

DIVISION OF MINES AND MINING

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FOREWORD

The Division of Mines and Mining in the biennium ending December 31, 1938, has been active in its functions, as provided by law, giving special consideration to the following:

1. Compilation and dissemination of information on mining in the state. This includes completion of transcription of mineral claim records from the books of county auditors; compilation of a directory of mining properties, with information on production and active development work; preparation of federal and state mining laws, ready for printing and distribution; distribution of publications of Department of Conservation and Development relating to mining; furnishing special information in reply to hundreds of inquiries by letter and by visitors to the office.

2. Supervising a W. P. A. project for investigations of certain minerals in various parts of the state. This is referred to in greater detail later in this report.

3. Cooperating with prospectors and miners in their work of organization in order that they may give united consideration to their common problems.

4. Continuing to add to collection of mineral specimens from mining properties of the state.

5. Continuing to add to library of books and bulletins on mining, milling and metallurgy.

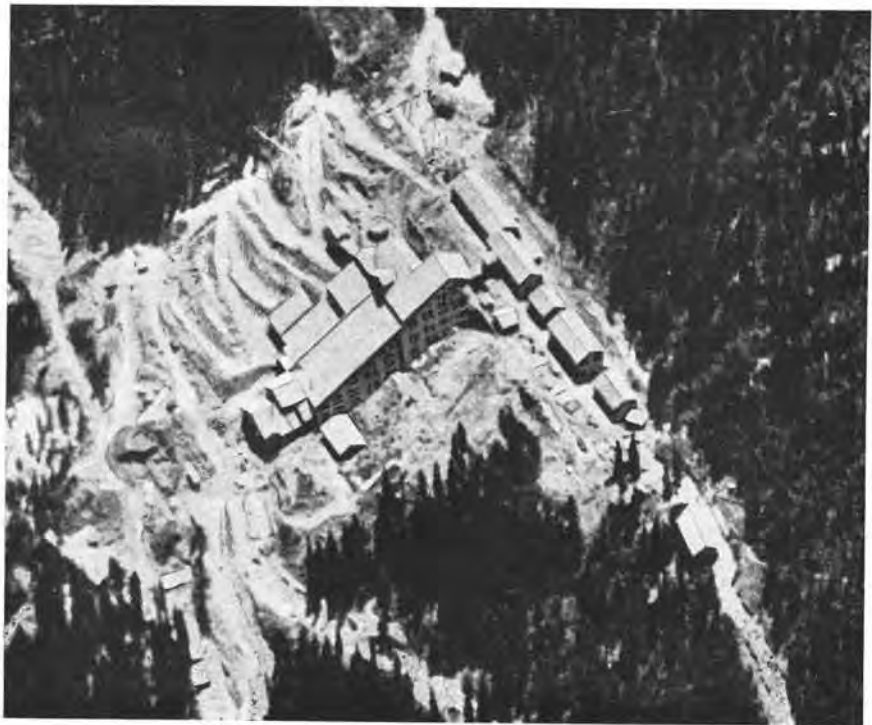
6. The Division has continued to cooperate with state and federal departments and institutions in furnishing information on the mineral industry of the state. It has cooperated with State Progress Commission to obtain material for general exhibits at the expositions at San Francisco and New York.

HISTORICAL NOTE ON MINING IN WASHINGTON

The first official mention of mineral resources in what is now the State of Washington was made by Dr. William Fraser Tolmie of the Hudson's Bay Company in 1833, and the first actual mining in this state was in 1848 when a small amount of lignite was dug from the banks of the Cowlitz river by Hudson's Bay Company's men. The first gold and silver that was mined in the state was at Fort Colville in 1855. From that time for a period of ten years there was considerable activity in gold mining in what was then Washington Territory at Oro Fino, the Boise Basin now in Idaho, and in the western part of Montana. It is reported that in 1861 nearly \$3,000,000 in gold was mined in that territory and in eastern Oregon, and that gold shipments through Walla Walla in 1862 were about \$7,000,000. Following this activity in the early 1860's there was little further expansion in mining, excepting of coal, in this state for the next twenty years.

About 1880 there was a renewed interest in mining in Washington, and for the following two decades until 1900, there was much activity in prospecting and in developing mining properties, although at no time was there heavy production except in coal. Thousands of claims were located throughout the state during this period, particularly in the Cascades and in the northern tier of counties, and development work was done on hundreds of these.

Aerial view of the concentrating plant of the Chelan Copper Division of the Howe Sound Company, located on Railroad Creek near Lake Chelan in Chelan County. This plant was put in operation in April, 1938, and is milling and concentrating 1,800 tons of raw ore per day. The ore carries values in copper and some gold. The concentrates are refined at the Tacoma smelter. (Picture courtesy Northwest Mining.)



EARLY DEVELOPMENT

In 1897, L. K. Hodges wrote a book on "Mining in the State of Washington," of which there are only a few copies now available. In this book is published a description of practically all of the more important mineral discoveries and the development work that was done on them. The manuscript embraced about 200 typewritten pages and covers 34 mining districts in 15 counties. Hundreds of properties are described. It is evident from this record that there was widespread activity throughout the state, hundreds of men being employed, and hundreds of thousands of dollars being spent in development work.

This unusual activity in exploring and developing the mineral resources of Washington came to an end when gold was discovered in Alaska, because the reports of the rich placer deposits on the Yukon attracted practically all of the prospectors and miners of the state. Interest in mining was not again revived to a marked degree until within the last ten years. During all of this time, however, there had been some mining development, and there had been a few mines producing on a substantial scale.

