

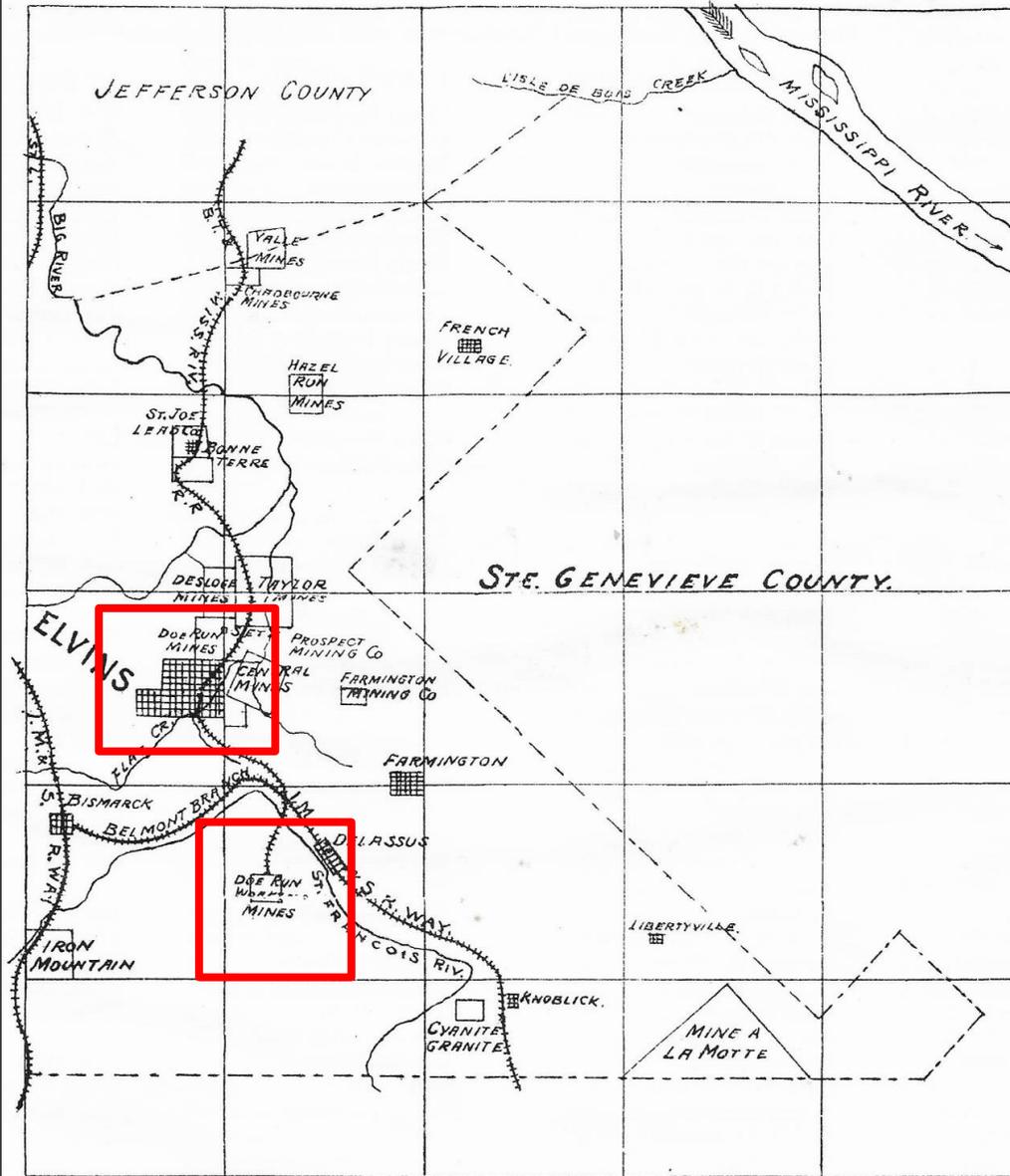
# St. Joe's "Younger Brother" -The "Original" Doe Run Company-



JAKE JONES,  
JANUARY 31<sup>ST</sup>, 2023

MAP OF ST. FRANCOIS COUNTY, LEAD FIELDS.

1898



# Overview:

- History of the Doe Run Lead Company.
- Eventual purchase and dissolution of The Doe Run Lead Company.
- The Doe Run Lead Company's role in establishing the towns of Doe Run and Flat River.
- The events leading to the creation of the present Doe Run Company in 1986.

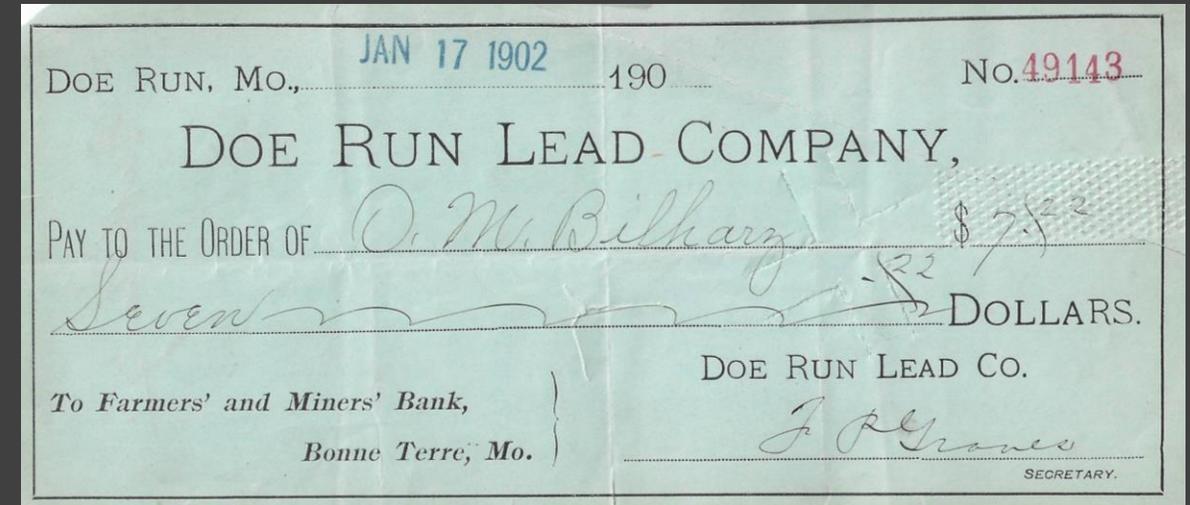


Doe Run Lead Company Mill #1 -Doe Run, Missouri

# The Original Doe Run Lead Company- Background

## Founded 1886

- Ore was discovered on the banks of Doe Run Creek near Farmington.
- The discovery of this ore was brought to the attention of the St. Joseph Lead Company by Judge William R. Taylor.
- Several St. Joe board members declined the purchase but encouraged fellow board members to create a new company if they wanted to.
- The new company would be named after the nearby creek.
- While these were two separate companies, St. Joe and the Doe Run Lead Company shared several operations.
  - St. Joe would begin smelting ore for The Doe Run Lead Company in 1891, upon the completion of St. Joe's Herculaneum Smelter.
  - Ore was hauled from Doe Run on the Mississippi River and Bonne Terre Railway (The railroad subsidiary of St. Joe).

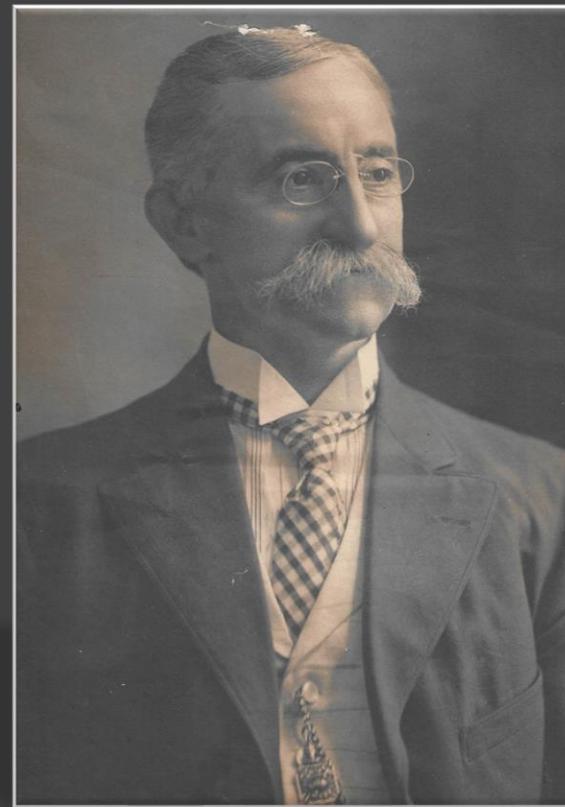


Company payroll check made out to O.M Billharz, mining engineer. Mr. Billharz would become the Rivermines division superintendent in following years.

