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DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
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ANALYTICAL LABORATORIES OF THE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

By
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Laboratory Services

The analytical laboratories of the Department of Geology and Mineral Industries are the chemical, fire assay, and spectrographic laboratories. These services are set up to aid Oregon's prospectors and to help any resident who is interested in the analysis of rocks, minerals, or ores of the State. Figure 1 (page 72) shows the routing procedure for samples received by the Department for analysis.

Samples to be analyzed may be brought in or mailed either to the Department's laboratories in Portland or to the field offices in Grants Pass and Baker. Each sample submitted, except those for spectrographic work, must be accompanied by a "Request for Sample Information" form or a statement giving the name of the sender, location where the sample was taken, the analysis desired, and other pertinent information. Forms to accompany the samples may be obtained from any of the Department's offices. All services, except those of the spectrographic laboratory, are performed in exchange for the information requested and no charge is made. The spectrographic laboratory, according to law, operates under a schedule of charges. The various types of analytical service provided by the Department are briefly described below.

(1) Fire assay: The fire assay furnace is used to determine the values of gold, silver, or platinum-group metals present in a sample.

(2) Chemical analysis: The chemical laboratory is equipped to make qualitative and quantitive chemical analysis of rocks, minerals, and ores submitted by the public and by Department staff members assigned to examine mineral deposits.

(3) Spectrographic analysis: The primary use of the spectrograph is to determine qualitatively all the major, minor, and trace elements in a sample. It is often used to determine which metallic elements are present before performing chemical analysis. It is also used to identify very small samples or unknown inorganic materials.

(4) Petrographic determination: Major minerals, or rock type of the sample, are identified through visual examination. If warranted, the petrographic microscope is used to make more exacting determinations of minor or unusual minerals.

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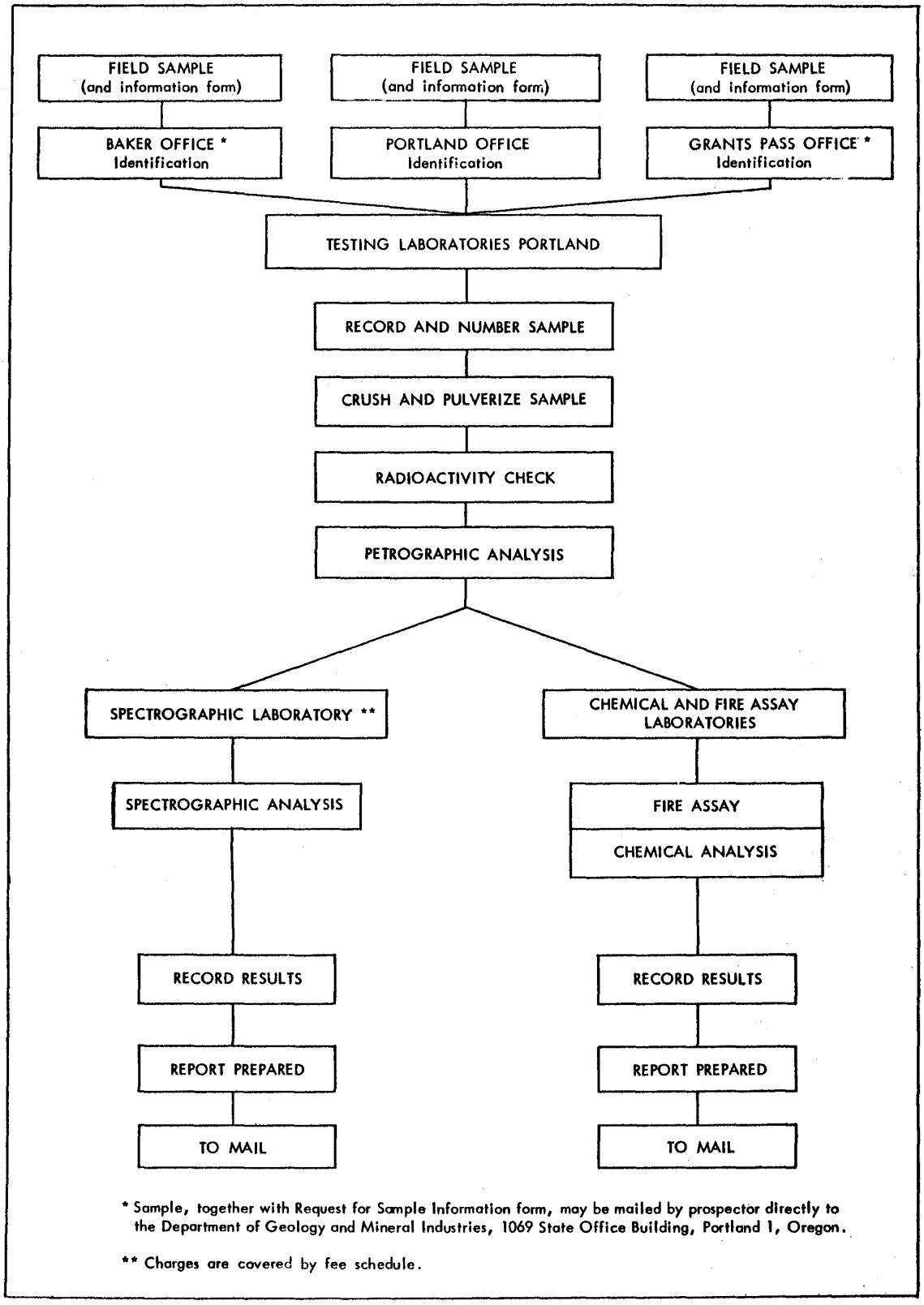

