STATE OF MAINE

LAND USE PLANNING COMMISSION HEARING

In the Matter of

Zoning Petition ZP 779A

Wolfden Mt. Chase, LLC

Application for Zone Change, Pickett Mountain Mine

October 16, 2023

Day 1 of 3 of Testimony and Evidence

BEFORE: Angella D. Clukey, Notary Public, at Stearns Jr. Sr. High School, 199 State Street, Millinocket, Maine.

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(This hearing was taken before Angella D. Clukey, Notary Public, at the Stearns Jr. Sr. High School, 199 State Street, Millinocket, Maine, on Monday, October 16, 2023, beginning at 9:32 a.m.)

MR. WORCESTER: Good morning. I now call to order public hearing on the Land Use Planning Commission on Zoning Petition ZP 779A Wolfden Mt. Chase, LLC proposed rezoning to allow for the development of Picket Mountain Mine.

My name is Everett Worcester. I'm the current chair of the LUPC and I'll be the hearing officer through this proceeding.

Now I'd like to introduce the other commissioners. Leo, would you like to start?

MR. TRUDEL: Leo Trudel, Aroostook County.

MR. PRAY: Peter Pray, Penobscot County.

MS. HILTON: Gwen Hilton, Somerset County.

MR. WORCESTER: And this is Stacie Beyer, she's the executive director of the LUPC.

MR. ELWELL: Caleb Elwell, Assistant Attorney General, counsel for the Commission.

MS. FITZGERALD: Betsy Fitzgerald, Washington County.

MR. ELLSWORTH: Perry Ellsworth, Franklin County.

MR. WORCESTER: We also have one commissioner who -- Millard Billings, who will be listening. He's not able to communicate.

We have a second commissioner who's in transit and won't be able to hear the presentations.

We're also short one commissioner. Their term expired and the county commissioners have appointed their replacement, but they haven't gone before the joint standing commission of the legislature. There's a joint standing committee that we all have to pass muster with. So they won't come on board until the legislature meets again.

That's the downside of that. The upside is the legislature isn't meeting.

The hearing is being held pursuant to provisions of Title 12 Section 684 and Chapter 12 of the Commissions' rules: Mining and Level C Mineral Exploration Activities.

The hearing will be conducted in accordance with Chapter 5 of the Commission's Rules for the Conduct of Public Hearings, the State's Administrative Procedures Act, and the five procedural orders issued by the presiding officer in advance of this hearing.

This hearing is being held to receive testimony on the proposed rezoning that would allow for the development of Pickett Mountain Mine.

This hearing is being recorded and live-streamed. All witnesses at this hearing will be sworn and any documents entered into the record.

At this time I ask all persons planning to testify today to please stand and raise your right hand. And since we're in a school situation -- I'm an old-time teacher, so I am not sure that you're prepared for this question, so the answer is yes.

Do you affirm that the testimony you are about to give is the whole truth and nothing but the truth?

TESTIFIERS: Yes.

MR. WORCESTER: Thank you. You may be seated.

The hearing will following the hearing schedule as provided in the fourth procedural order.

Tim Carr will now give the LUPC staff statement. Tim?

MR. CARR: Good morning. Good morning, Chairman Worcester, Commissioners, Executive Director Beyer, Counsel Elwell, my LUPC colleagues, the parties to the hearing, and members of the public.

I'm Tim Carr, senior planner with the Land Use Planning Commission, and I'll provide the staff introduction to the public hearing on ZP 779A Wolfden Mt. Chase's rezoning application for the proposed Pickett Mountain Mine.

The staff introduction will briefly review the timeline of the application and notices, the parties to the hearing, the schedule and topics of the technical sessions of the hearing, and public comment. And it will end with staff reviewing the administrative record and entering it into the hearing record.

To review the timeline at a high level, the rezoning application was filed in January of 2023 and in February was accepted as complete for processing following LUPC rules.

In June the LUPC provided additional notices that a public hearing on ZP 779A would be held, including information on filing petitions to intervene.

In September the LUPC provided notices of the hearing dates, times and locations, and these notices were published in the Bangor Daily News and the Houlton Pioneer Times, sent to the county governments of Penobscot and Aroostook Counties and state and federal resource agencies.

They were sent to persons requesting notice of the project, property owners in the area, and the appropriate state legislators. And additional notice was provided through the LUPC's web page dedicated to the review of the project.

There are three parties to the hearing.

There's the applicant: Wolfden Mt. Chase, LLC, whose representatives are seated behind me and to your left.

There's Intervenor 1, which is HC Haynes, in support of the application's proposal, and its representatives are seated directly behind me.

And Intervenor 2, the Penobscot Nation, Houlton Band of Maliseet Indians, Natural Resources Council of Maine, Conversation Law Foundation, and Maine Audubon, in opposition to the application's proposal and whose representatives are seated behind me and to your right.

Maine Audubon was granted status in the hearing as an interested person and was consolidated with the original Intervenor 2 group by the presiding officer.

You should all have a copy of the detailed hearing schedule, but at a high level, the technical sessions are starting today with an introduction to the project and opening statement by the applicants followed by opening statements from the intervenors.

The technical sessions will then follow a party-by-party approach in which each party presents a witness or panel of witnesses for direct testimony followed by cross-examination by one or more other parties as appropriate. Each party is allotted one or more panels of witnesses.

The applicant's panels will present today and tomorrow morning. Intervenor 2's panels will present tomorrow and Wednesday morning. And Intervenor 1's panel will also present on Wednesday morning. And the technical sessions will end with the applicant's redirect-examination on Wednesday.

The topics chosen for the technical sessions are a subset of the review topics and are: Financial practicability; water and fish resources and aquatic habitats; wildlife resources and habitats, natural character; historical and cultural resources and tribal impacts; and socioeconomics.

These six topics were chosen based on their importance to the Commission's review of the application, the level of interest expressed by the parties, the anticipated value of oral testimony on them, and anticipated public interest.

Public comment sessions will be held this evening and tomorrow evening here at Stearns Junior/Senior High School in Millinocket and next Monday evening, October 23rd, at the Cross Insurance Center in Bangor.

At the start of each session the applicant will briefly describe the rezoning proposal to the Commission, and this will be followed by public testimony in which each speaker's time is limited depending on the total number of speakers. Speakers will be called in the order in which they sign up.

Commissioners and staff may ask questions directly to members of the public. The parties may ask questions through the presiding officer.

The written comment period for the hearing record closes on November 2nd, and this is followed by a rebuttal period that closes on November 9th.

And lastly, in terms of the record for the public hearing, I'll now state that staff hereby enter into the hearing record exhibits representing the administrative record for ZP 779A from January 18, 2023, the date the rezoning application was filed, through October 14, 2023, this past Saturday. And that administrative record includes statutes and rules administered by the Commission, the application and additional materials submitted in response to LUPC questions and agency reviews, written public comments, prefiled testimony, and notices.

This concludes the staff introduction.

Are there any questions from the Commission?

Okay. Seeing none, thank you.

MR. WORCESTER: Thank you, Tim.

Next event is the applicant's project summary and opening statement.

MS. BROWNE: Is it on? Oh, great. No red light.

Good morning, Mr. Chair, members of the Commission, staff.

My is name is Juliette Browne. I'm counsel for the applicant.

And on behalf of the entire Wolfden team, I want to express our appreciation to the Commission and to staff for the work they've done in connection with this project leading up to where we are today and certainly the work you will do over the next three days of technical sessions.

We're looking forward to presenting the project, answering questions from the intervenors and the Commission, and we're excited to bring this proposal forward. We think it's an opportunity for the state of Maine.

I am pretty low tech so although you've got these great screens in front of you, we've provided a few handouts for the Commission that I'm going to refer to in my statement. I'm kind of old school, paper copies.

I'm going to begin just with some basics on the project. This is a proposal to rezone 374 acres in T6R6 from MGN to the DPD zone to allow a small state-of-the-art underground mine that will only go forward if and when the applicant demonstrates compliance with the strictest mining regulations in North America.

Now, as you can see from this map, the project is located on the edge of the jurisdiction. You can see that T6R6 in the Wolfden parcel touches Hersey, which is an organized town. Mt. Chase and Moro Plantation, which are on either side of T6R6, both have significant primary and secondary locations in them.

We included a reference to that map but the map's very hard to read so I didn't provide with the map showing the primary secondary locations.

This area is also within, and this map shows, the expedited wind permitting area. Now, you may recall that areas rezoned to the expedited wind permitting area were generally at the edge of the jurisdiction and were deemed more appropriate for large grid scale wind energy development. So T6R6 is in the expedited wind permitting area; Moro Plantation is; Mt. Chase is as well as T7R6.

Now, Intervenor 2 sites to the presence of Katahdin Woods and Waters National Monument in Baxter

State Park as evidence that this is not an appropriate location for wind power.

Did we do the map showing the --?

Baxter State Park is more than 22 miles from the project. The Woods and Waters National Monument is more than 8 miles from the project. And importantly, users of those resources will not see or hear the project, nor will users recreating on the Seboeis Trail or users on the scenic byway.

And importantly, as you can see from this first map, Wolfden owns a little more than 7,000 acres, and all except for the small rezone area will remain open for public recreational use, including traditional uses such as fishing and hunting and, importantly, uses including snowmobiling and ATV.

Now, snowmobiling and ATV has become an increasingly important component of the economic engine in this region, and you will hear from Terry Hill, a local businesswoman and somebody deeply invested in the wellbeing of her community, about the importance of these two recreational activities to her business, her business growth, and the region more generally. She will also describe why she supports this project and the opportunities she sees that it presents for the region.

So that's sort of the basic context of the project and where it's located.

I also want to talk a little bit about the regulatory context and the interplay between the LUPC rezoning and the subsequent DEP permitting that will occur. LUPC rezoning presents unique challenges both for you as a decisionmaker as well as for applicants.

On the one hand, it is a landscape level decision.

On the other hand, you need sufficient information to conclude that the use will not have an undue adverse impact on existing uses and resources.

It creates this inherent tension about the level of detail required for rezoning when there will be a subsequent permitting process that looks in great detail at all aspects of the project, and you will hear this tension played out during the next several days of this hearing.

For example, the opponents criticize the applicant for not having sufficient detail on a number of technical issues, including plans for managing risks associated with acid rock drainage, insufficient hydro geological modeling, insufficient detail on soils information.

