heinrichs
Asst. Manager of Exploration

EGH:td
enclosure
Paul Eimon
H. LANIER

6504 W. 44th Place
Wheat Ridge, Colo. 80033
April 27, 1971

Essex International Inc.
1704 W. Grant Road
Tucson, Arizona 85705
Mr. E. Grover Heinrichs

Dear Mr. Heinrichs:

You may remember my coming in last January and mentioning a copper district in Colorado. I have finally assembled what material is available, and have secured a number of leases on the properties. I believe that a fair size operation could result from an exploration program in this belt. I do not presume that the old operators left behind any quantity of good ore, but they must have left the chances for deeper ore. From estimating dumps and the few faces I was able to see, there must be at least 30,000 tons of 2% ore on hand, carrying some silver.

This does not make an operation, but it is a start. I do not have what is called a "bankable" situation; that comes after somebody with the funds and the nerve does the mapping and drilling necessary.

If you want to go over the area, the snow is gone and the roads will be dry in another day from this recent storm. It will occupy three full days to go over everything from Salida thru Canon City. Give me a couple days notice, to precede you down there. Folder in this same mail.

yours truly

Harry E. Coppin

Harry E. Coppin

September 20, 1971

Mr. Rey Hickey
2818 Royal Palm Drive
Tucson, Arizona

Dear Mr. Hickey:

Enclosed is a form which we use in order to get as much information as possible on a property prior to a field trip.

If you could fill this out and return in as detailed a fashion as possible it will help us considerably in our preliminary examination work.

Very truly yours,

ESSEX INTERNATIONAL, INC.

E. Grover Heinrichs
Asst. Manager of Exploration

EGH:td
enclosures

Bob H.

I can handle this type of thing if you like?

A courteous letter of rejection or something.

Fine Ed 9/24/74

SXM

SEP 17 1974

RECEIVED

12 September 1974

Dear Sirs:

My family owns the mineral rights to the Apache County, Arizona land described below and is interested in leasing them to your company.

Lease payments/royalties are open to negotiation and no lease is presently in effect. Please direct your reply:

Sincerely,

O. A. Garcia

O. A. Garcia
20954 Parthenia, No. 31
Canoga Park, California 91304

(213) 882-1085 (residence)
(213) 883-2400, ext. 3516
(business)

Property description:

1. Fee land located in Township 13 North, Ranges 30 and 31 East, and Township 14 North, Range 31 East, G&SRB&M, being the ranch property heretofore better known as the "Garcia Brothers Ranch."

2. Fee land lying in the St. Johns Townsite as shown by the Official Plat thereof filed in the Office of the County Recorders of Apache County, Arizona, and being bounded by the Little Colorado River on the West, a farm road on the East, and U.S. 666 on the South.

Mining opportunities

(602) 968-1275 (602) 277-2483

CHARLES R. WARD CORPORATION
Mining Development & Mineral Recovery

4706 EAST ALTA VISTA PHOENIX, ARIZONA 85040

25 October 1974

SXM

OCT 29 1974

RECEIVED

Essex International Inc.
1704 West Grant
Tucson, Arizona
85705

Dear Sirs:

The Ward Corporation has recently acquired several listings in regards to gold, silver, and copper, both in placer and lode deposits.

In order to better serve the needs of companies such as yours, we are asking that you inform us as to the general requirements on mining properties you seek.

Very truly yours,

Douglas K Martin

Douglas K. Martin
Vice President

DKM/ld

We need an economic deposit !!

November 7, 1974

Mr. Armand K. Dair
P.O. Box 513
Wofford Heights, Calif. 93285

Dear Mr. Dair:

This will acknowledge your letter to Essex International, Inc. received in Tucson on October 31.

Essex International is not currently engaged in gold exploration and therefore will not be able to examine your mines.

Very truly yours,

Paul I. Eimon

PIE:td

SXM

OCT 31 1974

RECEIVED

Armand K. Dair
P.O. Box 513
Wofford Hgts., Calif., 93285

Essex International Inc.,
1704 West Grant
Tucson, Arizona

Gentlemen:

I have a group of Gold Mines that I believe could be grouped together into a large mining operation. These gold mines were in production by the noted Cecil & Clifford Burton; mine owners and mill operators. They used the cyanide process. The mines were in operation until World War 11 closed them down. These mines are in the radius of 5 or 6 miles.

The names of these mines are: RUTH, MOHAWK, ORONDO, ST. PATRICK AND the DAVENPORT. Also in the same radius there are 5 or 6 promising prospects.

We are approximately 10 miles North of Trona, California in the Argus Range. Excellent all year mining weather.

If interested, contact me at the above address.