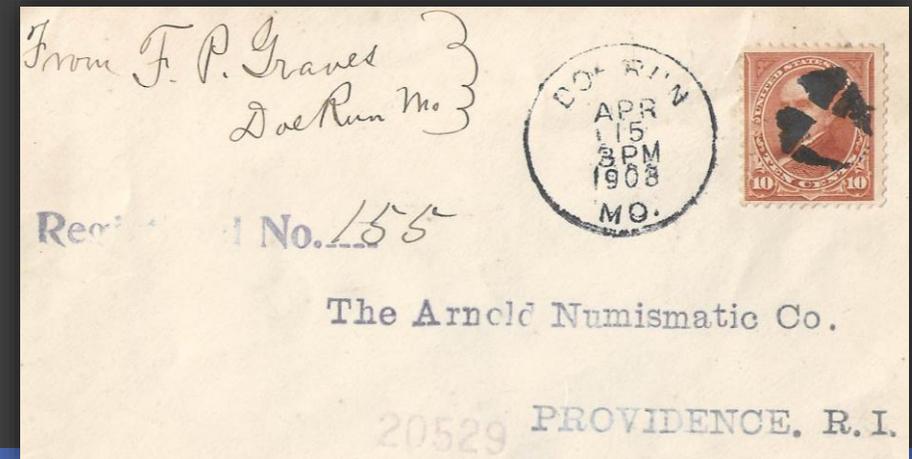
# Fayette P. Graves

## Who was Fayette P. Graves?

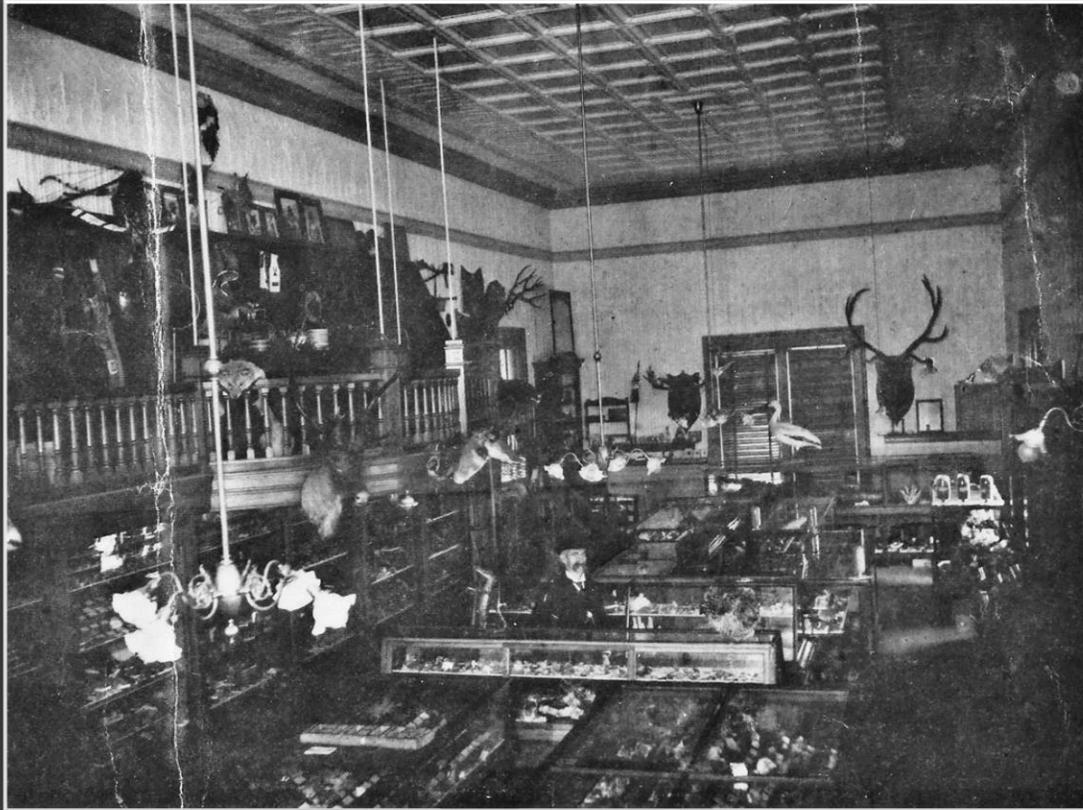
- Member of the St. Joe board of directors.
- A shareholder in the Doe Run Lead Company.
- Mr. Graves was appointed the general superintendent and president of the Doe Run Lead Company in 1886.
- Graves was an avid mineral and curiosity collector (coins, taxidermy, etc.).
- He was also the curator of a personal museum near his office in Doe Run, Missouri.



Portrait of Fayette P. Graves



# The Graves Museum



Mr. Graves seated in his museum- Doe Run, Missouri



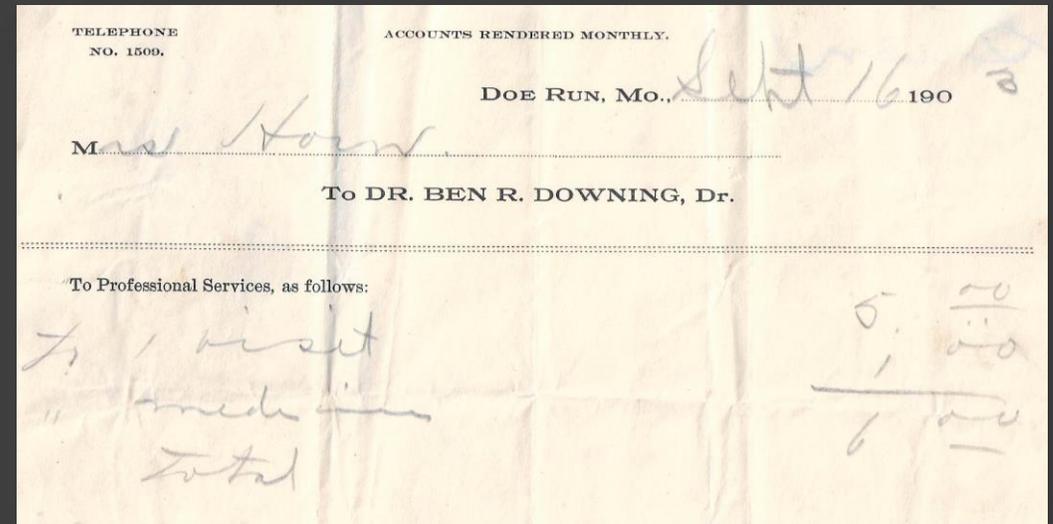
A display of Calcite in the Graves Museum- Doe Run, Missouri

# Doe Run, Missouri

- The town of Doe Run was established by the Doe Run Lead Company in 1886.
- Town included general stores, a post office, a masonic hall, several large blocks of company housing, and a doctor's office.
- At its peak, Doe Run boasted a population of 1,200 citizens. This was larger than the St. Francois County seat, Farmington.
- The St. Joe Lead Company would eventually extend their subsidiary railroad, The Mississippi River and Bonne Terre, to Doe Run including freight and passenger services.



Photo courtesy of Dave Darnell



# Flat River, Missouri



Photo courtesy of Rootsweb.com



Doe Run Lead Company Mill #3, Elvins (Park Hills), Missouri

- Prospecting at Flat River by the Doe Run Lead Company began in 1890.
- After a period of finding less than suitable results, drilling was almost abandoned. Thankfully George Williams, drilling engineer, persuaded the company to continue searching.
- Soon after, pay grade ore was found at a depth of approximately 300 feet. This was one of the first significant ore discoveries of the district.
- The Doe Run Lead Company began sinking their new shaft #1 at Flat River in 1891.
- What had started as the small camp of Flat River began to grow and prosper following the addition of this mine along with others.
- Flat River soon became the main economic and mining center for the region.
- In following years, several new mines and a new mill were built to the west of Flat River in the town of Elvins.
- Following the addition of further mines at Flat River, The Doe Run Lead Company would also purchase the properties of the Columbia Lead Company and the Donnelly Lead Company.

