RIFLE'S BLAST FROM THE PAST

RIFLE HERITAGE CENTER

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April is here and it's time to do a little spring cleaning and thinking about displays. It is a time each year that gives us pause to wonder why are we doing this? I ran across a passage in a book I was reading by Craig Childs called Finders Keepers. He states: "Time was never meant to last. It couldn't it has no shape. It threads through your fingers like water, no stopping it for any longer than you can cup your palm. Beyond the small memories of our generations, there are artifacts, the substance of history."

We are caretakers of artifacts, many of which are the substance of our local history. It is with pride that we do so, and with hope that we will pass down the stories of memories of other generations to new generations so that they will know the substance of our local history. That is why we do this. Come join us as we prepare to open for our 49th year. *Newsletter Editor, George Pearson*

The boom of the high powered rifle underground was deafening. That's right…you read it correctly… a rifle being fired underground in the Anvil Points Oil Shale Mine. The Rifle was a Remington Industrial Gun, weighing in at a hefty 92 pounds. The single shot shotgun of 8-gauge capacity shooting a three-ounce ball of lead. Why you say? It was an effective and simple way to bring down rock falls from the roof of the mine to protect the miners' safety. The rifle was mounted on a war surplus bomb cart and equipped with a remote trigger. The results were determined by the quality of the aim of the operator. A rifle being used in a local Rifle mine. I wonder what ever happened to it? Is it still in the mine?

Figure 12. - Industrial gun used for removal of loose rocks on mine walls.

Figure 2. - Traveling crane with self-leveling platform.

Many one-of-a-kind devices had to be built for the special needs of the mine. For example, a boom type scaling rig with a self-leveling platform was built on a small cat dozer to allow miners to reach up 27 feet above the mine floor to remove loose rock. A fork lift was converted to a mobile blaster's platform that could be used for both blasting and scaling. It was

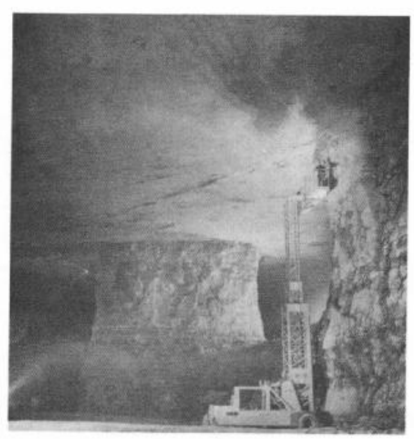

Figure 6. - Sixty-five-foot scaling rig in rooms 50 feet high.

remotely controlled and allowed more workers to access the roof and walls at each setting. A platform on a telescoping tower mounted to a heavy lift frame allowed workers to reach a height of 65 feet, and then would fold down so it could be transported around the mine. A special portable air compressor with a water system allowed for the elimination of air hoses from the outside compressors and made drilling of blast holes much more efficient. These and other innovations were part of parcel of what was being done in the nature of research to make the mine more efficient and safer.

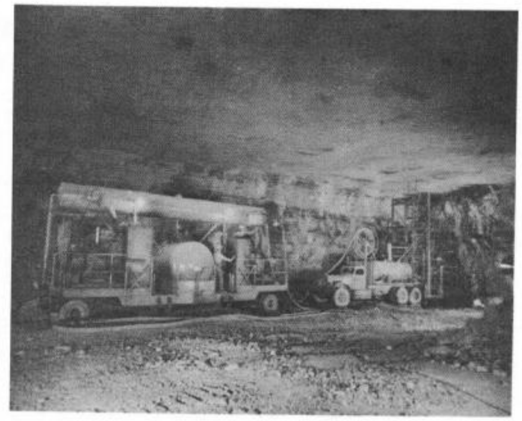

Figure 2. - Mobile utility station supplies compressed air to a four-drill jumbo.

But the mine was just one part of the operation that the Bureau of Mines had to consider, oil shale unlike some other ores was not going to be mined and shipped out to some processing plant, mainly because no such plant existed. So in order to get oil from the shale the entire process from mining, to rushing the ore, retorting the ore, and refining the oil from the ore, to the final product of whatever fuel was needed all had to be done here at this one location. In addition, the employees needed housing, office buildings were needed, laboratories, and a recreation center all become part of the complex.

