

# State Department of Geology and Mineral Industries

1069 State Office Building  
Portland 1, Oregon

See SHALE CITY  
(MIN-A-RAY PROPERTY) Ashland Area Jackson County  
(Oil shale & medical water)

Owner: Matthew P. Thommes, 1816 W. 8th Street, Los Angeles 5, California. Property known as Min-A-Ray Laboratories.

Location: N $\frac{1}{2}$  NW $\frac{1}{4}$  and NW $\frac{1}{4}$  NE $\frac{1}{4}$  sec. 16, T. 38 S., R. 2 E., and E $\frac{1}{2}$  NE $\frac{1}{4}$  and W $\frac{1}{2}$  SE $\frac{1}{4}$  sec. 16, T. 38 S., R. 2 E. Of the latter block, Thommes owns only the north 15 acres.

Area: 120 acres in the first block, and 15 acres of the second block.

History: The property has had a varied history, as received from various reports. It was originally opened for the production of a medical water. Certain portions of the tuff were leached and the leachings were used for various medical preparations. Later an attempt was made to distill oil from the reported oil shale. A retort was built, but insecurely anchored so that it blew over during a heavy wind storm. Another retort was built. An extensive open cut, nearly an eighth of a mile long was opened, with small underground workings. This project ultimately failed because of the small oil content, and principally because of financial troubles. About 1938, full title to the property was vested in M. P. Thommes, who prepares a "medical water."

The property has had various names. At one time it was called Railways & Industries Corporation. About 1927 it was known as Pacific Lumber & Shaleries, Inc., with Chas. D. Crouch as president, Ashland, Oregon. Later, (1936-1938?) it was known as Medico Minerals Company with E. C. Hurd of Ashland, as president. There is a record of a lease for oil shale, known as Oil Shale Lease, Roseburg O14464. This lease finally was terminated at the request of the Company as they were unable to keep up the lease payments.

At one time there were 32 cabins at the property, the locality being known as Shale City. It is so marked on the Medford topographic quadrangle. Only four or five of the cabins remain. The retort building is in ruins. Rails have been stripped. Little or no equipment remains.

The property was investigated by the USGS during the Medford geologic mapping. Wells was most unenthusiastic about the oil shale, but his principal statement is -- "The white tuff member contains some organic matter."

Development: Discussed largely under "History."

Geology: The country rocks of the area are the "Tvf" Lava Series of Wells (30) consisting of dominantly dark-gray andesite flows with local layers of tuff and breccia. Within the "Tvf" series is a White Tuff member consisting of fine-grained white rhyolitic tuff. The tuff is indurated to

practically shale that weathers into 1/8 inch shale plates. Occasionally layers of coarser material occur within the "shale"; they contain small pebbles which may be pumice.

The "oil shale" is found at two horizons. The upper stratum occurs above a poorly consolidated coarse-grained tuff that is dark colored in spots. The upper stratum is very poorly exposed and no samples were obtained. The coarse-grained tuff gives off a distinct odor of sulphur, and a suggestion of arsenic. This material forms the basis of the "medical water." The lower stratum occurs below a ten- (?) foot interbed of the coarse tuff. It is well compacted, and appears brownish to almost black from included organic matter. Dry pieces of this shale will burn. Two samples were obtained of this material.

Outcrops are poor, and old workings are caved and slumped so that no thickness of "oil shale" could be determined without considerable excavation.

The age of this white tuff is reported by Chaney (30) as being middle Miocene on the basis of leaf fossils. No diagnostic fauna have been found.

Samples: A specimen reportedly from this locality showed a little oil qualitatively. Two samples of the shale submitted subsequently failed to show any oil content.

References:

Wells (39) Medford Geologic Map

Chaney (30) Chaney, R. W. Suggestions regarding the age of the Southern Cascade Range: abst., G.S.A. Bull., v. 41, pp. 147-148, 1930.

Informants: M. P. Thommes and R. C. Treasher, July 23, 1943.

\* \* \* \* \*

Appendix - A

The property was visited on July 14, 1950 by Hollie M. Dole and David J. White, Department geologists. They reported that there had been no recent activity at the property and that the report prepared by Treasher in 1943 needed little or no revision. Dole, in a letter dated July 15, 1950 to the Portland office, stated that "I do not believe there is any great tonnage involved no matter what grade of "oil shale" it is. My reason for believing it is this: The exposure is in a saddle, no more than a few hundred yards long and no more than a few tens of yards wide. Stream dissection would have cut through and eroded away any quantity of "oil shale" that might have been present in an E-W direction and the hills rise sharply on either side of the saddle so that the lavas and pyroclastics would form an extremely thick cover in a N-S direction. But - there is no reason for believing the areal extent is very great. And then it is quite unlikely that the "oil" bearing beds are very thick. The whole section may be 30'-40' thick but the black shales are probably much less than that - probably no more than a few feet thick."

Samples submitted by Dole and White returned the following:

<u>No.</u>	<u>Description</u>	<u>Petroleum percent</u>
P-10095	Picked sample of white and brown shale from open cut above logging road	2.78
P-10096	Brown to black shale, chip sample along channel in upper 3-ft. of face of open pit below logging road	0.81
P-10097	Tan and white poorly consolidated coarse-grained tuff with dark spots and shale layers	0.92
P-10098	Shale and tuff	2.30

Appendix - B

Shale City was visited briefly by Vernon C. Newton, Jr., department Petroleum Engineer, and Len Ramp, Resident Geologist, on Nov. 16, 1965 to obtain samples for analysis. We saw evidence of recent activity. A new cyclone fence with locked gates had been erected around the buildings and a small rotary retort was installed in one of the buildings. Some new excavation work was in evidence at the pit south of the fence-enclosed area and a few plastic-covered stacks of oil shale were stockpiled at the pit. No one was present at the area and we could find no evidence of who was responsible for the recent activity. R. A. Myers, who has a nearby quicksilver prospect (phone communication) said that he thought Mr. Thommes was still the owner and was using the oil as a fertilizer or soil conditioner for alkali soil.

Two samples taken at the time of our visit were analysed by the U.S. Bureau of Mines, Laramie, Wyoming, Petroleum Research Center. They yielded 35 to 37 gallons of oil per ton. Further analyses are intended.

<u>Sample No.</u>	<u>Assay run</u>	<u>Product yield, wt per cent</u>				<u>Specific gravity of oil, 60°/60° F</u>	<u>Gal per ton</u>		
		<u>Oil</u>	<u>Water</u>	<u>Spent shale</u>	<u>Gas + loss</u>		<u>Oil</u>	<u>Water</u>	
700X	Oligocena 1	9609	13.1	5.0	77.5	4.4	0.899	34.9	12.0
		9610	13.2	5.2	77.6	4.0	.899	35.3	12.3
		Avg		13.2	5.1	77.5	4.2	0.899	35.1
701X	Oligocene 2	9611	13.8	7.0	76.0	3.2	0.904	36.6	16.8
		9612	13.8	7.1	76.0	3.1	.905	36.5	17.1

SUBJECT  
S H O R T Y H O P E M I N E

NAME: Shorty Hope Mine

LOCATION: Wagner Creek, Jackson County, Oregon, near City of Talent.

ELEVATION: 2450 feet.

AREA: 107 acres, more or less.

TITLE: Good commercial title. 27 acres, more or less, patented mineral and 80 acres deeded government land.

VEIN: True Fissure. Width 4-16 feet. Strike northwesterly. Dip slightly southwesterly. Cropping 3,500 feet.

FORMATIONS: Granite, diorite and associated formations.

ORE SHOOT: Apparently one continuous deposit of low-grade ore in evidence on the surface for a length of some 2,000 feet and having occasional shoots of higher grade ore ranging up to more than 100 feet in length as noted in underground workings.

ORES: White to dark grey quartz containing gold, little silver, pyrites and some galena.

MINERALS: Gold, silver, galena, iron pyrites, etc.

VALUES: A composite of all section samples taken on the better grade ores since reopening and resumed operations of the mine give an average assay return of \$15.20 per ton. Recent average sample of mill heads on this class of ore gave an assay return of \$18.35 per ton. A positive statement of the average value of low-grade ores cannot properly be made from the extent of present exposures but from what can be determined one might suggest a value of roundly \$4.00 per ton. It is claimed that original operations showed an average return ranging from \$4.00 to \$16.00 per ton.

DEVELOPMENT: The original working had about 1,600 feet along the strike of the vein for about 1,000 feet in length entered by a cross-cut from the surface in Bear Gulch. Several hundred feet in length has been stoped to the surface from this level and the workings are now closed. The present main working level has an entry on the opposite side of the ridge about 800 feet distant and 100 feet lower than the original workings and follows the vein system southwesterly for a distance of 1,446 feet underground gaining

ORETONNAGE:

this level. Present development is not sufficient to permit a computation of ores available above the main working level further than to suggest that the entire bulk of low-grade material in this zone would represent upwards of 50,000 tons. This would be without consideration for the downward continuation of ores below the main working level or for the northwesterly continuation of the deposit from the portal of the present workings.