# Merger and Absorption

- The St. Joseph Lead Company announced its purchase of the Doe Run Lead Company in 1912.
- Doe Run Mill #1 in Doe Run was closed by 1910 and would later be destroyed by a fire in 1914.
- The Doe Run Lead Company would still exist but would be operated as a subsidiary of St. Joe until 1936 due to shareholder disputes.
- St. Joe retained all mines, mills, and offices of the Doe Run Lead Company as their own property after The Doe Run Lead Company's 1936 dissolution.

- (1) Rivermines Division of The Doe Run Lead Company absorbed by Federal Division of St. Joseph Lead Company as of August 12th, 1934. All production on Doe Run Property included in Federal Division report.
- (2) The Doe Run Lead Company was dissolved as of Feb. 9th, 1936, for which reason the data given in this report covers the period from Jan. 1st, 1936, to February 8th, 1936, inclusive.

\*Rivermines Mill has not been operated since Aug. 12th, 1934.



# Mining Returns to Doe Run, MO (Briefly)

- Mining would briefly return to Doe Run in 1947 when St. Joe reopened a mine previously operated by the Doe Run Lead Company.
- At this location St. Joe sank a new shaft, #21.
- Ore from this location would be trucked to the “Federal Division” at Flat River for milling.
- Unfortunately, this was a relatively small ore deposit, and the mine would cease operation within 10 years.



St. Joseph Lead Company Shaft #21, Doe Run, Missouri

# The Modern Doe Run Company

- The St. Joe Lead Company discovered the Viburnum trend by 1955 and began building their mine #27 in 1958. This same year, mines began closing in St. Francois County.
- The St. Joe Lead Company became the St. Joe Minerals Corporation in 1970. Shortly after, the last mine/mill complex in St. Francois County ceased production in October 1972.
- St. Joe Minerals was purchased by the Fluor Corporation in 1981, during this time the company retained the name St. Joe.
- St. Joe Minerals began a partnership with the Homestake Mining Company in 1986, the partnership was named: **The Doe Run Company**.
- The partnership was most likely called “Doe Run” due to its familiar branding as St. Joe already marketed a “Doe Run” lead pig.
- This new Doe Run Company, while using the same name, would exist as a separate company, not affiliated with the original Doe Run Lead Company.
- In 1994 a subsidiary of the RENCO group purchased the St. Joe Minerals Corporation, at this point the name of the subsidiary was changed to: **The Doe Run Resources Corporation**, now known again as **The Doe Run Company**.



# What happened to the Graves Collection?

- The mineral portion of the collection, along with physical property such as display cases, labels, and the museum building itself became property of St. Joe after 1913.
- This was due to company specimens being used to trade for museum specimens.
- St. Joe donated the collection to the State of Missouri for display at the State Museum in Jefferson City. The collection would later be removed from the State Museum and given to the State Geological Survey.
- A large portion of the collection was later moved to Missouri Mines State Historic Site in Park Hills (Flat River) where it is currently on display.



# Remnants of the original Doe Run Lead Company?



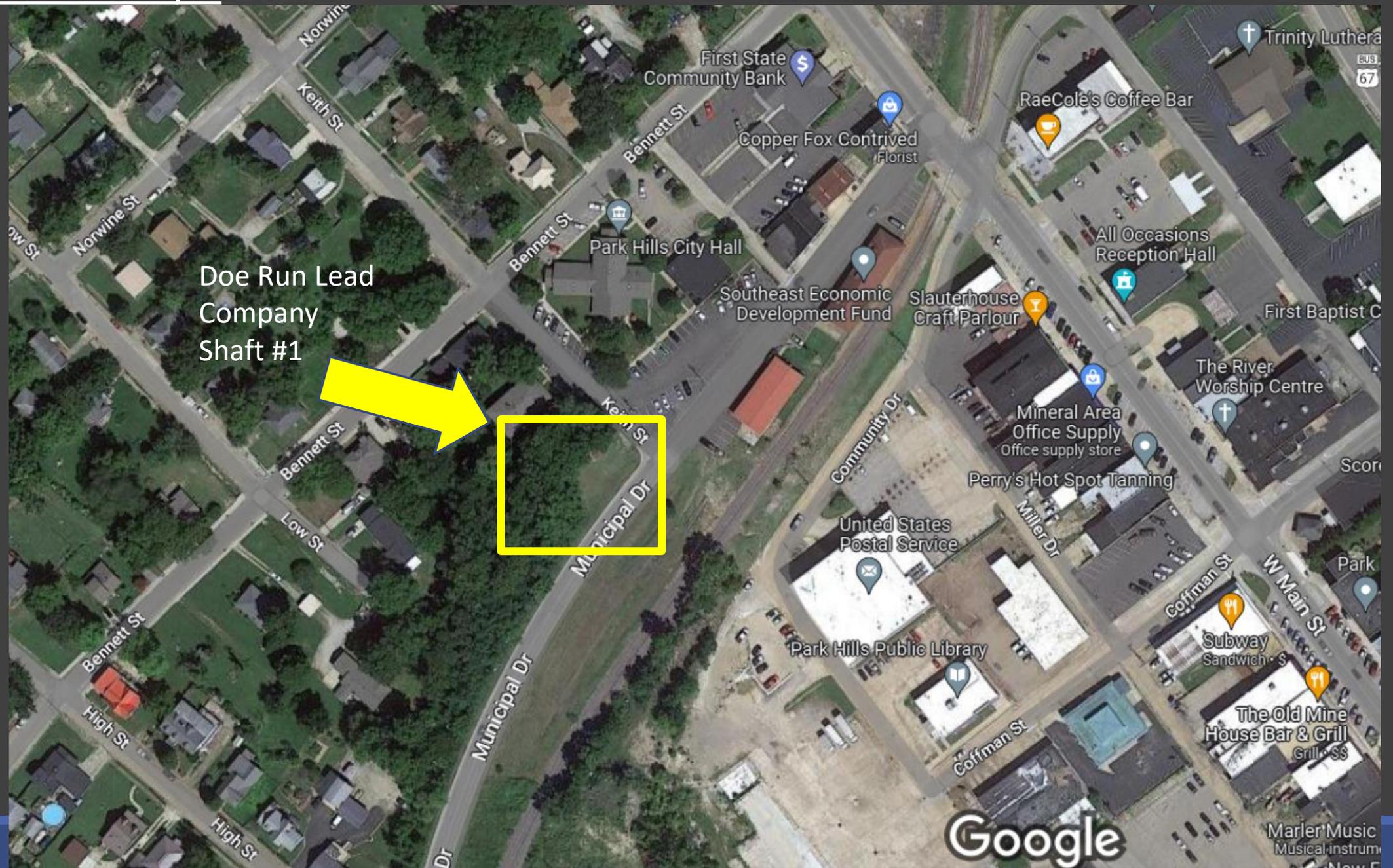
The Doe Run Lead Company office located in Rivermines (Park Hills).

# Remnants Continued...

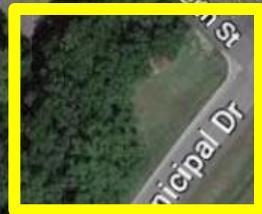


Rivermines Division Superintendent's mansion, Rivermines (Park Hills).

# Shaft #1 Today?



Doe Run Lead  
Company  
Shaft #1



Google

# Shaft #1 Today?



Questions?

