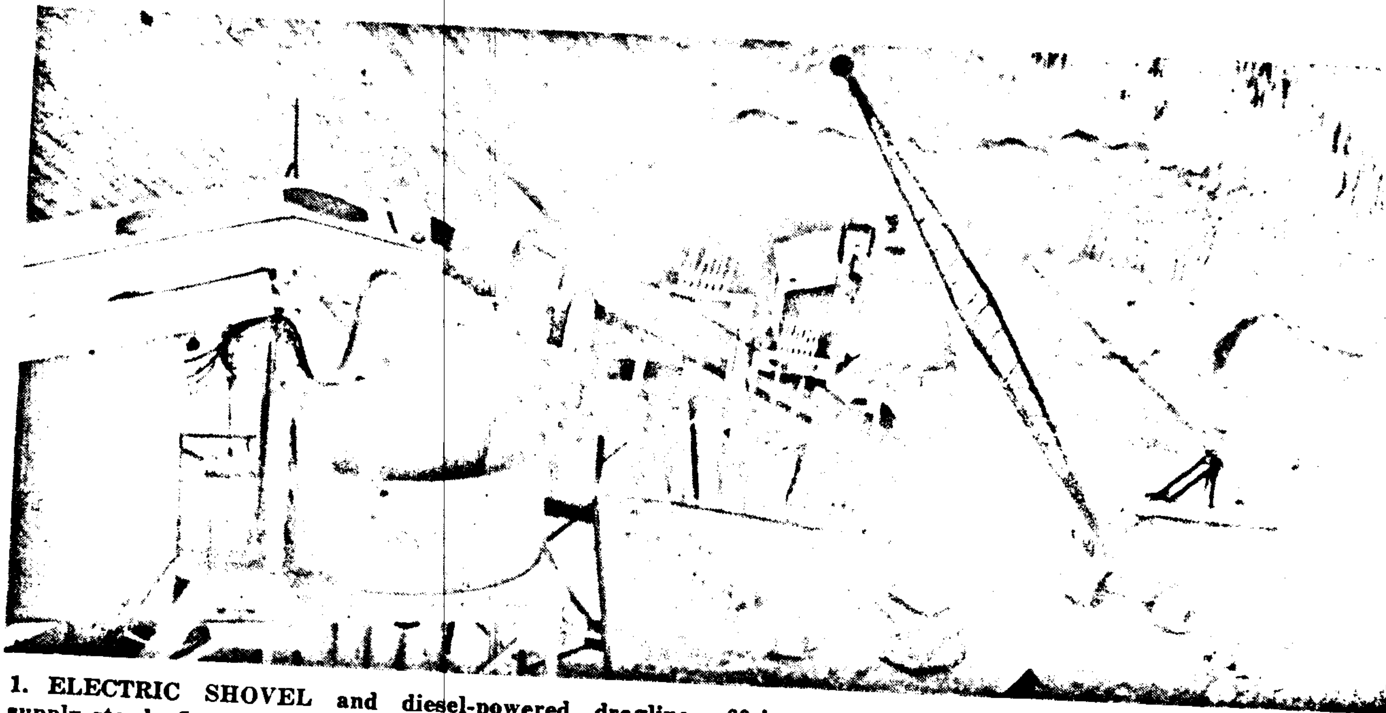
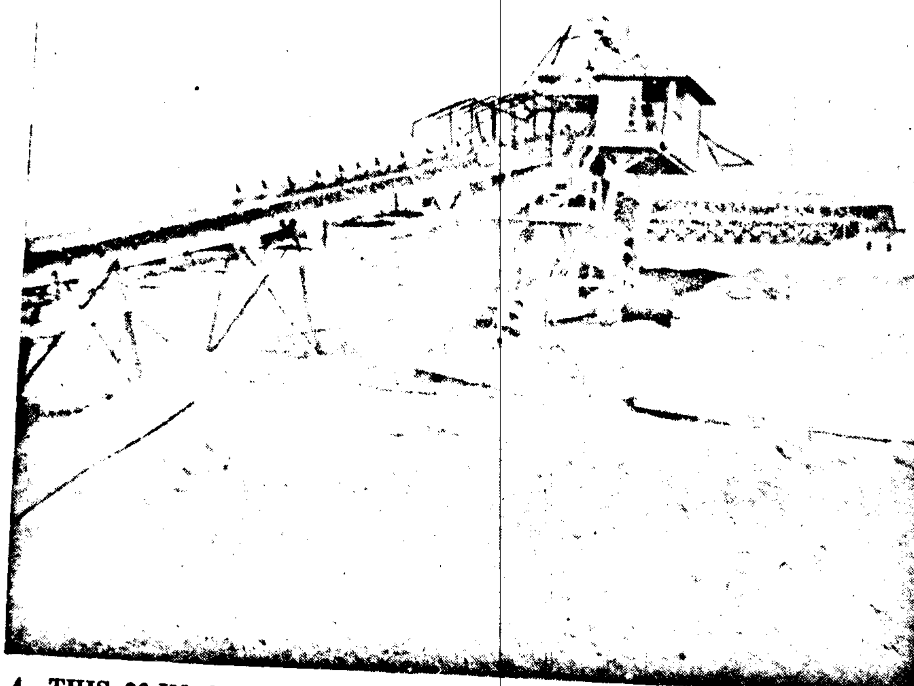