COSTS:

Past operations established an average cost of about \$2.00 per ton on a capacity of 40 tons per day.

POWER:

Electric power installed. Commercial, 3 phase, 440 volt, 70 HP connected load. Cal.-Oreg. Power Co.

WATER:

Sufficient for all needs, on the grounds.

TIMBER:

A good stand of excellent mine timber on the property.

TRANSPORTATION:

Macadam auto road connects with the railroad and Pacific Highway at Talent, Oregon, distance four miles.

BUILDINGS:

Five stamp mill building, office, etc.

EQUIPMENT:

Compressor connected by short belt drive to 40 HP electric motor, complete with air receiver, etc., installed.  
2,000 feet, more or less, 2" pipe, air line from compressor.  
3,000 feet, more or less, 20# track rail from mill thru main level.  
Five Stamp Mill complete with frame, feeder, etc., installed, connected by belt to line shaft driven by 20 HP electric motor. Blake type rock crusher belted to 10 HP electric motor.  
Platetable and amalgamating plates.  
Concentrating table belted to line shaft.  
Electric fixtures and other appliances complete for operation.

INVESTMENT:

Permanent improvements, underground workings, excavating, buildings, etc., exclusive of equipment may be given at a reasonable replacement value of roundly \$60,000.

REMARKS:

The material increase of size and value of ores as noted in the main working level, compared with ores above that level, and the very considerable improvement in values immediately below the main level indicate that the enrichment of the Shorty Hope Mine, like that of the Ashland Mine, will be found deep seated with greater values at depth.

The Shorty Hope Mine, with its past production record, present development, ore tonnage and future possibilities is far above the average gold property to be found available and with power, transportation, timber, water, equipment, etc., already provided presents an unusually attractive proposition for early returns with potential possibilities for a permanent producer of vast importance.

OWNER:

P. B. Wickham  
Ashland, Oregon  
March, 1939.

# State Department of Geology and Mineral Industries

702 Woodlark Building  
Portland, Oregon

RECEIVED  
FEB 28 1946  
STATE DEPT OF GEOLOGY  
& MINERAL INDS.

Jackson County  
Ashland District  
By: E. A. Youngberg  
February 26, 1946

## MINE:

Van Curler Mine - Gold

## OWNER:

Fred Van Curler, Rt. 2, Box 393, Ashland, Oregon

## LOCATION:

The mine is located in Sec. 6, T. 31 S., R. 1E, in Jackson County. The mine may be reached via the Ashland Mine road which joins with Highway 99 at the railway underpass at the northern city limits of Ashland. The Ashland Mine road crosses the property about two miles from this junction with Highway 99.

## AREA:

The mine is on deeded land which is part of the Van Curler Ranch.

## HISTORY:

The mine had a small production from an old pit just north of the Ashland road. Ore is said to <sup>be</sup> assayed \$40 per ton. There has been no recent production. First activity coincided with that of the Ashland Mine. Recent activity has been limited to the past five years.

## DEVELOPMENT:

The vein has been exposed by two crosscuts about 400 feet apart. The workings to the south are at present being extended. These workings consist of a crosscut with a westerly strike 140 feet in length and a drift to the north 50 feet along the vein. The workings to the north, which are just below the Ashland Mine road, consists of a westerly crosscut about 150 feet long, a raise to the surface on the vein, and a shaft about 50 feet deep. The shaft was abandoned due to water and lack of proper pumping equipment.

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## GEOLOGY:

The mine is located within the Ashland granodiorite stock. The rocks noted in the mine were siliceous with plagioclase feldspar and biotite mica. The present workings are still largely in the oxidized zone. A small lense of quartz and gouge material was encountered in the south workings which were unoxidized. Considerable finely divided pyrite was noted in the quartz and gouge. The vein shows considerable post mineral movement along the vein. Quartz where observed was badly broken and distributed through the gouge. Free gold can be panned from the oxidized portion of the vein. Values are reported to run from \$5 - \$20 per ton. The vein has a strike of N. 10° W. and a dip of 45° to the east and an average width between walls of 4 feet.

## EQUIPMENT:

There is no equipment of importance on the property. The drift is being advanced by hand steel and auger drill.

## GENERAL INFORMATION:

The present workings are on a gentle mountain slope which makes it difficult to cut the vein at depth with a crosscut tunnel of moderate length. There is a good road to the property.

Report by: E. A. Youngberg

# State Department of Geology and Mineral Industries

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## SUPPLEMENTAL REPORT

SHALE CITY  
(Min-A-Ray Property)

Jackson County  
Ashland Area

### Appendix C - Oil Shale Investigation

The Shale City deposit was visited again on July 14, 1966, by N. V. Peterson and V. C. Newton. The purpose of this investigation was to determine the limits of the deposit if possible.

Southeast of the "old camp" approximately 1/8 mile were the remnants of a crushing plant and retort. The structure was located on a steep hillside above the road to facilitate loading. A narrow gauge railroad led from the retort back uphill to the main pit; only the road grade remains with an occasional railroad tie along the edge.

The main pit is dug nearly on strike with the shale and extends for 150 feet. The oil shale is interbedded with fine silty tuffaceous sandstone. The top 12-18 feet of beds exposed in the pit are mostly thin shale layers underlain by approximately 6 feet of tuffaceous sandstone. The bottom 20 feet of exposed section is composed of thin shale beds and interbedded tuffaceous sandstone. The base of the lower shale section is not exposed and could extend many tens of feet below the pit. The thickest shale bed occurs in the upper portion of the pit; one bed is  $3\frac{1}{2}$ -4 feet thick.

The shale weathers a light buff to almost white. There are two types of shale: the black shale and the brown "mahogany colored" shale. Both types give off a bituminous odor on fresh fracture.



The shale could be traced for at least 600 feet along the strike and possibly could extend for 1000 feet. The exposed width of the body is close to 150 feet. Strike of the shale body is N. 50° E., dip approximately 20° SE.

The shale occurrence was explored in all directions. It appeared to be an elongate body 1000 feet in length by no more than 200 feet wide. The shale is covered on top by a whitish hard silicified or welded tuff and underlain by a medium gray tuff of the same type. The shale may be an erosional remnant of lake sediments enclosed in tuff beds or it may be a faulted portion of a small lake basin. In either case the deposit appears to be small or economically inaccessible to open pit operations. Estimated size is less than 150,000 tons.

Mr. Matthew P. Thommes was staying at his cabin on the Shale City site at the time the current investigation was made. He said that he still owned the property and used the "minerals" associated with the shale for a patented medicine. The mineral appeared to be a coating of sulphur on fracture faces in the shale.

The extent of the shale is fairly well outlined and complete analysis shows commercial grade material. No further investigations are planned of the Shale City deposit by the Department.

Report by: V. C. Newton, Jr.  
7-19-66

6/46

Shorty Hope Mine

Gold

NAME

OLD NAMES

PRINCIPAL ORE

MINOR MINERALS

39 South    1 West    12  
T                    R                    S

PUBLISHED REFERENCES

**Parks & Swartley 16:210-212**

**Ore. Metal Mines Hdbk. 14-C Vol. II Sec.2**

..... **Jackson** ..... COUNTY

..... **Ashland** ..... AREA

..... **5500 feet** ..... ELEVATION

..... ROAD OR HIGHWAY

..... **4 miles from Talent** ..... DISTANCE TO SHIPPING POINT

MISCELLANEOUS RECORDS

PRESENT LEGAL OWNER (S) ..... **P.B. Wickham** .....

Address ..... **Ashland, Oregon** .....

OPERATOR .....

Name of claims                    Area    Pat.    Unpat.

**107 acres patented land**

Name of claims                    Area    Pat.    Unpat.

EQUIPMENT ON PROPERTY

SHORTY HOPE MINE - Continued

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Continued

REMARKS:

The Shorty Hope Mine, with its past production record, present development, ore tonnage and future possibilities is far above the average gold property to be found available and with power, transportation, timber, water, equipment, etc., already provided presents an unusually attractive proposition for early returns with potential possibilities for a permanent producer of vast importance.

OWNER:

P. B. Wickham  
Ashland, Oregon.  
March, 1939.

INFORMANT: P. B. WICKHAM 3/18/39

SHALE CITY  
JACKSON

MEMORANDUM

TO: R. H. Peterson

FROM: G. L. Ojala

DATE: April 28, 1988

RE: BOISE CASCADE'S SHALE CITY PROSPECT, JACKSON CO., OREGON

\* \* \* \* \*

This is strictly a grassroots exploration play based on a "hot-springs" model - based on rock alteration; (chalcedonic) silicification; some geochemically anomalous mercury and arsenic values; and analogies with other, similar deposits.

There is no question that this is a valid exploration target.

On the other hand, geochemical sampling to date has revealed virtually no gold anomalies - the "system" appears so far to be devoid of significant gold deposition.