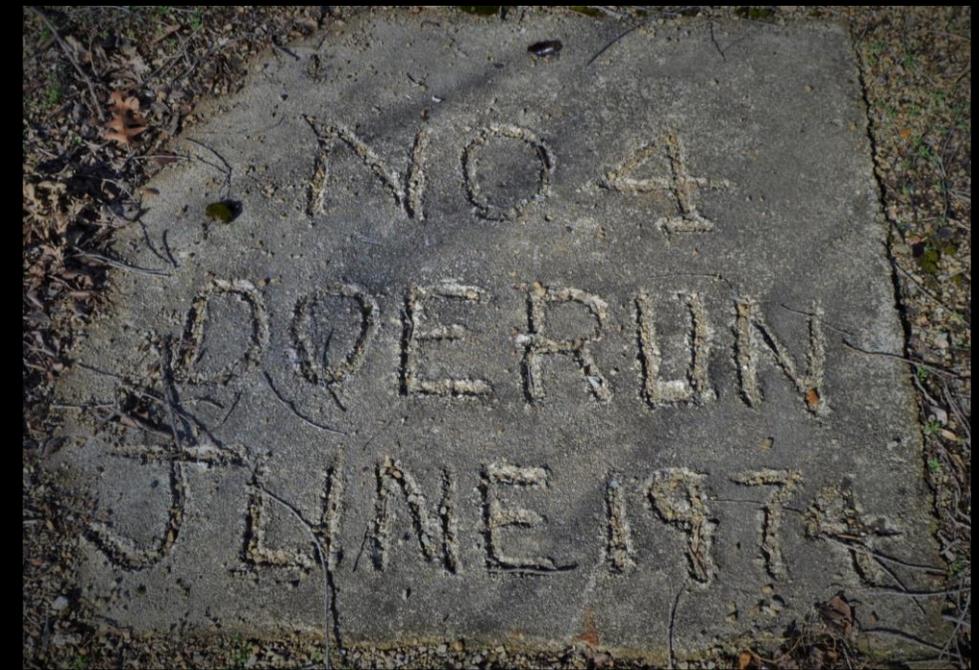
*Thank you!*

Jake Jones

January 31st, 2023



**Doe Run Lead Company Shaft #4,  
Flat River (Park Hills), Missouri**



**Shaft marker, Doe Run Lead Company Shaft #4,  
Flat River (Park Hills), Missouri**





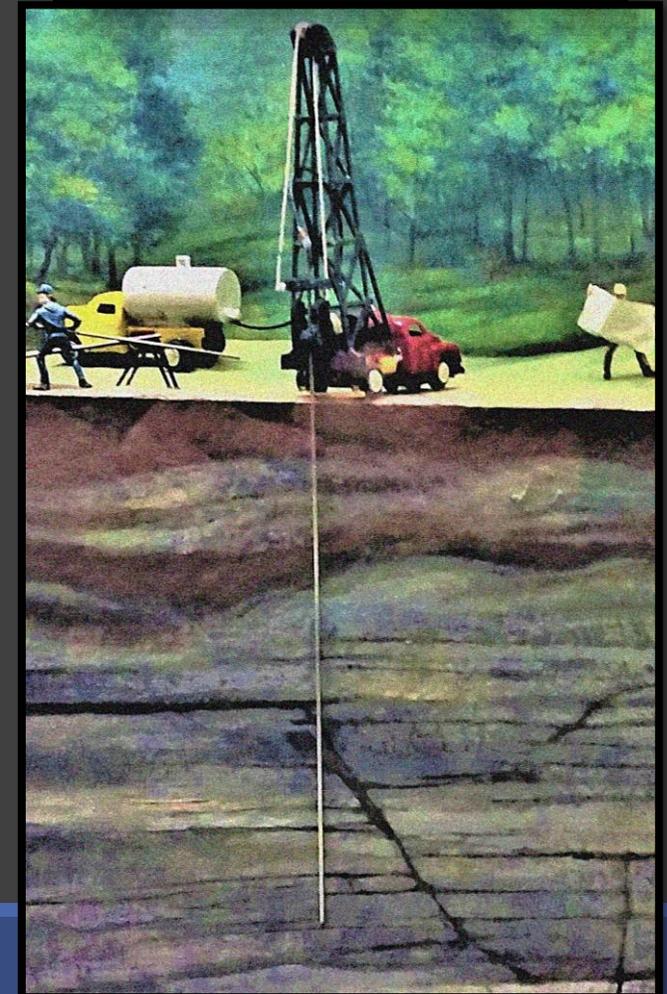
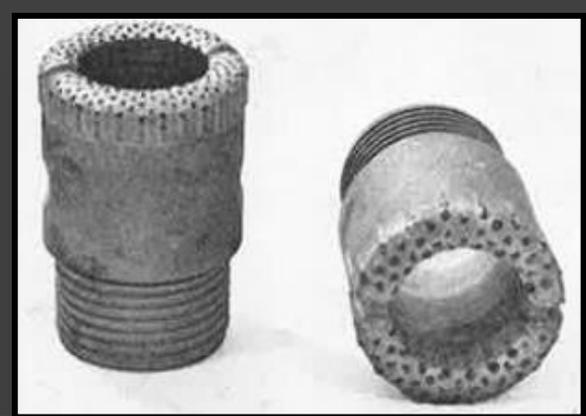
# Mineral Exploration

---

AND THE DISCOVERY OF NEW ORE DEPOSITS  
IN THE SOUTHEAST MISSOURI LEAD DISTRICT

# Introduction

- Mineral exploration is the process of using geologic knowledge to search for and map new or unproduced mineral deposits.
- Geologists make an educated guess on where to sample rock based on geologic data.
- The metal mining industry has utilized the Diamond Core Drill as its main method of exploration for approximately 154 years.
- The Diamond Core Drill is a steam, and later diesel, powered drill that utilizes a hollow, diamond studded bit. The rock inside the hollow portion of the bit is the “core”.
- The “core” allows geologists to see a cross-section of the rock, giving a small glimpse of the strata below. In optimal conditions, important minerals are present.
- Once viable mineral deposits are identified, additional drilling allows geologists to map the approximate boundary, depth, and volume of an ore deposit.



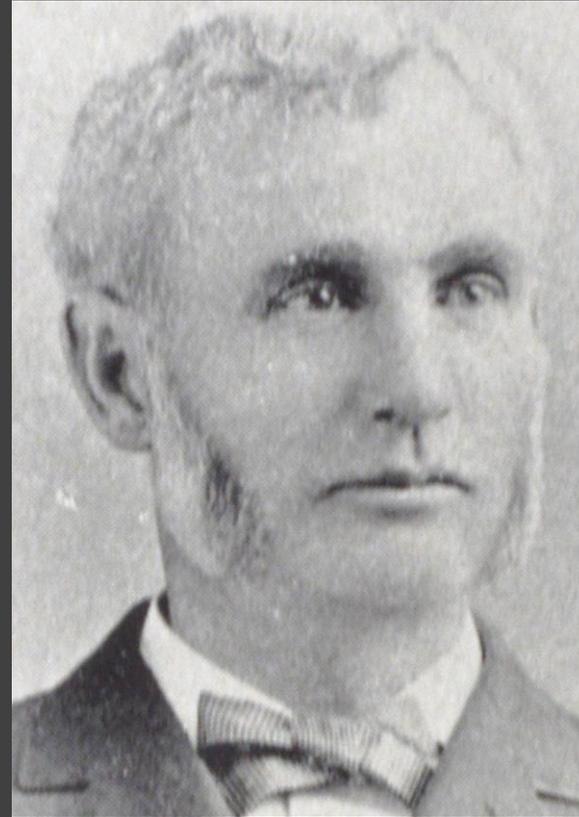
# The Diamond Core Drill-Background

- The first diamond core drill was designed by Rudolphe Leschot in 1860, with the first functional drill being used in 1862.
- The first major use of the drill was for tunneling.
- Circa 1862, Severance and Holt began using the drill to sample marble in Vermont.
- J. Wyman Jones, president of The St. Joseph Lead Company, heard of the drill's use while on vacation near Severance and Holt's operation.
- Jones, curious about a supply of marble on his land in New York State, contracted with Severance and Holt to sample his marble.
- After seeing the drill's potential, J. Wyman Jones theorized that the drill might be of use for the St. Joseph Lead Company's new operation in Bonne Terre, Missouri.



# The Core Drill Comes to Missouri

- J. Wyman Jones, over a short course of time, persuaded the St. Joe board of directors that it would be a worthwhile endeavor.
- The board agreed, though Jones would have to personally fund the project. Soon after, a contract between St. Joe and Severance and Holt was written up.
- The drill arrived in Bonne Terre on March 5<sup>th</sup>, 1869. With the drill came Severance and Holt engineer and drill operator, Albert Shepard.
- Following the execution of Severance and Holt's drilling contract with St. Joe, Albert Shepard chose to stay in Bonne Terre and work for St. Joe.