We fully agree that this is important

information, all of which is required, and will be presented as part of the subsequent phase, which is the DEP permitting phase.

And we think that your Chapter 12 rules reinforce this conclusion that the type of detailed information the -- the Intervenor 2 is criticizing the applicant for not presenting is more appropriate for the DEP permitting phase, so I have provided you with a copy of the Chapter 12 basis statement.

Chapter 12 is the set of rules that governs the DPD rezoning process for mining projects. And as part of that rulemaking, interested people/persons submit comments on what they think should or should not be included in the rule.

And a number of stakeholders, including NRCM and CLF who are intervenors here today, submitted comments stating that additional detail on things like rock chemistry, leachability tests, specific analysis of the risks associated with acid mine drainage from particular types of rock that will be removed from the site.

And the Commission responded. So for example I've just flagged a couple of pages. On Page 23 the Commission responded that LUPC does not believe that asking for contamination assessment is appropriate at the rezoning phase and when on to note that the DEP will require a description of the geochemistry of the ore, waste rock, overburden, including characterization of the leachability, reactivity and acid-forming characteristics as part of the DEP permitting process.

And I think as you consider the evidence before you, it is important to think about and appreciate the breadth and depth of the Chapter 200 permitting process. So one of the other exhibits you have is a chart that we prepared that just summarizes some aspects of the Chapter 200 process.

Importantly, before you can even submit an application to the DEP for a mining permit, you have to conduct two years of baseline surveys. It's a public process; the plan for collecting that data has to be approved by the Department and is subject to public comment.

The application requirements require detailed information on many of the issues you will hear discussed during these hearings: Leachability of rocks, potential for acid mine drainage, specific plans for managing the risks associated with acid rock drainage.

Now, I will just pause here -- there are a lot of technical issues: Acid rock drainage, leachability. I have asked my witnesses who will be talking about it to dumb it down so that I can understand it. I think they've done a good job at that, but some of it is technical and I apologize in advance for that. And I do encourage you to interrupt technical experts during their presentations if you want clarification because I think that might facilitate understanding by everybody.

Now, I'm not suggesting that the application doesn't need to include information on these issues. It does. You will hear from Mr. Ouellette about the mining plan, the proposal for how to manage rock that's removed from the mine and separate rock that is the ore that might be potentially acid-generating and rock that is not potentially acid-generating.

You will hear from Mr. Dudek, a geologist, on the substantial information that Wolfden has on the chemistry of the site and the type of rocks that are present there and the ways in which Wolfden believes it can place underground mining infrastructure in rock that is not likely to be acid-generating so they can develop a plan to minimize the potential for acid rock drainage.

You will hear from Dr. Finley on specific measures that exist and practices that exist to manage and address the risks associated with acid mine drainage.

You will hear from a panel of three experts, each with substantial experience in their respective field disciplines, on the proposal for collecting mine-impacted water, treating that water to background water quality levels, and then reintroducing that water into the environment in an manner that will protect the existing site hydrology.

Now, what is not part of the proposal before you is the tailings facility and the processing facilities.

Now, the DPD rezoning criteria includes a requirement that the site be the best reasonably available site for the use. So for the mine obviously it's dependent upon this specific location because that's where the resources is present. It's not necessarily the case that the processing in the tailings facility need to be colocated. There certainly are efficiencies of collocating, but it's not required.

So Wolfden was asked to evaluate alternatives for the processing facilities and the tailings facilities and whether or not this was the best reasonably available site for it. So one of the things they have done in the last year and a half, two years, is to meet with surrounding communities and look for locations that might be suitable locations for those facilities. Suitable both from a siting standpoint and also located in an area where there was meaningful local support.

So they've been able to do that and as a result, those two components are not part of this proposal. And I think it considerably simplifies the proposal that's before you. Those two aspects of the overall project are particularly technical, and this tension that I've referred to about the desire for more detailed information certainly plays out with respect to those facilities.

Now, you will hear from the intervenor -- Intervenor 2 they're focused on mining failures in the past, including mines that operated in the 1880s, mines that had no environmental management practices in place.

We all agree that those historic practices were not particularly environmentally protective. We all agree that acid mine drainage is something that needs to be managed in connection with mining. But the suggestion that some of those historic mines and historic practices are reflective of the risk associated with this project that is before the Commission is disingenuous.

There are well-established tools for managing those risks and you will hear about them, but in the prefiled testimony of Intervenor 2, they are largely ignored.

Now, Maine has an opportunity to be a leader in responsible mining. There's no dispute that this is a high value metal deposit. There's no dispute that the two most significant metals, zinc and copper, are on the critical materials for minerals list. These are metals and resources that are necessary for everyday life and also for the transition to a clean economy. There's no dispute that Maine has the most stringent mining regulations in North America, so no one can credibly claim we don't need to mine; the only question is whether we do so responsibly in a jurisdiction with strict regulations and local support, or we outsource it to another state or country which lacks regulations often to the detriment of local populations.

We respectfully request that the Commission approve this proposal for rezoning to allow Wolfden to proceed to the second phase which is a detailed, comprehensive permitting process in which it must demonstrate that there will be no adverse impacts to water quality because that's all that Chapter 200 allows.

Thank you for your time today and the next several days and for the public service that you all provide the state of Maine.

MR. WORCESTER: We'll now hear from Intervenor 1 with their opening statement, and you have 10 minutes.

MR. BEAUPAIN: Thank you. Welcome to Millinocket.

By coincidence, this is my hometown. I grew up here, practiced law here for over 40 years, and it's certainly nice to see you folks here.

My client intervened in this proceeding because it's very concerned about the tremendous economic and population losses that this area has suffered over the last 20 or 30 years.

You folks drove by the East Millinocket mill on the way here today. You did not see a paper mill. That mill closed in 2014. You can see that very little has occurred at that site since 2014.

When I graduated from Stearns High School in 1969 -- I hate to go back quite that far, but --

there were 180 kids in my class. Today there's 120 in this school in grades 9 through 12.

When the -- when I got out of high school, Great Northern was at its peak. 4,000 well-paid blue collar workers. Great Northern was an economic engine of statewide significance. That's gone.

We need economic help in this area. We support this project because it can only go forward if a permit is issued under Chapter 200 and you issue certification under your Chapter 13. Both of those can be with conditions.

So almost by definition, there can be no adverse impact from the permitted mine if the permit is issued by DEP.

We are at the beginning of a long process. The world is not going to end if you change this zoning. The only thing that's going to change is the applicant can proceed with an application under Chapter 200 and certification from you.

And once again, DEP, if it finds no adverse impacts or an adverse impact that can be mitigated, can add appropriate conditions to that permit. And as part of your certification process, you can do the same. So approving this zone change doesn't authorize any work at the site. I don't see how it can adversely impact anything.

Now, the Katahdin Region has a history of industrial development that precedes Baxter State Park. We had paper mills back as far as 1900 here. Some of us would like to see those again. It's a question for another day whether a paper mill near or in your jurisdiction could even get permitted today under current rules.

Now, we certainly know what the economic impact of those paper mills were, and it would be very sad to say that our system today won't even allow them. And what's just as sad is the opponents don't even want the applicant to have the opportunity to go through with the Chapter 200 process. Okay?

Well, that's why you want to keep in mind the zone change itself changes nothing. There's no impact on any uses because they don't have the permit. And this is a very specific zone change. It is only for the metallic mining proposal. If it isn't granted, the zoning reverts back. So I don't see what the harm is.

Now, you also know this is not the wilderness. When Great Northern was here, they processed 800 cords of wood into 800,000 tons of paper a year. That wood came down the Golden Road, that wood came from the project area, it came from a large radius around Millinocket. I don't know how you can go by 800,000 cords of wood and think you're in the wilderness.

This is private property. When you're -- the statutory changes were made that resulted in your 2012 guidance for interpretation of the CLUP, you were dealing with the legislative direction to take the concerns of the local residents and the property owners more into concern than apparently the Commission had been doing in the past.

You are our government. We're petitioning you for redress. 250 jobs for 10 years in this area is a huge deal, and if we can have those jobs with a permit with appropriate conditions under Chapter 200, we should have that opportunity. We should not just say no because we're imperilling somebody's idea of the wilderness.

Thank you.

MR. WORCESTER: Next on the agenda is Intervenor 2's opening statement.

MR. BLOOM: Good morning, Commissioners and staff. My name is Aaron Bloom, and I'm speaking to you today on behalf of the Penobscot Nation, the Houlton Band of Maliseet Indians, the Natural

Resources Council of Maine, and the Conservation Law Foundation, as well as intervenor -- as well as Maine Audubon as an interested person.

Thank you for the time and consideration you've already put into this matter and for the time that you will be continuing to put into it and the consideration you'll be giving it.

Commissioners, the area where Wolfden proposes to build this mine is truly spectacular. The Katahdin Region's wild beauty and pristine waters and undeveloped character make it not only a haven for the abundance of fish and wildlife, but also a destination for Mainers and tourists alike to hike, fish, hunt, paddle and ride ATVs and snowmobiles.

The region is also culturally significant to Maine's Wabanaki tribes who have historically occupied the area and who still use it for hunting, fishing, guiding and traditional practices.

The proposed mine site is immediately surrounded by three state heritage fish waters recognized for their habitat -- extremely good habitat for native brook trout and landlocked salmon, some of the best in the state. And the site is situated at the headwaters of the west branch Mattawamkeag River, which is federally-designated critical habitat for the endangered Atlantic Salmon.

In addition, the recently established Katahdin Woods and Water National Monument lies about five minutes from the proposed site. And these features have contributed to significant growth in this region's outdoor economy over the past decade.

In order to protect this irreplaceable asset, the LUPC is guided by regulations that impose significant guardrails against the loss of the region's unique natural character and the outdoor economy that it supports.

And so although Wolfden has -- you just heard -- has encouraged you to say that the Chapter 200 regulations for mining permits will take care of everything, this commission first has its own regulations to meet, which require it to consider specific things and require Wolfden to prove and demonstrate with substantial evidence that will meet this commission's actual regulations and standards.

And those standards require that the applicant prove, demonstrate with evidence, that it has -- that the project is financially viable, and that Wolfden has the financial resources and support to complete it, number one.

Number two, demonstrate that the project will not have undue adverse impacts on natural resources.

And three, demonstrate that the project will not be detrimental to the values inherent in the comprehensive land use plan.

Wolfden has not met its burden, and we submit that the Commission should deny rezoning.