In any case, while not denying that this is a worthwhile exploration target or prospect, I do not think the potential is so compelling, based on Boise Cascade's exploration results to date, that we should join them and take this project on.

*JLO*

Attachment  
/ck

April 28, 1987

Misc. Notes from Boise-Cascade visit re: SHALE CITY PROJECT  
(Jerry Lewis)

- Similarity to Galactic - Quartz Mt. deposit.
- BC work done 1982-1985.
- Argillaceous alteration in felsic volcanics.
- Underlying "oil-shale"; intrusive quartz-porphyry.
- Much of data derived from - 1984-1986 U.S.G.S. Cusmap work (Medford Quad.).
- Al Sarena mine to north of project area; \_\_\_\_\_  
mine to south.
- "Felsic pile" of Tertiary volcanics - intercalated volcanics, tuff, terrestrial sediments, oil-shale.
- Chalcedonic "cap."
- Land position - about two square miles total; fee lands plus 44 unpatented claims.
- Two silicified "knobs":  
                    1500 x 600                      1200 x 300
- Surrounded by a thick pile of more recent, basalt. Probable graben, with faults on either side.
- Shale pit on south end, about 100' x 100'
- On northwest edge of area - old kaolin mine.
- Some very high mercury anomalies, but to date, very poor gold results (no gold in rock samples). 1-300 ppm arsenic.
- Theory: "boiling zone" below - capped by oil shale - metals deposited at depth.
- Also quotes analogies to Ivanhoe, Paradise Peak, NV (??).

Shale City Project

April 28, 1988

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- Suggested Deal:

- They have budgeted \$100,000 for further work.
- Already spent about \$100,000.
- One-time payment: \$50,000 cash ... then ...
- Earn-in - 50% - by spending \$1 million over five years (covering main part of property plus about 40,000 acre area - including northerly altered zone identified in Cusmap work).
- Year 1 spending:
  - \$100,000 on Shale City occurrence (120-acre area)
  - \$100,000 in other area, to north
- If goes to production:
  - \$3.00/acre annual "rental"
  - 5% N.S.R.

/ck

SHALE CITY PROJECT  
JACKSON COUNTY, OREGON  
SUMMARY REPORT (1986-1987)

Target Concept

1. Epithermal hot springs system with bulk tonnage Au-Ag target within mid-Tertiary volcanics characterized by high levels of opal-chalcedonic alteration and strong Hg-As anomalies.
2. Target size is 1500 feet long by 300 feet wide by 100-200 foot depth, with an estimation of 3-6 million tons at 0.10 opt Au and 0.50 opt Ag.

Land Status

Boise Cascade holds 44 unpatented claims totaling 880 acres and 180 acres of fee land covering this prime target zone. All other adjacent lands are held as private patented fee lands.

Geology

Mid-Tertiary volcanics cover the area, consisting of underlying latite volcanic flows, breccias, agglomerates and tuffaceous rocks which also contain important intragaben basin sediments of carbonaceous "oil shale" and volcaniclastic sediments. Younger postmineral mafic flows and tuffs overlie this sequence and cover a broad area of the western Cascade province.

Strong northwesterly trending graben structures extend throughout this region and form block fault boundaries for the volcanic units and apparently acted as controls for the site of hot springs hydrothermal activity. The volcanic carbonaceous sediments appear to be flat-lying and are generally within a few ten to a few hundred feet of the surface.

A broad area of pervasive alteration covering about two square miles is developed in the Shale City area and appears to be controlled by graben boundary northwest faults. Within this alteration zone, there are local areas of intense opal-chalcedonic alteration and refractured and rehealed opaline breccia with intense clay alteration along the peripheral faults. Previous mining in the area includes Hg prospects, clay pits and naturally retorted shale oil all within the limits of the hot springs system. These altered zones are up to 2,000 feet in width and are covered by late-Tertiary post-mineral volcanics. Minimal sulfides are developed within the system and it appears to have the aspects of a classic, vertical-zone hot springs system.

Work Completed to Date

Preliminary evaluation has consisted of rock-chip sampling, grid soil sampling and semireconnaissance geologic mapping. A total of 44 claims were staked. Further detailed work is required.

Results of this program include:

1. Delineation of a large alteration zone with multilithologic latite volcanics covering an area of about two square miles. Strong pervasive opaline-chalcedony and clay are developed internally along major structures.
2. Soil geochemistry has outlined several Ag-Hg anomalies generally associated with the more intense alteration zones.
3. Vertical zoning may be evident as the opaline-chalcedony zones are exposed on higher ridges combined with Hg geochemistry, while clay and Ag-Hg anomalies are present at lower elevations in the deeply incised valley to the west.

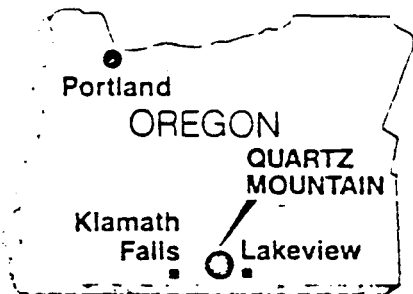
### Conclusions

Strong hydrothermal activity consisting of opaline-chalcedony, clay alterations, Hg prospects and naturally retorted "oil shale" indicate a large epithermal hot springs system which could be a prime gold-silver target based on application of vertical zoning models. The interbedded "oil shale" unit may produce a dual purpose of forming both an impermeable cap to circulating epithermal solutions as well as providing a highly reactive carbonaceous-rich zone for gold deposition once this cap was breached. High grade values within a limited vertical range may be the product of superimposing the hot springs system on the oil shale horizon.

The proposed program includes detailed geologic mapping, in-fill geochemical soil sampling, geophysical methods to trace major structures and 2,000 feet of reverse circulation drilling in four holes.



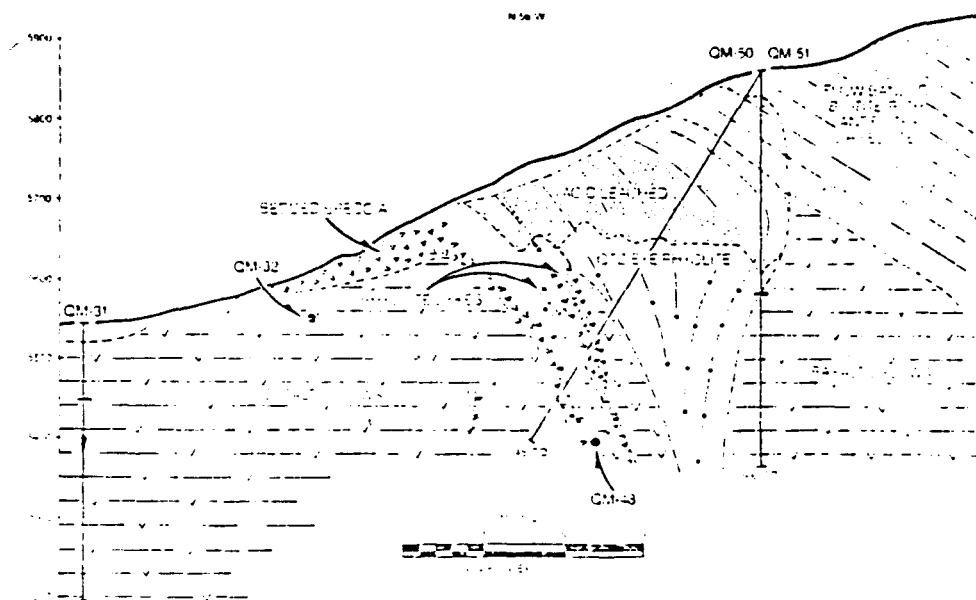
**THE CRONE HILL/  
QUARTZ BUTTE  
PROPERTY**



The 8000 acres owned by Quartz Mountain Gold Corp. are located in south central Oregon, 30 miles west of the town of Lakeview and 30 miles north of the California border. Highway 140 cuts across the southwest corner of the property and there are secondary roads providing additional access. The claims lie in the Fremont Range at an elevation of about 5,600 feet. Relief and climate are moderate.

In total, the property consists of a major gold discovery and three additional large gold exploration targets. Anaconda Minerals Company (a subsidiary of Atlantic Richfield Co.) originally put together the discovery, and at the time Anaconda ceased mining and exploration operations in 1985, Crone Hill was considered its best gold project. Anaconda's drilling outlined an enormous epithermal gold deposit similar in geology to Round Mountain and many other Nevada gold mines.