Sincerely yours,

Armand K. Dair

Armand K. Dair

THE BACON COMPANY
SPECIALISTS IN FINANCING - MERGERS - ACQUISITIONS

2900 SOUTH STATE STREET, SALT LAKE CITY, UTAH 84115

FRED J. BACON, JR.
PRESIDENT

(801) 484-1004

SXM
NOV 8 1974
RECEIVED

November 6, 1974

Mr. E. Grover Heinrichs
Assistant Exploration Manager
Essex International
1704 West Grant Road
Tucson, Arizona 85705

Dear Mr. Heinrichs:

As per our telephone conversation of November 5th, I informed you of a property that I now control known as the Horse Mountain Mine, east of Eureka, California. All assays average about 2% copper. If this property is still available when your circumstances permit, I will be glad to talk to you about it.

Very truly yours,

Fred J. Bacon

Fred J. Bacon, Jr.
President

FJB:mb

November 8, 1974

Mr. Jeff Knaebel, President
Resource Associates of Alaska, Inc.
3230 Airport Road
Fairbanks, Alaska 99701

Dear Mr. Knaebel:

Thank you for your letter of 29 October 1974. I'm sorry we missed connections in Las Vegas.

Essex is currently restricting its exploration efforts so would not be able to participate in the venture you propose at this time. Thank you for continuing to consider us in your tentative planning.

Very truly yours,

Paul I. Eimon

PIE:td

RESOURCE ASSOCIATES OF ALASKA, INC.
3230 AIRPORT ROAD, FAIRBANKS, ALASKA 99701
TELEPHONE: (907) 479-6231/6097
TELEX: 090 35402

XM

29 October 1974

NOV 1 1974

RECEIVED

Paul I. Eimon, Manager of Exploration
Essex International, Inc.
1704 W. Grant Road
Tucson, Arizona 85705

Dear Mr. Eimon:

We tried unsuccessfully to contact you at the AMC in Las Vegas, which has become a very hectic show. We hope you will not mind the intrusion on your time of this letter.

In 1973 you indicated a potential future interest in Alaskan property situations. Although at the moment all of our discoveries are in the hands of the clients on whose behalf we worked, we are now in the process of putting together a joint venture or syndicate exploration program in target areas favorable for large high grade copper-lead-zinc-silver deposits of the Arctic Camp type and/or precious metal deposits in volcanogenic settings, or lead-zinc deposits of the Bonnet Plume - Summit Lake type in carbonate terrain (Mississippi Valley type). The work is basically at the grass roots stage, although we have fairly detailed positive information in some cases. If you would be interested in participating in such a venture, please let us know, and we could then arrange for further discussions.

Sincerely,

RESOURCE ASSOCIATES OF ALASKA, INC.

Jeff Knaebel
President

JK/msj

Toni
MAKE A COPY
FOR OUR FILE & REVIEW TO CLYDE.

SCHULTZE OIL COMPANY
PLAZA TRUCK TERMINAL
BOX 906, 666 E. PINE — PHONE 546-3451
DEMING, NEW MEXICO 88030

September, 18, 1970

Clyde E. Osborn
5315 E. Broadway
Suite 104, Tucson, Arizona

Dear Clyde:

I visited the copper property in Chihuahua that we discussed recently and I was much impressed with the possibilities of it being a very large copper deposit. There is little development to prove an orebody, except for a 250-meter shaft which is reportedly bottomed in ore. I was unable to visit the location of the shaft.

My three-day trip to the property barely gave me time to get a quick look at one end of it. After five hours ride on mule-back, I visited the south end of the property and saw an orebody estimated at 90 ft. wide, with a 250 ft. tunnel driven into the orebody and into the waste on the east wall, which was the only limit of the orebody reached underground. Boulders taken off a muckpile in the tunnel assayed 6.4 % copper with chalcopyrite and chalcocite being the copper minerals. The tunnel showed copper mineralization from the portal all the way in, with high grade veins exposed and some little stoping for gold in an oxidized zone.

Quick acessibility to the property is non-existent except by helicopter or a very brave crew to attempt an airplane landing in the bottom of the canyon. Of course, accessibility has retarded development of this country. A road is being built now which will make this property reasonably accessible, so that drill rigs and heavy equipment can be moved in. A gold property worked for six years in this area and I presume that the copper was left on the dump.

I recommend that a crew be sent in to sample and map this area in the very near future. Two or three geologists could do a reasonable job in 10 days of mapping. Local labor and pack animals are available locally. If Essex is interested I would be happy to bring what reports, maps, and photographs that I have and discuss this proposition.

Best regards,

Ray Schultze

cc

9/22/70
CLYDE —
LETS REVIEW THIS.
Howard.

Grover Heinrichs

MAR 2 7 1970

March 13th, 1970

Howard Lewis

Mr. President,
ESSEX WIRE CO.,
TerraHaute, Ind.