First, Wolfden has not demonstrated that the financial resources it has are sufficient to complete this mining project, nor has it demonstrated that the project is financially viable.

Wolfden's financial statements show that the company is skating on thin ice. You will hear that the project is its only lifeline.

As of March of this year, Wolfden had lost more than $41 million since its inception and the company had only $2.7 million in working capital with no ongoing source of cash flows. And the Pickett Mountain was the company's primary asset.

Wolfden's financial statements also show that the company's fortunes are at the whim of unpredictable market forces. Its financial statements state: It is not possible to predict -- and I'm quoting here -- whether financing efforts will be successful or if the corporation will obtain profitable levels of operation.

As a result, Wolfden's independent financial auditor found, quote: There is significant doubt about the company's ability to continue as a going concern.

And not only are Wolfden's finances shaky, but so the Pickett Mountain Project's. Fully 50 percent of the Pickett Mountain mineral resource estimate is made up of what's called inferred resources. Inferred resources are, and I'm quoting now, Wolfden's own consultant, quote: Considered to speculative geologically to have economic considerations applied to them, yet Wolfden's preliminary economic assessment relies on these speculative inferred resources.

As a result, the author of that assessment admits quote: There is no guarantee that the economic projections contained in this preliminary economic assessment would be realized.

And on top of that uncertainty in cost, there's also -- in revenues, there's also uncertainty and actually underestimation on the project's cost. The economic assessment admits that its cost estimates are only accurate plus or minus 40 percent, and the economic assessment sticks with an unsupported $13.7 million estimate for a worst-case mining disaster, something that this commission actually wrote to Wolfden and said, appears too low, ask for further justification, which hasn't been provided.

Next, Wolfden has failed to demonstrate that the project will not have an undue impact on adverse -- on natural resources. Probably the most significant environmental danger posed by mineral mining is acid mine drainage. Acid mine drainage is created when sulfur-bearing rock is exposed to oxygen in water. The result is acidic water, which also can contain elevated levels of heavy -- leached heavy metals such as led, mercury, zinc, copper and arsenic.

And once acid mine drainage starts, it's very difficult to stop.

Now, this acidic metal-laden water is toxic to aquatic life and harmful to human health, and it's especially harmful in pristine waters with low hardness and low alkalinity like the state heritage fish waters and streams surrounding the site.

Wolfden promises that its acid mine drainage will not be a problem because it will come up with plan to deal with it and it will be part of this next process, but a promise to make a plan fails to -- far short of demonstrating to you at this stage that it will avert this major environmental risk.

Wolfden also fails to demonstrate that it will be able to treat all of the mine's water discharges down to pristine natural background levels, which Maine law requires.

Nearly three years ago the Commission staff, as well as the Maine Geological Society -- Survey asked Wolfden to provide an example of a comparable mine that can do this, and Wolfden has yet to do -- has yet to provide such an example.

Instead, Wolfden has never -- instead, despite the fact that Wolfden has never successfully developed or even operated a mine, Wolfden asked LUPC to trust that it will be able to achieve the levels of water treatment that it promises. Supplying only a deeply flawed computer model to support its assertion.

Wolfden also fails to adequately explain how it will deal with the toxic brine that comes out of that water treatment process. That toxic brine contains all of the -- the elements that are removed by the river's osmosis water treatment process, but in more concentrated form.

Wolfden says it will mix that toxic brine into cement, mix it with the waste rock from the project and backfill it back into the mine, but what they haven't provided is any information or analysis showing what will happen when that toxic cement is put back underground. Will it leach heavy metals? Will it create acid? And it also hasn't provided you any information as to whether Maine DEP would allow that kind of disposal of the brine. And if DEP doesn't allow it, Wolfden has not said what it's going to do with that toxic brine.

So these are questions that it has not demonstrated how it's going to deal with the adverse impacts of its project. In fact, in addition, these risks and uncertainties don't just apply to mine sites; they also apply to the ore processing and tailings facility that Wolfden will be locating at an undisclosed location outside of but very near to LUPC's jurisdiction.

And this matters because its -- LUPC's statutes requires it to consider impact not only within the jurisdiction, but in areas adjacent to it.

Now, Wolfden has removed its facility from its application, so it has presented no plan for addressing the risks that come from that ore processing facility. Those risk will be significant.

Processing ore from -- processing ore requires the use of toxic chemicals. Those chemicals will be part of the water treatment, but they can also leak. The wastewater treatment, again, will have to be treated down to natural background levels. Again, they're provided no example. And again, the water treatment at that ore processing facility will also create a brine, and they don't now have any cement backfill to put it in, so they haven't said anything about what's going to happen to that toxic brine.

Finally, the tailings produced by that ore processing and tailings disposal facility will -- will be -- will have a potential to create acid drainage. And again, Wolfden has presented no plan for dealing with that acid drainage.

Lastly, Wolfden fails to demonstrate that the project will not harm the area's natural character and outdoor recreation economy.

The mine will be operating 24/7. Trucks carrying 80,000 pounds of ore will be making 55 roundtrips per day, and there will be blasting occurring and mine facilities will be visible from Pleasant Lake and the top of Mt. Chase.

What's more, the mine will change Patten from the gateway to Katahdin Woods and Waters National Monument into the gateway to an industrial mining area, posing a serious risk to the area's burgeoning natural resource economy -- or outdoor economy.

And while Wolfden claims that it will be lots of jobs to the region, it has made no binding commitments to hire locally, and it is projected that at least for the first two years of mining, it will be hiring -- it will be hiring mine workers from contractors brought in from outside.

Further, the mine's work schedule alternating seven days on and off shifts seems tailor-made for an imported workforce potentially from Canada where there are experienced mine workers.

In sum, Wolfden has made plenty of promises, but has not met its burden to back those promises up with evidence.

Thank you very much.

MR. WORCESTER: The next item on the schedule is the applicant's testimony and evidence. That's a 50-minute session, and then we'll take a break.

Is this presentation centered around the slides?

UNKNOWN SPEAKER: Yes.

MR. WORCESTER: Do we have a picture?

MS. BROWNE: Believe it or not, we spent two hours yesterday to make sure this didn't happen.

(A discussion was held off the record.)

MR. OUELLETTE: Good morning, Chair Worcester, LUPC commissioners and staff.

My name is Jeremy Ouellette. I'm the vice-president of project development for Wolfden Resources. Along with me on our first panel today is Ron Little, the CEO with Wolfden.

We've got Brian LeBlanc who's a principal engineer with A-Z Mining and was in charge of developing the preliminary economic assessment for the project.

And Sean Fieler who's one of the principal investors with the company.

A little bit about the company, Wolfden Resources. So we are an exploration and mineral development company. We have a seasoned management team. I mentioned a little bit about Ron and I. A lot of our experience is related to design, financing, permitting, development and operation of mining operations globally, really.

And along with the two of us, we have Don Dudek, our VP of Exploration who is an extremely seasoned professional geologist, specifically with VMS knowledge. That's the type of deposit that we're talking about today.

And then also newer to the team within the last year, Leah Page, another professional geologist, extremely intelligent. She's from Bucksport, Maine, and she has opened and is managing our office in Patten, Maine.

So a little bit about my background. I'm a 16-year professional engineer with a master's in mineral resource engineering. Most recently, my experience has been just across the border a few hours away in New Brunswick, Canada, specifically the Halfmile deposit which is just outside of the town of Miramichi and then the Caribou deposit just outside the town of Bathurst in New Brunswick.

I've been on this project now for about five years. A lot has been going on over the last while related to, you know, technical design and communications with communities surrounding us.

And I guess getting into Picket itself -- so Picket is a -- it's a polymetallic proposed state-of-the-art small underground deposit, very small footprint. The principal metals involved are zinc, lead, copper and there is a little bit of silver, a little bit of gold.

As Ms. Browne had mentioned earlier, the zinc and copper minerals make up a majority of the -- the targeted minerals, which are both on the critical minerals list today.

So in terms of location, the project itself is about 9 miles north around along Route 11. And -- sorry, I'll be kind of travelling back and forth and pointing at the screen, but we're about 9 miles north along Route 11.

Okay. The green box -- the green box indicates our property ownership. It's around 7100 acres.

And then the yellow shape in the box represents the location that we are proposing to rezone, roughly 374 acres.

You can see a red line that travels from Route 11. That's about 4.4 miles off Route 11 to the northwest headed into the property. And that's an existing road. So that's used currently in the logging industry, a very well, you know, designed road. It holds up quite well.

It's not in the slide, but for reference, we're about 22 miles away from Mt. Katahdin.

Okay. So this is the layout itself. So for reference, the -- what you saw earlier in the yellow shape is represented on this slide by a dark black line, and that's complete outline for the 374 acres. So within that footprint, you know, obviously we've proposed a lot of infrastructure, and you'll notice that it's broken up into three really -- you know, three sections: Phase 1, Phase 2, and a proposed solar field in green.

So I want to start by talking about the portal. The portal is the entrance to underground -- I'll speak to this in a little bit more detail in future slides, but it's a small excavation that daylights on surface roughly 64 feet by 100 feet. And that is, you know, for reference, it's about the size of an industrial garage.

And so along with that, we have a series of storage paths which we'll talk about a lot. We have, you know, things like an industrial garage, warehousing, some lay down. We also have a set of offices, fuel storage, and as well our water storage and treatment facilities and water management area.

So in Phase 2 -- Phase 2, it's another entrance to underground. It's identified as a shaft as the primary infrastructure there and that's really a smaller opening for vertical development, and the purpose of that is to access deeper minerals later on in the mine life.

We're kind of expecting that Phase 2 will take place around Year 3, Year 4 of the general operation.

And then on top of that in the green to the north we have a proposed solar field. Altogether those represent about 129 acres of the proposed rezoned 374, of which the solar field is just under 50, and the rest is within the Phase 1, Phase 2.

So I also wanted to talk a little bit about, you know, the specifics around this infrastructure. We're going to talk a lot about water collection, water treatment and water distribution, but to get into it a little bit here at a high level, essentially this entire area is lined -- double lined. So any potential water that can be contaminated is collected. It's collected and stored to a pretreatment water storage pond. That water storage pond is rated for a 100 -- or, sorry -- 1 in 500-year 24-hour storm event. And from there, it runs through a state-of-the-art water treatment plant which is a UFRO ultrafiltration reverse osmosis.

We'll speak to that in a lot of detail later on, but essentially, that water treatment plant has to be able to treat water to background or better water quality.