MINING AN IMPORTANT INDUSTRY

That mining has been an important industry in Washington, is indicated by the fact that the total production of gold, silver, copper, lead, zinc and coal from 1860 to 1937, inclusive, is valued at \$430,518,523. Figures on production of all the other metallics and non-metallics are not available, but total mineral production for the state since earliest settlement is estimated at upwards of three-quarters of a billion dollars.

Throughout the history of mining in this state, coal has been predominant until its peak year, 1918, when 4,128,424 tons were produced. There was then a steady decline until 1934, when 1,382,991 tons were produced. Coal mining is again on the increase, as indicated by the following figures on production:

1935.....	1,559,206 tons
1936.....	1,812,104 tons
1937.....	2,018,036 tons

REVIVAL IN MINING

The revival of mining in general in this state began about 1933. There were many contributing causes. The increase in the price of gold and silver, and higher metal prices in general, resulted in increasing activity. Interest on the part of the public was materially promoted by reason of an allotment of funds by the Emergency Relief Administration to the Department of Conservation and Development for stream gauging, river surveys, topographic mapping and geological and mineral investigations. The total amount of this allocation was \$80,000, and a considerable part of it was used in connection with federal funds through CWA and WERA projects to develop and compile information on mineral resources. The Division of Mines and Mining was created in 1935 and has continued this work. The combination of economic factors, and a greater interest on the part of the public, are responsible for the progress that is being made in mining in this state.

The mineral production of Washington for 1937, has been compiled by the Division of Mines and Mining from various sources, but chiefly from the

1938 Minerals Year Book, published by U. S. Bureau of Mines. It is believed that these figures are substantially correct. The following table shows the mineral production of Washington for 1937, as compared with the production for 1936;

MINERAL PRODUCTION IN WASHINGTON 1936-1937

PRODUCT	1936 Quantity	1936 Value	1937 Quantity	1937 Value
Gold, oz.	12,317	\$427,609	36,310	\$1,270,850
Silver, oz.	66,900	51,814	126,304	97,696
Copper, lbs.	204,000	18,768	128,000	15,488
Lead, lbs.	1,680,000	77,280	5,660,000	333,940
Zinc, lbs.	8,800,000	440,300	8,232,000	535,080
Iron, tons	9,082	36,361	10,044	32,850
Manganese			①	①
Molybdenum, ore, tons			3,000	①
Tungsten (concentrates) tons	48	36,294	63	47,636
Mercury	①	①	①	①
Antimony	①	①	①	①
Coal, tons	1,812,104	5,504,000	2,018,036	6,404,174
Coke, tons	28,680	172,368	14,993	74,966②
Briquets, tons	②	②	19,086	114,516②
Peat	1,052	14,505	①	①
Petroleum			①	①
Natural gas, cu. ft.	141,600,000	99,000	142,578,000	99,803
Carbon dioxide gas			①	①
Cement, bbls.	①	①	4,107,432	8,890,798
Stone, tons	2,321,710	2,279,465	2,027,420	1,909,604
Sand and gravel, tons	8,079,849	5,942,080	9,376,644	6,818,154
Lime, tons	36,638	340,724	65,272	647,692
Fire clay			28,787	46,161
Miscellaneous clay, tons			21,071	45,118
Clay products		1,262,525	①	①
Magnesite, tons	①	①	①	①
Diatomite, short tons	880	10,579	①	①
Pulpstones and grindstones	①	①	①	①
Talc and soapstone	462	1,805	①	①
Gem stones			①	①
Mineral waters			①	①
Miscellaneous (estimated)		\$6,609,926		\$4,000,000
Totals		\$23,092,007		\$31,135,053

① Included in miscellaneous.

② Not included in state total.

The total value of gold, silver, copper, lead and zinc produced in Washington in 1937 was \$2,253,054, as compared with \$1,015,771 in 1936, and \$394,041 in 1935. The output of these metals for 1938 will show a material increase over 1937. The Chelan Copper Division of Howe Sound Company, which began production in April of 1938 is milling 1,800 tons of ore a day, and recovering substantial copper and gold values. The Arlington Mine in Okanogan county also began operation in the spring of 1938 and is reported to have produced over 80,000 ounces of silver, 64¼ ounces of gold, and nearly 33,000 pounds of copper by December 1. Other smaller mines have come into production in the current year, and most of the established producers of gold, silver, lead and zinc increased their operations.

DIRECTORY OF MINES

Following is a list of the metallic mines of the state on which information has been obtained:

Name	County	Product
Admiral Consolidated Mining Co.....	Stevens	S.G.
Aichan Bee Mine.....	Stevens	S.L.Z.
Aladdin Mines, Inc.....	Stevens	G.S.C.L.Z.
†Alder Mining & Smelting Co. (See Chelan Mining Co.)		
*American Manganese Corp.....	Jefferson	Manganese
†American Rand Corp.....	Okanogan	G.S.L.C.
†American Tungsten Mines, Inc.....	Stevens	Tungsten
Anacortes Gold Mining Co.....	Whatcom	G.S.
†Apache Gold Mines, Inc.....	Okanogan	S.C.G.
†Apex Gold Mines, Inc.....	King	G.S. Arsenic
†Apex Mercury Mines, Inc.....	Lewis	Mercury
†Ark Mines Co.....	Stevens	G.S.C.Z.
†Arlington Mines, Inc.....	Okanogan	S.G.
†Asbestos Talc Products of Washington, Inc.....	Skagit	Talc
Aurora Mining Co.....	Okanogan	G.
†Aurum Mining Co.....	Ferry	G.S.
†Azurite Mine	Whatcom	G.
(American Smelting & Refining Co.)		
†Bailey-Hanson		L.
*Baltimore Mines, Inc.....	Whatcom	G.
†Barnum & Patterson Mercury Co.....	Lewis	Mercury
*Bear Creek Property.....	King	C.G.
Beaver Mine	Okanogan	G.S.
†Ben Hur Mine (See Mountain Lion Consolidated Mining Co.)		
*Big Chief Mine.....	King	G.C.
†Big Iron Mining Co.....	Stevens	Magnetite
*Big Silver Mining Co.....	Ferry	S.G.C. Arsenic
*Billy Goat Mine.....	Okanogan	G.
Black Canyon Mining Co. (See President Mining Co.)		
Black Rock Zinc Mine.....	Stevens	Z.
*Black Rosauer Mines Co.....	Grant	G.S. Bismuth Molybdenum
†Black Tail	Ferry	G.
*Black & White Mining Corp.....	Chelan	G.S.
†Blaine-Republic (See Eureka Mining & Milling Co.)		
†Blewett Mine	Chelan	G.
Blue Ridge Mine.....	Stevens	G.S.Z. Iron
†Boucher, B.	Stevens	L.
†Boundary Gold Placers, Inc.....	Okanogan	G.
Boundary Red Mountain (See International Gold Mines, Ltd.)		
†Bringham & Simonson.....	Stevens	L.
British Mining Co.....	Skagit	
Brown, E. C. & Associates.....	Skamania	S.G.Z.L.
*Bruder Mining Co.....	Pend Oreille	S.L.
†Bryan Mine	Stevens	S.L.G.
Buckhorn Mining Co.....	Okanogan	G.S.

†Reported As Producing
 *Reported As in Active Development
 Inactive

G—Gold
 C—Copper
 L—Lead

S—Silver
 Z—Zinc

DIRECTORY OF MINES—Continued

Name	County	Product
Burcham Mine	Kittitas	G.
*Burrus, J. W., Mine	Stevens	G.S.L.Z.
†Cascade Chief Mining Co.	Kittitas	G.
†Cascade Gold Syndicate Corp.	Okanogan	G.
†Central Mine	Okanogan	G.
Chancellor Mine	Okanogan	G.
*Chelan Mining Co.	Okanogan	G.
*Chewelah Eagle Mining Co.	Stevens	L.S. Lime
*Chief Barnaby Mines Co.	Ferry	G.
†Chinto Copper Mining Co.	Stevens	S.G.C.
*Christensen, B.	Ferry	G.
*Chromium Corp. of America	Whatcom	Chrome
*Cleveland	Pend Oreille	
†Cleveland Mine	Stevens	S.L.
Cliff Gold Mining Co.	Okanogan	G.
Coffin Mine	Stevens	Z.L. Molybdenum
Columbia Mountain Mines	Snohomish	G.S.C. Antimony
†Columbia River Copper Co.	Stevens	C.S.L.Z.
Columbia Tungsten	Stevens	
†Colville Queen Mining Co.	Stevens	S.L.Z.
†Coney Basin Gold Mines	King	G.S.L.
*Consolidated Mines & Smelting Co.	Ferry	G.S.C. Molybdenum
Consolidated Silver Mountain Mines	Stevens	S.C. Iron Arsenic
*Continental Gold Silver Mining Co.	Okanogan	G.S.C.L.
†Copper Mining Co.	Yakima	C. Tungsten Molybdenum
†Copper Zone	Okanogan	C.
Covered Wagon Mine	Snohomish	G.C.S.
Crescent Marble Mining Co.	Skagit	Limerock
Cross, Joe	Okanogan	G.S.
*Cuprite Mining Co.	Stevens	G.S.C.L.
*Custer Mining Co.	Snohomish	
*Damon & Pythias Gold Silver Mine	King	G.S.
*Dan Lee Mines	Okanogan	
†Davidson Property	Okanogan	
†Deer Park Natural Pigments Corp.	Stevens and Grant	Clay Diatomite
*Deer Trail Group	Stevens	S.
†Deer Trail Monitor Mines	Stevens	Molybdenum
*Dia-Cousti-Lite Products Co.	Grant	Diatomite
†Doblasua Lime & Mining Co.	Ferry	Limestone
Double Eagle Mining Co.	Stevens	C. S. Magnesite
Dutch Miller Mine	King	G.S.C.L.
Echo Mining Co., Inc.	Stevens	S.L.
†El Caliph	Ferry	G.
†Electric Point Mining Co.	Stevens	L.
†Espin, A. & J. Johnson	Stevens	L.
Eureka Gold Mining Co.	Whatcom	G.
†Eureka Mining & Milling Co.	Ferry	G.
*Evans-Smith-McKittrick-Hammond Co.	Stevens	G.S.L.
†Everett Lime Co.	Snohomish	Limerock
*Evergreen Mines Co.	Whatcom	G.
Faithful Surprise Mining Co.	Ferry	G.
†Farmer Mine	Stevens	

†Reported As Producing

*Reported As in Active Development

Inactive

G—Gold

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DIRECTORY OF MINES—Continued