Dear Mr. President:-

About two years ago I wrote to you as to developing rich copper tracts in Mexico, but you turned it down but since the price of copper is going beyond its value due to curtailing of supply by Anaconda Copper Co., only using forty percent of its Chile and El Salvador operations; this may interest you now especially since the U. S. A. Agency - International Development Service will guarantee any loan that a company may make to get a development going.

A loan of only $350,000 for mining, milling and refining equipment along with sites and payroll to subsidize me to get this copper to you at twenty (20%) percent under market prices should be an inducement to do this.

The tract I had then is gone but two other tracts were submitted to me to develop which run over twenty percent of copper content per ton and would produce around one million and one half pounds of copper monthly and should this not be sufficient for your requirements, then from the profit of this, another set-up would be undertaken and this would double the amount of refined copper per month.

Might also suggest that the Nibco of Elkhart, Ind., maybe interested to go into this with your company providing you are intererested as I wrote them.

U. S. A. International Development Agency will guarantee any loan made by your company or direct financing by your company, which certainly should make this inviting considering the twenty (.20¢) cent saving per pound.

Yours truly

Ed. H. Schmidt

Ed. H. Schmidt,
3627 W. 104th Street,
Inglewood, Calif. 90303
213-674-5844

Ask for more information (with out commitments) on properties & qualifications of Schmidt.

Grover Any Comments? +

HEINRICHS GEOEX
Cable: GEOEX
BOX 5964 TUCSON, ARIZONA 85703
Phone: (AREA 602) 623-0578

RECD APR 8 1970 RECD

4/

H. Lanier

APR 20 1970

B.F.Goodrich Chemical Company

A DIVISION OF THE B.F.GOODRICH COMPANY

3135 EUCLID AVENUE · CLEVELAND, OHIO 44115 · PHONE 216-881-8200

THOMAS B.NANTZ
PRESIDENT

April 3, 1970

Mr. Paul O'Malley
Essex International
1601 Wall Street
Fort Wayne, Indiana

Dear Paul:

Harry Warner was in Abadan, Iran in late fall to participate with the Shah in the dedication of our new $30 million petrochemical complex. We own 26% while the Iranian Government owns the remainder.

In riding down on a chartered plane he sat with one of the Ministers who told him that they had a couple of interesting copper discoveries and were looking for companies that might be interested in developing them.

You might wish to talk to Harry by phone and learn more about this. I am sure he can give you the names of the people in Iran that you should contact, if interested.

Best regards.

Sincerely,

Tom Nantz

T.B.Nantz/ja

J. O'Connell note & pass to H. Lanier 12

Heinrichs RST evaluated one deposit

August 30, 1971

Mr. Clyde Davis, Director
Mineral Development
A-387-ASB
Brigham Young University
Provo, Utah 84601

Dear Clyde,

Thank you for your letter of August 23, 1971 giving me the name and telephone number of Griff Lloyd.

I have been in touch with Mr. Lloyd and he is planning to forward to me information for our review.

I am having difficulty in scheduling Mr. O'Malley for a trip to Brigham Young University. There is some question that he will be able to take the time for a visit to the campus in mid-September as planned. In view of this I suggest that we cancel these plans until I am able to get a firm date with him for a trip.

As I have told you, his daughter is planning to move to Salt Lake City and work as a nurse. She tentatively has made arrangements to go to Salt Lake in October and it is possible that Mr. O'Malley will be here at that time. I shall review his plans and advise you if we can arrange a more definite date.

Best personal regards,

Howard Lanier, General Manager
Copper Operations

ESSEX INTERNATIONAL, INC.

HL:td

August 31, 1971

Mr. G. V. Lloyd, President
G.V. Lloyd Exploration Ltd.
703 Fifth Street S.W.
Calgary 2, Alberta
Canada

Dear Mr. Lloyd:

Thank you for your letter of August 27,1971 describing the Copperkettle Creek and Rayfield River prospects. Both appear to have interest for exploration attention.

Your letter arrived just as we are starting a major drilling project in Arizona. I hope to get up to Vancouver this fall and stop at your office to discuss these and other prospects you may have.

Best regards,

Paul I. Eimon
Manager of Exploration

ESSEX INTERNATIONAL, INC.

PIE:td
cc: H. Lanier

2 June 1971

Mr. Harold E. Talbott
1005 Canyon Avenue
Miami, Arizona

Dear Mr. Talbott:

Thank you for your interest in Essex International, Incorporated.

We most certainly would be interested in a geological report on your property and we will promptly return it after assimilating the information.

Very truly yours,

ESSEX INTERNATIONAL, INC.