And then just to ensure and make sure that the treatment plant did, in fact, work, we discharge from the water treatment plant to a second pond. The second pond is a post water treatment -- post treatment water storage pond. We test the water, ensure that it's achieved the regulation, and then from there we're able to discharge.

Now, I say state of the art not because of specifically the mining plant, not specifically because the water treatment plant even though it's a very robust treatment plant, but really how we're managing water back into the environment.

So after we've -- only after we've confirmed everything is -- meets the regulation, then we're -- what we're proposing to do is to spray, irrigate and snow make. And by doing that, we are replicating the natural precipitation and the natural hydrology that exists out there today.

One other bit, speaking of hydrology, you'll notice an additional blue outline, the lighter blue outlines. So those represent maps -- so we did -- we hired a Maine wetlands scientist. They went out and did a wetland delineation survey, and this is the result of that.

It's important to know, too, we've purposely avoided all those wetlands and, in fact, including a 75-foot offset from any wetlands with our infrastructure.

So getting into the mine detail a little bit, I mentioned the portal earlier. On the bottom left here, this is an example of what portal might look like. For scale, that white vehicle there is about the size of a half-ton truck. And you can see sort of the tunneling -- the start of the tunnels for underground in the image as well.

So those tunnels represented on the right here, you can see sort of where the portal access would be or the expression on surface. And then essentially we drive a series of 16-foot by 16-foot cross-section tunnels 16 feet at a time and we run them in a -- in a helical or a switchback ramp. And that ramp brings us down to specific elevations.

Once we get to desired elevations then we drive similar dimension horizontal drifts that access the deposit itself, which is represented by the orebody here.

So after we've developed on two different horizons into the orebody then we drill between those two horizons and then we blast and fragment the rock. Then we use small front-end loaders -- low profile front-end loaders to excavate the material. It loads it into a truck. That truck then drives up onto the surface.

Now I mentioned there are 3 pads on the previous slide. As we're developing these tunnels initially, we collect enough data to insure that those tunnels can be developed into inert material or essentially aggregate. So by doing that, we temporarily store the rocks that are excavated from the tunnels onto a lined pad. And as we're excavating the orebody itself, then we can reuse those rocks because they're essentially clean aggregate. We bring them back underground and then we backfill.

So for scale the deposit is roughly 4 million tons. We excavate around 4,000 tons at a time, so a small -- you know, a small incremental panel. Before moving to the next one, we backfill that incremental panel and then we excavate beside it.

Now, obviously, we do this on a couple of different horizons to make sure -- you know, productivity, but that's essentially how it works.

I should mention too that in accessing the deposit, there will be varying grades because it's a geological resource. So we do have two additional pads on the surface. One is a staging pad for ore itself. That's the economic rocks that we're after. That's a staging pad for, you know, around seven days of inventory.

And then we do have a low-grade ore storage pad and what that's used for is as we're developing in and we've produced some of that lower grade material, we have a blending strategy, a geological blending strategy, and that keeps things running smooth on downstream facilities.

One other thing to mention is we do have a series of infrastructure in the underground components as well, one of those being sumps. And what we do is because as we excavate, those tunnels become atmospheric pressure, essentially, and the groundwater pressure is higher than that. So inherently water seeps into the tunnels, not from the tunnels out into the groundwater.

So we collect that water and pump it to surface to our water storage, water treatment, and water management facility.

The -- what we've proposed here -- you'll hear this question come up a little bit later on, but what we propose is roughly 30 gallons a minute near the end of the mine is how much water that we're going to be going through -- receiving from seepage. And that's justified by -- essentially it's an extrapolative exercise where there are other mining properties with tunnels with a certain surface area, we calculated the surface area and the amount of water that they were discharging and extrapolated that to the surface area that we have here proposed at Pickett.

MR. WORCESTER: I have a question. When you -- I thought there was an elevator involved in bringing the ore to the surface. Was I mistaken on that?

MR. OUELLETTE: So that's in the Phase 2, and that will be for the deeper rocks.

MR. WORCESTER: Okay.

MR. OUELLETTE: So in addition to the trucks hauling out materials up the ramp, later on in the mine life in that Year 3, Year 4 while we're accessing the deeper material, we do have a proposed shaft as a secondary conveyance. It's just -- it's a vertical elevator, yeah.

MR. WORCESTER: So if you estimated the water volume, you did it by examining some other mining site?

MR. OUELLETTE: You got it, yeah. And those mining sites are small underground type of developments, and they're within the same geological region. And specifically they're from the Halfmile and Caribou sites.

MR. WORCESTER: They're located in New Brunswick?

MR. OUELLETTE: Yeah.

MR. WORCESTER: Okay.

MR. OUELLETTE: Okay. Thank you.

MR. ELLSWORTH: Question.

MR. WORCESTER: Okay.

MR. ELLSWORTH: Do you -- is this whole system of roads built and you start at the bottom or you're going to start at the top?

MR. OUELLETTE: Yeah, thanks -- great question.

So going back to the previous slide, so we do develop this -- I won't say it's completely developed before we start into the deposit and I did mention earlier we operate on a couple of different horizons.

And what we'll do is, you know, for rough scale, we'll be developing about a third. And then as we're producing from the top third of the deposit, we're continuing development to the deeper -- the deeper portions of the resource.

MR. ELLSWORTH: So follow-up question, so you're building debris back in on the upper sections before you've gotten to the bottom section.

How is that going to stabilize?

MR. OUELLETTE: Correct. So one of the -- you know, one of the most significant disciplines in the mining industry is geotechnical engineering, and the way that we segregate various zones of mining is by leaving a sill pillar. And that sill pillar is a --

it's a bridge of rock, essentially, and it's designed specifically to -- to separate levels of operation.

Okay?

MR. ELLSWORTH: Thank you.

MR. OUELLETTE: Thank you.

So this is just a couple of cartoons. I won't spend much time on it, but this is just a depiction of the development taking place through the deposit with a horizontal drill, a vertical drill that's drilling between sublevels, and then that's a scoop tram on the bottom that's excavating broken rock.

And once again, there's no image showing the backfilling taking place, but this is showing the sequence of which -- so -- an area is excavated and then it's filled with that inert -- or aggregate, and then beside that, it's excavated again.

So I should mention, too, after this is all completed, the -- the project fully exhausts the resource then at the final stages of this, we have a couple of years built in for reclamation. And what that includes is making sure that the deposit is backfilled with that inert rock, all of the surface infrastructure is removed, everything is regraded and revegetated, and essentially it's -- it looks the way it looks before development.

I wanted to show a couple of examples of where this is taking place, or where it has taken place. So this Flambeau Mine, and this was operated between 1993 and '99. And this is an image of what it looked like before the mining operation.

Now I want preface this. This isn't the type of mining operation that we're proposing, obviously. This is a much larger, open-pit type of mine, but this is what it looks like, you know, at the peak of operation for open pit. And then this is the -- the reclaimed site afterwards.

So once again, the impacted areas were regraded and then everything was revegetated. And I believe this entire area was basically resubmitted for recreational uses.

This is another example, Lamefoot. So this was an underground mine. You can see sort of the waste rock piles here and accesses to it. Some of the infrastructure associated to that facility.

And this is an image of that after it's been reclaimed. So, once again, regraded, vegetated and -- and brought back to its original state.

So in terms of timeline and schedule, obviously -- you know, we're here at the hearing for the Land Use Planning Commission. Pending a favorable decision in this process, we then have to propose a baseline study evaluation for the proposed site.

We -- that baseline study evaluation includes public comment as well. And then if that -- you know, when that's agreed to, then there's a minimum of, you know, two years of statistical studies that are taking place with a heavy focus on, you know, water management and then the ecology around air quality, you know, every discipline that you can kind of think of.

And parallel to that, the -- you know, Wolfden has to also complete full feasibility studies for the project. Where we've currently done an preliminary economic assessment, we would then move in to parallel to take the baseline studies and the data associated to that and develop a full feasibility, which has a high confidence in a lot of the detailed studies needed to take place and -- including, you know, specifics around metallurgy, water treatment, and all that -- all those other disciplines.

So then after the baseline studies have been completed, environmental impact assessments have been completed, feasibility studies have been completed, at that point we're able to apply for a mining permit under the DEP.

We suspect that's going to be about a year-long process. And then if that's approved, you know, call it four to five years out from now, if that's all approved, at that point we're able to complete financing, initiate construction, roughly a two-year construction phase, and then 10 to 15 years of operating. We're forecasting 10 years of a steady state operation right now. And then two to three years of reclamation, monitoring into perpetuity after that.

So I thought it was really important because there is some experience in the state with -- related mining. Now, it's quite old experience, I suppose. This is a perfect example of that. So Callahan Mine is -- was developed on the coast and -- so along -- in Brooksville, Maine.

It's a little bit hard to see on the image here, but it was an open pit excavation basically within a coastal estuary. Waste rock from that open pit was stored in an unlined pad and any of the water was able to discharge directly into the estuary adjacent to it, and those piles were adjacent to salt marshes.

Tailings from the operation, everything was processed on site. Tailings in the operation were an unlined wet tailings facility, which you can see here. Once again, directly adjacent to that estuary. It ceased operations in 1972. And that number -- or that year is extremely important because that predates, you know, things like the Clean Water Act and the Natural Resources Protection Act.

The company walked away from that asset without reclaiming it, and that is now a superfund site. And you know, why am I pointing out, you know, a type of disaster? Because this is exactly the type of scenario that operating under Chapter 200 can't happen. There's no such thing as an open pit in Maine. There's no such thing as developing a mining operation underneath, or obviously replacing water resources. Those types of things just can't happen, specifically, you know, the way that the tailings were managed.

Things like walking away can't take place because a worst-case scenario fund is put in place with the DEP prior to -- prior to initiating operations.

So this is another example of something similar. This is Blue Hill. Care American Mine. This is in Blue Hill, Maine. This was, in fact, an underground mine. It was developed underneath a freshwater pond between the 1980s in -- sorry, 1880s and 1970s.

Waste rock, again, was stored in an unlined pad. There were two dams -- sorry, two streams were dammed for tailing storage and those tailings were allowed to discharge into Carlton Stream.

Once again, none of this would be allowed under Chapter 200. So we -- and with our, you know, proposal at Pickett, any of the issues associated to these deposits are dealt with in the proposal. And you know, frankly, I'm quite excited by that.