Albert Shepard

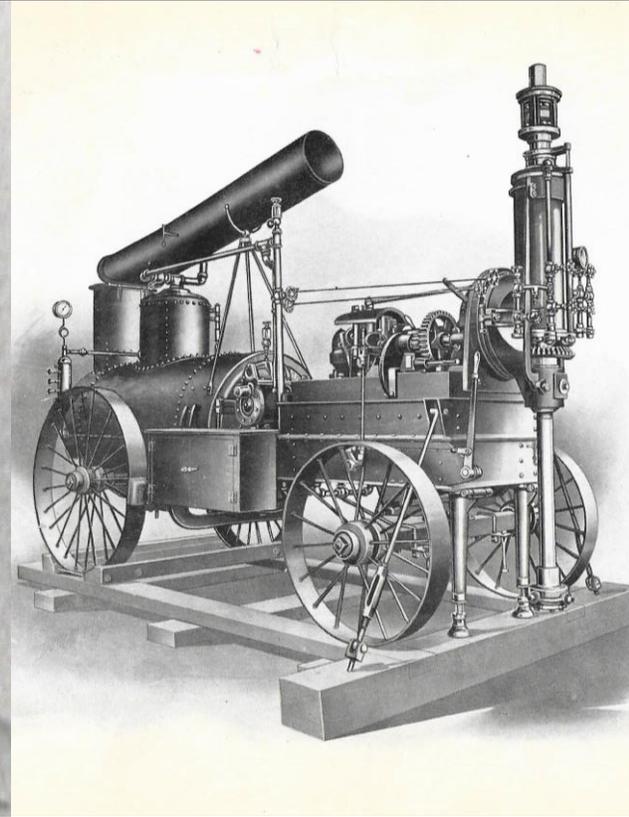
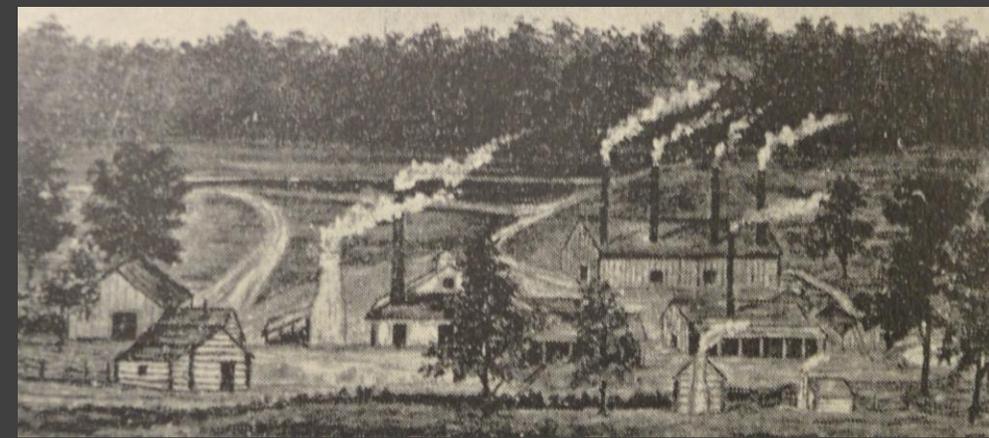


Illustration of a diamond core drill

# The First Of Many To Come.....

- Upon arrival and setting up of equipment, three test holes were drilled. The first two holes yielded unfavorable results, far from the expectations of St. Joe.
- The third hole hit a “fair” amount of ore at a depth of approximately 120 feet. In 1870 the “Camp Shaft” would be sunk at the hole’s location.
- Unfortunately, ore produced from the bottom of this shaft yielded poor results, but a drift mined a short distance south from the shaft hit the desirable ore that had been hoped for.
- This discovery of ore proved the drill’s usefulness to St. Joe and the mining industry.
- ***The use of the diamond core drill to search for metallic minerals in Bonne Terre was the first documented example of such for metal mining in North America.***
- Further drilling by St. Joe and other companies in the following years would lead to the development of the “Old Lead Belt” mining region of St. Francois County- the leading Lead producer for the United States until 1972.