E. Grover Heinrichs
Asst. Manager of Exploration

EGH:jbg

11 June 1971

Mr. Albert Hopkins
810 Dupke Avenue
Toronto, 12, Canada

Dear Mr. Hopkins:

Mr. Paul Eimon, who is leaving shortly on a brief foreign assignment, asked me to reply to your letter of May 17th, 1971.

We have reviewed the data and do not think it fits our current program.

In any case, we want to thank you for considering Essex.

Very truly yours,

ESSEX INTERNATIONAL, INC.

E. Grover Heinrichs
Assistant Manager of Exploration

EGH:jbg

COUNTY:	COUNTRY:	STATE:	NAME OF PROPERTY:
JUAB	USA	UTAH	DESERT MOUNTAIN

DISTRICT OR AREA:	METALS:	ACCOUNT NUMBER:	NUMBER:
DESERT MTN	Cu - Ag		

GENERAL DESCRIPTION:
± 25 mi N. DELTA UTAH

EXAMINED BY: J.R.W.
DATE: 5-4-73

BRIEFED BY:
DATE:

STATUS:
UNPATENTED CLAIMS (17)

TYPE OF DEPOSIT:

GEOLOGY
Qm - GRANITE STOCK PROTRUDING FROM Qal. STOCK MED-CSE GRAINED HBLND-BIO Qm - GRAN
LOC 1-2" PHENOS OF ORTHOCLASE
10-50' WIDE DIORITE DIKE N60-80E
Bx ZONE (FAULT) CARRIES Cu Ox MIN
ALT'N: MOD CLAY IN Bx
UNALT AWAY FROM Bx
LOC APLITE DIKES

LOCATION:

ELEVATION:

LAT: LONG:

ACCESS:

DEVELOPMENT:
NONE

MINERALIZATION: OCCURS ALONG 10-80' WIDE FAULT - Bx ZONE
Cu Ox
1. MALACHITE - AZURITE
2. Cu PITCH
FLUORITE - SPECULAR HM - GN

PROPERTY & OWNERSHIP:
BUNT SORENSON
MR. SHIELDS
DELTA UTAH

GEOPHYSICS:
AIR MAG (STATE)
GRAVITY (STATE

AERIAL PHOTOGRAPHS:
NONE

GEOCHEMISTRY:
NONE

TOPOGRAPHIC MAPS:
DELTA A.M.S.

MAPS & REPORTS:
GUIDE BOOK 17 Be-U MINERALIZATION IN W. JUAB CO UT
MAG & GRAVITY OF DESERT MTN JUAB CO UTAH

MINERAL PROSPECT DEPOSIT DATA SHEET

ESSEX INTERNATIONAL, INC.
1704 WEST GRANT RD., TUCSON, ARIZONA 85705
PHONE (602) 624-7421

BY: John R. Wilson
DATE: 5-7-73

NAME OF PROPERTY: DESERT MTN

NUMBER:

REFERENCES:

PRODUCTION & RESERVES

RESERVES I 25-50000 TONS

< 1.0% TOTAL Cu

SAMPLES: Cu - Ag

4956
4957
4958
4959
4960

METALLURGY:

ENGINEERING:

NONE

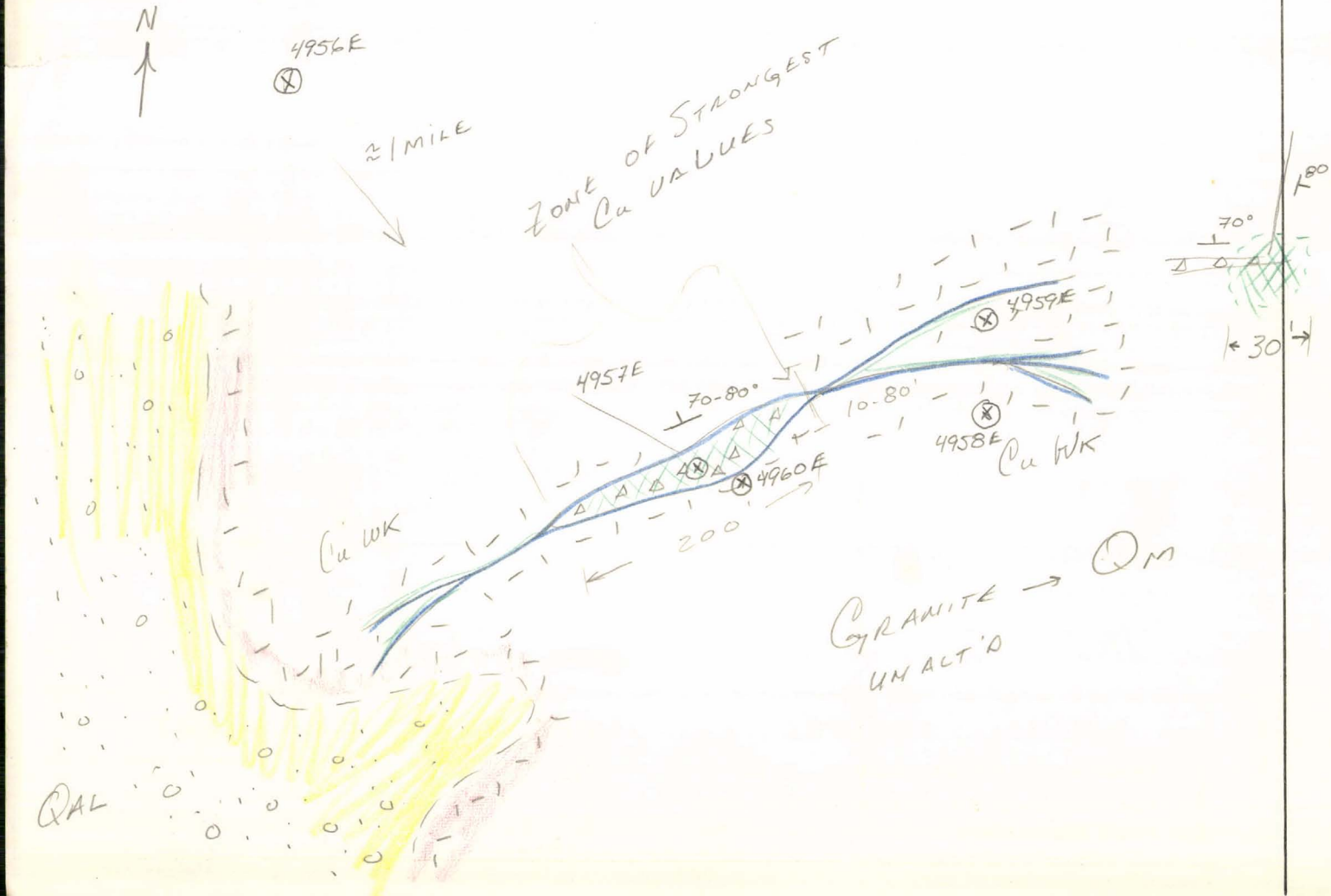
FACILITIES:

NONE

EXPLORATION POSSIBILITIES:

POSSIBILITY EXISTS FOR DOUBLING ORE RESERVES

ADDITIONAL INFORMATION OR SKETCH MAP:



ESSEX

MILFORD MINE
ESSEX INTERNATIONAL, INC.
METALLURGICAL AND MINING DIVISION
P. O. BOX 888
MILFORD, UTAH 84751
PHONE 801-387-2427

April 28, 1972

Mr. Carl Truman
Minersville,
Utah 84752

Dear Mr. Truman:

Thank you for the visit to the Creole and other mines we made on April 18, 1972.

The three samples I collected in the Creole Mine have been assayed for copper and soluble copper. The results follow:

Location	% Total Cu.	% Soluble Cu.
South rib	0.50	0.20
Central pillar	2.44	0.25
Base of oxidation	0.49	0.12

I will appreciate the opportunity to follow your development of these mines and visit them again as work progresses.

Sincerely yours,

MILFORD MINE
ESSEX INTERNATIONAL, INC.

DENNIS C. TEMPLE,
Senior Geologist

DCT:kt

CC: J. K. Jones
D. C. Beling

COUNTY:	COUNTRY:	STATE:	NAME OF PROPERTY:
Beaver	U. S. A.	Utah	Creole Mine

DISTRICT OR AREA:	METALS:	ACCOUNT NUMBER:	NUMBER:
Minersville	Pb, Ag, Zn, Co		

GENERAL DESCRIPTION:
First mining dist. in Utah. Contact deposits & veins, mined for Pb. and Ag. in oxidized zone. Intermittent work to present.

EXAMINED BY: D.C.T.
DATE: 4/18/72
BRIEFED BY:
DATE:
STATUS:

TYPE OF DEPOSIT:

GEOLOGY
Bedded contact deposits in Pe lms. ±10' above contact with Quartz Monz. stock. Mines and prospects follow this cont., ± 2 mi.

LOCATION:
ELEVATION:
LAT: LONG:
ACCESS:

DEVELOPMENT:
Main stope 200' × 300' × 30' Tunnel to base of stoped area. No support in stope. Few pilars.

MINERALIZATION:
Pb, Zn, Ag, Co sulf. in argil. alt. scarn. Oxidation is strong ±60' down dip from surface. Primary sulf. below.