Figure 1 - Sample Routing Procedure.

(5) Radiometric test: Since 1954 all samples sent to the Portland laboratory have been scanned by a sensitive Geiger counter. Samples brought in to the offices can be tested on a counter immediately if requested. A radioassayer, on loan from the Atomic Energy Commission, is available for more accurate qualitative tests in the range of .01 percent to .15 percent uranium equivalent.

(6) Fluorescence test: A short wave lamp is used to identify the presence of minerals, such as scheelite, autunite, etc., which give diagnostic fluorescence. A sensitive and quick qualitative test for mercury makes use of the fact that mercury vapor is opaque to ultraviolet light.

(7) Differential thermal analysis: This procedure is used to help identify the minerals in clays, shales, and similar materials. It is used only after other tests have indicated that the material has possible economic value.

Authority for Performing Analytical Services

Chemical and fire assay service

The law establishing chemical and fire assay work in the Department is quoted in part from Oregon Revised Statutes as follows:

> "516.040 Assays for the public. The department shall make or have made quantitative determinations of ores and minerals when submitted for the purpose, that are from original prospects or properties within the state, and shall mail to the sender the results obtained within 10 working days after receipt of samples. This service shall be performed by the department without charge to the sender and shall be rendered in exchange for information 1/ for the records of the department, stating the name and residence of the sender, together with a history of the ore or mineral, giving as nearly as possible the location from which the sample was taken, including the name of the county, and any other matters that may be beneficial touching the same. All determinations made pursuant to this section shall be performed under the following rules, regulations and restrictions:
>
> "(1) No samples submitted by engineers sampling prospects or mines for the purpose of evaluation, or submitted by operating mines milling or shipping ore or hiring labor, shall be accepted by the department for assay or analysis, unless taken in the field by members of the department staff in conducting the work of the department within the scope of this chapter.
>
> "(2) The number of samples which any single person or group of persons may submit shall be limited to two in any 30-day period and all samples shall be assayed or analyzed by the department in the order received, as far as possible.
>
> "(3) All information received and results of determinations sent out shall be open to public inspection and may be published by the department.
>
> "(4) Before any work is done on the material submitted, all information required must be possessed by the department and the 10-day limit for reports will count from the time such data are received by the department."

Spectrographic service

The spectrographic laboratory was established by the 41st Legislative Assembly. Under the direction of Earl K. Nixon, former Department Director, and Dr. Harold C. Harrison, former head of Department laboratories, a 3-meter Baird spectrograph was purchased and put in operation in 1942. The law establishing this service states:

1/ Underlining by authors.

"516.050 Spectrographic laboratory; establishment and operation. The Department shall establish, equip and operate a spectrographic laboratory."

"516.060 Spectrographic laboratory; duties. The laboratory shall:

"(1) Make spectrographic determinations at the request of any department, institution or other agency of the state, without any charge in excess of the actual cost thereof.

"(2) Make other spectrographic determinations at a reasonable charge in excess of the actual cost thereof."

"516.070 Spectrographic laboratory; disposition of money. All money received by the department from charges for spectrographic determinations shall be paid over to the State Treasurer and by him deposited in the General Fund."