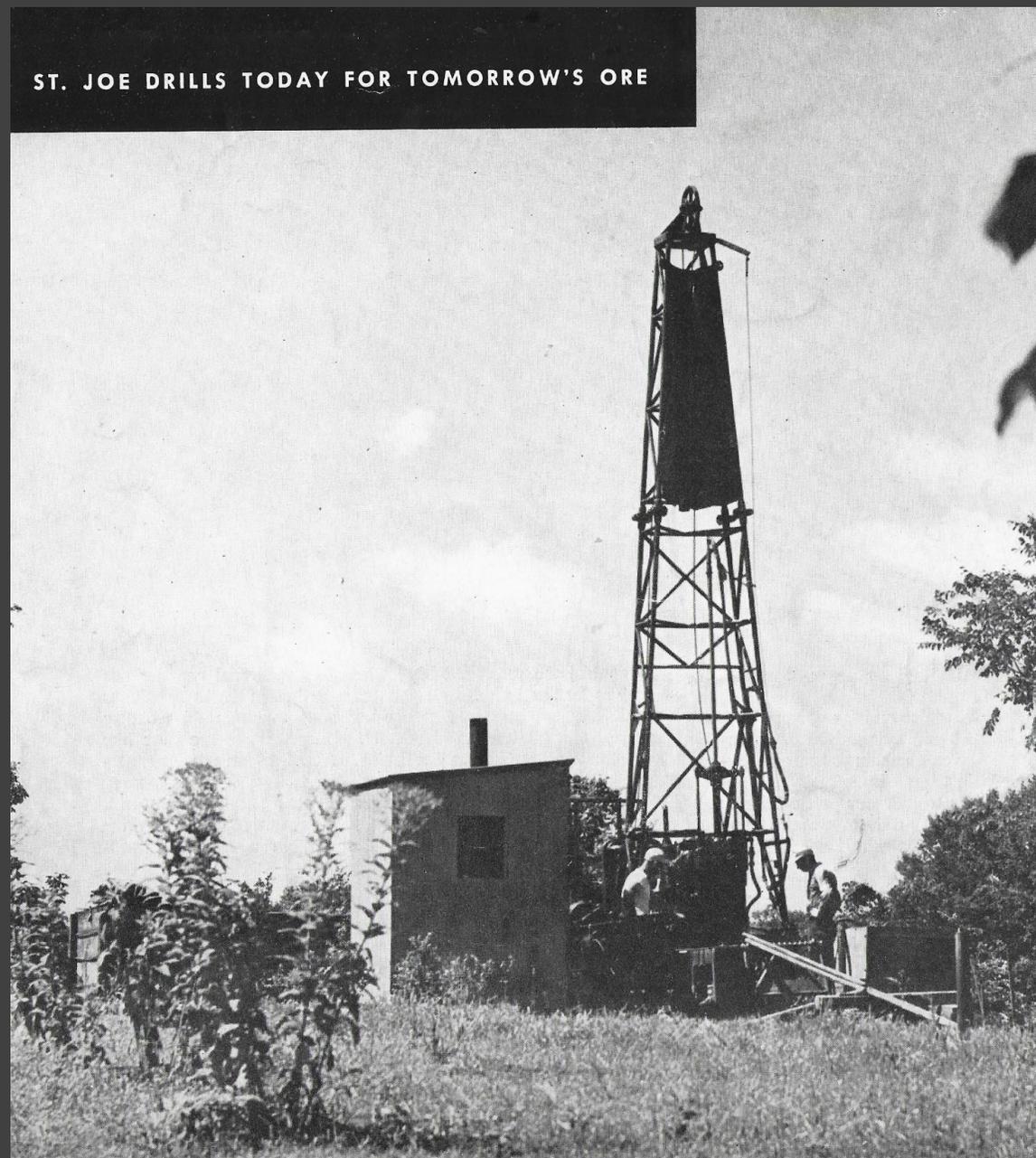
Bonne Terre Circa 1865



Core drill in use in Bonne Terre Circa 1880

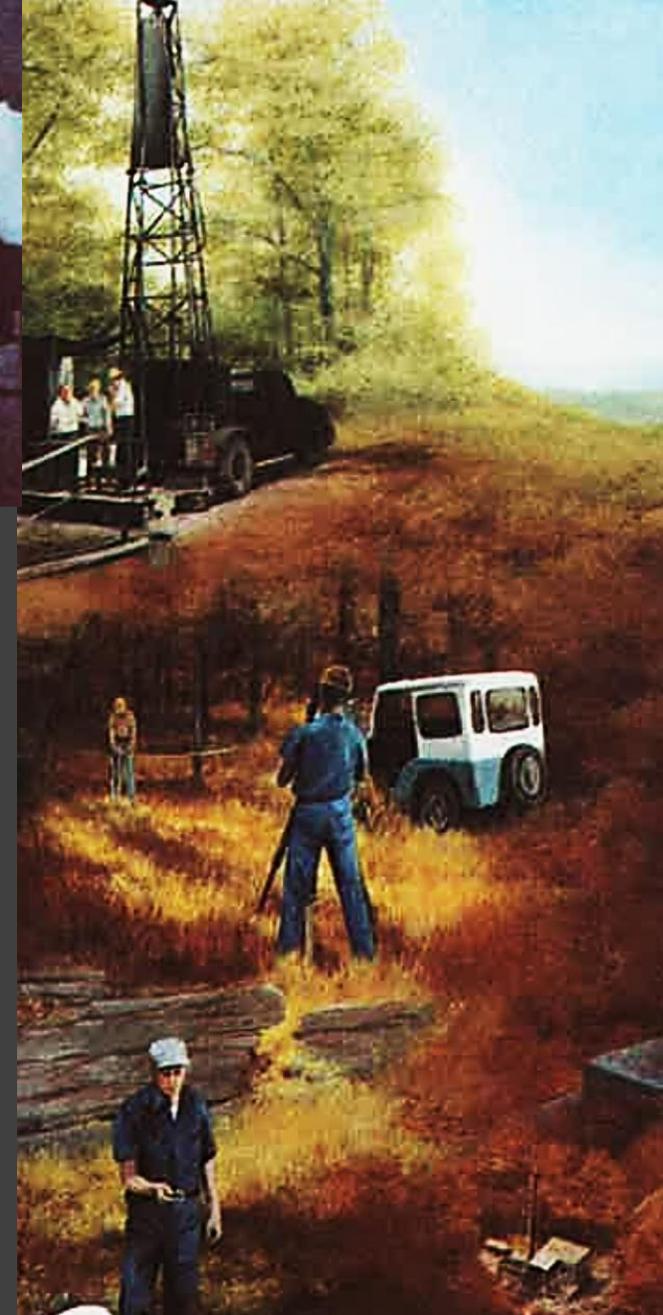
# Depletion of Ore reserves

- By the end of World War II, After 76 years of nearly non-stop large scale mining, St. Joe began to note a decline in the quality of the ore reserves in St. Francois County.
- In its time of operation, ore from the Old Lead Belt had produced approximately 8,509,000 tons of lead metal once smelted.
- A small list of products utilizing lead during this time were: Paint, Gasoline, Piping, Glass, Ammunition, and Lead Solder.
- Exploration had been done in and around the active mining region to add to the district's reserve of ore, but this drop in quality signaled the need for another supply.
- To find a new deposit, geologists began developing a better understanding of how the minerals in the region were deposited.



# The Hunt For New Deposits

- In 1946 geologists began to estimate possible ore bearing locations.
- Three previously mined deposits: Mine La Motte, Annapolis, and Irondale, were considered, but their ore reserves were thought to be too small.
- One previously mined deposit in Doe Run, Missouri was reopened in 1947.
- A new deposit west of Leadwood, Missouri was developed for mining starting in 1948. This was called the “Hayden Creek Mine”.
- Drilling was carried out at various locations in Washington County where historic (late 18<sup>th</sup> and 19<sup>th</sup> century) mining had been done such as: Palmer, Furnace Creek, Wallen Creek, and New Diggings. None of these locations yielded desirable results.



# Discovery of Indian Creek

- In 1946 St. Joe optioned two tracts of land from the Potosi Tie and Lumber company near Ebo, Missouri (north of Potosi).
- The first holes drilled on these tracts yielded poor results.
- St. Joe, unwilling to give up, began drilling three additional holes west of Ebo in January 1947.
- Two of the three holes again yielded little to no results. The third hole was plagued by a “stuck” bit.
- In a last-ditch effort, a company field engineer persuaded St. Joe’s Geology department to bypass the stuck bit by “wedging” the hole. This was new to the exploration department as they had not attempted wedging in previous drilling.
- Near the bottom of this hole, a “trace” amount of mineral was discovered. Without this hole it is likely drilling at Ebo would have ceased.

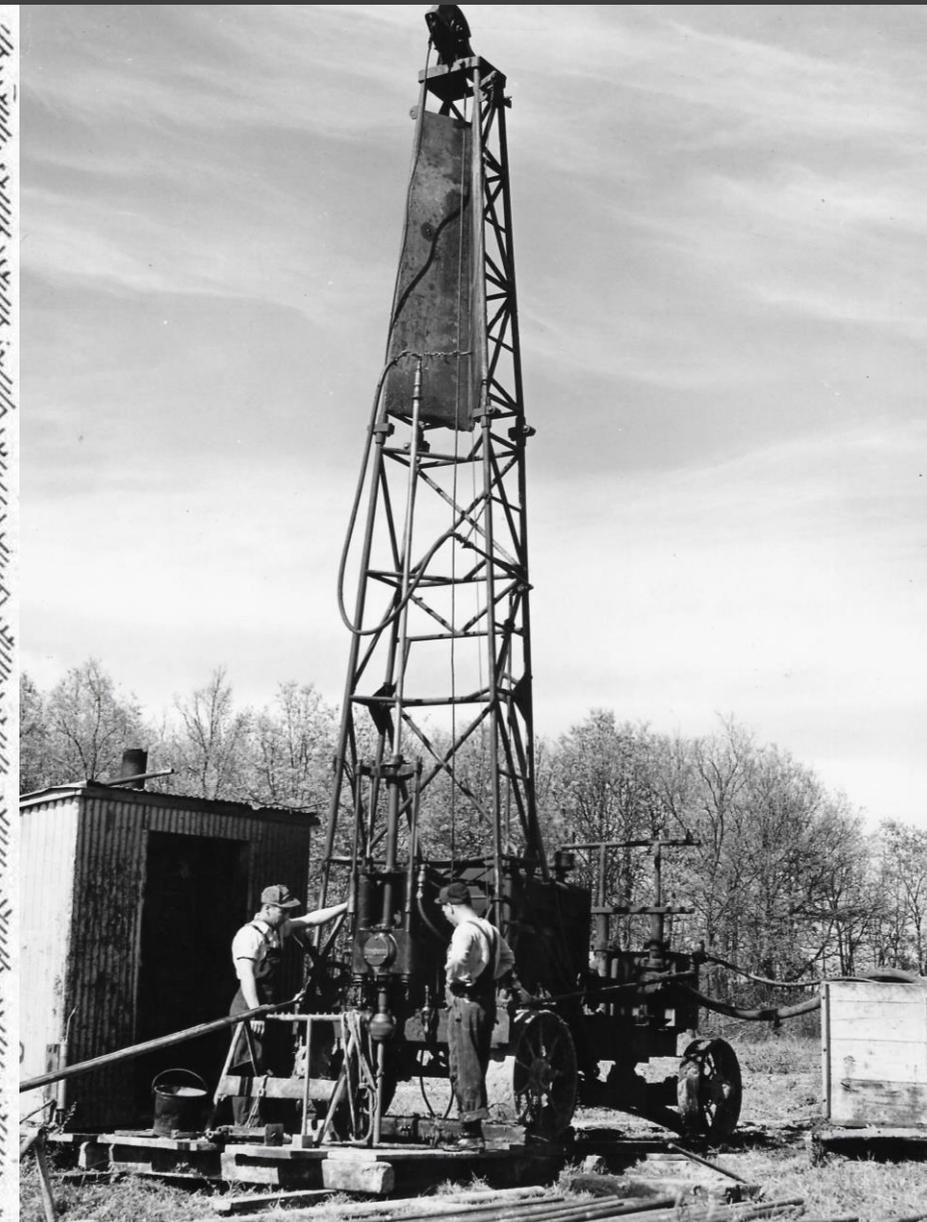
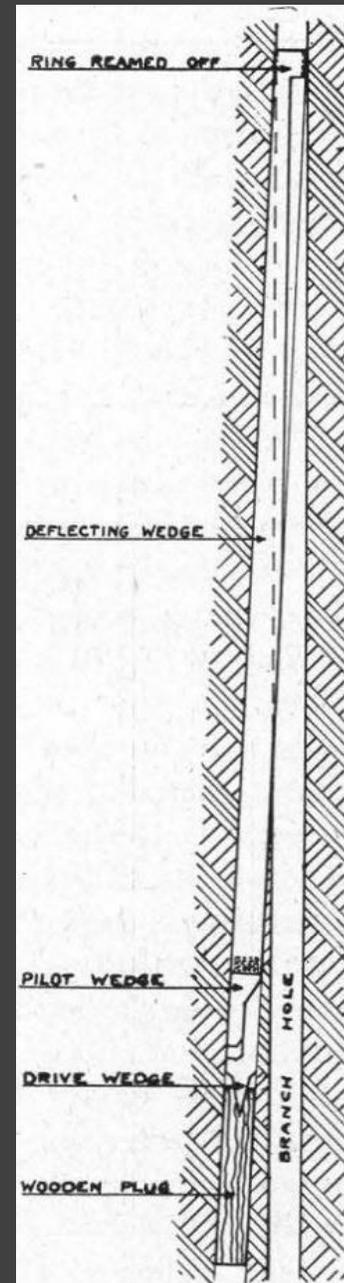