PROPERTY & OWNERSHIP:
Area controled by Mr. Carl Truman Minersville, Utah

GEOPHYSICS:

AERIAL PHOTOGRAPHS:

GEOCHEMISTRY:

TOPOGRAPHIC MAPS:
U.S.G.S. 7½", 15" + A.M.S.

MAPS & REPORTS: P.P. Mining Dist. of Utah

MINERAL PROSPECT DEPOSIT DATA SHEET

ESSEX INTERNATIONAL, INC.
1704 WEST GRANT RD., TUCSON, ARIZONA 85705
PHONE (602) 624-7421

BY:
DATE:

NAME OF PROPERTY: Creole Mine

NUMBER:

REFERENCES:

PRODUCTION & RESERVES

Reportedly 309,000 tons drilled.

SAMPLES:

Main stope	% Cu	% Sol. Cu
South rib	0.50	0.20
Cent. pilar	2.44	0.25
Base of Ox.	0.99	0.12

METALLURGY:

ENGINEERING:

FACILITIES:

Plans to build mill on site.

EXPLORATION POSSIBILITIES:

Small underground mines should continue intermittently along cont. May be profitable for small operator.

ADDITIONAL INFORMATION OR SKETCH MAP:

THE SHIELD DEVELOPMENT COMPANY, LTD.

UTAH MINES DIVISION

EXPLORATION ASSAY REPORT

Date 4-19-72

Report By Dean Thomas

PROJECT		Cu.	Oxide	Insol. Cu.			
4951 S side		.50	.20				
4952 Cent. pilar		2.44	.25				
4953 Base of oxide		.49	.12				

OFF. 936-5952

OCT 22 1970

RES. 933-7622

RECEIVED

S. O. CURTIS REALTY & MORTGAGE

S. O. "SAM" CURTIS
MAILING ADDRESS
10950 Saratoga Circle
Sun City, Ariz. 85351

S. O. "SAM" CURTIS
OFFICE
6313 W. Van Buren
Phoenix, Arizona

October 20, 1970

Mr. Grover Heinricks
ESSEX INTERNATIONAL, INC.
2030 East Speedway
Tucson, Arizona 85719

Dear Mr. Heinricks:

As per our telephone conversation of this date, I am enclosing a plat of a Copper Property that is adjacent to the Phelps Dodge Open Pit at Ajo, Arizona.

The West and South Areas are owned by different partners and have been assembled by Mr. James W. Sharp, who has full control and power of attorney to negotiate for the two Groups, thus each Area is a separate negotiation. These properties are presently adjacent to the Ajo Pit. There has been no drilling done on the West Area but one I. P. Line has been made which shows an anomoly and as a result, with a dozer we uncovered a large Area of Copper.

On the South Area there were six holes drilled of which we can give you a report on the results.

For further information on this area, you will find information regarding the Ajo Area available at Arizona University at Tucson, which is written by Dr. James Gillully, and also a report, "Large Porphory Deposits of the Southwest."