1. ELECTRIC SHOVEL and diesel-powered dragline supply steady flow of ore which passes through grizzly to 60-in. pendulum conveyor. Hopper at top feeds a portable crusher which discharges to 42-in. belt conveyor system.

New 17,000-ton Dry-Land "Dredge" Uses

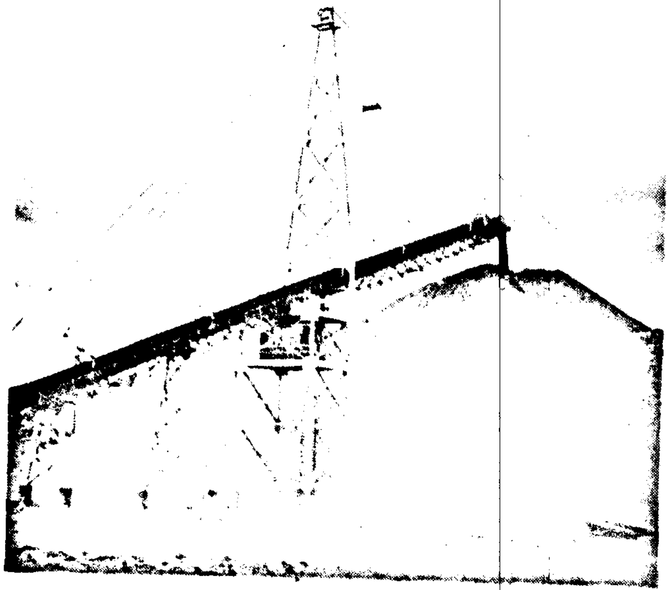
JOHN B. HUTTL
Associate Editor

MINING GOLD-BEARING GRAVEL at a daily tonnage rate closely approaching that of some porphyry copper mines in the west is a task rarely performed in the gold mining industry. An exception is the Round Mountain Gold Dredging Corp., Nye County, Nev., which since Jan. 1, 1950, has been operating a plant capable of handling 17,000 tons of gravel a day. The word "dredging" in the name of the company may be a little misleading, for while exploitation of the available gravel deposit follows conventional dredging methods somewhat, the operations are not strictly of the bucketline dredge type. True, the installation at Round Mountain does resemble a large dredge, but on dry land, with the central washing plant representing the dredge body proper; the electric shovel in the pit and conveyor system leading to the plant, the digging ladder; and the two adjustable waste conveyors, the stacker. Gravel fed by conveyor to the washing plant receives similar treatment as that elevated by the bucketline to the gold recovery equipment installed atop the hull of a bucketline dredge.



4. THIS 36-IN. BELT leading to a boom stacker transfers sands from the washing plant to waste pile, and corresponds to the stacker on floating dredges.

The town of Round Mountain lies at an elevation of about 6,300 ft., 55 miles north of Tonopah, the nearest supply center. It derives its name from a mountain rising several hundred feet above the surrounding country containing the principal lode deposits, the more productive ones being known as the Los Gazabo, Keane and Placer. From the erosion of these veins and the stringer zone lying between them, the main placer deposits now under exploitation have been derived. The principal lode deposits were discovered by Louis D. Gordon in 1906, and in the same year Thomas Wilson found placer gravel. Both lode and placer mining have



2. CRUSHED GRAVEL on 42-in. belt system is delivered to stockpile via 700-ft. conveyors suspended from tower.

3. STOCKPILED ORE goes to washing plant housing jigs, tables, amalgamators, and grinding and classifying units.

Draglines, Shovel, Belts, Washing Plant

been carried on intermittently since then. The first mechanical placer equipment was installed in 1934 by Nevada Porphyry Gold Mines, Inc., and capacity of the initial plant was 1,000 yd. of gravel per day.