CROSS SECTION OF THE QUARTZ BUTTE AREA



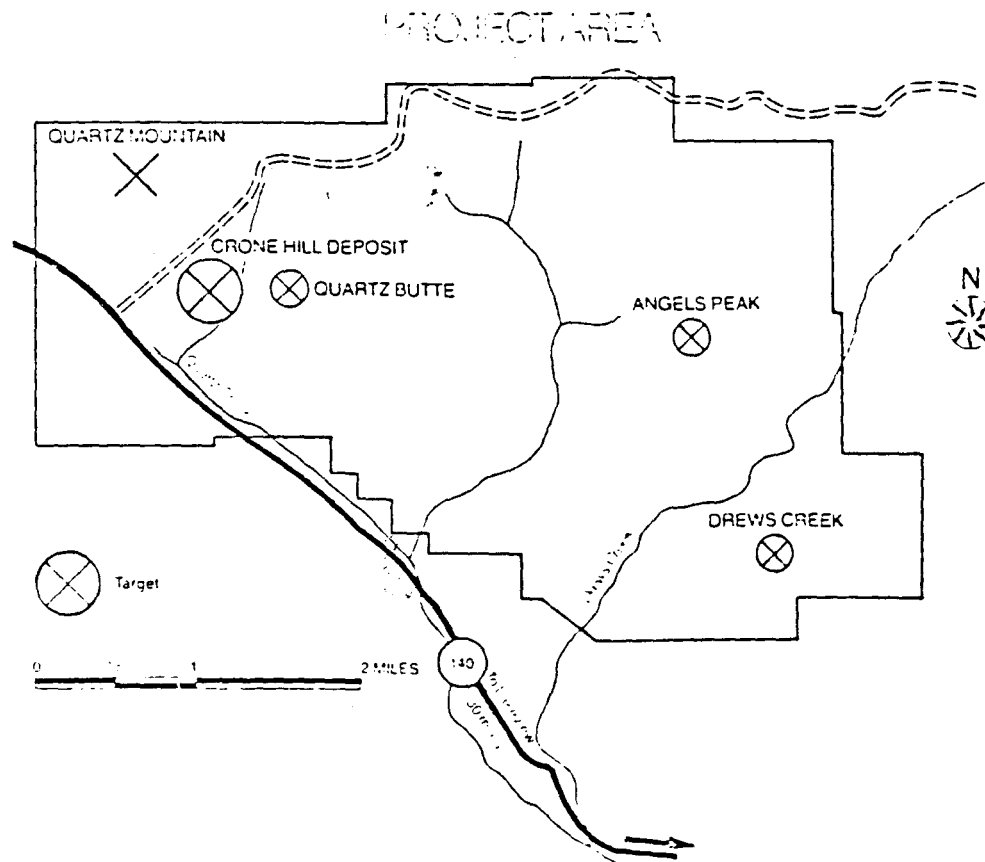
## PROPERTY HISTORY

The earliest recorded activity on Crone Hill was carried out by Sun Oil Co. in the late 1930s, although overgrown pits and trenches attest to even earlier exploration, perhaps by migrant Chinese prospectors in the late 1880s. By 1949, only a small amount of gold had been recovered. In 1957, discoveries of uranium and mercury occurrences nearby supported a high level of prospecting activity, and mercury was mined at Angels Peak on the eastern part of Quartz Mountain Gold's property. The claims were allowed to lapse as the market for mercury declined in the 1960s.

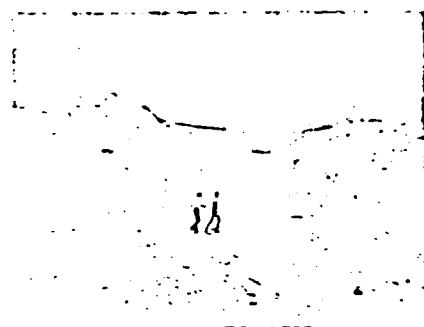
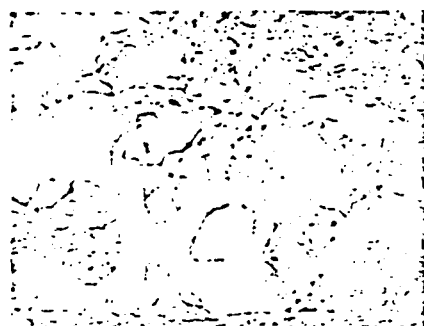
The few remaining claims were optioned by Exploration Ventures Co., of Spokane, who in 1982 joint ventured the property with Anaconda Minerals Company. At that time, Anaconda enlarged the claim block to its present size.

Between 1983 and 1985, Anaconda carried out field programs consisting of geological mapping, detailed mapping of Crone Hill, and soil and geochemical sampling in the Crone Hill area. A regional airborne magnetic survey and limited induced polarization resistivity surveys were carried out at the west end of the property. A ground magnetometer survey was also done across the IP grid.

Anaconda completed 30 holes totalling 11,525 feet of rotary reverse circulation and diamond drilling on the Crone Hill deposit and calculated open pit, drill-indicated mineral reserves of from 10 to 25 million tons grading 0.04 ounces of gold per ton using a cut-off of 0.020 and a 2:1 stripping ratio.



## GEOLOGY OF THE GOLD MINERALIZATION



The Crone Hill orebody is a disseminated, volcanic hosted, hot springs gold deposit, similar in character to many of the Nevada Basin and Range gold mines. It occurs in and around one of a series of highly altered, seven million year-old rhyolite domes that were injected in a northwest trending belt along Basin and Range structures. Gold mineralization was deposited by hot springs associated with the late stages of this rhyolite volcanism.

Breccias and fracturing created during injection of the rhyolite, and permeable layers within the surrounding volcanic rocks, distributed the gold-bearing fluids. The major ore type at Crone Hill is hosted by the surrounding altered volcanic rocks. One particular layer, referenced as #5, is extensively mineralized. It is a gently dipping bed that crops out along the south flank of Crone Hill where it can be traced for over 3000 feet. Drilling has located bed #5 over 2000 feet down dip from outcrop.

The first series of eight holes drilled by Quartz Mountain Gold at Crone Hill in 1986 intersected an average mineable ore thickness of 125 feet within bed #5. These holes were 400 feet apart and from 200 to 400 feet or more from previous drilling. Without question, they add to the reserves predicted by Anaconda and confirm the existence of a significant orebody.

The primary mineralogy of bed #5 ore is relatively simple, consisting of free gold with silica and the iron sulfides, marcasite and pyrite. There is no indication that the gold is locked in the sulfides or in silica. Mercury and antimony, which occur with or without gold in some old mercury diggings on the property, are not found in significant quantities in bed #5.

Wherever the ore zone is at or near the surface, the sulfide minerals have been removed through oxidation. This essentially leaves only gold and silica. Approximately two-thirds of the ore drilled so far by Quartz Mountain Gold is oxidized. Bed #5 ore is also porous and easily crushed. These physical properties and the mineralogy indicate that the ore should be amenable to low-cost heap leach extraction.

Metallurgical samples of all ore types are presently being compiled. Testing will begin in early Autumn. A comprehensive program has been designed that will include a full range of laboratory tests, column leach tests and a pilot heap leach plant.

# State Department of Geology and Mineral Industries

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## SUPPLEMENTAL REPORT

SHALE CITY  
(Min-A-Ray Property)

Jackson County  
Ashland Area

### Appendix C - Oil Shale Investigation

The Shale City deposit was visited again on July 14, 1966, by N. V. Peterson and V. C. Newton. The purpose of this investigation was to determine the limits of the deposit if possible.

Southeast of the "old camp" approximately 1/8 mile were the remnants of a crushing plant and retort. The structure was located on a steep hillside above the road to facilitate loading. A narrow gauge railroad led from the retort back uphill to the main pit; only the road grade remains with an occasional railroad tie along the edge.

The main pit is dug nearly on strike with the shale and extends for 150 feet. The oil shale is interbedded with fine silty tuffaceous sandstone. The top 12-18 feet of beds exposed in the pit are mostly thin shale layers underlain by approximately 6 feet of tuffaceous sandstone. The bottom 20 feet of exposed section is composed of thin shale beds and interbedded tuffaceous sandstone. The base of the lower shale section is not exposed and could extend many tens of feet below the pit. The thickest shale bed occurs in the upper portion of the pit; one bed is 3 $\frac{1}{2}$ -4 feet thick.

The shale weathers a light buff to almost white. There are two types of shale: the black shale and the brown "mahogany colored" shale. Both types give off a bituminous odor on fresh fracture.

The shale could be traced for at least 600 feet along the strike and possibly could extend for 1000 feet. The exposed width of the body is close to 150 feet. Strike of the shale body is N. 50° E., dip approximately 20° SE.

The shale occurrence was explored in all directions. It appeared to be an elongate body 1000 feet in length by no more than 200 feet wide. The shale is covered on top by a whitish hard silicified or welded tuff and underlain by a medium gray tuff of the same type. The shale may be an erosional remnant of lake sediments enclosed in tuff beds or it may be a faulted portion of a small lake basin. In either case the deposit appears to be small or economically inaccessible to open pit operations. Estimated size is less than 150,000 tons.

Mr. Matthew P. Thomas was staying at his cabin on the Shale City site at the time the current investigation was made. He said that he still owned the property and used the "minerals" associated with the shale for a patented medicine. The mineral appeared to be a coating of sulphur on fracture faces in the shale.