The first retort, a facility that burns the oil shale and releases the oil, was actually two of the same kind of retort constructed side by side so that when one was down for service or testing, the other one could be in production. These retorts were call N-T-U retorts or Nevada-Texas-Utah retort. This type of retort was chosen because it was the same as the one tested in the area during the test from 1925-1929. The retorts had a 40-ton capacity each. This meant that 40 tons of oil shale could be processed during each run or firing of the retort. These were ready for operation by May of 1947.

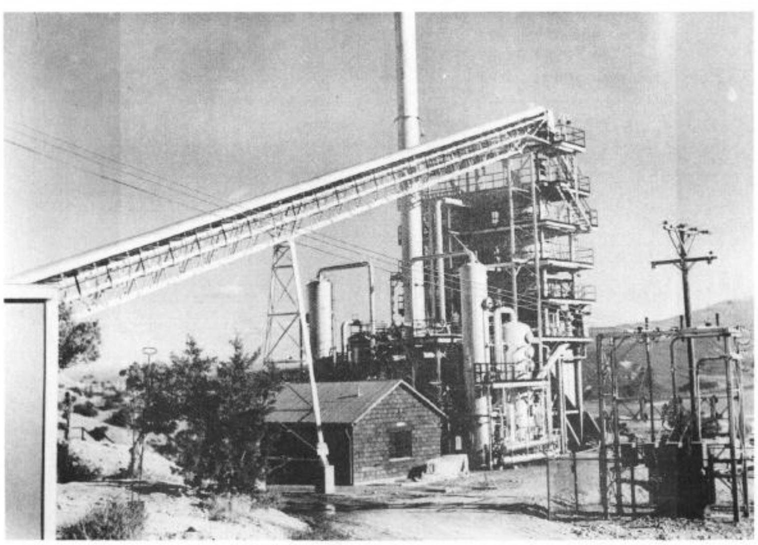

Figure 2. - N-T-U retorts, condensing system, and control house.

The N-T-U retort is a batch-internal combustion method of producing oil from oil shale. Forty ton of crushed oil shale rock is loaded into the steel upright tube of the retort, and then about 150 pounds of good oil soaked local kindling is put on top of the shale and lit with a match. The air is controlled by vents in the retort. Once the fire gets hot enough the shale begins to burn. This releases oil in both a vapor and liquid form, which are collected from the bottom of the retort and from heat exchangers that cool the vapors and condense the oil which is collected in separators. The temperature of the interior of the retort reaches from 800 to 900 degrees Fahrenheit. Once the burn is completed, the spent shale or ash is dumped out of the bottom of the retort, allowed to cool, and pushed into a local gully by a bulldozer. Along with the retorts construction, the Bureau, using Southwestern Engineering Company out of California, also constructed an oil shale rock crushing, conveying, and storage facility.

The N-T-U retorts operated from March of 1949 to February of 1951. The two retorts had a total of 554 runs with 22,457 tons of shale processed and 12,358 barrels of oil produced. The oil produced was heavy black, waxy crude that was like grease at room temperature. Every effort was made to operate it like a commercial facility, but many failures created considerable down time. The buildup of coke deposits in the oil recovery system caused failures in the gas blowers and would not allow for a complete burn in the lower part of the retort chamber. Because of this the decision was made to move on to a new type of retort developed by the Bureau of Mines called a gas-combustion process.