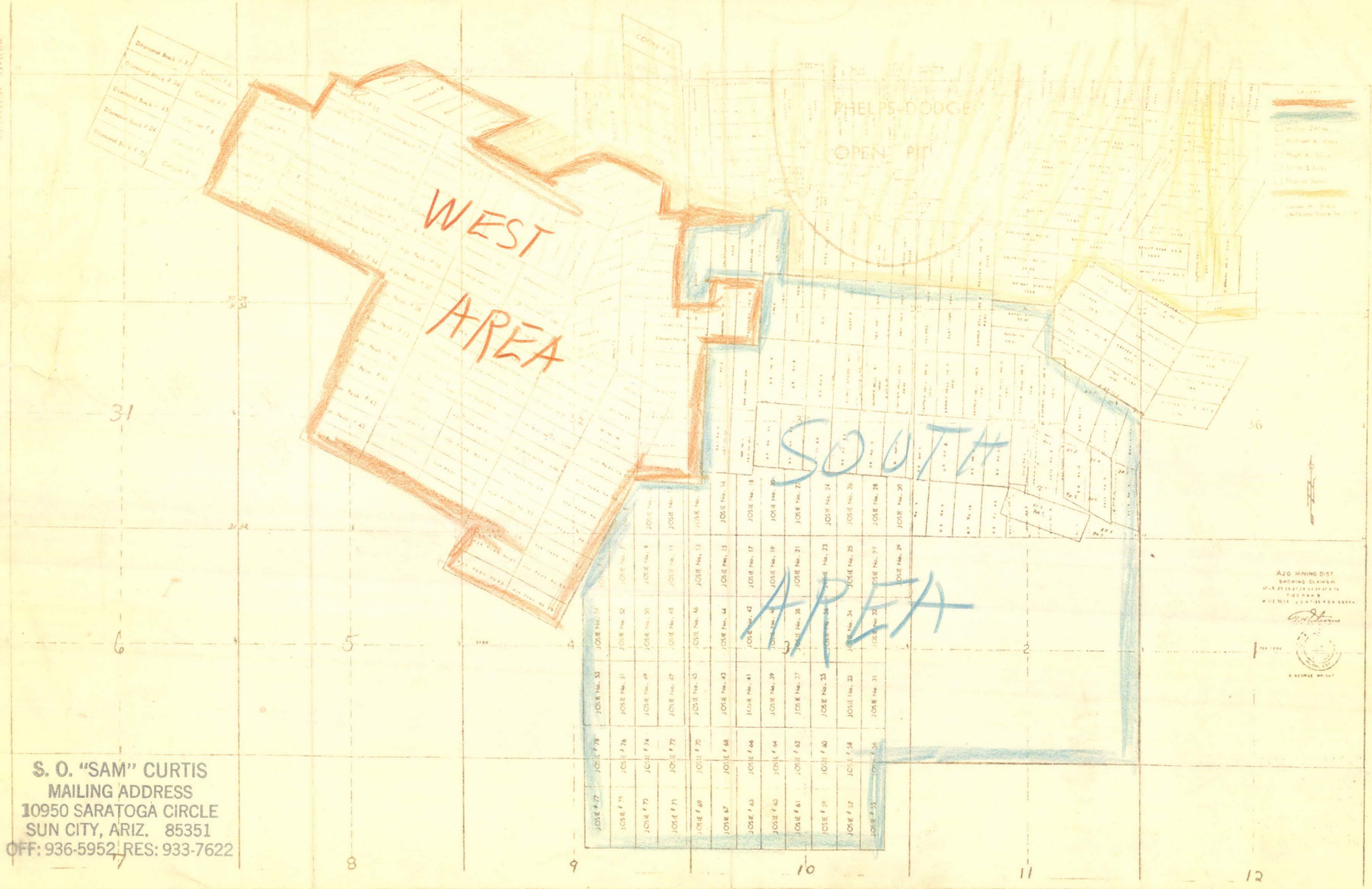
I am inviting your inspection of this property. Should you wish to make an inspection of the property, please get in touch with me several days in advance of the anticipated trip so that I could show you property lines and known information.

Sincerely yours,

S. O. Curtis

S. O. "Sam" Curtis

SOC:h
Encl.



S. O. "SAM" CURTIS
MAILING ADDRESS
10950 SARATOGA CIRCLE
SUN CITY, ARIZ. 85351
OFF: 936-5952 RES: 933-7622

E.G.H talked to 10-20-7.
Sam Curtis

256 claims

adjacent Ajo pit

8 sections east 1/2 &
west 1/2

$3000/Mo. $2,000,000

10:00 a.m.
Oct. 19, 1970

Mr. S.O. Curtis (Phoenix) called. He would like you to return his call.

936-5959
#6
Phone number on letter head is 936-5952

He is selling ads on property next to Ajo pit

October 12, 1970

Mr. S. O. Curtis
10950 Saratoga Circle
Sun City, Arizona 85351

Dear Mr. Curtis:

Mr. O'Malley, President of Essex International, Inc., has forwarded your letter of September 18, 1970 to me.

In order that we may be properly prepared prior to going to the field, I suggest you send all the necessary information on your properties, such as:

(1) Location
(2) Number of claims
(3) Geologic environment (if known)
(4) Type of mineral if other than copper

and any other information on your properties that you think is pertinent.

Thank you for directing these opportunities to Essex, and we will be happy to schedule an inspection of your properties after receipt of the specific information on them.

Very truly yours,

ESSEX INTERNATIONAL, INC.

Howard Lanier, General Manager
Copper Operations

HL:td

OFF. 936-5952 RES. 933-7622

Grove Let's Discuss.

S. O. CURTIS REALTY & MORTGAGE

S. O. "SAM" CURTIS
MAILING ADDRESS
10950 Saratoga Circle
Sun City, Ariz. 85351

September 18th, 1970

S. O. "SAM" CURTIS
OFFICE
6313 W. Van Buren
Phoenix, Arizona

Mr. P. W. O'Malley, President
o/o Essex International Corpn.,
1601 Wall Street
Ft. Wayne, Indiana - 46804

SXM
SEP 28 1970
RECEIVED

Dear Mr. O'Malley:

I have been told that your Company are looking for a Copper Mining property for your own Development and Mining.

I have several Meritable Properties with both Oxide and Sulphide Ores that can be operated Open Pit.

Also have a 1000 Tom Concentrating Mill that is in good working condiditon that can be bought at about .10¢ on the dollar of what a New Plant of same kind and capacity could be purchased.

Also have several good Lead, Zince, Silver and Gold properties to offer.