So a couple of other examples. So you know most people have probably seen this, you know, Red River picture. And really what I wanted to point out here is that any amount of, you know, acid-generating material that's generated from the project has to be placed and will be placed on a double-lined pad. We collect all of the water that communicates with it, and then we make sure that it's treated to a Class A standard and we test to ensure that it's achieved that Class A standard prior to being able to discharge it.

Here's another example. This one's nearby. Brunswick 12. Now, to -- from scale to size, this is a world class deposit. Not so much in terms of the early stage management. So this was designed without remediating -- without remediation or reclamation considered. Completely opposite of what we're proposing.

The water treatment is going to end up taking place into perpetuity because of how this was originally laid out, and our proposal ensures that we don't have to actively reclaim into perpetuity. Of course there's monitoring, and we need to ensure that things take place, but we're able to close down the site without any sort of active treatment and really return it back to the way it looks today.

So I want to get into a little bit of the communications that we've been --

MS. HILTON: I have a question.

MR. OUELLETTE: Sorry, go ahead.

MS. HILTON: So you don't have any pictures of, you know, mine sites where it's been successful; you've just shown us a number of sites where there have been problems.

So have they been able to do it in the methodology that you're proposing here in a way that shows that it can be environmentally sound?

MR. OUELLETTE: Of course.

MS. HILTON: Do you have any samples?

MR. OUELLETTE: Great question. And thank you.

So the purpose of these slides was to really show -- because these types of, I guess, projects are discussed heavily when we're talking about initiating a new project. And we want to address them and kind of identify why Pickett won't be those examples.

Along the testimonies, absolutely, we're going to be talking about, you know, different projects that do work and examples of, you know, where this is actually taking place, yeah. So they -- I guess my the answer to the question is they are coming, yeah.

MS. HILTON: You are -- I'm sorry.

MR. OUELLETTE: Some examples will be coming. Absolutely.

MS. HILTON: Okay. I'll look forward to see them.

MR. OUELLETTE: So the communications that have been taking place, we wanted to make sure -- you know, especially over the last couple of years, we wanted to make sure that transparency was key, the communities around us had a real clear understanding of what we're proposing, have the opportunity to answer any questions, that sort of thing.

This is an initiative that we -- that's still pretty fresh. We've had about three meetings so far, but our Community Advisory Committee, or CAC -- the CAC is developed of a panel of representatives from the communities surrounding the project, and those representatives essentially select a topic that is to be discussed and -- or presented and then discussed with the public. It's open public meetings.

The topic that the Community Advisory Committee selects is based on input from the public from the meeting before that. So these discussions have been fantastic, very well attended. Been really happy with that initiative so far and looking forward to keeping it moving on.

I want to talk a little bit, too, about, you know, the -- Chapter 200 has been discussed already, but I want to just kind of highlight some of those -- the high-level bits from Chapter 200.

Super heavy focus on water management and it -- specifically water treatment ensuring that anything that's collected has to be treated to achieve, you know, that Class A standard up in T6R6.

Underground mining only, which we've discussed already, and then reclamation closure funding in trust essentially eliminates the financial risk on the tax payer if there's some sort of issue that takes place.

It's important to know that Chapter 200 was in a big way developed with support of environmental organizations throughout the state. This was developed to make sure that nothing could take place and, in fact, the NRCM stated publically on several occasions that if the Pickett project could achieve the various strict regulations of Chapter 200, albeit without trying to change the regulation which we're really quite comfortable with, that they would indeed support a project taking place.

Work to date has indicated, in our opinion, that that is -- that is possible. And essentially indicates the ability to meet those Chapter 200 requirements.

And just to point out, once again, Chapter 200 process involves a comprehensive data gathering and analysis of all of the data over several years. Geochem, hydrogeology are two that are included, but really covers every discipline that's out there, and we have to demonstrate compliance with those highly-protective standards.

Now, when you -- when we've been having our conversations with the public members, I guess the understanding on how restrictive and how protective Chapter 200 is goes a long way with the community members kind of taking a little bit more interest in the project I'll say. And what's important to note is that what I've been really happy to see is while discussing with communities, I've noticed that, you know, public members are extremely engaged and already educated when we're getting into these types of discussions.

So when we're getting into, you know, the several town meetings that we have, you know, we have countless selectmen meetings, planning board meetings. We've hosted our own meetings, information sessions, on, you know, a wide range. And those are very good question-and-answer period types of meetings because the general population has taken an opportunity to read through Chapter 200 and the rules associated to it.

To that end, we've proposed to some of the towns -- well, a few of the towns around the project site -- other resolutions or ordinances basically as a mechanism for a public vote so that Wolfden can have a sense of level of confidence whether we should move forward on, you know, large and significant investments.

And of the six towns that have gone to public vote, five of those six have voted overwhelmingly in favor of moving forward. And one of those votes was a 50/50 split exactly, which is really quite interesting. And I think that speaks volumes in, you know, that town specifically wanting more information, which is exactly, you know, what we're proposing for the next level of study.

MR. ELLSWORTH: Question.

MR. OUELLETTE: Yep.

MR. ELLSWORTH: Five of the six. What was the percentage of a difference on those?

MR. OUELLETTE: So it varies -- it varies, but three towns voted at roughly 92 percent in favor, and then there was one around 75 percent in favor and one, I think, was around 82 percent.

MR. ELLSWORTH: Thank you.

MR. OUELLETTE: Yep. Thank you.

So we're also able to do -- we've polled the public comments from the Land Use Planning Commission public comment web site, and we're able to geospatially identify where those comments came from.

And I will note on this slide that we did omit nine comments, and it's just because they didn't have a location addressed to them. But we're pretty -- we're very happy with, you know, the look of the map.

So why, though -- why are people interested in the project? And, I guess, what do we bring to the table? So we've discussed the protective nature of the project or the proposal and how we've -- we are confident that we can protect the natural resources around it. But what we also bring to the table is a series of 270-plus jobs, 272 jobs; 233 of those are associated directly to the mining project in T6R6 that we're proposing. Extremely high wages. But one of the questions that I often get is, how are you going to find these people? How are you going to find 233 people -- or 270 people?

And what we're proposing, because we do have such a long permitting process, we have a better runway and we have a -- we have a training program, a 12-week training program that we'd like to propose.

We've initiated conversation with educational institutes, been in chats with Region II, Region III vocational schools, Eastern Maine Community College, Northern Maine Community College.

Now, they're conversation, of course, but when presenting the 12-week course, we haven't seen any or heard of any real hiccups in being able to implement those. So what that also gives us an opportunity to do is to work with those same institutes, but specifically -- specifically with the students and kind of understand if they'd be interested in this type of employment.

Something that's really attractive so far to folks is that the schedule we're proposing is a week on, week off work schedule, ten and a half hour shifts. So theoretically, you've got a very high wage certainly with the respect to the economic region, and you're working about half of the year.

So because of that schedule, I'm really -- I feel very confidently that that opens up our workforce pool to the outer extents of the county, and we're able to reach into populous areas or more populous areas like Millinocket, like Presque Isle, like Houlton, and we actually are able to draw from a much larger workforce pool than just, you know, specifically Patten, Maine.

In addition to that, we did run socioeconomic reports. An economist out of Yarmouth ran a socioeconomic report, and that will be discussed at length. But essentially it boils down to around 700 million of economic output in the economic region.

So what do those positions look like, the employment? So of course we need, you know, senior management, a few folks up there; but the guts of the employment is really with the underground workforce. And these are skill sets that exist in the state already.

For example, if you can operate a front end loader on surface or in the woods or at a construction site, you can do the same thing underground. And the focus of that training course is really training for the environment that they're going to be working in as opposed to the functions that they're going to be doing. So it's important for folks that are working underground to recognize, you know, different types of hazards for a safe working environment, and there are -- it's similar to working in the woods except there's different management styles.

And so that's the real focus of that. And you can see here that that's the majority of those -- of the folks that build up the workforce.

So Ms. Browne already talked about the Comprehensive Land Use Plan so I won't spend a lot of time on that slide, but I did want to -- I did want to make a comment on Maine Geological Surveys' evaluation of the project. And to summarize it, essentially, Pickett is a -- you know, it's a very small, compact deposit. It's sort of exactly the type of deposit that was considered when developing the Maine Metallic Minerals Mining Act.

And because we're proposing a project that is able -- is very protective of the natural resources around us, suggesting that we absolutely can achieve those Class A standards in terms of water management, we are able to avoid any direct impact to water features that are around the site, habitats, air quality, et cetera.

This is really sort of what that was designed for. In fact, they state: Therefore in our view -- and I'm quoting -- therefore in our view, it would be more appropriate manage of the metallic mineral deposit to allow it to proceed to permitting process as envisioned by the CLUP and regulated by the Metallic -- sorry, Maine Metallic Materials Mining Act than to have it remain as general management zone.

And with that, thank you for your time, and...

MR. WORCESTER: Thank you. I think we're scheduled for a 15-minute break.

Oh, the time isn't up? I wondered why everybody was up there.

MR. FIELER: Good morning. Is this on?

Good morning. My name is Sean Fieler. I am the Chief Investment Officer of Equinox Partners. Equinox Partners is a money manager in Stanford, Connecticut. We have value investors. The typical holding period for our investments is 10 years, and I've been with Equinox Partners for 28 years. And for the last 23 years, we've been investing in mining companies. We have a team of three individuals who are dedicated into their work on mines, and we own just under 20 percent of Wolfden.

We manage $600,000,000 and about half of our firm's capital is invested in mining companies.

Now, most of the mining companies that we're invested in are in production, unlike Wolfden. These operating companies have financial statements that can be analyzed to determine the quality of their operations; their margins, cash costs return on capital employed can all be derived from their audited financial statements.

We do, however, devote a segment of our funds to mining companies that are pre-revenue. The evaluation of pre-revenue mining companies is fundamentally different than the evaluation of mining companies already in production.

In the case of pre-revenue mining companies, the future cash flows have to be analyzed based on the merits of the project rather than the company's financial statements. Their financial statements actually tell you almost nothing about the quality of the assets; in fact, literally nothing about the quality of their assets.

So -- and that is part of the reason why we invest in pre-revenue mining companies is that the relevant information about these investments cannot be found in their financial statements, so it tends to be an inefficient part of the market where diligent investors can identify misvalued companies, but just reading the financials or doing a screen isn't really going to tell you that much about the particular company in question.