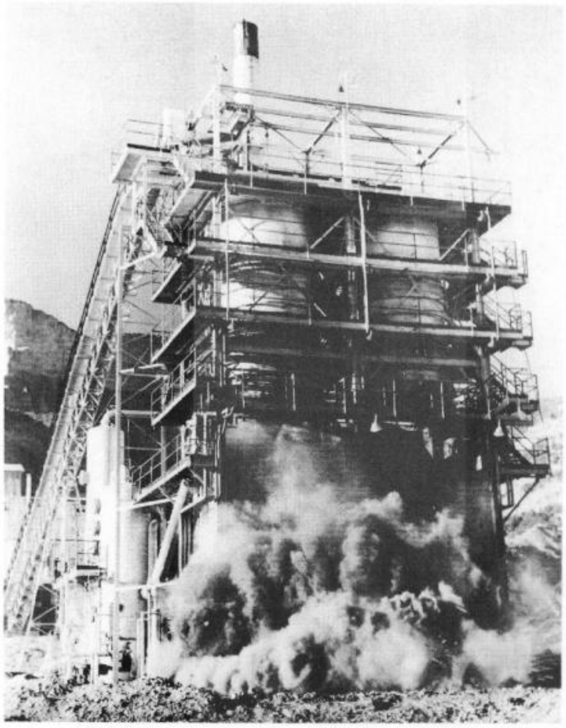

Figure 3. - N-T-U retort discharging approximately 28 tons of ash.

The first gas-combustion retort was a six-ton-a-day plant. It was constructed using some of the tower and equipment from the N-T-U retort.

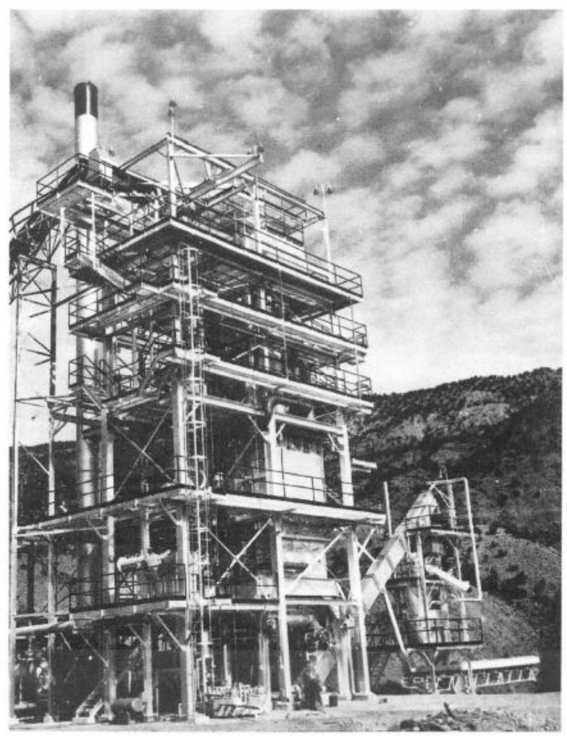

Figure 1. - Gas-Combustion Demonstration Retorting Plant, Rifle, Colo.

In the introduction of the 1952 Synthetic Fuel Report the following statement was made:

The Bureau of Mines Synthetic Liquid Fuels Program again forged ahead during 1952, and important technical advances led the way to improved methods of converting coal and oil shale into liquid fuels. Marking the eighth year of activities under this program, the past 12 months brought a new domestic industry nearer realization.

The increasing demand for gasoline and oil and the rising cost of finding new petroleum, coupled with the growing dependence on imports and unsettled international situation, have continued to emphasize the importance of the Bureaus Synthetic Fuels Program. Oil, the indisputable material of wartime, likewise has critical importance in peacetime, touching as it does the life of every individual. Supplementing petroleum with synthetic liquid fuels will not only conserve the Nations petroleum reserves but also bring into greater use its tremendous reserves of coal, as well as vast deposits of oil shale for which no other practical use has yet been found.

The Korean War started on June 25, 1950 and was still going at the time of this report. The nation was at war and as you can see by this statement, every action to produce oil from oil shale was considered important.