Operation of the Chemical and Fire Assay Laboratories

General

In 1943 the State assay laboratories were moved from the Grants Pass and Baker field offices and combined in the Portland office. Since that time, 24,000 samples have been received in the chemical and fire assay laboratories. The number of analyses requested on each sample varied from one to six with an average of over two per sample, requiring a total of some 54,000 analyses in this 16-year period. Determinations have been made for sixty different elements. Because of the high cost and length of time required for a complete chemical analysis, this is performed only for a few critical Department projects or in special instances for prospectors when their samples warrant a complete analysis.

Sample preparation

Information received with each sample accepted for analysis, fire assay, and identification is copied in a record book. A permanent number is assigned to each sample and its information form. The sample, which should be a minimum of one pound in weight, is examined by a geologist, who may make additional requests for analysis. Rock type or principal minerals are indicated on the sample information form in a space marked "Sample description." After visual examination, samples are crushed to approximately $\frac{1}{4}$ inch in size and separated into portions by passing through a Jones sample splitter. A quarter-pound portion of the sample is then pulverized to the point where 95 percent will pass through a 100-mesh screen (each opening .0058 inch on a side). The rejects (nonpulverized portion) from the sample splitter are sacked, checked for radioactivity, and placed in storage for possible future reference. After one year the rejects are discarded. The pulped (pulverized) portion of the sample is then ready for either chemical analysis or fire assay. After tests are completed the pulps are held in storage for at least one year before discarding.

Fire assaying

Pulverized samples received in the assay office are analyzed by the "fire method" for the determination of gold, silver, platinum, and other precious metals of the platinum group. In the fire method the weighed sample is mixed in a fire clay crucible with a flux composed largely of silica (silicon dioxide), soda ash (sodium carbonate), borax glass (fused borax), and litharge (lead oxide). The fluxing mixture will be varied depending on the composition of the ore to be assayed. A known but small quantity of silver is added to insure a modest surplus of silver over gold in the final bead so that the parting (described later) will proceed to completion. After the sample and its flux have been thoroughly mixed the crucible is placed in a gas-fired assay furnace and heated gradually to a temperature of about 1150° C.(2100°F.).

The samples are placed in a muffle which insures an even distribution of heat around the samples and protects them from direct contact with the gas flame. During the early part of the heating period, part of the litharge in the flux is reduced to fine globules of lead. These lead globules move through the gently boiling mass of rock sample and flux to dissolve the precious metals. As the molten mass subsides and the fused mixture becomes quiet the lead, with its dissolved precious metals, settles to the bottom of the crucible. While still molten, the contents of the crucible are poured into a cone-shaped iron mold where the lead-precious metal mixture separates from the slag.

After cooling, the slag is discarded and the lead button is returned to the furnace in a preheated bone ash cupel where it is gradually heated to a temperature near 850°C. (1560°F.). The lead in the button is partly absorbed in the cupel and the remainder volatilized and drawn off in the furnace gases. When all the lead is removed the remaining bead of precious metal is cooled, removed from the cupel and weighed. This weight is the total weight of all the precious metals.

The gold is "parted" from the silver and platinum group metals by treatment with acids. The gold is then washed, dried, annealed (heated to coalesce the gold sponge), and weighed. The quantity of silver is found by difference except when determination of the platinum group metals is needed. In this case the metals dissolved in the acid are individually precipitated with suitable chemicals and weighed after separation. All precious metals are reported to the prospector as ounces per ton of ore.

Chemical analyses

The chemical laboratory is equipped to make determinations for practically all the elements found in rocks and minerals in the State of Oregon. The determinations most commonly requested for chemical analysis are chrome, iron, silica, mercury, alumina, nickel, copper, lead, and zinc Pulverized portions are analyzed by standard methods given in manuals covering analytical procedure. These methods are recognized by all leading chemical laboratories as the most accurate known today.

All analytical results are recorded in a permanent record book and on the sample information form sent in with the sample. This information is then copied on duplicate forms, one copy of which is mailed to the sender and the other mailed to the branch office nearest the locality where the sample originated. The original form is placed in a permanent file in the Portland office.

Operation of the Spectrographic Laboratory

General

Spectrographic analysis is used to identify the chemical elements of inorganic materials by interpretation of the light emitted when the test specimens are heated. Every chemical element can be made to give off light by subjecting it to a temperature high enough to vaporize it. As no two elements emit light having the same characteristics, each element can be identified from its known spectrum. The light from a complex mineral sample or metal alloy will exhibit the characteristics of each of the elements in the mixture. Qualitative analysis reveals the presence of each element through the identification of lines of its characteristic wave lengths in the total emitted light. Quantitative analysis determines the approximate amount of the element present through measurement of the intensity of the selected lines.