So all of that said, there are a few obvious ways to evaluate a deposit of a pre-revenue mining company, most notably grade, size, geometry of the orebody. There are, in addition to the obvious factors, more nuanced factors, many of which would prevent a particular deposit from becoming a mine. So metallurgy, ground conditions, variability in the dimensions or grade of the orebody. The list is very, very, very long.

So in addition to analyzing the potential problems with the mining project ourselves, of the most important things that we do as investors is we are -- we partner with managements and their directors and the companies in which we're invested in.

And what we're really looking to do in these partnerships is we're looking to partnership with management that have a proven track record of actually advancing ore bodies into mines, and that's not everyone.

In the mining space, and in my experience, you basically have two types of management teams. You have management teams that are always trying to put their project in the best possible light, sugarcoat the facts, and often those management teams have, over the course of their career, associated themselves with ore bodies that don't, in fact, eventually become mines, because they're not being forthright with the investment community but what they're actually doing.

And then you also have other management teams that are more technical, that are honest with investors in the marketplace about what they're trying to do. And if they find something, you know, whether there's a plus or minus about the mine, they're being clear in terms of the disclosure of what those pluses and minuses are.

And so I think that -- that's why Ron Little's leadership here at Wolfden is so important. He's spent his career on ore bodies that have actually become mines. And that, in my experience, is the single best indicator as to whether or not you're dealing with the type of management that's just out there telling a story about something or they're actually working on a project that is actually going to be -- that they're actually able to see through towards production.

So I met Ron almost two decades ago in Florida when, at the time, he was shepherding through two projects in West Africa, Essakane and Bomboré, both of which are currently in production. Both Essakane and Bomboré are technical and financial successes. These mines each generate hundreds of millions of dollars every year in revenue and have strong operating margins.

And I can speak in some depth in particular about Bomboré, which I recently visited, and of which my firm is still a 10 percent owner. It's a very impressive operation, excellent geology, great financial characteristics, worth hundreds of millions of dollars in the stock market.

And this background, I think, is really important here when we're talking about Pickett Mountain because if there was a fatal flaw, if there was something wrong with this project, it wouldn't be people on my side of the table in the investment community; it would be the leadership, and Ron, in particular, would be the first to raise their hand and say, you know what, this doesn't work. You know, we're wasting our time. The economics, the geology, whatever; all the fatal flaws, you know, they prevent this from going ahead.

And that's obviously not the case here, which is why we're testifying, trying to get the licensing permitting to be able to progress to the next step here.

So given that background in terms of the quality of the project, the next -- what we do and what Equinox Partners has done here is we do an economic analysis. So given the fact that this is viable and this is attractive and it's technically feasible, right, what are the economics of the project from an investment perspective?

And so the first point -- the first thing to point out about Pickett Mountain is the high grade of the orebody. At today's prices, each ton of ore at Pickett Mountain has a market value of $478 per ton, so that's at -- within the portfolio of companies that we're invested in, that would be at the high end in terms of the value of that underground rock.

Another way to think about the value of that rock is the mining and processing costs estimated at Pickett Mountain are about $100 a ton. So it gives you a sense, in terms of the EBITDA margin that this would have in production over 75 percent.

So in the mining industry, because it's a capital-intensive business, you have a lot of upfront costs, you typically have relatively high EBITDA margins, north of 40 percent, but north of 70 percent or north of 75 percent, you're really talking about something that is very high grade orebody.

And if you benchmark this particular orebody globally, you'll see that there are a number of other operating zinc mines with grades in that 9 percent range. It's further corroboration that in the real world when you're looking out there at other mines that have this kind of grade zinc, that they're profitable and they're actually in the right half of the cost curve of zinc mines globally.

And in the case of Pickett Mountain's zinc, it's not just a zinc mine; zinc only accounts for just about half of the revenue of the project. You also have copper, gold, lead and silver, and so you get to that very high value on a per-ton basis.

Now, when you look at the financial statements of Wolfden, it's clear that they can't self-fund the development of this project. Right at the last -- I think we had the second intervenor made this point. In their Q2 financials, they had $2.1 million in cash and no revenues, right? So it's a pre-revenue company, obviously there's no revenues.

But this is the nature of a pre-mine -- pre-revenue mining company. They don't generate positive cash flow until they go into production. And the important thing is to -- to point out is that this is not unique to Wolfden, and it doesn't have anything to do with whether or not the project's going to be financed or not.

And it certainly doesn't have anything to do with whether or not it's a going concern. If you think about the going concern, people on my side of this -- in my business, we finance these companies as they progress through the permitting process. So you don't put all your money in before they get through this process or the next process; you put enough money -- in this case we're talking about equity investment -- for them to get through this process, and then you finance again and you finance again. You don't put all your money in years in advance in terms of what they need or in advance in terms of the permitting decisions.

To give you a real-world comparison for Wolfden, we're invested in another VMS deposit, and this one's in Latin America. It's owned by a company called Adventus Mining. Adventus Mining has a net cash on their balance sheet at the end the second quarter of $2.8 million, almost the same as Wolfden, and they are fully financed to break ground on a $235 million capital expenditure in the first half of 2024. And that's typical of the way of these pre-revenue mining companies are financed.

So getting into specifics for Adventus, because I think it's relative to some of the concerns raised here this morning, is they raised $180.5 million from Wheaton Precious Metals through a gold and silver stream as well as equity, and then they raised an additional $55 million from Trafigura in debt and equity.

So the Adventus project is larger than Pickett Mountain. Wolfden will need to raise less capital than Adventus did, but the larger point is that an economically robust project will be financed by the market. The key is not how much cash they have on their balance sheet; really it's the merits of the project that determine the ability to finance a particular mine.

Finally, I'd like to say something about the timeline. The most challenging aspect of mine investing for us, and I think for most investors in pre-revenue mining companies, is the delay between the discovery and the final investment decision.

The capital is committed at very low valuations because we don't know if and when a project is going to become a mine.

The valuations of these companies, like in the case of Wolfden, is incredibly low. In the case of Wolfden, we think it's too low, which is why we're invested.

The market is saying there, the equity market is saying given the lack of history of Maine permitting metallic mines, it's difficult for the market to determine if and when this mine will be permitted at all. So when we do that analysis and we come up here and we look at the mine, we look at the economics of the mine, we look at the technical aspects of the mine, we see a very low tonnage, high grade, small footprint mine with dry tack -- with dry stack tailings.

And what does that mean in plain English? From my side of the table, that looks like if Maine is going to be in the business of permitting mines, this is the exact type of mine Maine should be permitting. So we're expressing our confidence that Wolfden can meet all of the technical hurdles in this very rigorous jurisdiction to permit metallic mining. They check all the necessary boxes.

It's also our believe that this project, this mine will provide obvious benefits to the community and the local communities that strongly support the mine. As a New Englander myself, I will say that I am, you know, familiar with the type of environment that Wolfden is operating here. I have a sense in terms of the deep and strongly-held environmental concerns the community has and a really good sense in terms of the team that Ron has put together here and the technical expertise that they bring and their ability to check and meet all those requirements, check all those boxes as you go through the process. And that's -- basically, that's why we're invested.

Yes?

MS. HILTON: Help me with this. So in this -- how do you figure in the expense in the long-term maintenance of this mine once it has closed, you know, and so -- the closure plan?

MR. FIELER: So that's part of the --

MS. HILTON: Can I -- oh, okay. That's the question. I'm sorry. Do you want me to repeat that?

VIDEOGRAPHER: I would say yes, just for the live-stream.

MS. HILTON: Okay. So my interest is in how you look at the closure plan, and I realize that money has to be set aside in a trust fund. But in -- like Western Africa or some of the other places you've mentioned, including probably other places in the United States, they don't have regulations that are as stringent as ours, and it seems like that would be an additional consideration for you.

MR. FIELER: So it's definitely part of the IRR calculation, the internal rate of return calculation. Closure costs are in that mass of the 37 percent that you would have seen and the feasibility study includes that.

I would say globally, the mining industry is -- is mainly run out of Canada and Australia, the formal mining industry. Irregardless if you're here in Maine or wherever in Latin America or Africa, closing costs, the standards to which the Canadians and Australians are running these mines globally are incredibly high, so you're not building mines without closure plans. It's just not happening.

Where you really have lax environmental enforcement is when you talk -- you're talking about informal mining or artisanal mining, which is not -- it has nothing to do with what we're talking about here today. So that would be where you would see those kind of calculations not included.

I would say in the IRR calculation, the real factor, the biggest single variable that we have a hard time managing is the time, is the time delay between when they raise the money, when they get this permit, when they get the next permit and when they're able to make a final investment decision and actually go into production.

That is far and away, certainly in the case of this particular project, the biggest single factor.

MR. WORCESTER: Leo? Use your mic, please.

MR. TRUDEL: Yes. Thank you for your presentation.

My question is: Currently what is your value -- you said you have 20 percent into Wolfden.

Can you give a calculation on that?

MR. FIELER: I mean, the market cap is infinitessimal. It's $10 million, so it's -- $2 million is invested.

MR. TRUDEL: And what are you willing to put in down the road if this is passed?

MR. FIELER: So the way it works for equity investors like us in pre-revenue mining companies is we would tend to participate in the financing going up to the capitalization of the company to go into construction. So similar to the Adventus case. So equity investors like myself are providing the millions, in some case tens of millions of dollars to get up to that point. And at that point when you have the ability to make a construction decision, now you're talking about streams, debt and equity. And usually equity may be some from us, but usually from other providers at that point.

So this is more of the kind of nurturing capital along the way is what we're providing.

MR. TRUDEL: And I understand that. And I actually understand the calculations. My question is, again: How much are you willing to put in?

MR. FIELER: So we have -- we have single investments that are as large in the mining space as $30,000,000. The largest particular investment we have on a company basis is about $90,000,000.

So here in this case, a lot -- a lot will depend upon how this process goes, what the next phase of the environmental impact assessment says, what the updated feasibility says in terms of cost. All those things would affect the IRR and our appetite to invest in, you know, how much incremental capital in this particular project.

MR. TRUDEL: So what you're telling me is you haven't planned that far out?

MR. FIELER: What I'm telling you is we do this habitually and you don't make a decision until you have to.

MR. TRUDEL: Thank you.

MR. WORCESTER: Is the time slot up?

Okay. So we -- we need to address a time management problem here.

You still have two gentlemen I assume you want to testify.