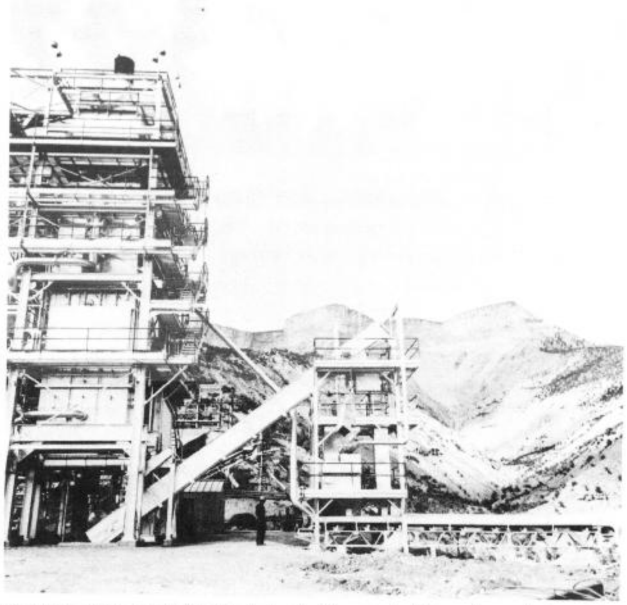

Figure 18. - Retort vessel of the Gas-Combustion Demonstration Plant and spent-shale sampling and discharging equipment.

The six-ton-a-day retort was built in 1950-1951 and was tested and was successful. In 1952 a 150 to 300 ton per day facility was designed and construction started. The important part of this process was the gravity flow of oil shale into the retort and the countercurrent exchange of heat between the shale and the retorting gas. The operation is arranged mechanically so that when shale, air, and recycled gas are introduced in the proper proportions, the material streams leaving the vessel are relatively cold. High temperatures are restricted to the middle zones of the retort, where they are needed for combustion and retorting reactions. Therefore, no cooling water is required, and the disposal of the spent shale is no problem. The lack of the need for cooling water is very important in the arid high desert area that oil shale is found. The oil recovery rate during test runs was 94.1% compared to the average N-T-U rates of 79.7%.

Now that we knew we could make oil, the next critical step in the process was to build and develop a refinery. Crude shale oil, just like crude oil, must be refined in order to produce yields of distillate products compared with those produced from petroleum. Since no one had ever refined oil shale in large quantities, the investigation of refining methods had to cover a broad field. Consideration had to be given to the process or combination of processes that would yield the products needed, such as diesel fuel, gasolines, and oil. Also, all of the byproducts produced, what they could be used for, or how to dispose of them had to be considered.

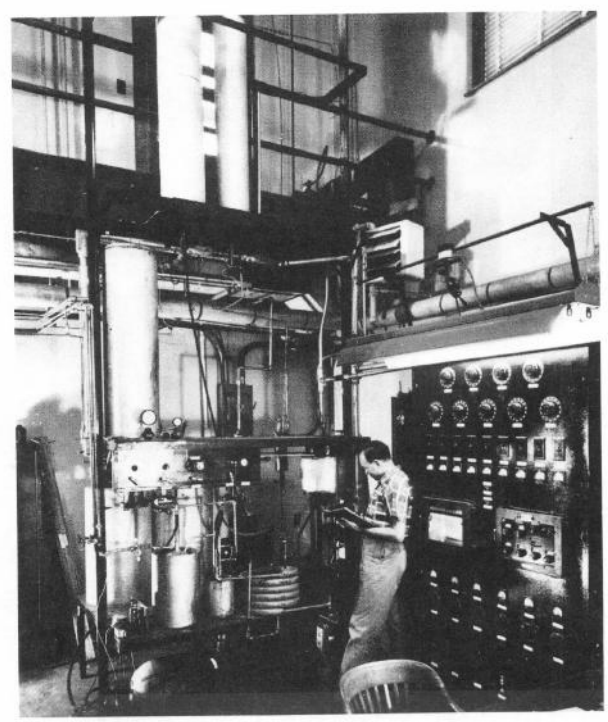

Figure 35. - Equipment for studying high-temperature processing of shale oil.

The major equipment in the refinery included a thermal cracking unit and a continuous cold sulfuric- acid treating plant. A fairly new system called Suspensoid Cracking was also being used, along with Thermal Cracking. By 1952, relatively large quantities of leaded gasoline were available and being tested in the station's cars and the mine's trucks and buses. Asphalt was also produced and blended to road oil specifications. The facilities roads were paved using these products.

By 1952, the Bureau of Mines knew how to mine the shale, how to retort the shale, and how to refine the oil produced from the shale. What next? Stay tuned for the rest of the story.