The basic instrument for spectrochemical analysis is the spectrograph. This apparatus receives the light emitted by the specimen, sorts or disperses it into its component wave lengths, and records the spectral lines corresponding to these wave lengths on a photographic plate (see

Figure 2 - Section of a Spectrographic Plate.

Figure 2). These lines are arranged in order on the plate according to their wave-length value and are identified by comparison with known charts and tables.

The Baird 3-meter grating spectrograph at the Department is a wide-range instrument capable of photographing the spectrum from 1,800 angstroms to 21,000 angstroms. It is contained in a case 2 feet square and 11 feet long, with the optical bench and arc stand extending an additional 5 feet. The use of electric motors for focusing, racking, grating rotation, and plate swing, gives unusual flexibility (see Figure 3). The grating element, which is the heart of the spectrograph, consists of a concave glass mirror, coated with aluminum, and ruled with very fine lines, 15,000 to the inch. Direct current for the arc is supplied by a 5-h.p. Reliance motor-generator set. During 1960, the installation of a new arc stand and other equipment will make the high-voltage spark procedure available for use on metallic alloys.

The spectrograph provides a semiquantitative analysis for most of the inorganic elements, except the gases and a few other elements such as sulphur, selenium, phosphorus, and carbon. Its most useful range is that below 1 percent, as contrasted to chemical analysis, which is best at higher ranges. Sensitivities for many elements go down to .0001 percent, but some others are only sensitive to .1 percent.

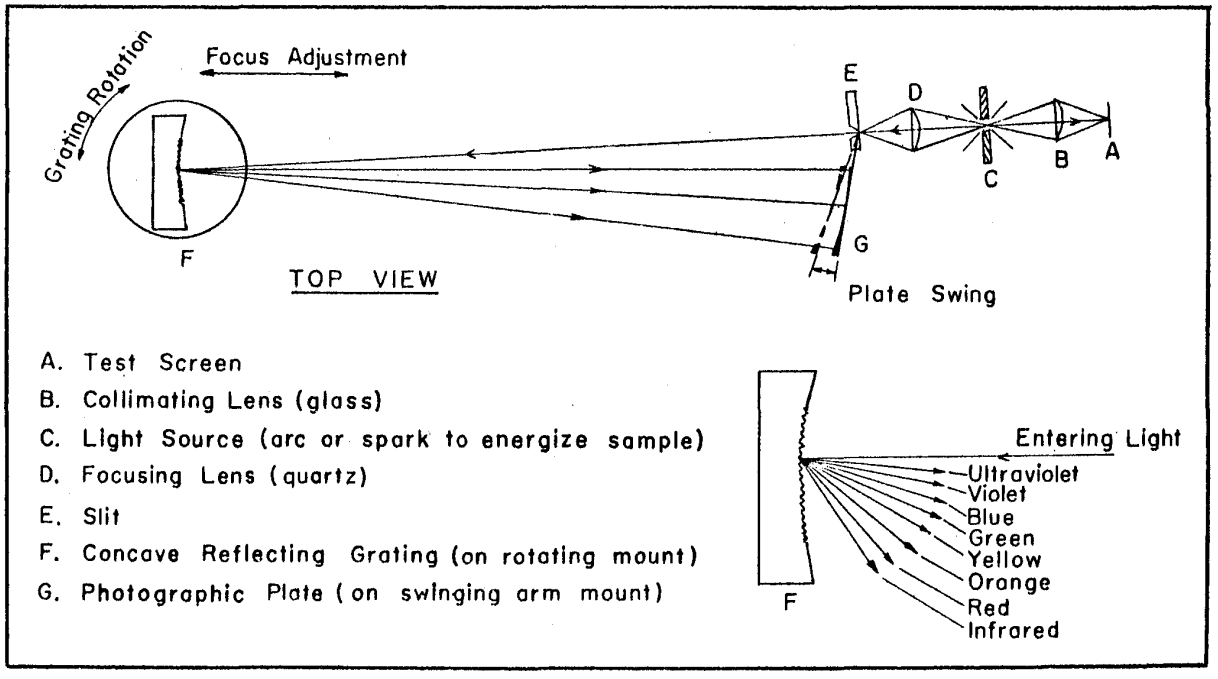

Figure 3 - Diagram of Baird grating spectrograph, using Eagle mounting.

Submission of samples

Samples submitted for spectrographic analysis should be one pound in weight if possible and representative of the whole material to insure accurate information. Samples may be as small as 1 or 2 milligrams, but accuracy will be impaired and quantitative results difficult to obtain.