Photo courtesy of Missouri State Parks, Missouri Mines State Historic Site

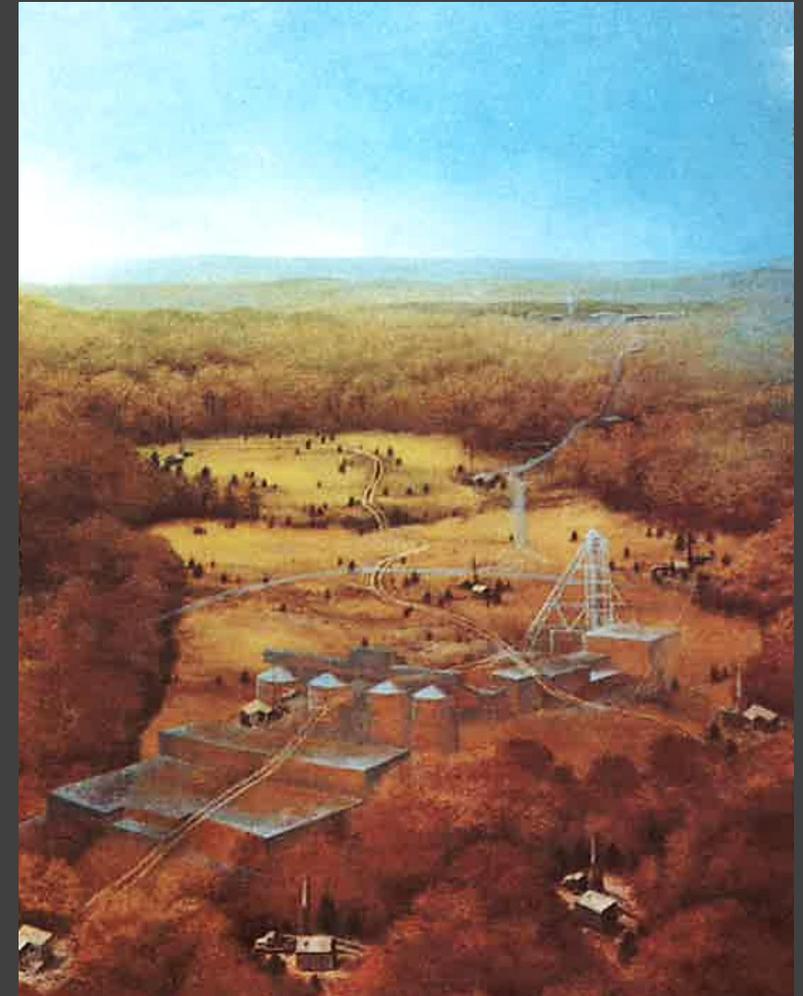
# Discovery of Indian Creek Continued

- More drilling near the “trace” hole was done at 500-foot spacings. Unfortunately, most results were not favorable.
- However, a small group of these holes indicated some mineralization leading in an east-northeast direction.
- Further drilling 1-2 miles east of these trace amounts was commenced. Increased mineralization in these holes indicated that an “ore-center” was likely.
- By April 1948, the first “pay” grade hole was bottomed.
- With this finding, the company began further drilling in the vicinity of the “pay” hole. These holes continued to yield great mineralization.
- St. Joe chose to name this new deposit after nearby Indian Creek. Soon after, St. Joe’s #23 mine was constructed at this deposit, 500 feet south of the initial “pay” hole. This mine went into production in 1953.



# The Gateway to Southeast Missouri

- With the discovery of Indian Creek, The St. Joseph Lead Company had found one of first major bodies of lead ore in Southeast Missouri since the discovery in Bonne Terre in 1869.
- This also brought about the idea that large scale lead deposits could exist outside of St. Francois County.
- The discovery of the Indian Creek deposit led to St. Joe investing heavily in their mineral exploration program.
- The founding of Indian Creek also persuaded the company to invest mines previously thought to be unprofitable. In 1956, the Mine La Motte Corporation (St. Joe and National Lead) would build their #26 east of the Mine La Motte Domain.
- #26 would be St. Joe's last mine east of the St. Francois mountains.
- By 1955, St. Joe took interest in a location named Czar Knob in far western Iron County and had begun drilling.



# The Viburnum Trend

- After a period of drilling at Czar Knob, St. Joe found yet another ore reserve in September 1955.
- This reserve was mapped by further drilling.
- The Czar Knob deposit would later be developed into St. Joe's mine #27 in 1958.
- Though it was not a large discovery, the presence of the Czar Knob deposits again hinted at something much larger.
- On May 3<sup>rd</sup>, 1956, St. Joe bottomed a “pay” grade hole near a location called Viburnum. This would become the first “pay” hole of what the company would call “The Viburnum Trend”.
- Near this location, St. Joe would begin work on their mine #28, along with a new mill.
- A new company town, named Viburnum, was established along with the new mine. This town would become the company's new local headquarters by 1976.



St. Joe Shaft #28 and Viburnum Mill under construction

Photo courtesy of Missouri State Parks, Missouri Mines State Historic Site

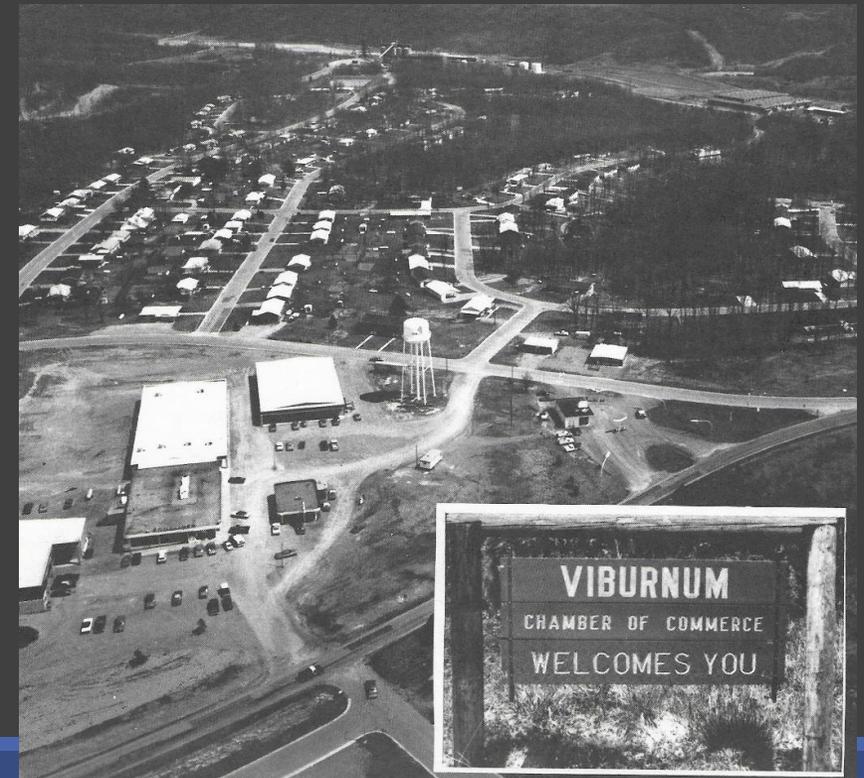
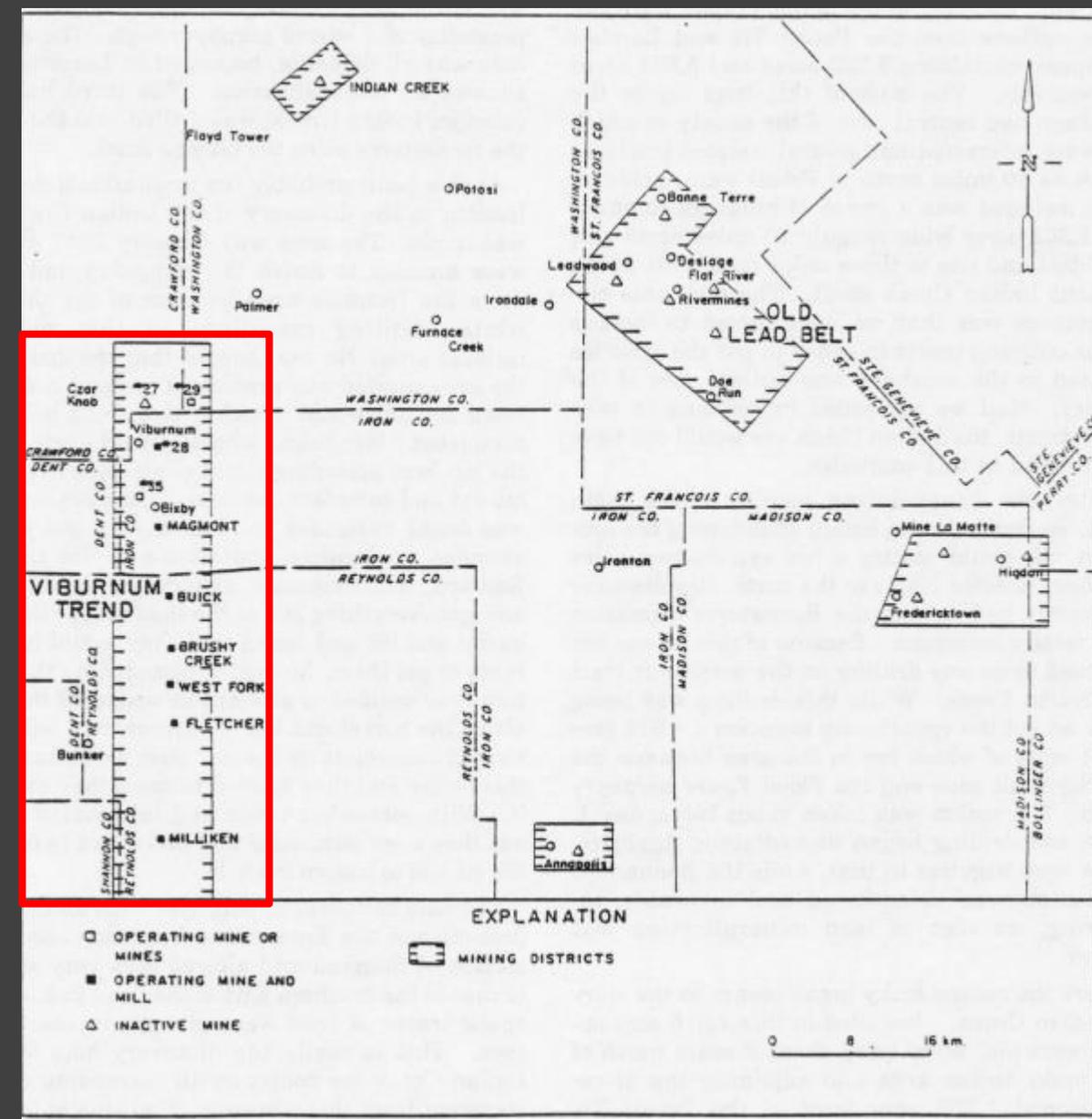