Name	County	Product
Ferry Mining Co.....	Ferry	
†First Thought Mine Corp.....	Stevens	G.S.
*Flag Hill Mines.....	Ferry	G.
†Florence Rae Copper Co.....	Snohomish	G.S.C.
Forty-Five Mines, Inc.	Snohomish	S.G. Arsenic
Four Metals	Okanogan	S.G.L.
*Frisco-Standard Mining Co.....	Stevens	S.L.G.
*Garrett Property (See Walsh, Garrett).....	Ferry	C. Silica Bornite
Gem Gold Mines, Inc.....	Stevens	G.
†General Electric	Stevens	Tungsten
*Georgia May Mines, Inc.....	Ferry	L.G.S.
*Glacier Peak Mining & Smelting Co.....	Snohomish	C.G.S. Molybdenum
†Gladstone Mountain Mine.....	Stevens	L.S.
*Golconda Mining & Milling Co.....	Okanogan	G.C.
*Gold Arrow Mines, Ltd.....	Pend Oreille	G.S.L.
*Gold Axe Mine.....	Okanogan	G.
*Gold Bar Mining Co.....	Stevens	L.G.C.
†Gold Bond Mining Co.....	Chelan	G.
*Gold Cup Mining Co.....	Ferry	C.
Gold Hill Consolidated Mining Co.....	Yakima	S.C.G. Tungsten
Gold Hill Operating (See Northern Cascade Mines)		
*Gold Reef	Stevens	G.
Golden Chariot Mining Co.....	Okanogan	G.S.C.
Golden Eagle Mine.....	Snohomish	C.
Golden Fleece	Kittitas	G.
†Golden Harvest Mining Co.....	Ferry	G.S.
*Golden Hope Mining Co.....	Okanogan	G.S.
†Golden King Mining & Development Co.....	Chelan & Okanogan	G.S.
*Goldstake Mining Corp.....	Ferry	G.
*Good Hope Gold & Copper Mining Co.....	Snohomish	G.S.C.L.
Gopher Mining Co.....	Stevens	Iron
†Grand Coulee Mines, Inc.....	Okanogan	G.S.
†Grand Summit Mining Co.....	Okanogan	G.S.
†Grey Eagle Lead Mining Co.....	Okanogan	L.
*Gubser Mine	Okanogan	
*Hatfield, John	Okanogan	Tungsten
Heald, Geo. (Sunrise Mine).....	Snohomish	C.G.S.
*Hilo Group	Okanogan	G.S.
Holden Gold Mines, Inc.....	Okanogan	G.S.C.
*Hoover Mining Co.....	Pend Oreille	Z.L.
†Howe Sound (Chelan Division).....	Chelan	C.G.
†Index Gold Mines, Inc.....	Snohomish	S.G.L.Z. Tin
†Indiana Mine	Whatcom, Okanogan	G.S.
Industrial Mining, Inc.....	Whatcom	Chromite
International Gold Mines, Ltd.....	Whatcom	G.
†Interstate Mining Co.....	Lewis	Mercury
†Iowa Mine (See Sultan Basin, Geo. G. Startup)		
*Jay Dee Mining Co.....	Stevens	S.
*Joamco Mining Co.....	King	C.G.
†John Judge Gold Mining Association.....	Okanogan	G.
†Jordon, Clarence	Kittitas	G.
*Jordon, Ollie	Kittitas	G.

†Reported As Producing
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DIRECTORY OF MINES—Continued

Name	County	Product
†Judy Mine	Okanogan	
*Juno Echo Mine.....	Stevens	Molybdenum C.
Justham, S. R. (Huckleberry Mine).....	Kittitas	G.S.C.
*Kaaba Texas Mining Co.....	Okanogan	S.G.
†Kearney, C. A. Co.....	Okanogan	Epsom Salts
Kelly C. H., Claims.....	Snohomish	G.S.C.
†Kemp Ross Co.....	Okanogan	Marl
*Kettle River Gold Mining Co.....	Stevens	G.S.
†Keystone Lead Mining Co.....	Stevens	L. Iron
Keystone Mining Co.....	Yakima	Tungsten C.
King Solomon Claims.....	Okanogan	
†Kittitas Diatomite Co.....	Kittitas	Diatomite
†Knob Hill Mines, Inc.....	Ferry	G.
†Knowles, M.	Snohomish	C.
*Kromona Mines, Inc.....	Snohomish	G.S.C.
Krug Gold & Copper Mining Co.....	Stevens	S.C.G.L.
†Last Chance Mine.....	Stevens	L.S.
*Laycock, J. R., & Associates.....	Okanogan	G.S.L.Z.
†Leadhill Mines Co.....	Stevens	L.
*Lenox Mining & Development Co.....	King	G.S.
†Liberty Mines, Inc.....	Kittitas	G.
*Lillman Mine	Okanogan	S.G.C.
Little Noisy Mining Co.....	Pend Oreille	L.Z.C.S.G.
*Lockwood Property	Snohomish	G. Iron Sulphur
Lombardine, Mrs. Anna & Josephine.....	Klickitat	C.
Lone Jack	Whatcom	G.
†Lone Pine	Ferry	G.
Lone Pine Surprise (Aurum Mining Co.).....	Ferry	G.S.
Lucky Lady, Inc.....	Okanogan	G.
Mackinaw Metals Co.....	Snohomish	Nickel
Madeline Manganese Mine.....	Clallam	
*Magma Mines & Metals.....	Stevens	Z.L.C.G. Molybdenum
†Magnesia Co.	Okanogan	Epsom Salts
†Magnetic Mining Co.....	Okanogan	Magnetite
Maloney, John (Cleopatra Mine).....	King	G.S. Antimony
†Mammoth Gold Mines Corp.....	Whatcom	G.
Manitau Mining & Milling Co.....	Yakima	G.S. Iron
Marcus Mining & Milling Co.....	Stevens	G.S.
†Mazama Gold Mines Consolidated, Inc.....	Okanogan	G.S.
†Melrose Mining Co.....	Stevens	G.S.C.
Mercer Mine	Kittitas	G.
Merchant Mine	Snohomish	C.G.S.
*Metaline Contact Mines.....	Pend Oreille	Z.L.
*Metaline Mining & Leasing Co.....	Pend Oreille	Z.L.
*Mexico Claim (Silver Basin Mining Co.).....	Stevens	
†Middleport Mine	Stevens	Z.L.G.S.
*Mineral Center Mining Co.....	Snohomish	G.S.C.L.
*Mineral Creek Copper Co.....	Kittitas	G.S.C.
Mineral Hill Mines, Inc. (See Seven Devils Mine)		
Mineral Mines, Inc.....	Snohomish	C.
*Molybdenum Mining Co.....	Okanogan	G. Molybdenum
†Monica Mining Co.....	Whatcom	G.
Montana Mine	Ferry	G.