MS. BROWNE: So because of the time restrictions, only Sean and Jeremy are presenting direct presentations, and all of the witnesses are available for cross-examination.

MR. WORCESTER: Thank you. I understand.

MS. BROWNE: So we had to pick and choose and tried to focus on the most technical issues.

MR. BRANN: You're not planning to bring back either Mr. LeBlanc or Mr. Little before further --

MS. BROWNE: Correct. This is it.

MR. BRANN: Got it.

MR. WORCESTER: Am I correct that it's break time? We're taking a 15-minute break.

(Whereupon a recess was held at 11:11 a.m. and the hearing was resumed at 11:23 a.m.)

MR. WORCESTER: Let me just talk to my fellow commissioners a second.

Actually, the way the schedule was set up, we had allocated time for the commissioners to ask their questions, but we're in the -- we've always asked the questions as they come to us, and I don't want to shut that down. Okay?

So what we're going to do, rather than take your presentation time away with our questions, we're going to stop the clock if there's interaction.

Anyone have any questions on that?

MS. HILTON: I have a question on it.

MR. WORCESTER: Well, if you're allocated 50 minutes, let's say, and somebody here interrupts you with a question, they're going to stop timing so that you have your 50 minutes in the end. Okay?

We're learning this process, too.

MS. HILTON: So, well, I have some questions about the -- the mining operation. Am I going to have an opportunity to -- I mean, just the logistics, and I kind of felt like at the beginning when somebody had the whole scheme up there that that was a good time to ask it, but I didn't.

Are we going to get a chance to ask those questions of any of these folks at some point?

MS. BEYER: This would be a -- this would be a good time, you know, when we've got 20 minutes of staff and commission questions after they get done with their cross. That would be a good time while this panel is still here.

MS. HILTON: 20 minutes after they're finished?

MS. BEYER: Yes, after the cross-examination.

MR. BRANN: So just so I understand, which I think is what you're saying is, you'll stop the clock so it's -- people can ask questions, but then you're not getting rid of your own time to ask questions; you'll have that as well, right?

MR. WORCESTER: Well, we're probably eating into our own time a little bit.

MR. BRANN: As long as it's not my time, you know...

MR. WORCESTER: All right.

Intervenors, Cross-examination, Intervenor 2.

MR. BRANN: Thank you, Mr. Chairman.

CROSS-EXAMINATION OF: MR. FIELER

BY MR. BRANN:

Q Mr. Fieler, my name is Peter Brann. I'm a lawyer from Lewiston, Maine. I'm going to be asking you a few questions.

We agreed to do you first so that you'd be able to fly back to Connecticut today so I'm going to -- I have a questions for you.

A Great.

Q All right?

So my understanding is you said that Wolfden -- Equifax -- Equinox owns 19 percent of Wolfden, and if we -- just to -- so everyone's looking at the right thing, we'll put up from the Hearing Exhibit 21, which is a statement of operations from this year in June of '23.

So that's saying that -- that the -- there are a total of about 164 million shares, right?

A I'll take your word for it. If that's what it says, that sounds good.

Q Okay. And if I do the math, it's about -- Equinox owns about 31 million shares; is that about right?

A Whatever the 19-plus percent is.

Q All right. And you began -- according to your prefiled testimony, you began buying -- Equinox began

buying these in about 2021, fall, correct?
A Two years ago, yes.
Q And at the time in the fall of 2021, the share price was between 18 and 21 cents; do you recall that?
A Sounds about right.
MR. WORCESTER: Excuse me. I can't -- maybe you could use the mic?
MR. FIELER: Oh, yeah. No, but everything so far sounds accurate. Yes.
MR. BRANN: Hold on a second. I think we've got a mic adjustment issue here.
(A discussion was held off the record.)
BY MR. BRANN:
Q Okay. All right. So -- and so if we look at Hearing Exhibit 33, the price varied between 18 and 21 cents during that period of time.
So would it be fair to say that --
MS. BROWNE: It's very difficult to see these. Do you have a paper copy to hand the witness?
MR. BRANN: No.
(A discussion was held off the record.)
BY MR. BRANN:
Q All right. So Equinox bought its 19 percent for about $6 and a half million; is that right?
A I'll take your word for it.

Q Okay. And the current share price if we look at Hearing Exhibit No. 22 is a little less than 7 cents; correct?
A That sounds right.
Q And so the value of your investment has lost two-thirds of the value in the two years you've owned it, correct?
A I wish this experience was isolated solely to Wolfden, but yes, this is true in the case of Wolfden.
Q Okay. And -- and the share price has lost another 55 percent in the last year, correct?
A It's been since the summer of 2020, junior mine stocks are down. Wolfden's not alone in this. It's been a difficult market.
Q And so that -- and that -- so Equinox has -- and so if your current value, following up on Commissioner Trudel, is about 2 million and you paid about 6.8 million --
A Yeah.
Q -- for the stock. You have millions of dollars at stake in whether or not this rezoning is approved, correct?
A Well, we own a couple million dollars' worth of stock, we only 19 plus percent of the company. Yes,

obviously we're economically, financially interested in the outcome.
Q And so you -- and Equinox touts itself as -- you're here to talk about what investors care about, and you tout yourself as being contrarian, right, that you don't go along with the prevailing wisdom; is that fair in looking at the investments?
A Well, we're long-term investors looking to take advantage of rather than be victims of the cycles is the way we put it to our investors.
Q All right. So --
A So we have a ten-year holding period, so we're not trying to time the quarter of the month or, sadly in this case, it's been -- yeah, obviously a couple years of a tough cycle, but that's not our investment --
Q And if we look at Hearing Exhibit No. 23, the LinkedIn page, you say that the firm's fund aims to have low overlap with relevant indices in the prevailing wisdom, correct?
A Wolfden would be safe. It's not an index stock.
Q And you've -- you have told people you've actually been wrong about the market for the last 10 years, have you -- have you not?
A Well, this is our --

Q Uh, I -- can you --
A -- fourth year --
Q Excuse me.
A -- of 20-plus percent performance.
Q We have a very limited amount of time.
A We've had some --
Q Is it -- have you said that?
A Have I said that? I've certainly been wrong about the junior gold mining stock index --
Q All right.
A -- for much of the last 15 years.
Q Let's listen to a clip --
A It's not a gold mine.
Q Let's listen to a clip from the -- a podcast called the Contrarian Podcast in 2021.
Let's hear it, please? Which is Hearing Exhibit what? Which is Hearing Exhibit 1.
(A discussion was held off the record.)
(Podcast was played.)
BY MR. BRANN:
Q Would you say that -- one of the other things that you've said is the most -- one of the most enormous problems facing the mining industry today, including junior miners such as Wolfden, is inflation, correct?
A Well, in this particular case, I think it's more

permitting, but inflation has been -- certainly coming out of the 2020 inflation has -- there's been significant inflation in the mining industry over the last three years.

Q All right. Let's go to an interview that you gave in 2022, which is out of hearing Exhibit No. 3, about talking -- with you discussing inflation and the mining sector, please.

(Interview was played.)

BY MR. BRANN:

Q And so -- and you're aware that notwithstanding this -- what you described as horrible inflation affecting the sector, that there was no adjustment of 40 to 50 percent in the cost of this project in the updated preliminary economic assessment, right?

A So the interview that you're citing there, I think, is from 2022.

Q Mm-hum. Correct.

A So there was very significant cost inflation in the mining space from the summer of 2020 from COVID, basically, through the December of '22. Cost inflation has really abated quite significantly --

Q Excuse me --

A -- over the last --

Q -- Mr. Fieler, my question was: Are you aware that,

notwithstanding whatever inflation there's been, there was no additional money placed on the cost of the building this mine by the expert, Mr. LeBlanc, sitting at the end of the table?
A The $147 million capital cost, I think, was a -- I should know this -- 2021 figure?
UNIDENTIFIED SPEAKER: 2020.
A 2020 figure.
BY MR. BRANN:
Q And there was no -- let me try it again.
A No, it's a 20 --
Q There was no adjustment --
A It's a 2020 figure.
Q Excuse me. Let me finish.
There was -- there was -- you're talking, in this 2022 interview, that the junior miner sector has seen sometimes these cost blowouts of 40 to 50 percent and yet, in this case, with the updated statement from the expert on what -- on the preliminary economic assessment, there was no increase?
A Most of the cost increases, especially the very large capital blowouts that we saw in the 2020 to 2022 period had to do with earth works, and a lot of those are much larger tonnage operations than this.
So the average tons here a day is how much?

UNIDENTIFIED SPEAKER: 1,200.

A 1,200 tons a day. So if you're looking at something like the Magino Mine in Ontario where you've had the --

BY MR. BRANN:

Q No, Mr. Fieler --

A -- these big, big cost over -- this is important because it's -- you're asking a technical question. We've had the big cost overruns --

Q But I was asking -- excuse me. If I could just --

A They've specifically been --

(Reporter interjects.)

MR. WORCESTER: Gentlemen, we can't -- we can't be talking over each other.

A So I can answer the question if you let me answer the question.

BY MR. BRANN:

Q So the question --

A So the big cost overruns --

Q No, no. The question was simply: You're aware that there was no change in the cost estimate for this particular project based on inflation?

A Can I -- can I answer that question?

MS. BROWNE: Could you just clarify that you're talking about the PEA in the document?

MR. BRANN: Yes. Correct.
MS. BROWNE: I think we can all stipulate that the PEA was not updated in this case.
MR. BRANN: All right. Thank you, Ms. Browne.
BY MR. BRANN:
Q Look, let me go to just another area here.
So the only area -- the only areas where these -- where mining projects are coming in on budget and on time is West Africa, according to you, correct?
A So in West Africa, for a number of years, you've had a disproportionate number of mines come on time, on budget.
Q And you have said that's the only place where they're coming on budget -- on time and on budget, right?
A As a general rule, yes.
Q Okay. And so -- well, let's...
All right. In an interview in 2022 -- let's play from Hearing Exhibit No. 3.2. It will go quick.
(Video played.)
BY MR. BRANN:
Q Okay. Your prefiled testimony, you say that the -- this project is financially viable because it's technologically straightforward, correct?
A It's a -- it's a small tonnage, high grade, technically straightforward mine, yes.

Q And you say that there's a -- there's a modest -- they have a modest balance sheet notwithstanding the fact that the -- the accountants say there's a substantial question as to whether or not this mine -- whether or not this company has an ability as a going concern?

