At Prince William Forest Park...

Sounds good to me.

Hey, what's pyrite anyway?

You know, fools gold?

At the end of the trail...

Hey, what's gives?

There's no tunnels or minecarts or anything.

Yea, there's nothing here.

More here than meets the eye.

Who said that?

Sorry if I startled you. The name's Thaxton. The Pyrite Man.

Where did you come from?

Where most pyrite comes from - heated water solutions bearing minerals. As the solution rises into cracks and cools, the minerals precipitate out.

Looks line nothin' now, but back in the day, the mine was busy 24/7.

Didn't have the value of gold, but pyrite like myself was pretty valuable.

The ancient Greeks called pyrite "the stone that strikes fire."

Maybe he should go by Thaxton the Pyromaniac.

Pyrite? Valuable? Why would anyone want fools gold? Is your fire dead out?
Well after the civil war farmers were scraping by.

Fed their families, but not much more.

With industry growing, and the pyrite discovery here on Quantico Creek, things changed fast.

Pyrite is sulfur and iron. Mining pyrite to extract sulfur allowed people to make a living.

But it was by no means the easiest. Mining pyrite was dark, dank and dangerous. Miners had to blast it out.

I love this job.

Sulfur? That rotten egg smell? What good is sulfur?

Why, without sulfur paper, tires, gunpowder, and some medicines couldn’t be made. Back then, pyrite was the cheapest way to get sulfur.

But it couldn’t have been that dark.

There were light bulbs, right?

In the early days miners had a small oil lamps.

Which didn’t hold a candle to the sun in the sky.

Everyone was assigned a crew...

Drillers

Powdermen

Muckers

Timbermen

Bored holes for dynamite.

Carried and set the dynamite.

Loader ore into wagons.

Built wooden supports.

This was the only place to work. Everyone - Italians, Irish, freed slaves all worked here.

And the Cabin Branch Mining Co. had ways of keeping them here. Namely, debt bondage. Miners were paid mostly script-money only good at stores owned by the mine. The mine also owned the houses so they collected rent.

Blaster supervised the process and were paid by the distance they progressed.

Three shifts a day, for $4 a day. Just shy of $7.50 in today’s money. And men always knew a cave-in, gas leak, or explosion could kill you quick.

If it was so dangerous, why would people do it?
As for the miner's children...

They went to school over in Batesville, a town of mostly freed slaves, and Hickory Ridge. But this was a poor mining community. School didn't pay so even kids sorted ore for 50¢ a day.

Eventually, they did. America entered World War I in 1917. Cabin Branch produced 1/3 of this country's pyrite used mostly for gunpowder. After the war, the price dropped.

The miners went on strike for a 50¢ raise.

The mine decided that, since pyrite was becoming less valuable, they would shut the mine down instead of giving the miners a raise.

Things here were quiet 'till after the Great Depression of '29. FDR formed the Civilian Conservation Corps to give people jobs.

Men built roads, buildings in parks and made other improvements on public lands.

This was Chopawamsic Recreation Demonstration Area. Area farmers were paid for their land and were able to move to less depressed areas.

Over 2,000 men with the CCC were paid to build cabin camps, roads, lakes and dams. In the end it was summer camps for under-privileged city kids.

Things here for the kids were good. But the land and creek near the site of the mine were dying.

Remember I said that pyrite is rich in sulfur? Well, when pyrite is exposed to air and water, it starts to change.

First the sulfur oxidizes:

\[ 2 \text{FeS}_2 + 7\text{O}_2 + 2\text{H}_2\text{O} \rightarrow 2\text{Fe}^{2+} + 4\text{SO}_4^{2-} + 4\text{H}^+ \]

(pyrite) (air) (water) (iron) (sulfate)

Then the iron oxidizes to ferric iron:

\[ 4\text{Fe}^{2+} + \text{O}_2 + 4\text{H}^+ \rightarrow 4\text{Fe}^{3+} + 2\text{H}_2\text{O} \]

(iron) (air) (ferric iron) (water)

Then, rain reacts with ferric iron to make ferric hydroxide:

\[ \text{Fe}^{3+} + 3\text{H}_2\text{O} \rightarrow \text{Fe(OH)}_3 + 3\text{H}^+ \]

(iron) (water) (ferric hydroxide)

Finally, it turns to sulfuric acid.

Sulfuric acid lowered stream pH levels to that of vinegar. What's worse, some seeped into the water table underground and polluted the area surrounding the mine.

Runoff of iron hydroxide blocked out sunlight and covered the streambed with a nasty, thick, red blanket.
So, what did they do?

Reclamation is like making it habitable again. In the early '80s there was no good wildlife.

First off they tried a storm water conveyance. They carved ditches that curved around tailing piles to divert water from the polluted part of the mine so chemicals wouldn't leach into the water.

Next thing they did was to cover the tailings with dirt, lime and sanitized sewage to keep heavy metals from washing into the creek.

Finally, they capped the shafts with huge blocks of concrete. Those pipes with chains through them are a warning system. If the chain is pulled tight, the shaft has caved.

So, is the creek clean now? Safe for wildlife?

It's getting there. Rangers keep an eye on things. They test the soil and water, plant trees to slow the rain water from running off the hillside and into the creek. A lot of reclamation is trial and error and because we're talking about nature, results don't show up right away.

When you plant trees you have to wait to see if they take root. When you add soil you have to wait to see if it makes a difference downstream.

I wonder, what would've happened if the Clean Water Act had happened earlier or later or not at all? How long would it have taken to discover that things were a mess?

I'll be here for millions of years more so I'll be able to see what works and what doesn't.