The extent of the shale is fairly well outlined and complete analysis shows commercial grade material. No further investigations are planned of the Shale City deposit by the Department.

Report by: V. C. Newton, Jr.  
7-19-66

STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES  
702 Woodlark Building, Portland 5, Oregon

CLAY FIRING REPORT

(4)  
IG-251

Date January 20, 1949

Reference number P7995-C-228

Dear Mr. Dole:

The analysis of the clay you submitted to this office for testing is as follows:

Dry color: Cream  
Texture: Pulps received  
Wet color: Grey cream  
Plasticity: Poor  
Drying shrinkage: 6%  
Drying behavior: Good  
Water of plasticity: 45%

Firing properties

At 1900°-F.:

Color Pink  
Shrinkage

Total shrinkage:

Absorption

1938

3

8

29

At 2050°-F.:

Color Pink  
Shrinkage

Total shrinkage:

2030

9

15

15

Firing behavior: Good

Remarks:

Clay

STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES  
702 Woodlark Building, Portland 5, Oregon

CLAY FIRING REPORT

(8)  
IG-255  
P7999  
P7994 - C224

Date January 19, 1949

Reference number P7994 - C224

Dear Mr. Dole:

The analysis of the clay you submitted to this office for testing is as follows:

Dry color: Pale cream

Texture: Very fine grain massive

Wet color: Dark cream

Plasticity: Highly plastic

Drying shrinkage: 9% linear

Drying behavior: Poor, great deal of warpage and twisting

Water of plasticity: 54%

Firing properties

At 1900° F.:

Color Pink  
Shrinkage

Total shrinkage:

ABSORPTION

1958

7%

16.%

2030

7.5%

16.5%

At 2050° F.:

Color Grey Pink  
Shrinkage

Total shrinkage:

2138

8.5%

17.5%

2175

8.5%

17.5%

Firing behavior: Poor

Remarks:

Absorption

1958 - 9.7%  
2030 - 0.4%  
2138 - 0.13%  
2175 - 0.0

Clay

STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES  
702 Woodlark Building, Portland 5, Oregon

CLAY FIRING REPORT

(9)  
IG-256

P8000

C-230

Date January 20, 1949

Reference number C-230

Dear Mr. Dole:

The analysis of the clay you submitted to this office for testing is as follows:

Dry color: Lt. grey cream  
Texture: Pulp received  
Wet color: Grey cream  
Plasticity: Extremely plastic  
Drying shrinkage: 16%  
Drying behavior: Poor  
Water of plasticity: 68%

Firing properties

At ~~1900° F.~~ :

Color Buff  
Shrinkage

Total shrinkage: Absorption

1958

4

20

21.6

2030

5

21

16.7

At ~~2050° F.~~ :

Color Buff  
Shrinkage

Total shrinkage:

2138

7

22

12.1

2175

6

22

12.8

Firing behavior: Fair

Remarks:

Clay



STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES  
702 Woodlark Building, Portland 5, Oregon

CLAY FIRING REPORT

(3)  
IG-250

Date January 20, 1949

Reference number P7994-0229

Dear Mr. Dole:

The analysis of the clay you submitted to this office for testing is as follows:

Dry color: Lt. Cream

Texture: Pulp received

Wet color: Grey cream

Plasticity: Extreme

Drying shrinkage: 15%

Drying behavior: Very poor, great lamination and checking of bars. Did not dry in 7 days at 75°F.

Water of plasticity: 2.5%

Firing properties

At <del>1900</del> -F. :	Color Buff Shrinkage	Total shrinkage:	Absorption
1938	3.5	18.5	13.0
At 2050-F. :	Color Shrinkage	Total shrinkage:	
2175	5.0	20.0	5.9

Firing behavior: Poor - spalling and excessive checking.

Remarks:

Chap

STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES  
702 Woodlark Building, Portland 5, Oregon

CLAY FIRING REPORT

(2)  
I.G.L. 249

Date January 20, 1949

Reference number (P-7993-C-227)

Dear Mr. Dole:

The analysis of the clay you submitted to this office for testing is as follows:

Dry color: Cream  
Texture: Received pulps  
Wet color: Dark cream  
Plasticity: Very good  
Drying shrinkage: 16%  
Drying behavior: Good  
Water of plasticity: 51.2%

Firing properties

At 1900°-F. :

	Color	Buff
1958	1.5%	
2030	4.0%	

Total shrinkage:	Absorption
17%	15%
20%	11.2%

At 2050°-F. :

	Color	Buff
2138	5.5%	
2175	5.5%	

Total shrinkage:	
22%	7.2%
21%	7.7%

Firing behavior: Good

Remarks:

*Clay*

# Ceramic Tests

## Summary

### HAMISH BENTONITES

2 P7993  
3 P7994  
4 P7995  
7 P7999  
9 P8000

These materials vary as to physical properties. Two, P7993 and P7995 are almost non-swelling and have the best drying qualities and lowest water of plasticity. These work more like clays. All the others, P7994, P7999 and P8000 are of the swelling type and are gummy and sticky and show a great deal of warpage and rather high shrinkage. These are much too plastic to be used alone as a raw material for any ceramic product at the present time.

In samples P7993 and P7995 the shrinkage between C/04 and C/02 is rather high on a percentage basis. While in the other samples the shrinkage is not so great in this temperature range.

These samples were put through a standard test for clay for the ceramic industry as set up by the A.S.T.M. and the comparisons are therefore against a somewhat different material.

The only recommendation that could be made for these materials is for samples P7994, P7999 and P8000. These could be used in the ceramic industry as a floative for enamel and glaze slips in percentages of  $\frac{1}{2}$  - 1% and as a plasticizer or binder for plastic bodies in the amounts of 1 -  $2\frac{1}{2}$ %.

Charles W. Jacobs

PETROGRAPHIC REPORT

Sample No.	Color (air-dried, finely ground)	% of feldspars	Index of Refraction
2 P-7993 (IG-249)	Tan-cream	5-10%	circa 1.55 all > 1.54 99% < 1.56
3 P-7994 (IG-250)	White with tinge of cream	5% <del>±</del>	> 1.55 < 1.56
4 P-7995 (IG-251)	Off-white (grayish tinge)	5-10%	circa 1.54 (1.543) est. to circa 1.51 (1.528) est.
5 P-7996 (IG-252)	Off-white	10-15%	> & < 1.51 (mostly > )
6 P-7997 (IG-253)	White with tinge of cream	10-15%	> & < 1.51 (mostly > )
7 P-7998 (IG-254)	White with slight tinges of grey	5-10%	> & < 1.52 (mostly > )
8 P-7999 (IG-255)	White with slight tinges of grey	5-10%	> & < 1.52 (about=amts.)
9 P-8000 (IG-256)	Pure white	10-15%	> & < 1.51 (mostly > ) > & < 1.52 (mostly < )

Petrographic Report (cont.)

Amount of Swelling in Water	Color reaction with Benzidine Base	% anisotropic	Determination
None to extremely slight	instant = colorless ----- After 5 min. = aquamarine 3I pg 93*	70	<u>Predom.</u> Halloysite ?
Very slight	very light blue ----- Medium lt. blue 5F pg 93	80	<u>Predom.</u> Halloysite ?
None to extremely slight	very lt. blue ----- medium Dk. blue 4G pg 95	75-80	<u>Predom.</u> Beidellite and/or Montmorillonite
Slight 1-2 times	Dk. blue ----- Deep bright blue 12J pg 95	50-60	<u>Predom.</u> Montmorillonite
Estimated 5 x plus	Same	60-70	<u>Predom.</u> Montmorillonite
Est. 2-3 times	Same	75-85	<u>Predom.</u> Montmorillonite
Est. 2-3 times	Same	70-80	<u>Predom.</u> Montmorillonite
Est. 1-2 times	Lt. blue ----- little lighter than above, 10K pg 93	50-60	<u>Predom.</u> Montmorillonite

\* Numbers refer to color in Maerz & Paul "Dictionary of Color".