†Reported As Producing
*Reported As in Active Development
Inactive

G—Gold
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DIRECTORY OF MINES—Continued

Name	County	Product
*Monte Carlo Mine.....	King	G.S. Molybdenum
†Morning Glory Mines, Inc.....	Ferry	G.
†Morning Star Mining Co.....	Ferry	G.S.C.
†Morris Mine	Kittitas	
Mortenson, Orin A.....	Ferry	S.L.C.
†Mother Lode Mine.....	Okanogan	G.C.L.
Mount Colman Gold Mining Co.....	Ferry	G.
Mount Fairy Mining Co.....	Pend Oreille	G.S.L.
Mount Saint Helens Consolidated Mining Co.....	Skamania	C.
*Mountain Beaver Mine.....	Okanogan	G.C.
*Mountain Cedar Mine.....	Snohomish	G.S.C.
†Mountain Daisy Mine.....	Kittitas	G.
†Mountain Lion Consolidated Mining Co.....	Ferry	G.
*Mule Deer Mining Co.....	Pend Oreille	G.S.L.
*McDonald, Archie & Donald.....	Stevens	S.L.
†McKenzie Mine	Okanogan	
†McNally Mine	Ferry	S.L.
†Napoleon	Stevens	Iron
†Neutral	Okanogan	Iron
*New California Mining Co.....	Ferry	G.
*New Deal Mining Co.....	Benton	G.
*New England Mine.....	Stevens	L.Z.G. Cobalt
New Light Gold Mine (See Monica Mines, Inc.)		
*Nighthawk Mines, Inc.....	Okanogan	G.S.
No Monicker	Okanogan	G.
*Northern Cascade Mines, Inc.....	Whatcom	S.L.G.Z.
†Northern Gold Corp.....	Okanogan	G.
†Northwest Magnesite Co.....	Stevens	Magnesite
†Old Dominion	Stevens	S.L.C.
*Old Gray Mare Mine.....	Snohomish	
Ore Recoveries, Corp.....	Snohomish	G.S.
*Orient-Eureka Gold Mining Co.....	Ferry	G.
†Overtop Mining Corp.....	Okanogan	G.
†Owasco Mine	Okanogan	G.
*Pacific Mutual Silver Lead Co.....	Ferry	S.L.C. Tungsten
*Pacific Nickel Co.....	Skagit	Nickel
Pacific Sulphur Mines, Inc.....	Yakima	Sulphur
Patterson Mines, Inc.....	Ferry	G.S.
Peerless Mining Co.....	Kittitas	Chrome G.S.C.
†Pend Oreille Mines & Metals.....	Pend Oreille	L.S.Z.
*Pend Oreille Premier Co.....	Pend Oreille	L.S.Z.
*Pend Oreille Silver Corp.....	Stevens	S.
†Peterson Mine	Okanogan	
*Pitney Butte Mine.....	Stevens	S. Tungsten Molybdenum
*Piamondon Indian Mines, Inc.....	Skamania	G. Platinum
*Pocahontas Mining Co.....	Skagit	S.L.
†Poland China Mine (See Overtop Mining Co.)		
Polar Star Mining Co.....	Lewis & Skamania	Iron C.
†Poor Man Mine.....	Pend Oreille	L.Z.
Porcupine Mines	Okanogan	
*President Mining Co.....	Stevens	
*Primary Gold Co.....	Skamania	G.S. Platinum

†Reported As Producing

*Reported As in Active Development
Inactive

G—Gold

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DIRECTORY OF MINES—Continued

