

Q: Today's date is November 23, 2004. I'm speaking to Robert Mahin. Bob could you please state your name and birthdate.

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Q: Bob I would like to ask you **Interview with Robert Mahin:**

**Regarding the discovery of the rich zinc mineral deposit in Menominee County and gold prospecting in the Upper Peninsula.**

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**Matthew L. Gougeon**

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A: My name is Robert Mahin, I was born on January 31, 1961.

Q: Bob I would like to ask you about your profession and your experience in your profession in the Upper Peninsula.

A: I am an exploration geologist. I look for mineral deposits, I look for ore deposits, gold, copper, nickel, whatever it may be in the Upper Peninsula of Michigan and the upper Great Lakes region as well and in Minnesota as well.

Q: Can you tell me about your past experiences either with companies here in the U.P. or elsewhere, to get a basis for what you've done.

A: I started out working out in Utah after I got my masters degree. I started out looking for gold in the Great Basin for a large multi-national Australian based mining and exploration company. They got involved in a joint venture with a company called Callaghan Mining. This was in, I think 1988. Callaghan Mining had re-opened the historical Ropes Gold Mine which was the only real gold mine in the UP that ever produced any gold. It was discovered by a man named Julius Ropes I think in the 1870's, 1873 comes to mind but don't quote me on that. Anyway it was an underground gold mine and I don't know how long it operated for, but it was shut down and this company

called Callaghan, which was a silver mining company based out of Idaho and Arizona, and based on the high prices of gold in the 1980's had come in and actually drilled out some reserve and re-opened the Ropes Gold Mine north of Ishpeming. They were doing a lot of exploration in the region but they were running out of money for their exploration program. The mining operation was still self supporting but they were losing money for the exploration. They were looking for more deposits like the Ropes.

Q: Did they think they were going to extract more gold from that mine, is that what they were after?

A: The Ropes Mine? They knew they were running out of reserves. Those kinds of things are dependent on the price of gold and that sort of thing. Any company that is mining in an area is always looking for more deposits.

Q: More deposits in different minerals or more of the same?

A: More of the same. They were mining gold and they were looking for more gold deposits. There happened to be a fairly impressive gold outcrop. That is to say an outcrop that you can sample and get an impressive gold value. There is an area there where there are impressive outcroppings but none big enough where you can make a mine. But certainly impressive enough to encourage a company to want to look for a deposit. The rock north of Ishpeming is actually similar to the rock in Canada where

there are huge deposits and also similar to the rock in Australia where they are mining gold. That is to say there are certain age of rocks... should I go into this?

Q: Absolutely. When you say the rocks are similar, what does that mean?

A: They are all archian greenstone belts. Archian is an age of rock which is used to be called pre-cambrian and the pre-cambrian was broken up into the archian and the protorezoac. And archian rock are anywhere from 2.5 billion years old or older and greenstone belts are large ----rock that were volcanic flows either on the ocean floor or the result of rich systems wich exist now, anyway, these greenstone belts are host to super giant gold deposits in Canada and Australia. When geologists look for those kind of deposits they look elsewhere in the world where these greenstone belts are found of the same age.

Q: These are north of Ishpeming?

A: These exact same kind of rock occur north of Ishpeming, called the Ishpeming greenstone belt.

Q: They were very excited about it?

A: The parent company saw all of the analogies and they said well this looks like a good opportunity. What they did was they got into this joint venture with Callaghan. The

company I was working for is called Western Mining Corporation. They went to Callaghan and Callaghan had gone all over trying to find partners. The company I worked for was a big company with lots of money and they said, 'Okay we will fund your exploration program as your doing it and if you find anything, we get 70% of it. Plus we get to install a couple of our people into the project. So they shipped me out here to Marquette, that was 1990. I Looked for gold in the UP greenstone belt for three years before both companies decided to call it quits for various reasons. Then I was a freelance contract geologist for a number of years. I worked mainly for Kennecot on summer jobs, on their now famous nickel exploration program with which they've had a major discovery.

Q: Did you also work for the Cleveland Cliffs Company?

A: Correct. The time when I was doing contract geology work was because there just wasn't any work going around and I was taking work as it came. Prior to working for CCI I actually had a steady job for two years with this "mom & pop" company called Minerals Processing Corporation.

Q: "Mom & pop" mining?