Qualitative spectrographic analyses made on samples 4, 5, 6, & 9 are as follows:

QUALITATIVE SPECTROGRAPHIC ANALYSIS

(Quantities estimated to nearest power of ten)

#4	#5	#6	#9
(P-7995)	(P-7996)	(P-7997)	(P-8000)

1. Elements present in concentrations over 10%

Si	Si	Si	Si
Al	Al		Al

2. Elements present in concentrations 10% - 1%

	Ca		
Na	Na	Al	Na
Fe	Fe	Fe	Fe
	Mg	Ca	Ca

3. Elements present in concentrations 1% - 0.1%

Mg		Mg	Mg
		Na	

4. Elements present in concentrations 0.1% - .01%

Ca	Ba	Mn	Ba	Ti	Ti
Ti	Sr	Ti	Ni		Pb
Pb	Ni	Pb	Sr		Ba
Cr					Ni

5. Elements present in concentrations .01% - .001%

Mn	B	Mn	Sr	Mn	B
V	V	V	B	V	Sr
Ga	Ga	Ba	Ni	Ga	
B					

6. Elements present in concentrations below .001%

Cu	Cu	Cr	Cr
	Cr	Cu	Cu
			Be

---

Sample no.	Color (air-dried, finely ground)	% of feldspars, etc.	Index of Refraction	Amount of Swelling	Color reaction with Ben. Base	% anisotropic	Called
P-3277 (old sample)	White with tinge of yellow	5-10% Ab <sub>6</sub> An <sub>4</sub>	>1.50 (80% <)	Est. 2-3 times	Same as IG-252 to IG-255	70	<u>Predom.</u> Montmerillionite

Sample No.	Color (air-dried, finely ground)	% of feldspars, etc.	Index of Refraction	Amount of Swelling	Color reaction with Ben. Base	% anisotropic	Called DETERMINATION
2 P-7993 (IG-249)	Tan-cream	5-10%	circa 1.55 all >1.54 99% <1.56	None to extremely slight	Instant = color less ----- After 5 min. = aquamarine 3I pg 93 *	70	<u>Predom.</u> Halloysite ?
3 P-7994 (IG-250)	White with tinge of cream	5%±	>1.55 <1.56	Very slight	Very light blue ----- Medium lt. blue 5F pg 93	80	<u>Predom.</u> Halloysite ?
4 P-7995 (IG-251)	Off-white (grayish tinge)	5 - 10%	Circa 1.54 (1.543) est. to Circa 1.52 (1.528) est	None to extremely slight	Very lt. blue ----- Medium dk. blue 4G pg 95	75-80	<u>Predom.</u> Beidellite and/or Montmorillonite
5 P-7996 (IG-252)	Off-white	10-15%	>&< 1.51 (mostly > )	Slight 1-2 times	Dk. blue ----- Deep bright blue 12J pg 95	50-60	<u>Predom.</u> Montmorillonite
6 P-7997 (IG-253)	White with tinge of cream	10-15%	>&<1.51 (mostly > )	Estimated 5x plus	Same	60-70	<u>Predom.</u> Montmorillonite
7 P-7998 (IG-254)	White with tinge of grey	5-10%	>&<1.52 (mostly > )	Est. 2-3 times	Same	75-85	<u>Predom.</u> Montmorillonite
8 P-7999 (IG-255)	White with slight tinge of grey	5-10%	>&<1.52 (about=amts)	Est. 2-3 times	Same	70-80	<u>Predom.</u> Montmorillonite
9 P-8000 (IG-256)	Pure white	10-15%	>&<1.51 (mostly > ) >&<1.52 (mostly < )	Est. 1-2 times	Lt. blue ----- little lighter than above, 10K pg 93	50-60	<u>Predom.</u> Montmorillonite

\* Numbers refer to color in Maerz & Paul, "Dictionary of color"



# State Department of Geology and Mineral Industries

702 Woodlark Building  
Portland, Oregon

Report by H. D. Wolfe  
February 10, 1949

Ashland Mining Dist.  
Jackson County

Name of property Hamish Bentonite (Ormico)

Owner Harry Hamish 2805 NE Weidler St.  
Portland, Oregon

Area 400 acres of deeded land and 7 claims.

Location In sections 4, 5, and 9, T 38s, R 2e. Camp is at the former location of Climax P. O. The principal workings are reached from Camp by approximately  $1\frac{1}{2}$  mile of trail. It is 28 miles from Medford by road. This included approximately 11 miles of paved and 17 miles of dirt and graveled road, the latter part of which is accessible during the summer months only. Camp is at approximately 3500' elevation and the principal workings are located at 4300-4500' elevation.

History "Bentonite was first recognized in 1944. Prior to this the property was worked for the medicinal values obtained from the clay and springs, from which the Ormico Products are made-----"\*

In August, 1948 seven claims were located in section 9 adjacent to the deeded property.

Department

\* Report by H. M. Dole - 9/10/46

en, Mo, Zm

Development Work

Development consists of numerous small cuts. See accompanying map showing location of these and section under geology for description.

Geology

The area has been mapped by Wells\* as part of the Tertiary Volcanic Rocks of the Western Cascades. The bentonite occurs in a land slide area along or adjacent to what has been mapped as a fault contact between the lava series (dominantly dark-gray andesite flows) and the overlying white rhyolitic tuff. Alteration of the tuff to bentonite is believed to have been largely due to percolating waters along the fault. Referring to the tuff Wells says, "The tuff layer is about 250' thick and in most places does not show distinct bedding but breaks off in flakes or thin slabs. It is uniformly fine grained and of silicious composition. Leaf prints were found in this tuff in one place."

The topography is extremely irregular and hummocky with seeps and springs common. The landslide area extends at least as far south as the Pit claim. In Durrham and Durrham #2 claims there was little noticeable evidence of displacement in the immediate vicinity of the cuts visited.

Description of samples and the cuts from which they were taken are as follows:

\* Preliminary Geologic Map of the Medford Quadrangle- F. G. Wells - 1939

<u>Sample No.</u>	<u>Assay No.</u>	<u>Description</u>
1.	no tests made	Sample of slightly altered white tuff from location cut of Durrham #2 claim. Material exposed is soil and unconsolidated weathered tuff. Cut is 10' into hill - 6' depth at face. Aneroid-4500'.
2.	P-7993 IG-249	Sample of tuffaceous, cream colored clay from cut on Durrham claim. Cut is 8' into hill - 8' depth at face. Aneroid-4475.
3.	P-7994 IG-250	Sample of tuffaceous, white to cream colored clay from location cut on Durrham claim. Cut is 25' into hill - 10' depth at face. Aneroid-4490'.
4.	P-7995 IG-251	Sample of grayish white clayey tuff from cut on Durrham claim. Cut is 10' into hill - 8' depth at face. Aneroid-4480'.
5.	P-7996 IG-252	Sample of grayish white clay from cut near north center-post of Pit claim. Cut extends 6' into hill - 6' depth at face. Aneroid-4375'.
6.	P-7997 IG-253	Sample of grayish cream colored clay from location cut of Sunshine claim located 1000' from north end-line. Small veins of aragonite are present in the clay. Cut extends 12' into hill - 10' depth at face. Aneroid-4325'.

Geology (cont.)

<u>Sample No.</u>	<u>Assay No.</u>	<u>Description</u>
7.	P-7998 IG-254	Sample of grayish cream colored clay from the north cut on Sunshine claim. Cut extends 10' into hill - 5' depth at face. Aneroid-4350'.
8.	P-7999 IG-255	Sample of grayish cream colored clay from cut located on deeded land 75' NW from the NE corner of the Sunshine claim. Cut is 10' into hill - 8' depth at face. Aneroid-4340'.
9.	P-8000 IG-256	Sample of white clay from cut located on trail 125' north from the NE corner of the Sunshine claim. Cut is 10' into hill - 6' depth at face. Aneroid-4375'.

A small cut on Durrham #1 claim, located well below the trail at approximately 4300' elevation was also examined but no samples were taken. The material exposed is a weathered, non-bentonitic, buff-colored tuff.

Dole's petrographic determinations limit the true bentonite clay to samples 5 through 9. These are characterized by a predominance of montmorillianite and by the substantial swelling when placed in water.

A possible length in excess of 1500' for the bentonite is indicated, however, the continuity of the zone between widely spaced surface cuts has not been established. All of the bentonite cuts visited are in the "slide" area and at no point was the bentonite observed in place with the possible exception of the two cuts in section 4. Neither the width nor thickness of the deposit is indicated by present exposures.

Samples 2 and 3 appear to be common clays derived by surface weathering of the tuff. It is doubtful if they are related in origin to the bentonites.

Sample 4 is essentially a tuff rather than a clay. It has, however, been partially altered to a clay which shows some bentonite characteristics.

Of interest is the 5-15% feldspar content in all samples. Lowry\* identified it as either basic oligoclase or acid andesine in sample P-3277. These grains presumably occurred as phenocrysts in the original tuff.

\* Letter to H. M. Dole - 9/25/46

Note:

Complete results of petrographic examination, spectroscopic analyses, and ceramic tests are included in the supplement to this report.