Photo courtesy of the St. Joe Headframe Magazine

# Competing Companies

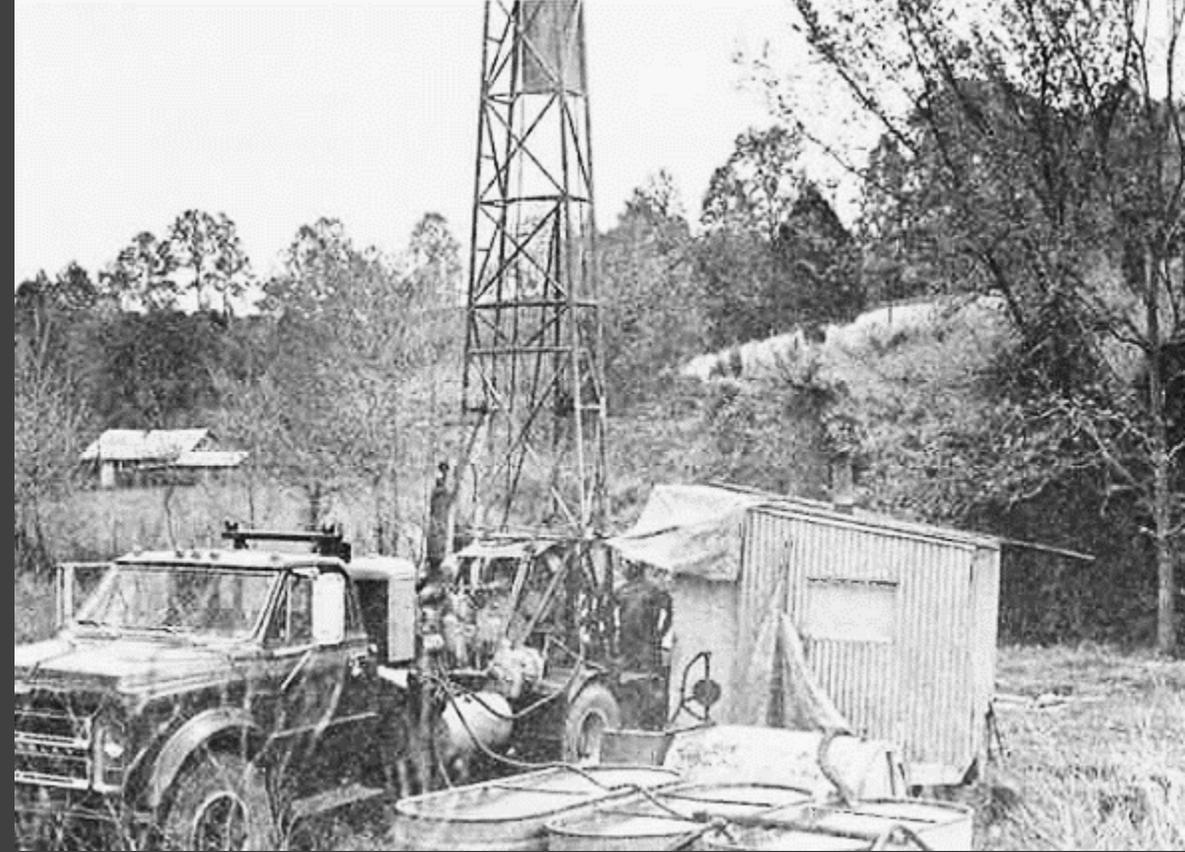
- As was the case in St. Francois County, St. Joe's initial discovery of ore led to a widespread drilling campaign by St. Joe and competing companies.
- Several competing companies began operating mines on the Viburnum Trend:
  - The Ozark Lead Company (Kennecott Copper Company)
  - AMAX Lead Company of Missouri (AMAX Inc. and The Homestake Mining Company-Buick)
  - Cominco American Inc. and Dresser Industries (MAGMONT)
  - The American Smelting and Refining Company (ASARCO)
- By 1964 a string of ore deposits spanning approximately 40 miles in a north to south direction was mapped. This deposit would again become the United States' leading lead producer.



Map courtesy of: *Recent Exploration History of Southeast Missouri*, E.L. Ohle and P.E. Gerdemann

# Continued Drilling

- Like the Old Lead Belt, diamond drilling is still a vital part of operations on the Viburnum Trend.
- Throughout the 1980's and into the 1990's a series of partnerships and buyouts led to what we now know as the Doe Run Company. During this time, several competing companies would cease their operations or sell their holdings. Drilling would continue on these properties as well.
- The final properties to be acquired by The Doe Run Company were ASARCO's in 1998. This purchase made the Doe Run Company the sole operator on the Viburnum Trend.
- Continued diamond drilling, both surface and underground, is used to identify new ore bodies in order to add to existing ore reserves.
- Using the diamond core drill, the mining cycle is continued, and vital mineral resources are discovered locally and by other companies worldwide.



Questions?

*Thank you!*

Jake Jones

January 31st, 2023



# *References- The “original” Doe Run Company*

- Thompson, Henry C. (1992). Our Lead Belt Heritage. [Walsworth Publishing Company].( Original work published 1955)
- McHenry, Robert E. (2006). Chat Dumps of The Missouri Lead Belt. [Self Published].
- Crane, Clinton H. (1987). Mining Memories.[St. Joe Minerals Corporation].
- Darnell, Dave (1991) St. Francois County Looking Back. [Walsworth Publishing]

# *References- Mineral Exploration*

- Wharton, H. M. (1977). Guidebook to the Geology and Ore Deposits of Selected Mines in the Viburnum Trend, Missouri.
- Gerdemann, P. E., & Ohle, E. L. (1989). Recent Exploration History in Southeast Missouri. Department of Geology and Geophysics, University of Missouri.