A: "Mom & pop" mining, well exploration anyway. They had actually bought the old mill that Callaghan was using to process gold. They acquired the rights to most of the gold prospects that Callaghan was working on and that I worked on and tried to take

another stab at finding minable amounts of gold in the same greenstone belt. Because I had experience in the area- there was one guy who was running the program and about four investors- they hired me on and I did the same thing, I looked for gold in the UP for two years. We didn't find a deposit and two years is a typical time limit for this type of project if it doesn't produce any serious encouragements. So, that job started to fizzle. So, an opportunity came at CCI for one year in the geological research department.

Q: So you spent five years looking for gold in the UP?

A: Five solid years and a couple summers inbetween.

Q: To your knowledge is there anyone else currently looking for gold here?

A: Well its interesting, the UP, and the U.S. in general is a small mining exploration community, and what we call the mid-continent region is the UP and Minnesota and the whole area around Lake Superior, is an extremely small community of exploration geologists. I know every exploration geologist working and that has worked in the UP in the past 20 years. I know them all and can count them one hand. What was the question again?

Q: If anyone was looking for gold?

A: Gold? Currently no one is looking for gold because the price of gold has been so low- below \$300.00 ( per ounce) since 1999-2000. That's when the project I was working on with Mineral Processing Corporation started to "go south". When the price goes over \$400.00 and stays there for awhile there may be some interest.

I currently work for Mineral Processing Corporation, and have for two years, on a different project, a new discovery that isn't gold. They still hold a lot of the leases in the greenstone belt and they may try to resurrect them if the price of gold rises. But I don't think anyone else is looking for gold in the UP.

Q: Let's talk about your current project. What is involved in it and where is it?

A: The current project is something called the "Back Forty Project". It is a bona fide ore deposit discovery, which in the exploration world is actually quite rare. As an exploration geologist your really lucky to be involved in one once or twice in your career. There are exploration geologists who are out there, hammering on outcrops, taking notes, making geological maps, as I've done in the UP, and never, ever, come across a discovery. They may advance to a state where they have a lot of drilling and a lot of delineation, but to have that advance further to an ore deposit- a discovery is really quite rare. 1 in 10,000 prospects may actually become a development. And this is one true bona fide discovery. Quite a major deposit. It's a zinc and gold deposit about 12 miles due west of the little town of Stephenson. Stevenson is a little town that is just north of Menominee and Marinette. So in that part of the UP that dips down toward the northwest shore of Lake Michigan.

Q: You were in on the discovery of this ore?

A: I wasn't, to a certain extent. The history of this deposit is that a water well company was re-drilling a water well to a camp owner who had a very bad tasting water. This water well driller had a partner who was an exploration geologist who had trained their drillers to be on the lookout for anything interesting or out of the ordinary. In fact they were drilling this water well and they were getting mineralization in the cuttings and they recognized it for what it was. It was a zinc rich mineralization. A lot of pyrite, a lot of --rite, and that was basically the discovery. They didn't even know what they had. They started to acquire ground, but they couldn't get any interest from any companies. This was basically two guys with not a lot of experience and a water well rig. And not much experience dealing with the modern exploration industry. They really had a difficulty finding a partner who recognized what they had- or to get anyone to listen to them.

Minerals Processing Corporation, the guys name is Tom Quigley, he's one of the handful of geologists doing mineral exploration including myself and a couple of other guys, he latched onto the project and he was really the only active company based in the region and realized that, yeah, they might have a real deposit here.

Q: After he realized there might be something there, he brought you into the picture?

A: Yeah, they ran some geophysical tests and drilled two holes. The one hole, which was considered the discovery hole, it's like drilling the mother lode, they drilled the mother



lode of zinc, is what they did. It was really quite fabulous, to drill that kind of thing. They knew that they had something significant. They didn't know how big it was, but knew it was significant. With just that one hole they were able to go out and find a major multi-national company to pay them for their exploration. That's how rich the one hole was. They were negotiating with this company and in the mean time Mineral Processing Corporation knew they were going to have a major deposit, knew they were going to need people so I had worked for Tom before and he gave me a call. I quit CCI in January of 2000, I worked for a few weeks with Kennecot on their major nickel discovery just as an extra hand, in the summer of 2002 and after I was laid off by Kennecot, within days Tom called me and said they had this major project coming up. Said it full-time work for two years.

A: Yes But what I was involved in was not the first two holes, but the next seventy holes which outline and delineate the project. Which enabled us to determine how large it was. I basically became the project geologist, supervising all of the core. Taking the continuous cylinder of rock that gets drilled, of course that gets broken up into specific lengths, that all have to be identified and described.

Q: When you say you took part in the drilling of seventy holes, is it actually drilling into the rock, and with what?