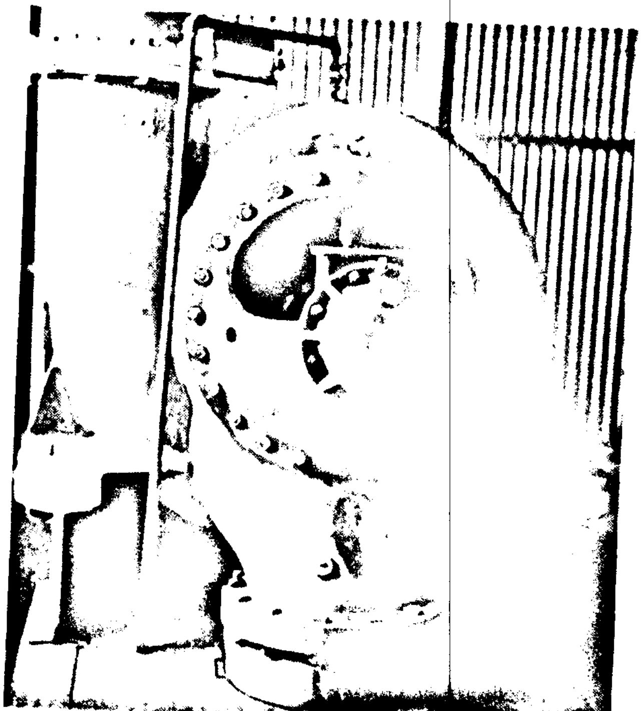
The main placer deposit is on the south and west slopes of Round Mountain. It is of the residual type, none of the gold having traveled more than several hundred feet from its source. Gravel depths vary from a few feet to more than 200 ft. About 20% of the gravel consists of coarse angular boulders of rhyolite, the remaining 80% being sand and gravel, and the bed is slightly stratified. The gravel is bonded by a limy deposit into a medium hard conglomerate, particularly near bedrock. The gold is disseminated throughout the gravel, with enrichments near bedrock, and the gold particles are angular and show no evidence of having been transported. Many are encrusted with quartz or siliceous limonite. The gold recovered from previous placer operations averaged 635 fine, being alloyed with silver. Bedrock is a rhyolite porphyry, uneven in many places.

The large-scale placer operations now in progress were started by Round Mountain Gold Dredging Corp. early this year, and the construction program preceding them involved building a large central gravel washing plant, preparation of pit, installation of a portable crushing plant, and conveyor system for transporting mined and crushed gravel from the pit to the washing plant and a water supply system. Pit methods and equipment used very much resemble those employed in the modern mechanized gravel plants active in the Los Angeles area, with the shovel working against a face or bank exceeding 100 ft.

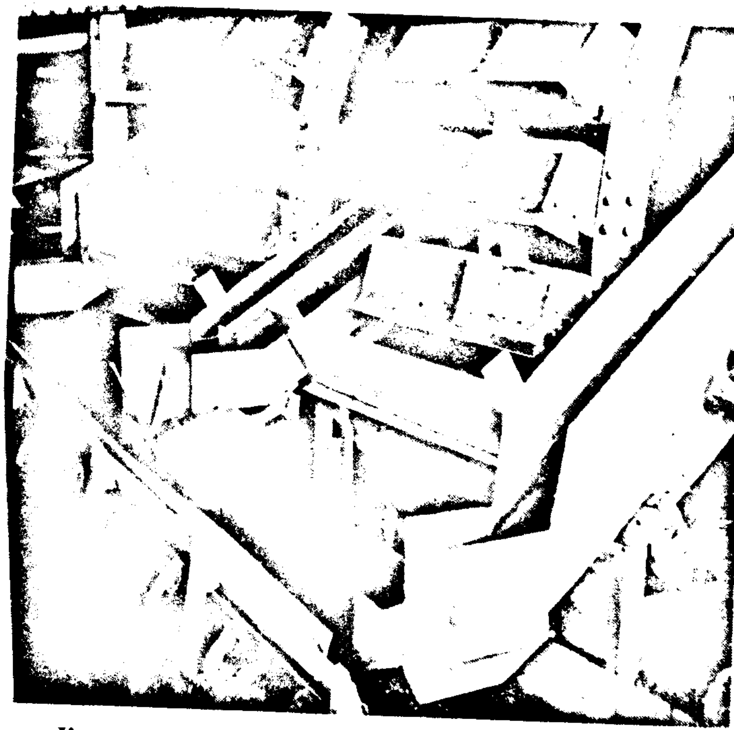
This high bank presented quite a problem, for while the gravel will stand practically vertical for a height of 100 ft. or more, there is danger of caving as the shovel undermines the bank. The difficulty was overcome by the use of a heavy plow or scarifier operated by a dragline stationed on the original ground surface on top of the bank. The scarifier is pulled up the face or bank with the drag cable on the dragline and is dropped down the bank, suspended on the hoist cable running over the boom sheave. In this manner, the slope of the bank is reduced to about 70 deg. with the horizontal, and the scraped material accumulating at the floor of the pit is bailed by the shovel into a loading hopper. The shovel digs only the lower portion of the bank.