Any person, whether or not a resident of the State of Oregon, may send in samples for analysis, and it is unnecessary to include the location from which the sample was taken. Each sample should be accompanied by the form "Price List for Spectrographic Analysis," giving the name and address of the sender and indicating the type of analysis desired. As soon as received, the sample is given a number and this number should be referred to if future correspondence becomes necessary. The form includes a list of all elements determined; so that only a few may be checked if desired, but the most common type of analysis is to search for all elements listed. Prices include the following:

1. Qualitative and estimated quantitative analysis for 66 elements $7.00
2. Qualitative and estimated quantitative analysis for any 2 or 3 elements on the list 3.00
3. Oregon citizens may obtain a 20-percent discount if the sample originated in Oregon and the covering affidavit at the bottom of the form is signed and submitted with the sample.

Analytical procedure

To analyze a sample of ore, the crushed and pulverized material is thoroughly mixed to make sure that it is homogeneous. A weighed amount, usually 50 milligrams, is packed into the cup of a carbon electrode, which is placed in the direct current arc and vaporized. A lens focuses the arc flame on the slit of the spectrograph, as shown in Figure 3. The beam of light from the slit falls upon the grating, from which it is reflected onto a glass photographic plate. The plate, after developing, is placed in a Model 2000 Jarrell-Ash microphotometer in which the spectrum of the sample is magnified and projected so that it can be compared with standard spectrographic plates displaying the spectrum of known elements. The spectra on the standard plates are made up from samples of known quantity, such as 10%, 1%, .1%, .01%, .001%, and .0001%. The final report places each element from the original sample in one of these brackets, as nearly as can be read from the density of the spectral line.

Examples and Uses of Spectrographic Analysis

Material Analyzed	Use of Analysis
1. Metallic ores	Assists in prospecting
2. Process samples from mills	Tests efficiency of separation
3. Slags and waste products	Finds economic uses
4. Boiler and pipe scale	Determines impurities in water or liquids
5. Manufactured parts	Checks alloy composition
6. Glass or paint particles	Identifies for crime laboratories
7. Engine crank case drainings	Checks bearing wear or dirt
8. Commercial fertilizers	Finds advantageous trace elements
9. Metal platings	Checks for poisonous metals
10. Rare earths	Identifies elements easily
11. Oyster shells	Determines fertilizer possibilities
12. Thin metallic coatings	Identifies composition

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PORT OF PORTLAND ADDS ORE-HANDLING EQUIPMENT

The Port of Portland has captured the bulk of inbound ore shipments on the Pacific Coast despite the fact that it lies 110 river miles from salt water. In the past five years shipments of ores from overseas have increased more than five times. The table below shows movement through the Port of Portland for 1957 of various ores, concentrates, and metals. To provide

MINERAL-COMMODITY FREIGHT TRAFFIC, PORT OF PORTLAND, OREGON, 1957 *
(Short Tons)

Commodity	Total	Foreign		Domestic (Coastwise)	
		Imports	Exports	Receipts	Shipments
Anthracite coal	10,017	----	10,017	----	---
Bituminous coal, lignite	550,382	----	550,382	----	---
Coke, including petroleum coke	7,385	----	7,385	----	---
Building cement	118,766	142	----	104,251	---
Stone and manufactures	99	48	----	51	---
Glass, glass products	4,133	3,599	----	452	82
Raw clays, earths	2,655	----	----	----	---
Brick, tile	600	62	4	435	7
Other clay products	964	640	----	312	12
Sulphur	30,852	----	----	15	---
Salt	65,814	----	----	65,784	---
Iron, steel scrap	179,220	----	178,676	180	364
Iron, steel, semifinished products	15,868	281	1	15,279	137
Manganese	36,648	35,690	958	----	---
Chrome	12,501	12,490	----	11	---
Other ferroalloys, ores, metals	1,071	----	1,071	----	---
Aluminum ores, concentrate, scrap	7,357	7,064	293	----	---
Aluminum metal, alloys	10,133	35	9,825	14	259
Copper ore, concentrate, scrap	1,489	----	1,489	----	---
Lead ores, concentrate, scrap	58,483	58,483	----	----	---
Lead and alloys	----	8	----	2	---
Tin metal forms	----	11	----	----	---
Zinc ore, concentrate, scrap	44,109	44,030	57	22	---
Zinc forms	136	----	----	136	---
Other nonferrous ores, metals, scrap	776	440	30	131	159
Nitrogenous fertilizer materials	3,961	3,911	50	----	---
Phosphate fertilizer materials	1,821	----	1,821	----	---
Potash fertilizer materials	31	31	----	----	---
Other fertilizers and materials	266	218	1	16	31