Informant:

Harry Hamish

Report by:

H. D. Wolfe

Date of Report:

February 10, 1949

Petrographic Report:

H. M. Dole

Spectroscopic Analysis:

Thomas C. Mathews

Ceramic Tests:

C. W. F. Jacobs

SUPPLEMENT

to accompany report on  
HAMISH BENTONITE PROPERTY  
Ashland Mining Dist. - Jackson Co.  
February 10, 1949

Included are:

Sketch Map of Property  
Petrographic Report  
Spectrographic Analyses  
Ceramic Tests

Ceramic tests

Samples 2, 3, 4, 8, and 9 were put through a standard test for clay for the ceramic industry as set up by the American Society of Testing Materials with the following results:

CLAY FIRING REPORT

Date January 20, 1949

Reference number 2  
IG-249  
P-7993-C-227

Dry color: Cream  
Texture: Received pulps  
Wet color: Dark cream  
Plasticity: Very good  
Drying shrinkage: 16%  
Drying behavior: Good  
Water of plasticity: 51.2%

Firing properties

At:	Color Buff Shrinkage	Total shrinkage:	Absorption:
1958°F	1.5%	17%	15%
2030°F	4.0%	20%	11.2%
At:	Color Buff	Total shrinkage:	Absorption:
2138°F	5.5%	22%	7.2%
2175°F	5.5%	21%	7.7%

Firing behavior: Good



CLAY FIRING REPORT

Date January 20, 1949

Reference number 4  
IG-251  
P-7995-C-228

Dry color: Cream

Texture: Pulps received

Wet color: Grey cream

Plasticity: Poor

Drying shrinkage: 6%

Drying behavior: Good

Water of plasticity: 45%

Firing properties

At:	Color Pink Shrinkage	Total shrinkage:	Absorption:
1938°F	3	8	29
At:	Color Pink Shrinkage	Total shrinkage:	Absorption:
2030°F	9	15	15

Firing behavior: Good

CLAY FIRING REPORT

Date January 20, 1949

Reference number 3  
IG-250  
P-7994-C-229

Dry color: Lt. Cream

Testure: Pulp received

Wet color: Grey cream

Plasticity: Extreme

Drying shrinkage: 15%

Drying behavior: Very poor, great lamination and checking of bars. Did not dry in 7 days at 75°F.

Water of plasticity: 2.5%

Firing properties

At:	Color Buff Shrinkage	Total shrinkage:	Absorption:
1938°F.	3.5	18.5	13.0
At:	Color Buff	Total shrinkage:	Absorption:
2175°F.	5.0	20.0	5.9

Firing behavior: Poor - spalling and excessive checking.

CLAY FIRING REPORT

Date January 19, 1949

Reference number 8

IG-255  
P-7999-C-224

Dry color: Pale cream

Texture: Very fine grain massive

Wet color: Dark cream

Plasticity: Highly plastic

Drying shrinkage: 9% linear

Drying behavior: Poor, great deal of warpage and twisting

Water of plasticity: 54%

Firing properties

At:	Color Pink Shrinkage	Total shrinkage:	Absorption:
1958°F	7%	16%	9.7%
2030°F	7.5%	16.5%	0.4%

At:	Color Grey Pink	Total shrinkage:	Absorption:
2138°F	8.5%	17.5%	0.13%
2175°F	8.5%	17.5%	0.0

Firing behavior: Poor

CLAY FIRING REPORT

Date January 20, 1949

Reference number 9

IG-256  
P-8000-C-230

Dry Color: Lt. grey cream  
Texture: Pulp received  
Wet Color: Grey cream  
Plasticity: Extremely plastic  
Drying shrinkage: 16%  
Drying behavior: Poor  
Water of plasticity: 68%

Firing properties

At:	Color	Buff	Total shrinkage:	Absorption:
1958°F	4		20	21.6
2030°F	5		21	16.7
At:	Color	Buff	Total shrinkage:	Absorption:
2138°F	7		22	12.1
2175°F	6		22	12.8

Firing behavior: Fair

## Ceramic Tests

### SUMMARY

These materials vary as to physical properties. Two, P-7993 and P-7995 are almost non-swelling and have the best drying qualities and lowest water of plasticity. These work more like clays. All the others, P-7994, P-7999 and P-8000 are of the swelling type and are gummy and sticky and show a great deal of warpage and rather high shrinkage. These are much too plastic to be used alone as a raw material for any ceramic product at the present time.

In samples P-7992 and P-7995 the shrinkage between C/04 and C/02 is rather high on a percentage basis. While in the other samples the shrinkage is not so great in this temperature range.

These samples were put through a standard test for clay for the ceramic industry as set up by the A.S.T.M. and the comparisons are therefore against a somewhat different material.

The only recommendation that could be made for these materials is for samples P-7994, P-7999 and P-8000. These could be used in the ceramic industry as a floative for enamel and glaze slips in percentages of  $\frac{1}{2}$  - 1% and as a plasticizer or binder for plastic bodies in the amounts of 1 -  $2\frac{1}{2}$  %.

# State Department of Geology and Mineral Industries

702 Woodlark Building  
Portland, Oregon

Report by H. M. Dole  
September 10, 1946

Ormico (Hamish) Bentonite

Ashland Mining District  
Jackson County

Owner:

Ormico Products  
Harry Hamish, pres.

P. O. Box 845  
Medford, Oregon

Wilford Long, sec.

401 Pittock Bldg.  
Portland, Oregon

Area:

400 acres of deeded land.

Location:

In sections 4 and 5, T.38S, R.2E. Camp is at the former location of Climax P. O. The headwaters of Antelope Creek run through the property. It is 28 miles from Medford and 18 from Ashland by road.

History:

Bentonite was first recognized in 1944. Prior to this the property was worked for the medicinal values obtained from the clays and springs, from which the Ormico Products are made. Present work consists of leaching the "medicine" clay and preparation of their product.

Topography:

typical landslide topography.

Development work:

One small (4' wide by 1' deep) cut and several hand auger holes for the bentonite. The "medicine clay" has been "opened up" by a few small cuts. There are several sheds to hold the "crystals" of the "medicine clay" and one building for the curing and bottling of the tonic.

Geology:

The Preliminary Geologic Map of the Medford Quadrangle (Wells '39) shows this to be a landslide area in the tertiary lava series of the Western Cascades. A fault is mapped at this locality as forming the contact between the lava series and the overlying white rhyolitic tuff. One mile to the southeast is Shale City where Wells reports a "very thinly laminated, carbonaceous, tuffaceous shale containing leaf prints", and Mr. Hamish stated that coal seams are found on Grizzly Peak one mile to the southwest.

As far as could be determined, the bentonite and "medicine" clay has been explored only along the fault zone.

# State Department of Geology and Mineral Industries

702 Woodlark Building  
Portland, Oregon

The area that was visited and in which the exploration has been done is typical landslide topography: hummocky, small blocks tipped at all angles, disrupted drainage, and uneven slopes. Springs and seeps are common and evidently mark the fault mapped by Wells. It is believed that percolating waters along the fault have been largely responsible for the alteration of the ash. Throughout the shifted blocks there are spots of altered material which appear to be of a fairly good grade of bentonite and much better quality than the cut visited. These spots were not continuous and were mixed with the soil so are not of economic size. However, they indicate that alteration and saturation by solutions is the reason for the bentonite and the landslides. Therefore if any bentonite is to be found it will be near the fault zone and its quantity would be determined by the amount left after movement.

Mining:  
None.

#### Economics:

The continuity of the bed exposed by the cut saw is questionable. But if tests prove this to be a good grade of bentonite it is likely that the horizon could be found in place without too much expense.

Mr. Hamish states that in the cuts made, a thickness of 15' to 20' is indicated. He also stated that a small drift in bentonite was driven last year about a mile north of the one cut visited. This drift is now covered so was not seen. But if this is also of good quality considerable tonnage is indicated.

If possible several new cuts and drifts are to be made this autumn to try and determine the exact attitude of the bentonite horizon. If this work is done I will revisit the property.

At the present time the road from Medford to the property is only a fair weather road and in many spots is very rough. The last  $\frac{1}{2}$  to a mile must be made on foot. Next month, October, a logging outfit is supposed to start putting in a gravelled road which will connect with the road to Ashland. If this is done the property will be readily accessible.

#### Samples:

1. From the 4' x 8' cut visited. This has been exposed for some time and is somewhat weathered. The material is light yellowish-green in color, somewhat sticky and has a "soapy" feel.

2. Float from just below the bunkers of the "medicine clay". White in color, unctious, and has a conchoidal fracture. This is probably just a common clay. Mr. Hamish thought it might be desiccated "medicine clay".