Some of thses properties have been operated and some are Good Prospects.

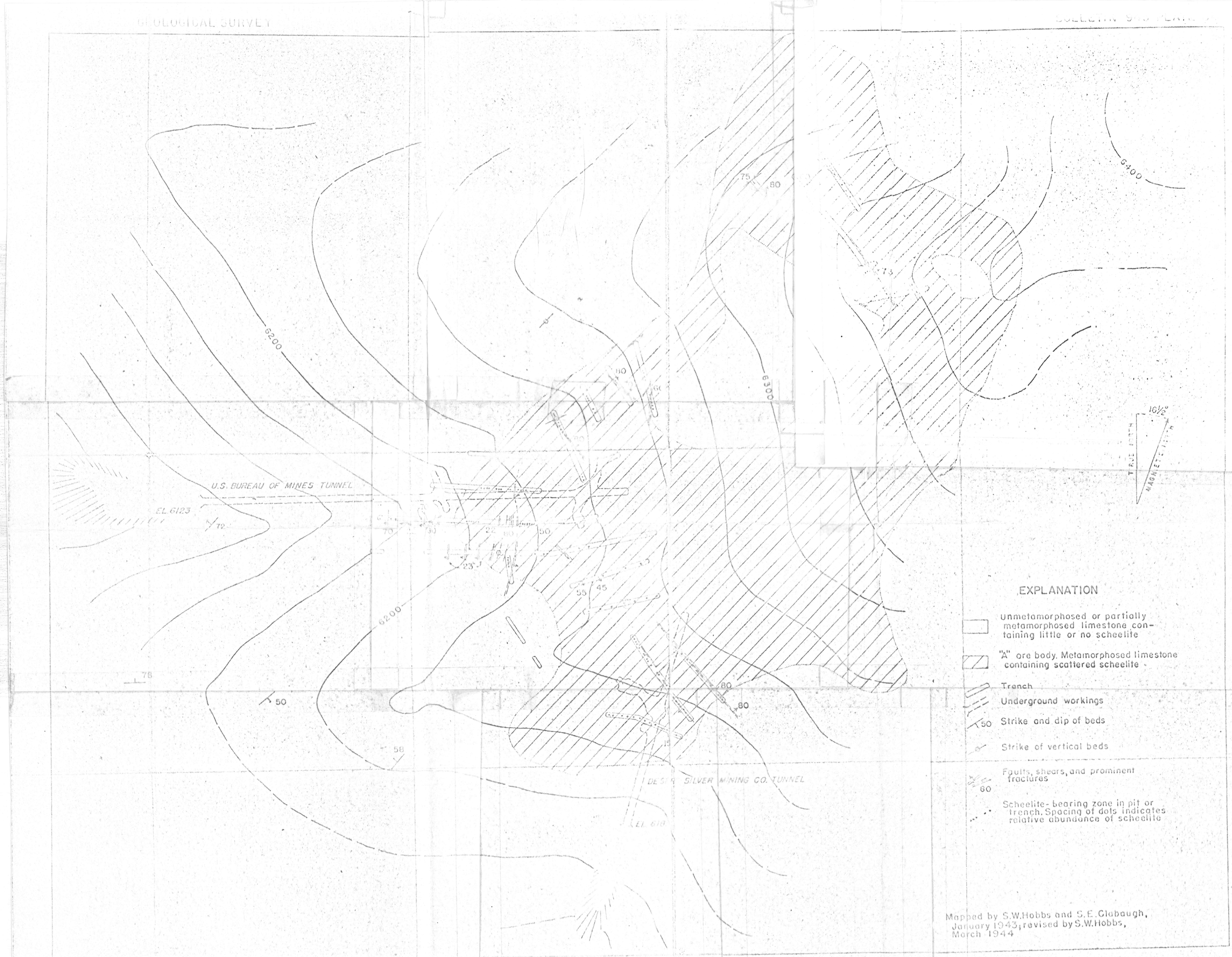
If you are interested and have a good Geologist or Mining Engineer that could come to Arizona and check them over I will be very happy to furnish him with transportation if needed.

These properties can all be purchased on very reasonable terms with a long time payoff.

If I can be of any assistance to you I will be very happy to serve.

Sincerely,
S. O. Curtis
S. O. Curtis

H. Lanier



Mapped by S.W.Hobbs and S.E.Clabaugh, January 1943; revised by S.W.Hobbs, March 1944

GEOLOGIC MAP OF THE "A" ORE BODY, CUPRIC TUNGSTEN DEPOSIT, BEAVER COUNTY, UTAH

40 0 40 80 Feet

Contour interval 20 feet

Datum is approximate mean sea level

U.S. GOVERNMENT PRINTING OFFICE: 1945 O - 642703