* Source: "Waterborne Commerce of the Pacific Coast, 1958," U.S. Army Engineers.

for future increases in imports and speedier turn-around time for vessels, the Portland Commission of Public Docks has announced that added facilities will be installed shortly. The following article, which appeared in Grow With Oregon, July 1959, describes the project:

"The Portland Commission of Public Docks has awarded a $2,249,400 contract to the C. M. Corkum Co. for construction of a new bulk cargo discharging pier at Terminal No. 4.

"The new facility will be first of its kind on the Pacific Coast, and will be in operation by the middle of next year. It is designed to handle imports of ores, ore concentrates, and other bulk commodities moving over the Portland public docks. A 900-ton per hour bulk unloading tower, now being built by Dravo Corp., Pittsburgh, will be erected on the finished pier.

"The project will give Portland two additional deep-water berths with a minimum depth of 35 feet and will include a 100-car capacity rail holding yard adjacent to the pier, and several acres of open storage. While the initial project is designed for overland transportation of incoming ocean cargoes, plans contemplate a future barge basin with a conveyor belt to discharge cargo directly onto barges. The full project will cost an estimated $3,150,000, all financed by general obligation bonds already voted by the people and funds in the commission's reserve account.

"The tower will project 130 feet above the pier deck and the operator will ride a cab 80 feet in the air, high enough to permit positioning directly over ships to observe operation of the 13-ton capacity clam shell bucket. The dock will carry three rail tracks, two under the tower and the other along the pier edge. Cargo will be deposited in a 2,000-cubic foot receiving hopper delivering to two apron feeders depositing into weigh hopper that will automatically weigh the cargo and dump it into rail cars or trucks. One feeder will be equipped with a conveyor belt."

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GEOLOGY OF ANLAUF AND DRAIN QUADRANGLES ON OPEN FILE

"Geology of the Anlauf and Drain quadrangles, Douglas and Lane counties, Oregon," by Linn Hoover has been issued as a preliminary, open-file report by the U.S. Geological Survey. It is not for distribution, but may be examined at the Department library, 1069 State Office Building, Portland, and also at the Survey's offices in Denver and Menlo Park. The report consists of 95 typewritten pages, photographs, a geologic map, cross sections, a columnar section, and a check list of foraminifera.

Geologic studies in the Anlauf and Drain quadrangles were undertaken principally to evaluate the petroleum possibilities and tie this previously unmapped area with the Survey's oil and gas investigation mapping in western Oregon. On the basis of surface data, no source beds or reservoir rock suitable for the formation and accumulation of petroleum are indicated. Subsurface information is lacking for this area.

The Anlauf and Drain quadrangles are underlain by about 20,000 feet of lower Tertiary sedimentary and volcanic rocks which include the Umpqua, Tyee, and Spencer formations, all of Eocene age and chiefly of marine origin. These formations have been folded and are overlain in part of the area by nonmarine volcanic and waterlaid materials of the Eocene-Oligocene Fisher formation dipping gently eastward. Small basaltic and diabasic bodies intrude most of the rocks. Mineralization accompanying intrusions deposited cinnabar and other sulfide minerals, carbonates, and silica.

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ASSESSMENT DEADLINE SEPTEMBER FIRST

Annual assessment work on mining claims which have not been patented should be completed not later than noon, September 1st. Public Law 85-736, passed by the 85th Congress and signed by the President on August 23, 1958, establishes this new date for the beginning and ending of the assessment year. There has been no change in the $100 which must be expended on each claim annually.

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NEW OIL AND GAS DRILLING PERMITS

Permit No. 35 was issued to Ross R. Mitchell, Canby, Oregon, on July 23, 1959. The drilling is located 492.3 feet south and 3110.3 feet west from the N.E. corner sec. 15, T. 8 S., R. 5 W., Polk County. Surveyed elevation is 317.9 feet, ground. The lessors are Walter and Arthur Bliven. This test hole will be called Bliven No. 1.

Permit No. 36 was issued to the Oregon Oil and Gas Company of Albany, Oregon, on August 4, 1959. The drilling is located in the NE¼ sec. 25, T. 10 S., R. 8 W., Lincoln, County. The lessor is Edward Roberts. Mr. A. M. Ropp, Route 1, Box 412, Albany, Oregon, is president of the company. The test hole will be called Roberts No. 1.