3. Float from various places along the trail from end of the road



**STATE DEPARTMENT OF GEOLOGY  
AND MINERAL INDUSTRIES**

702 WOODLARK BUILDING  
PORTLAND 5, OREGON

General Laboratory Number P-7995, P-7996  
P-7997, P-8000

Date received \_\_\_\_\_

Spectrographic Laboratory Number \_\_\_\_\_

Sample received from H. Dole

**QUALITATIVE SPECTROGRAPHIC ANALYSIS**

(Quantities estimated to nearest power of ten)

#4 (P-7995) #5 (P-7996) #6 (P-7997) #7 (P-8000)

1. Elements present in concentrations over 10%.

Si	Si	Si	Si
Al	Al		Al

2. Elements present in concentrations 10% - 1%.

Na	Na Ca	Al <sup>mg</sup>	Na
Fe	Fe	Fe	Fe
	Mg	Ca	Ca

3. Elements present in concentrations 1% - 0.1%.

Mg		Mg	Mg
		Na	

4. Elements present in concentrations 0.1% - .01%.

Ca Ba	Mn Ba	Ti	Ti
Ti Sr	Ti Ni		Pb
Pb Ni	Pb Sr		Ba
Cr			Ni

5. Elements present in concentrations .01% - .001%.

Mn	B	Mn Sr	Mn B
V	V	V B	V Sr
Ga	Ga	Ba Ni	Ga
B			

6. Elements present in concentrations below .001%.

Cu	Cu	Cr	Cr
	Cr	Cu	Cu
	Be		Be

Thomas C. Matthews, Spectroscopist



KG-154-155  
Oil

REQUEST FOR SAMPLE INFORMATION

The State Law governing free analysis of samples sent to State Assay Laboratories requires that certain information be furnished the Laboratory regarding samples sent for assay or identification. A copy of the law will be found on the back of this blank. Please fill in the information called for as completely as possible, and submit it along with your sample. Keep a copy of the information on each sample for your own reference.

Your name in full H. M. Dole and David J. White

Post office address Portland Office

Are you a citizen of Oregon Yes Date on which sample is sent July 17, 1950

Name (or names) of owners of the property M. P. Thommes (?)

Name of claim sample obtained from Min-A-Ray Property, Shale City

Location of property or source of sample (describe as accurately as possible below):  
(If legal description is not known, give location with reference to known geographical point.)

County Jackson Mining district Ashland

Township 38 S Range 2 E Section 16 Quarter section \_\_\_\_\_

How far from passable road and name of road immediately below a logging road

	Channel (length)	Grab	Assay for	Description
Sample no. 1	<u>3 1/2'</u>		<u>OIL</u>	<u>Chip sample along a channel in lower 3 1/2' of open pit</u>
Sample no. 2			<u>OIL</u>	<u>Picked chips of shale and tuff</u>

(Samples for assay should be at least 1 pound in weight; clay samples for ceramic testing, at least 5 pounds.)

**IMPORTANT:** A vein sample should be taken in an even channel across the vein from wall to wall. Location of sample in the workings, together with the width measured, should be recorded

(Signed) David J. White

DO NOT WRITE BELOW THIS LINE - FOR OFFICE USE ONLY - USE OTHER SIDE IF DESIRED

Description #1 tan & white poorly consolidated coarse-grained tuff w/dark spots and shale layers; #2 shale & tuff.

Sample number	GOLD		SILVER		PETROLEUM			
	oz./T.	Value	oz./T.	Value				
P-10097 KG-154	---	--	---	--	0.92%	---	---	---
P-10098 KG-155	---	--	---	--	2.30%	---	---	---

Report issued \_\_\_\_\_ Card filed \_\_\_\_\_ Report mailed 8-7-50 Called for \_\_\_\_\_

STATE OF OREGON DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES  
ASSAY LABORATORY

KG-152  
KG-153  
Oil

REQUEST FOR SAMPLE INFORMATION

The State Law governing free analysis of samples sent to State Assay Laboratories requires that certain information be furnished the Laboratory regarding samples sent for assay or identification. A copy of the law will be found on the back of this blank. Please fill in the information called for as completely as possible, and submit it along with your sample. Keep a copy of the information on each sample for your own reference.

Your name in full H. M. Dole and David J. White

Post office address Portland Office

Are you a citizen of Oregon Yes Date on which sample is sent July 17, 1950

Name (or names) of owners of the property M. P. Thommes (?)

Name of claim sample obtained from Min-A-Ray Property, Shale City

Location of property or source of sample (describe as accurately as possible below):  
(If legal description is not known, give location with reference to known geographical point.)

County Jackson Mining district Ashland

Township 38 S Range 2 E Section 16 Quarter section \_\_\_\_\_

How far from passable road and name of road On a logging road

	Channel (length)	Grab	Assay for	Description
Sample no. 1		x	Oil	Shale
Sample no. 2	3'		oil	Shale

(Samples for assay should be at least 1 pound in weight; clay samples for ceramic testing, at least 5 pounds.)

**IMPORTANT:** A vein sample should be taken in an even channel across the vein from wall to wall. Location of sample in the workings, together with the width measured, should be recorded

(Signed) David J. White

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Description #1 Picked sample of white to brown shale from open cut above logging road; #2 brown to black shale, chip sample along channel in upper 3' of face of open pit below logging road.

Sample number	GOLD		SILVER		PETROLEUM			
	oz./T.	Value	oz./T.	Value				
P-10095 KG-152	- - -	--	- - -	--	2.78%	- - -	- - -	- - -
P-10096 KG-153	- - -	--	- - -	--	0.81%	- - -	- - -	- - -

Report issued \_\_\_\_\_ Card filed \_\_\_\_\_ Report mailed 8-7-50 Called for \_\_\_\_\_

# State Department of Geology and Mineral Industries

702 Woodlark Building  
Portland, Oregon

to the mineral springs. Similar to #2.

Note:

This is put on pink paper because it is thought that insufficient exposures were seen to warrant anything but a cursory examination. As a result it is but a preliminary report and should be recognized as such. Also the whole thing seems quite "iffy" to me but I believe it is worthy of some kind of a report.

CONFIDENTIAL

# State Department of Geology and Mineral Industries

702 Woodlark Building  
Portland, Oregon

The area that was visited and in which the exploration has been done is typical landslide topography: hummocky, small blocks tipped at all angles, disrupted drainage, and uneven slopes. Springs and seeps are common and evidently mark the fault mapped by Wells. It is believed that percolating waters along the fault have been largely responsible for the alteration of the ash. Throughout the shifted blocks there are spots of altered material which appear to be of a fairly good grade of bentonite and much better quality than the cut visited. These spots were not continuous and were mixed with the soil so are not of economic size. However, they indicate that alteration and saturation by solutions is the reason for the bentonite and the landslides. Therefore if any bentonite is to be found it will be near the fault zone and its quantity would be determined by the amount left after movement.

Mining:  
None.

## Economics:

The continuity of the bed exposed by the cut I saw is questionable. But if tests prove this to be a good grade of bentonite it is likely that the horizon could be found in place without too much expense.

Mr. Hamish states that in the cuts made, a thickness of 15' to 20' is indicated. He also stated that a small drift in bentonite was driven last year about a mile north of the one cut visited. This drift is now caved so was not seen. But if this is also of good quality considerable tonnage is indicated.

If possible several new cuts and drifts are to be made this autumn to try and determine the exact attitude of the bentonite horizon. If this work is done I will revisit the property.

At the present time the road from Medford to the property is only a fair weather road and in many spots is very rough. The last  $\frac{3}{4}$  to a mile must be made on foot. Next month, October, a logging outfit is supposed to start putting a gravelled road which will connect with the road to Ashland. If this is done the property will be readily accessible.

## Samples:

1. From the 4' x 8' cut visited. This has been exposed for some time and is somewhat weathered. The material is light yellowish-green in color, somewhat sticky, and has a "soapy" feel.

2. Float from just below the bunkers of the "medicine clay". White in color, unctious, and has a conchoidal fracture. This is probably just a common clay. Mr. Hamish thought it might be dessicated "medicine clay".

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# State Department of Geology and Mineral Industries

702 Woodlark Building  
Portland, Oregon

Report by H. M. Dole  
September 10, 1946

Ormico (Hamish) Bentonite

Ashland Mining District  
Jackson County

## Owner:

Ormico Products  
Harry Hamish, pres.

P. O. Box 345  
Medford, Oregon

Wilford Long, sec.

401 Pittock Bldg.  
Portland, Oregon

## Area;

400 acres of deeded land.

## Location:

In sections 4 and 5, T.38S, R.2E. Camp is at the former location of Climax P. O. The headwaters of Antelope Creek run through the property. It is 28 miles from Medford and 18 from Ashland by road.

## History:

Bentonite was first recognized in 1944. Prior to this the property was worked for the medicinal values obtained from the clays and springs, from which the Ormico Products are made. Present work consists of leaching the "medicinal" clay and preparation of their product.

## Topography:

Atypical landslide topography.

## Development work:

One small (4' wide by 3' deep) cut and several hand auger holes for the bentonite. The "medicine clay" has been "opened up" by a few small cuts. There are several shed to hold the "crystals" of the "medicine clay" and one building for the curing and bottling of the tonic.

## Geology:

The Preliminary Geologic Map of the Medford Quadrangle (Wells '39) shows this to be a landslide area in the Tertiary lava series of the Western Cascades. A fault is mapped at this locality as forming the contact between the lava series and the overlying white rhyolitic tuff. One mile to the southeast is Shale City where Wells reports a "very thinly laminated, carbonaceous, tuffaceous shale containing leaf prints", and Mr. Hamish stated that coal seams are found on Grizzly Peak one mile to the southwest.

As far as could be determined, the bentonite and "medicine clay" has been explored only along the fault zone.