A: Exploration drilling usually involves drilling with diamond drill rigs. And you drill core. There are two ways to do exploration drilling, one is called coring where your drill bit is actually a hollow bit. It's a steel cylinder and the face of it is embedded in

diamond. It's like a hole saw is what it is. You actually get a continuous cylinder of rock.

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Q: How deep? We haven't closed them off. So we need to do quite a bit more drilling to find the ultimate extent of this deposit. When that's done, and who knows how

A: As deep as it needs to be. We've been working in meters. Anywhere from 200-550 meters. So from 200 feet to 2,000 feet. It'll vary depending... this deposit is shooting downward at an angle, shallower in some spots, deeper in others.

At that point we'll do an economic evaluation based on the grade of deposit, fair metal.

Q: How long does it take to drill a 200 meter hole? It'll be done. This deposit hasn't even started to surface. It actually outcrops and then it plunges down at an angle and gets

A: You might expect that drillers have their own culture and drillers are a rough bunch because it's loud and your handling greased pieces of 10 feet long steel. Driller actually get paid based on how much they can drill. Typically, in a 12 hour shift, if they can drill 300 ft. they're doing really, really well. You can break that down anyway you want. It depends on how hard the rock is. Some of this rock is actually quite hard, so it's pretty slow. If they can get a hundred meters in one 12 hour shift, they're doing pretty good.

Q: So if everything is in line, or in order, how is the mining done? Currently, today there is a big gefuffle about Kennecot and their nickel deposit, how is the zinc mined?

deposits in Nevada were open pitted. There were some deposits in Utah that were open

A: I'm going to back you up on that question. Because you skipped a step. Kennecot has essentially drilled out their deposit. We know this because they've actually shown fairly

complete models and reserve estimates. So they know exactly what they have. Where it stops, where it starts. They've closed it off on all ends, they've done enough drilling.

We're at the stage where some of our edges, some of the ends of our deposit are what we call "still open". We haven't closed them off. So we need to do quite a bit more drilling to find the ultimate extent of this deposit. When that's done, and who knows how many more holes that will take... the seventy holes we've drilled have turned out to be 20,000 meters of core. We probably need another 20,000 meters to bring the deposit to a state of knowledge where we are comfortable enough to do an economic evaluation. At that point we'll do an economic evaluation based on the grade of deposit, fair metal prices, and the mining the types of mining that could be done. This deposit hasn't even started to surface. It actually outcrops and then it plunges down at an angle and gets deeper and deeper at a regular angle and so far we have it at about 1500 feet below surface. So, the general plan is to have the upper part, the outcrop, be a small open pit and then where it gets to deep to open pit, to go underground. It could be a combination of open pit and underground.

Q: Sounds a little more traditional...

A: Traditional in the sense of underground, yeah. Open pit is fairly new technology basically in the 60's open pitting became a reality for mines. Some of the big ore deposits in Nevada were open pitted. There were some deposits in Utah that were open pitted before that. The iron mines in the UP didn't realize the value of open pitting until the 1960's and actually the 1970's.

deposits as well is what took us over the top. It's not really high grade gold but it's

Q: Is Tom Quigley and his Mineral Processing Corporation still the lone wolf on this project?

Q: How is the public in the area of the deposit accepting the exploration and are you

A: They are. At one point during the project after drilling that second hole, the discovery, which was a huge length of zinc, which by the way had significant gold credits too, which adds a lot to the value. That was enough to attract a major company that funded the next years worth of exploration. They funded the 20,000 meters of drilling. That company is called Inco of Canada. They are the world's largest nickel producer. At that time they were interested in diversifying out of nickel a little bit and so they financed this project. During that year, they had a re-visioning and decided not to branch out of nickel and decided not to continue this project and Mineral Processing Corporation and it's small group of investors to go it on their own, and since then we've been looking for financing and if you don't have a major company doing your financing the next road is to go into the public arena for selling stock on the retail market to raise money that way. What we've been doing for the last year is to try to find the right avenue of public...

which

Q: With the zinc in that ridge does that make it easier to go public?

Q: What is their complaint? Are they concerned over the degradation of the forest? Do

A: Unfortunately, zinc has been the whipping boy of debate metals market. It's low on the totem pole as far as... copper and nickel are far more lucrative and gold are the top as far as the food chain goes. The grade of the zinc is very impressive but they're almost at the break even point for the current price of zinc. But the fact that we have gold in this

deposit as well is what took us over the top. It's not really high grade gold but it's enough to be a significant credit.

Q: How is the public in the area of the deposit accepting the exploration and are you running into any resistance, or are you being welcomed with open arms and are they looking forward to it?