Name	County	Product
†Queen Seal Mining Co..... Quilp Mine (See Eureka Gold Mining Co.)	Stevens	S.
†Quincy Products Co..... Rainbow Mining Co.....	Grant	Diatomite Vanadium L.C.
†Randle Property (See Mazama Gold Mines Cons.)	Skamania	
*Reco Gold Mining Co.....	Okanogan	G.S.
†Red Shirt Mining Co. (See Cascadian Gold Syndicate Corp.)		
†Red Top Mining Co.....	Stevens	S.L.Z.
*Rex Mine	Chelan	G.S.
*Rick, W. D.....	Ferry	G.S.
Robinson Mines Co.....	King	G.S.C.
†Roosevelt Mine	Stevens	G.S.
*Roy Mining Co.....	Lewis	Mercury
Royal Development Co.....	Chelan	C.S.
†Ruby Mountain Mining Co.....	Okanogan	S.
*Russell & Smith.....	Skagit	Iron
†Scheel, H. P. & Co.....	Skagit	Silica
†Seattle	Ferry	G.
*Seven Devils Mine.....	Okanogan	G.S.L.
*Shamrock Silver Lead Mine, Inc.....	Ferry	S.L.
*Silver Basin Mining Co.....	Stevens	S.
*Silver Creek Mining Co.....	Kittitas	G.S.
Silver Creek Copper Mining Co.....	Snohomish	G.S.
*Silver Key Mines Corp. (Big Chief Group).....	Stevens	S.L.
Silver Mountain Mining Co.....	Stevens	S.L.
†Silver Queen Mine (Operated by Ark Mine Co.)	Stevens	
Silver Star Mining Co.....	Clark	G.S.C.Z.
*Silver Tip Mining Co.....	Whatcom	G.S.C.
*Silver Trail Mining Co.....	Stevens	S.L.
†Skagit Talc, Inc.....	Skagit	Talc Soapstone
*Skrinde, W. E.....	Snohomish	G.S.C.
†Sleight & Moon Co.....	Stevens	Barite
S. M. P. Mining Co.....	Snohomish	G.S.C.L.Z.
Snoqualmie Mining Co.....	King	C.I.G.S.L. Molybdenum
†Sonny Boy Mine (Operated by Ruby Mountain Mining Co.)		
*Spokane Molybdenum Mines.....	Stevens	Molybdenum
Spokane Tin Mines.....	Spokane	Sheelite, etc.
*Square Deal Claim.....	King	
†Square Shooter	Whatcom	G.
†State Products Co.....	Yakima	Diatomite
†Sterling Zinc Lead Co.....	Pend Oreille	Z.L. Iron
*Sultan Basin Mining Co.....	Snohomish	G.S.C. Molybdenum
Sultan King Mining Co.....	Snohomish	G.S.C. Molybdenum
Summit Gold Mines, Inc.....	Chelan	G.
*Sunset Syndicate Corp.....	Snohomish	C.S.G.
*Sunshine Chief Mine.....	Okanogan	G.
†Surprise Lease (Operated by Aurum Mining Co.)	Ferry	G.
*Swauk Mining & Dredging Co.....	Kittitas	G.

†Reported As Producing

*Reported As in Active Development
Inactive

G—Gold

C—Copper

L—Lead

S—Silver

Z—Zinc

DIRECTORY OF MINES—Continued

Name	County	Product
*Ten Bells Mining Co.....	Whatcom	Placer
*Thomason, R. C.....	Stevens	S.C. Iron
*Thompson, Clara Property.....	Snohomish	C.S. Iron
*Thunder Creek Silver Lead Mines.....	Skagit	S.G.L. Molybdenum
†Tom Thumb Mine (Operated by Aurum Mining Co.)	Ferry	G.
Treasure Gold Mining Co.....	Stevens	G.S.
*Triangle Mining & Development Co.....	Cowlitz	
†Triune Mine	Okanogan	G.S.
True Fissure Gold Mines.....	Kittitas	G.
*Tungsten Corporation, Inc.....	Stevens	Tungsten
†Tungsten Products, Inc.....	Stevens	Tungsten
*Tyler, Glenn E. Property.....	Whatcom	G.S.
*United Copper Mine.....	Stevens	S.C.
Vanguard Metals	Snohomish	G.S.C.
†Van Stone Mine.....	Stevens	G.S.L.C.
*Walsh, Garrett	Ferry	C. Bornite Silica
Washington Cascade Mining Co.....	Pierce	G.S.
*Washington Gold Company, Inc.....	Kittitas	G.
*Washington Metals, Inc.....	Stevens	Tungsten
*Washington Nickel Mining & Alloys Co.....	Chelan	C. Iron Molybdenum
†Webley, E. J., Mines.....	Grant	Diatomite
*West King Mining Co.....	Stevens	G.S.
†Whistler	Whatcom	G.
White Horse Mining Co.....	Stevens	C.G.S.
*Wilson, R. W.....	Benton	G.
*Young America Mine (See Cuprite Mining Co.)		
Zala M Mining Claims.....	Ferry & Okanogan.	G.

†Reported As Producing

*Reported As in Active Development
Inactive

G—Gold S—Silver
C—Copper Z—Zinc
L—Lead

W. P. A. PROJECTS

The Division of Mines and Mining has supervised two W.P.A. projects sponsored by the Department of Conservation and Development. Under one of these projects the records of mining claims were transcribed in the offices of the county auditors of the state, and then assembled for reference in the office of the division. Under the other project investigations of certain strategic minerals are being made, to determine their extent and quality. The primary purpose of this project is to obtain information on minerals, the development and reduction of which will furnish a market for power generated at Grand Coulee and Bonneville, and to obtain information as to geologic structures, formations, etc.

TRANSCRIPTION OF MINERAL CLAIM RECORDS

This project was put into operation early in 1936. From time to time as arrangements could be made workers were assigned to each of thirty-two counties of the state. The number of workers in each county varied from one to four, depending upon the number of claims that had been located

in the county. The essential information in each location notice recorded in the county auditor's office was transcribed and sent to the office of the Division of Mines and Mining, where from two to four workers, assigned for this purpose, classified and typed these records and placed them in form for ready reference.