Excavating equipment in the pit consists of 7½-yd. Bucyrus-Erie 170-B electric shovel. A 54-B diesel dragline operates the plow or scarifier mentioned previously. The electric shovel loads directly into a circular steel hopper containing a Jeffrey feeder at the end of a 60-in. pendulum conveyor which subsequently elevates the grizzly undersize material to a portable crushing plant housing a 36x42-in. jaw crusher. The heavy steel grizzly on top of the loading hopper is spaced 24 to 30 in. A second diesel dragline is stationed near the loading hopper in the pit to service the heavy grizzly and remove large boulders therefrom. Crushed gravel is elevated by a 42-in. belt conveyor to the transfer point at the end of the main 42-in. conveyor leading to the stockpile at the head of the washing plant.

As the shovel advances, extra sections are added to this conveyor. The main 42-in. conveyor is installed in two sections—an 1,800-ft. unit receiving material at the edge of the pit and having a transfer point at the discharge end, and a 700-ft. unit leading from the transfer point to the stockpile resting on a long concrete tunnel. The discharge end of the shorter conveyor is suspended from a vertical steel tower and can be adjusted to meet the height of the stockpile. Material from the stockpile is drawn through two feeder gates in the tunnel equipped with hinged rail



INSIDE THE WASHING PLANT, water is supplied by two 14-in. pumps, one high-pressure and one low-pressure.



Jig overflow and classifier overflow are handled by the 14-ft. twin sand wheel shown at right. Sands go to waste.

sections and elevated to a 9x50-ft. revolving screen on the top floor of the washing plant.

The building housing the gravel treating equipment is an all-steel structure covered with corrugated galvanized iron sheets. All equipment units are easily accessible for adjustment and repair, and as on a bucketline dredge the flow of material from the stockpile to the washing plant can be observed and controlled from a central point or room facing the stockpile tunnel. Here a Ratograph is installed which indicates to the operator the rate at which the material flows to the revolving screen. A Merrick weightometer is installed in the stockpile tunnel.

Flowsheet of the washing plant is as follows:

The plant is divided into a coarse jigging section and a fine jigging section. Washing and scrubbing is done in the revolving screen covered with screen sections containing ½-in. holes. Undersize is passed over four 4x12-ft. Tyrock vibrating screens, while the oversize goes via twin 36-in. boom conveyors or stackers to the waste pile. The conveyors are built in sections and are lengthened whenever desired. The oversize from the Tyrock screens goes to four 42x42-in. 4-cell Yuba jig units, with the overflow passing to a twin 14-ft. coarse sand wheel, and a hutch product flowing successively over riffled gold tables, and a 42x42-in. 2-cell Yuba cleaner jig. Sands from the sand wheel join the revolving screen oversize and go to the waste pile, while the overflow goes to a small settling tank to trap any coarse material and thence to the 250-ft. traction thickener.

Jigs Recover Gold

Undersize from the Tyrock screens flow to a 36-ft. Dorr hydro separator. The overflow from this unit goes to a 250-ft. Dorr traction thickener outside the washing plant building, and the underflow is passed over six 42x42-in. 4-cell Yuba jig units. Overflow from these jigs after passing over riffled gold tables goes to a 24-ft. Dorr hydro separator, while the hutch product receives added treatment first on riffled gold tables and then in a 42x42-in. 4-cell Yuba jig unit. The hydro separator underflow is directed to the fine sand wheel, and the overflow to the 250-ft. traction thickener.

The hutch product of the 4-cell cleaner jig goes to a Dorr classifier operating in closed circuit with a ball mill equipped with an amalgamator on the discharge end. This classifier also receives the hutch product of the 2-cell cleaner jig in the coarse jigging section. Overflow from this jig goes to the fine sand wheel, which also receives the classifier overflow after passing over riffled gold tables. The overflow from the fine sand wheel returns to the 250-ft. traction thickener, and the sands go via a conveyor belt to the two boom stackers and to waste. Plant water is supplied by two 14-in. Yuba pumps, one high pressure and the other low pressure, taking suction in the sump receiving the overflow from the 250-ft. traction thickener.

The primary water supply is obtained from three sources—namely, (1) water rights on Jett Creek. The water is brought to the plant via an 8-mile 14-in. pipe line and pumping plant. (2) "A" well equipped with deep-well and booster pumps; and "B" well equipped with deep-well and booster pumps. Both pump installations are connected to the Jett Creek pipeline. Distance from the washing plant is 4 and 3 miles, respectively. The pumps are manually controlled from the washing plant control station. Automatic operation is planned. Power is obtained from the Sierra Pacific Power Co.'s 66,000-v. power line running from Tonopah to Round Mountain. Additional surface plant buildings include a combination office and warehouse building, retort plant, and general repair shop.

In conclusion I wish to thank W. C. Browning, vice president and consulting engineer, for permission to publish the foregoing article, and grateful acknowledgment is made to E. H. Oshier, field superintendent for the courtesies shown me while visiting the plant.