A: Like the rest of the country on most issues, it's closely divided. There have been two groups that have arisen after we went public with our project. An opposition group organized and active and opposed to a mine operation going on in Menominee County. They have gone to great effort to influence the local government in trying to discourage any effort at putting a mine development into production. On the other hand, another group, much smaller, has put up a website and is a little less biased and more evenhanded as far as distribution of information is concerned. It's been a struggle because there are some local people who are very influential with local officials, so we really don't know what the majority of people in that township think, or feel. They're being squeaky wheels.

Q: What is their complaint? Are they concerned over the degradation of the forest? Do you know how many jobs potentially the mine could provide?

A: We've had open houses where we describe the possible number of jobs from 100 to 400.

Q: That's significant?

A: We've got figures on the average mining wage of around \$44,000.00 per year. That kind of thing and plus all of the mercurial spin off contract work that will happen. The opposition are a small select group of land and camp owners right in the area and a few other people who are convinced that it's going to affect them. A few people that have land close enough that might be impacted by the mine. And there are some concerns about pollution, air pollution, dust pollution, things like that. And having an industrial operation right in the vicinity. There are also some concerns about water pollution. There's a problem that is in this particular opposition tends to spread information which isn't accurate in terms of what could be polluted and what will be polluted. We've had people come to us with concerns about us polluting Lake Michigan which is dozen of miles downstream on the river. The struggle to find in the public arena to find rational, and trying to explain to people what we really know is believed to fact and in the engineering of what we are doing, versus what we consider to be exaggerated pseudo science. But yes, there is some strong resistance to where we are.

Q: Does the project have a name? Does the mine have a name?

A: Right now it's called the "Back Forty Project". Don't confuse that with the "Front Forty Project" because that's the opposition. The Back Forty Project is actually a group of projects. This particular deposit is called the El Duque Deposit.

Q: Would you go so far as to divulge a potential time the mine could open?

A: That's difficult. If we did what we want to do and that's drill another 20,000 meters, the new company that's going to be the public entity is going to be called Aquilla Resources, which means eagle. Anyway, if Aquilla Resources gets its funding and pushes ahead and we do an adequate amount of drilling it will take at least another year if not another year and a half. A feasibility study would be another 6 months, so up to two years. And permitting- we don't know how long permitting will take. Kennecot hasn't filed for permits for their underground mine and there's a new law right now on the floor of the Senate and House of the state of Michigan specifically addresses underground mining. So length of time we have no idea. Could be 6 months could be a year. I would say a year before we submit an application for a mine permit. After that could be months or years. Five years before a mine could open.

Q: One last question. Your favorite, greatest moment as a geologist in the field?

A: Oh, that's easy. It was 1999, I was working for Minerals Processing Corporation the first time, doing gold exploration and we were doing some detailed mapping on what we considered our best gold prospect, and I came across a chunk of quartz about two inches wide and I realized there was some visible gold in it.

Q: Came across it?

Q Still a bit of a moment.

A: Well, I was looking for faults in the rock, a particular orientation, when you look for gold in archaic rocks, you look for fault systems. If you can identify a fault system with the right conjugate, that is the right fault with a certain orientation, some of them will be gold bearing and some of them won't. I won't go into why, but if you can identify the orientation of structures... I was looking on the face of this one outcrop and not a tree growing over it but a root system growing over it, but a likely orientation so I dug in there a bit and found some quartz in there and was looking at it in my hand and could see some flecks of gold. Which is really rare these days. It is so rare to find gold that you can actually see with your eye, using a hammer in an outcrop. All the gold deposits being mined in the world today are mining what is called "invisible gold". Gold on a microscopic scale, you can't see it, you don't know it's there. I found this one chunk of rock that had this visible gold in it. I hadn't seen any gold in years, I wasn't even sure that was it, so I called over Tom and said, 'What do you think of this?' Looked like gold to me, so we started digging into this little vein, two to four inches wide and we found just spectacular little flakes of gold in the rock. It was like kids in the candy store on Halloween, we were shaking with excitement saying 'Look at this, look at this!' We kept finding better and better flakes of gold. That could have meant that there was a fabulously rich deposit right there, that was a feeder zone or a leakage zone of a major deposit. Turned out that that was all there was. It was just one vein, a couple inches wide, it went for 10 feet in one direction and maybe ten feet deep and then it just pinched out in every direction and that's all it was.



Q: Still, a hell of a moment.

A: Yeah, the only visible gold found in the UP for decades. Well, since the Ropes mine.

Q: Thanks, Bob.

A: Sure.