The results obtained are summarized in the following table:

MINING CLAIMS LOCATED IN WASHINGTON

COUNTY	Date ^①	Coal	Oil	Mineral	Survey ^②	Patent ^③	Total
Adams.....	1-03			83			83
Benton.....	4-37		317	354	1		671
Chelan.....	11-34	14	18	8,794	112	35	8,826
Clallam.....	5-37	18	2,145	832			2,995
Clark.....	5-36	8		867			875
Columbia.....	1-08			17			17
Cowlitz.....	10-36			508	1		508
Douglas.....	7-19			242	1		242
Ferry.....	7-37	3		14,853	427	558	14,856
Franklin.....	8-03			51			51
Grant.....	12-36	2		370			449
Jefferson.....	10-37	704	302	1,855			2,861
Kings Harbor.....	12-36	11	2,239	1,205	4	3	3,446
King.....	7-37	72		5,755	132	104	5,827
Kittitas.....	5-38	33		12,678	134	90	12,714
Klickitat.....	10-05	97	33	115			245
Lewis.....	11-37	54		2,588	3		2,642
Lincoln.....	6-37		16	980	1		996
Mason.....	2-37		81	1,147			1,228
Okanogan.....	7-37			4,404	507	383	4,404
Pend Oreille.....	7-31			2,960	139	93	2,960
Pierce.....	12-36	61	21	3,736	23	15	3,818
San Juan.....	7-06			368	7	4	368
Skagit.....	1-37			3,787	111	91	3,787
Skamania.....	10-37	1		2,728	171	105	2,729
Snohomish.....	7-37	27	2	12,876	557	467	12,905
Spokane.....	10-37	11	112	543			666
Stevens.....	10-37	0	37	21,322	282	216	21,365
Thurston.....	1-37			54			54
Walla Walla.....	9-34			125			125
Whitcom.....	6-37	155	1	10,680	84	37	10,846
Yakima.....	7-37	6		2,142	14	14	2,148
Total.....							125,762

① Date of last transcription.

② Surveyed for patent.

③ Claims patented.

The seven counties, Asotin, Garfield, Island, Kitsap, Pacific, Wahkiakum and Whitman, not included, are those in which few mining claims have been located.

About 70 persons from relief rolls have been employed on this project, the time of service varying from a few months to the entire life of the project. The amount of federal funds authorized to be spent on the project was \$80,199. When the project is completed, about 35 per cent of the amount authorized will have been expended, or about \$28,000. The sponsor contributed supervision, some clerical service, use of typewriters, incidental materials, and obtained the cooperation of county auditors and their staffs.

It is recommended that provision now be made to obtain from county auditors mineral claim records as filed. The complete records will then be available for reference at any time in the files of the Division.

MINERAL INVESTIGATION

A W. P. A. project for the purpose of making investigations with respect to certain minerals, sponsored by the Department of Conservation and Development and the Commissioner of Public Lands, was approved and placed in operation in February, 1936. Until March 31, 1937, it was supervised by the Division of Geology. It has been continued, with certain modifications, since that time under the supervision of the Division of Mines and Mining.

The purpose of this project is to investigate the extent and quality of certain minerals on public lands. The investigations have been made chiefly in relation to those minerals, in the mining and reduction of which, large amounts of electrical power will be used. This will indicate a potential market for some of the power to be generated at Coulee Dam and Bonneville, and by other plants both publicly and privately owned. Men trained in geology and mineralogy have been in direct charge of the field work, assisted by men assigned from relief rolls.

Federal funds expended on the project from February 1, 1936, to September 30, 1938, amounted to \$167,573. The number of men employed has averaged over one hundred. The sponsors have provided general supervision, and have contributed equipment of various kinds, laboratory supplies, transportation, etc. The counties in which the project has operated have cooperated closely, and have assisted in providing needed transportation, equipment, etc.

PROGRESS OF INVESTIGATION

Progress reports on the investigations are made from time to time, but final reports cannot be made until the project is closed. Then the field work and analyses of samples will be coordinated, and all of the valuable information that has been obtained will be made available to the public. Following is a summary of the work to date:

INVESTIGATIONS IN 1936

Whatcom County—Four complete sections of the Mount Sumas area were investigated for occurrences of dunite, which is the host rock of chromite. This investigation was carried on throughout the year 1936 under the supervision of S. H. Green, with a crew of eleven men.

King County—Geological reconnaissance was carried on in the north-eastern part of King county for the purpose of aiding in future prospecting of the area. A crew of 13 men operated from January to May, 1936, under the supervision of the late M. C. Butler, and from June to November, 1936, under the supervision of Frank Kloptic.

Snohomish County—An investigation was undertaken in eastern Snohomish county to check on reports of glass sand, limestone, dunite, feldspar, molybdenum, chromite and to develop further geological information. A crew of 13 men was employed under the supervision of P. E. Crane from January to May, 1936, and under J. O'Connor from May until November, 1936.

Spokane County—An extensive investigation of clays in eastern Spokane county was made. An area embracing approximately 440 square miles was investigated and mapped, and a total of 451 samples of clay was obtained and

analyzed. A crew of 13 men was employed under supervision of F. M. Handy from January to June, 1936, and under Robert Meyer from June to September, 1936.

Pierce County—Geologic conditions and the reported occurrence of gold deposits were investigated in eastern Pierce county near the summit of the Cascades. Eight square miles were thoroughly investigated. On this work a crew of 13 men under the supervision of Amos Slater was employed from January, 1936, until October, 1936.

Clark County—Mineralized dikes in the northern part of Clark county were investigated for geological information and for mineral occurrences. A crew of 13 men under R. S. Penrose was engaged in this work from January to October, 1936.

Ferry County—Two investigations were made in Ferry county. The first covered the limestone deposits in the western part of the county, and the other made a study of fossils in an area near Republic for the purpose of developing important geologic information. A crew of 11 men was employed under the supervision of J. P. Isaacs, from January until June, 1936, and under the supervision of Roy Anderson from June until October, 1936.