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CAMP HANCOCK ATTRACTS YOUNG SCIENTISTS

A total of 106 boys and girls, ranging in age from 12 to 17 years, attended Camp Hancock this summer. The camp, located near Clarno on the banks of the John Day River in Wheeler County, Oregon, is the only one of its kind in the United States. It is designed to acquaint youngsters with the various natural sciences, and each summer three 2-week sessions are sponsored by the Oregon Museum of Science and Industry. Instruction in geology, biology, paleontology, and general science is provided by hard-working staff members who volunteer their time and energy, usually for a 2-week period. The guiding spirit for the camp is furnished by Mr. and Mrs. A. W. Hancock who spend their entire summer here each year. "Lon" Hancock has been engaged for many years in unearthing mammal bones from a site nearby, and the material recovered from this locality has added immeasurably to knowledge of the life of the past in Central Oregon. Not far from camp are the world-famous "nut beds" where fossilized nuts, seeds, and fruits of many plant species now extinct are dug by the youthful scientists.

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OME ISSUES NEW PAMPHLET ON MINERALS EXPLORATION PROGRAM

The Office of Minerals Exploration has issued a new pamphlet in question and answer form on the Minerals Exploration Program. The pamphlet relates to the OME program of Federal assistance in financing exploration for domestic mineral deposits. Under this program the Government will pay up to 50 percent of the cost of exploration which uses recognized and sound procedures including standard geochemical and geophysical methods to obtain pertinent mineralogical and geological information. Copies may be obtained from OME, Department of the Interior, Washington 25, D.C., or from the field office, Region 1, South 157 Howard Street, Spokane 4, Washington.

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NOW IT'S OFFICIAL

The U. S. Board on Geographic Names has just issued List No. 5901 containing decisions on names in the United States, Puerto Rico, and the Virgin Islands. These names represent decisions rendered by the Board from April 1957 through December 1958. The list for Oregon is as follows:

Ackerley Lake: the smallest lake in a chain of four lakes, about 3 miles northeast of Florence; Lane County; SE¼ sec. 11 and SW¼ sec. 12, T. 18 S., R. 12 W., Willamette meridian; 44°00'54" N., 124°04'54" W. Not: Ackerly Lake, Allison Lake, Little Lake.

Celilo, Lake: lake about 28 miles long, formed by The Dalles Dam in the Columbia River; Sherman and Wasco Counties, Oregon, and Klickitat County, Washington; 45° 37' N., 121°08' W.

Elbow Lake: lake with an area of about 10 acres and an elbow-shape, immediately west of Waldo Lake, in Willamette National Forest; Lane County; unsurveyed sec. 13, T. 21 S., R. 5½ E., Willamette meridian; Lane County; 43°45'00" N., 122°04'20"W. Not: Klovdahl Lake.

Grassy Creek: stream about 5 miles long, heading southwest of Grasshopper Mountain and flowing west-northwestward to Christy Creek, in Willamette National Forest; Lane County; sec. 11, T. 19 S., R. 4 E., Willamette meridian; 43°55'40" N., 122°17' 30" W. Not: Mossy Creek (name sometimes applied to the lower course of the stream).

Harvey Lake: lake with an area of about 20 acres, on the township line north of Lake Kiwa and about 1.5 miles north of the north end of Waldo Lake, in Willamette National Forest; Lane County; sec. 5, T. 21 S., R. 6 E., and unsurveyed sec. 32, T. 20 S., R. 6 E., Willamette meridian; 43°47'15" N., 122°02'15" W. Not: Lake Kiwa (q.v.).

Kiwa, Lake: lake with an area of about 20 acres, on the section line south of Harvey Lake and about 1 mile north of the north end of Waldo Lake, in Willamette National Forest; Lane County; secs. 5 and 6, T. 21 S., R. 6 E., Willamette meridian; 43°46'45" N., 122°02'30" W.

Martie Creek: stream about 1.5 miles long, flowing southwestward into Eighth Creek about 1 mile above its mouth, in Willamette National Forest; Lane County, sec. 7, T. 20 S., R. 4 E., Willamette meridian; 43°50'30" N., 122°23'00" W.

Marys Creek: stream about 5 miles long, heading on the northeast side of Coffin Mountain and flowing generally northward to the North Santiam River about 1.5 miles below Misery Creek, in Willamette National Forest; Linn County; sec. 23, T. 10 S., R. 6 E., Willamette meridian; 44°41'15" N., 122°02'00" W. Not: Coldbrook Creek, Macy Creek.

Owyhee, Lake: lake about 55 miles long, formed by damming the Owyhee River about 20 miles upstream from its mouth; Malheur County; 43°30' N., 117°20' W. Not: Owyhee Reservoir.

Salal Creek: stream about 1.5 miles long, heading between Huckleberry Creek and Eight Creek and flowing southwestward into Huckleberry Creek, in Willamette National Forest; Lane County; sec. 8, T. 20 S., R. 4 E., Willamette meridian; 43°50'30" N., 122°22'00" W. Not: Martie Creek (q.v.).

Second Creek: stream about 1.5 miles long, flowing generally westward into First Creek about 1 mile above its mouth, in Willamette National Forest; Linn County; sec. 26, T. 20 S., R. 3 E., Willamette meridian; 43°47'50" N., 122°24'35" W.

Squaw Creek: stream about 2 miles long, in Mount Hood National Forest, heading in Squaw Lakes and flowing generally southward to Roaring River; Clackamas County; secs. 13, 14, 23, 24, and 25, T. 4 S., R. 6 E., Willamette meridian; 45°12'05" N., 122°01' 15" W. Not. Clemens Creek.

Timothy Lake: reservoir about 2 miles across, in Mount Hood National Forest, made by damming the Oak Grove Fork of Clackamas River and inundating Timothy Meadows; Clackamas County; secs. 12, 13, 14, 23, 24, 25, and 26, T. 5 S., R. 8 E. and secs. 11 and 14, T. 5 S., R. 8½ E., Willamette meridian; 45°07' N., 121°47' W
Not: Timothy Lake Reservoir, Timothy Reservoir.

Umatilla, Lake: lake about 77 miles long, formed by the John Day Dam in the Columbia River; Gilliam, Morrow, Sherman, and Umatilla counties, Oregon, and Benton and Klickitat counties, Washington; 45°43' N., 120°42' W.

Wallula, Lake: lake about 45 miles long, formed by the McNary Dam in the Columbia River; Umatilla County, Oregon, and Benton, Franklin, and Walla Walla counties, Washington; 45°56' N., 119°18' W.

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LAKEVIEW MINING COMPANY REORGANIZES

The operational staff of Lakeview Mining Company has been reorganized effective August 8. The new President, replacing Dr. Garth W. Thornburg, is George A Nicoud, Jr., of Dallas, Texas. The General Manager is John L. Robison, who will also maintain his position as Manager of Gunnison Mining Company, Gunnison, Colorado, a companion operation of Lakeview Mining Company. The mine staff has been replaced by engineers from the recently closed Howe Sound mining venture at Cobalt, Idaho. Kenneth Kutz is Mine Superintendent, and Thomas L. Wilson, Assistant Superintendent. Two new geologists, J. Y. Greene and Verne Garten, have also been brought in from Cobalt, Idaho.

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NEW OFFICERS ELECTED

The Eastern Oregon Mining and Mineral Association elected new officers at a meeting held in Baker on August 4. Carl Suksdorf of Oil and Mineral Operators, Inc., Mormon Basin, was named President. Ward Hill of the Greenhorn and Bourne mining properties was named Vice President; Jim Dickerson, Hereford, Second Vice President; Ben Bailey of John Day, Vice President for Grant County; Harley Haskins, Baker, Vice President for Union County; Jim Anderson, Hereford, Secretary; and Fred Moes, Baker, Treasurer. Trustees will be Ivan Thompson, Durkee, and Chester Christenson, Baker. Goff Smith, Carl Bowman, and Culley Trickel of Baker were named directors.

Harold Banta, Baker, Board member of the Department of Geology and Mineral Industries, spoke before the group on the sad plight of the gold miner. The Eastern Oregon Mining and Mineral Association is preparing resolutions to be presented to the group at its August 18 meeting on gold, imports "prejudicial to the welfare of mining," and land policies of the U.S. Bureau of Land Management.

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VANCOUVER CLUB EXHIBITS GEM STONES

The third in a series of exhibits by local rock clubs is on display in the Department's Portland office, 1069 State Office Building. This exhibit is by the Fort Vancouver Gem and Mineral Club, which has its headquarters in Vancouver, Washington. The exhibit, arranged by club president Mrs. Pat Harmanson, consists of an excellent variety of agate material, jewelry, petrified wood, geodes, and fossils. All of the material is from Washington and much of it from the Vancouver area. The exhibit will be on display through September.

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