Kittitas County—An investigation was made of reported large deposits of diatomite in southeastern Kittitas county. Some time was also spent in the investigation of a reported cinnabar deposit in the northwestern part of the county. A crew of 11 men was employed under the supervision of Paul H. Knowles from January until June, 1936.

INVESTIGATIONS IN 1937

Snohomish County—A large pyrite deposit on state land in this county was carefully investigated, the area mapped and many samples taken. In addition, a reconnaissance of 150 square miles west of Monte Cristo was made to determine general geologic relations with the view to aid future prospecting and mining. There was a crew of 18 men under the supervision of P. E. Crane, and operations were continuous from January to December, 1937.

Skagit County—An investigation was made of a reported nickel deposit in the western part of the county. Three sections of land were covered by this investigation which included development of geologic information. Operations were begun for investigation of iron deposits in Central Skagit county, but were stopped when the project was suspended for a time. A crew of 11 men, under the supervision of P. E. Crane carried on the Skagit county work from January to December, 1937.

Lewis County—Investigation of deposits of coal and cinnabar on state lands was conducted in Lewis county, covering an aggregate of about nine square miles. The work was done by a crew of 23 men under the supervision of J. O'Connor, from June to December, 1937.

Cowlitz County—The report of coal deposits on state land in Cowlitz county was the basis for an investigation by a crew of 15 men under the supervision of J. F. O'Connor, from January to June, 1937.

INVESTIGATIONS IN 1938

Clallam County—As part of the investigations to determine the approximate extent and quality of the manganese deposits on the Olympic Peninsula,

a unit of the project was assigned to Clallam county in March, 1937. Since the opening of the project at least 16 square miles have been carefully examined west of Lake Crescent. A crew of from 40 to 50 has been at work on this area under the supervision of S. H. Green.

Jefferson County—A unit of the project, supervised by S. H. Green, operated for about two months in this county investigating a considerable area in northeastern Jefferson county.

Grays Harbor County—A unit of the project was set up in the Quinault area of this county and has been working since that time investigating manganese deposits. There have been about 30 men in the crew, under the supervision of Amos Slater.

Whatcom County—A crew of 15 men under the supervision of E. J. Dailey, investigated the chromite and dunite of the Twin Sisters area between June and November, 1938. In the northern side of Twin Sisters, 22 miles of the dunite contact was accurately surveyed, and several square miles examined for new chromite deposits, with representative samples taken.

Thurston County—A unit of the project under the supervision of E. J. Dailey, with a crew of about 20 men was engaged in November, 1938, in investigating iron deposits on state land in the Black Hills area. The area is being mapped by means of magnetic dip needle.

FUTURE OF MINING IN WASHINGTON

The mining industry in Washington is on a sound, substantial basis, and an increase in production may be expected each year. It has experienced no boom, but has been developing in a normal manner. It desires no subsidy, nor other special consideration, but there are various services that the state should render in order that the development of our mineral resources may be further stimulated.

It is felt that this is not an unreasonable suggestion because all other basic industries, agriculture, forestry and fisheries, are receiving aid from both State and Federal governments to an extent far out of proportion to the small amount now being given to mining.

One of the most serious obstacles to mineral development, lack of transportation facilities, can be removed by the State, and its political subdivisions, by a comparatively small annual expenditure of funds for the construction of roads. Some of the most highly mineralized areas of the State are practically untouched because of the lack of even crude transportation facilities. Development work would immediately begin on hundreds of promising properties as soon as there was official assurance that roads would be built, and mines would be in operation immediately following actual construction. In view of the fact that the traffic on roads used in mining operations pays a heavy gas tax, such roads would soon pay for themselves. Roads into mineralized areas are urgently needed, and should be provided as quickly as possible. This would be a greater benefit to the State than to individual mine owners.

More rapid advance in mineral development would be made if greater support were given to the matter of investigation, experimentation and research in the field of metallurgy and the general treatment of Washington ores. Good work is now being done by the University and State College, and some exceptional work has been done at the State Electrometallurgical

Laboratory at Pullman by Director A. E. Drucker, and small staff, with the co-operation of the U. S. Bureau of Mines. This laboratory was equipped through a contribution of \$10,000 from the Department of Conservation and Development, but this is only a beginning. Better equipment and a larger staff should be provided so that the many problems awaiting solution may be attacked. This is especially important now because of the great quantities of power that will soon be available from Coulee Dam, Bonneville, and the many other public and private hydroelectric plants. The combination of research and cheap power will mean much in the future of Washington mining.

There should be two competent mining engineers attached to the Division of Mines and Mining to act as field men to serve the mining industry, much as the Extension Service of Washington State College and the U. S. Department of Agriculture serves the agricultural industry. In addition to aiding and cooperating with prospectors, small mine owners and operators, these field men would obtain accurate information on mines, mining properties, operations, production, etc. Their service would be invaluable in promoting sound mineral development.

CONCLUSION

The Division of Mines and Mining acknowledges the cooperation it has received from the mining industry in Washington, from prospector and small mine owner to operator, as well as from individuals, groups and organizations interested in mining. Without this cooperation it would not have been possible for the supervisor and his small staff to have obtained much valuable information or performed such service as has been rendered.

The cooperation of the University of Washington in providing use of a part of its chemical laboratory, and of county commissioners, county engineers, and county auditors, is acknowledged as having made possible the successful operation of the W. P. A. projects supervised by the Division.

Dean Milnor Roberts of the College of Mines of the University and Dean A. E. Drucker of the College of Mines and Geology of the State College, and their staffs, have given most helpful advice and service, which has been deeply appreciated.