A So, Ron, I know you want to say something here on this.

This is the nature of the way junior mining companies are financed, is that investors like me are going to pull together the capital that they need, equity capital, to progress projects through the permitting process, and then when they get to a point where they have the ability to capitalize the actual mine, then us, along with other investors, come through and provide the debt and other equity depending on the economics of the project.

Q It's a modest -- you say modest, right?

A The current -- like the cash on the balance sheet, the $2.1 million? Yes, definitely modest --

Q All right.

A -- but not atypical.

MR. BRANN: That's all the questions I have of Mr. Fieler.

I'm going to ask a few questions of Mr. Little.

CROSS-EXAMINATION OF: MR. LITTLE

BY MR. BRANN:

Q Mr. Little, you're the CEO of this company?

A Good morning. Yes, I am.

Q Okay. And the plan here is Wolfden is going to build and operate the green -- the greenest state-of-the-art mine ever; is that one of the -- basically what you're saying here?

A Yeah, the project is designed to be state of the art according to mining standards.

Q I want to talk about Wolfden's experience for just a moment or two.

So Wolfden is not operating any mine anywhere in the world; is that correct?

A No, nor has it. It's the people who are in it that have.

Q And Wolfden is not building any mine anywhere in the world today?

A No, it's -- but it's the people in the company that have.

Q And Wolfden has never constructed a mine that is similar to the mine that is proposed here, correct?

A Nobody has built a mine to this standard anywhere in the world, but we will.

Q Okay. And -- and Wolfden has -- just to be clear,

has never built or operated a mine, right?
A No, but the people here have.
Q Okay. Let's -- what I want to do is I want to, for a few minutes, talk a little bit about some of the things that you've been telling investors about this process, this mine.
Okay?
A Sure.
Q All right. And that -- do you recall telling investors that the rezoning is a critical milestone that could put the company into play?
A Yes.
Q Something you said in 2021?
A Yeah, the rezoning is -- as Sean alluded to, it's a critical value item to us. It's the first step in rezoning, and we're trading at a discount because there's the uncertainty about the rezoning.
Q All right. Let's play from -- let's play from a inter -- from a presentation you gave in 2021, which is Hearing Exhibit 9.6.
(Playing video.)
BY MR. BRANN:
Q So it's to put the -- it puts the company into play; that is, it becomes -- there's a takeover possibility from -- is one of the possibilities from getting the

rezoning, correct?
A Yes, the takeover adds a premium to the stock. It doesn't mean we get taken over, but it adds value to the company, and that allows us to then finance the next piece of the operation.
Q And Wolfden is willing to sell out and -- instead of building the mine -- if that would be better for shareholders, correct?
A No, the statement was related to the value that it adds to the company. As a junior, you have to -- the takeover premium potential keeps a higher share price and it allows to raise the revenue we need to operate.
Q All right. Let's listen to another clip, which is what you told investors in 2020, which is Hearing Exhibit 8.1.
(Playing video.)
BY MR. BRANN:
Q You're one of the two largest individual shareholders in this company, correct?
A No, I'm probably, you know, one of the tenth or twelfth. I own about -- less than 2 percent.
Q And so if the company is -- is taken over, the Commission here is not going to know, when they approve this zoning, who it is who's going to

actually develop this mine, correct?
A No, they will know. We have to make public statements about something that comes up like that.
Q This hearing is what you would -- what you've told investors is a mini mining permit, correct?
A Yes. Everything we're doing here at rezoning to our opinion has to be replicated again under Chapter 200 but at a much more detailed process.
Q Let's listen to the clip from what you told investors in 2021 about this mini mining issue, which is Exhibit 9.3.
(Playing video.)
BY MR. BRANN:
Q All right. And so let me -- let me -- and you've also -- let's put up Hearing Exhibit No. 24, which is a slide from a presentation you gave in 2020, in which you refer to as supportive state regulators.
Do you see that?
A Yep.
Q And -- and so you're telling investors that the state regulators, which presumably including this commission, are supportive; is that --
A This was a 2020? I think -- yeah, in my opinion this was here because we had initial chats with both the DEP and the LUPC about the process. And in my

opinion, they were practical about what we were told we had to do. So in my -- that is different than other jurisdictions that I have worked in where I didn't get that kind of practicality and up front forthrightness.
Q You've also told investors that if you just tick the boxes, you get the permit, correct?
A Under the DEP, our opinion is if we follow all of the requirements scientifically and financially, then we would get the permit. That's my impression of the process now.
Q And what I want to go to -- let's listen to the clip from 2020 of what you're telling investors about just having to tick the boxes.
(Playing video.)
BY MR. BRANN:
Q And so beyond that the -- furthermore, you've told them that you have -- that the -- that the -- one of the reasons why this process is streamlined is there are no indigenous rights and that you're getting great support from all groups?
A No, that's not it at all. The streamlining is the timeline. The benefit I see of Chapter 200 is that they've set a two-year period to do the baseline study and the feasibility study. That's -- before

that, there is no certainty in when you'd get the permit.

Q All right. Let's listen to a clip from 2019, Hearing Exhibit No. 5.4.

(Video was played.)

BY MR. BRANN:

Q All right. And so let's go further. And so in that in 2020 is when you are implying that you had great support and there are no indigenous rights.

Let's listen to the clip from Hearing Exhibit 6.3.

(Video was played.)

MS. BROWNE: Mr. Brann, is there a question? It's not appropriate just to play clip after clip after clip. If there's a question, please direct the question and then --

MR. ELWELL: Excuse me, Ms. Browne. Could you use the microphone if you're making an objection?

A Yeah, this is taken out of context.

MS. BROWNE: I just -- there should be a question asked as opposed to just playing clips of videos. So I request that you direct a question so he can answer the question.

BY MR. BRANN:

Q Okay. Do you recall telling investors that there would be very little monitoring necessary after three years?

MS. BROWNE: Sorry. Could we back up? Was there a question related to those last two --

MR. BRANN: I'm moving on to the next one.

BY MR. BRANN:

Q Do you recall saying that there would be very little monitoring necessary after three years?

A I expect there's probably very little monitoring after we've gone through a period of closure and monitoring. That's the nature of the design.

Monitoring is --

Q And so -- all right. Well, let's hear what you said -- told investors in 2020. Hearing Exhibit 6.4.

(Playing video.)

BY MR. BRANN:

Q And -- and have you also been telling investors that the DEP is -- is pre-vetting the science, thereby implying that if you get the rezoning, you're good to go?

A No. No, the benefit of the process is that the DEP has been working with the LUPC through this so our concern from the beginning was that we have to pass Chapter 200 and LUPC so we've really had the benefit of the DEP overseeing everything we submit so that we

at least get feedback of whether this is matching 200 at the same time.
Q All right. We'll play the clip from 2021. Hearing Exhibit 9.4.
MS. BROWNE: Well, I request he be offered an opportunity to respond --
(Playing video.)
BY MR. BRANN:
Q All right. Let's -- I see that there are just a few minutes left here, so I'm going to go ahead to -- one second.
A Can I go back and clarify your question on indigenous --
Q You're going to have an opportunity on redirect to do all of that, I'm quite sure.
The -- let's go ahead to the current financial condition of the company, which is -- we're going to -- from previously filed Levit Exhibit No. 26.1.
Just so the Commission can see it, this is from the financial statement from Grant Thornton, one of the ten largest accounting firms in the world.
And is that -- no, it was 26.1. Let me...
All right. And so there's a substantial doubt as to the continued viability of this company, correct?
A Yes, and this statement is actually one we make in

our financial statements, and they repeat it, and it's a standard statement for non-revenue company.

Q And the -- and at the end of two-thousand twenty -- first quarter of 2023, you had $2.6 million in Canadian, correct, on hand?

A Correct.

Q And you haven't filed the reports for the end of two thousand -- the end of June of 2023, correct?

A No, we have. We're about to now produce the third quarter.

Q Okay. All right. Because when I went to look, I didn't see it there.

But -- all right. In order to do -- in order to pay for -- so with 2.6 million, you actually got an infusion of $3 million from selling off the timber rights, correct?

A That was back in 2021.

Q And so -- and you sold off 3 -- a total of $5 million worth of --

MR. ELWELL: I'm sorry, Mr. Brann. Your cross-examination time is up.

MR. BRANN: All right. Okay. Well, it -- let me just say -- we can talk about it later, but it -- we obviously have more questions, especially dealing with -- you know, we have these -- this four panel.

They only got to two of themselves with 50 minutes. We have 25 minutes.

Obviously, the finances of this company, which is -- and the financial viability of this project are of critical importance.

Too -- and significantly, we didn't hear anything in the opening statement, so we have -- you know, it tells us that this is something, as we had explained before, is very important --

MS. BROWNE: Object. The counsel is making a speech --

MR. WORCESTER: I -- I -- time is up.

MR. BRANN: Huh?

MR. WORCESTER: Your time is up.

MR. BRANN: All right.

MR. WORCESTER: Your time is up.

MR. BRANN: All right. Let me just say --

MR. WORCESTER: Your time is up.

MR. BRANN: -- we would like to propose --

MR. WORCESTER: Your time is up.

MR. BRANN: -- we would propose to be able to bring back the -- not Mr. Fieler, he can go, but the others.

MR. WORCESTER: I hear you. Your time is up.

MR. BRANN: Okay. We will revisit this.

MR. WORCESTER: Staff, do you have questions?

MR. TRUDEL: I have one question. And it was stated that you do not own or run another mine, but I have a question in regards to your Snow Lake Flin Flon Greenstone in Manitoba.

What -- can you speak to us about that?

MR. LITTLE: Are you talking to me? Sorry.

MR. TRUDEL: Any of you. I'm looking at your description on your stock page as it pertains to your profile.

MR. LITTLE: Oh, I just heard Greenstone Manitoba.

MR. TRUDEL: Yes. Do you -- do you or do you not have a project that covers 2.6 thousand hectares of land located in Snow Lake?

MR. LITTLE: Yes.

MR. TRUDEL: What can you speak of that?

MR. LITTLE: So in -- we have two projects in Manitoba. They're both big -- you know focused on nickel sulfide potential. And the one in Snow Lake has about 7 and a half million tons at about 1 percent nickel. It's very close to Hudbay's concentrator. So it's a development project as well, and we're trying to see if we can add more resources to that orebody.

And the second project in Manitoba is equally about 7 to 8 million tons at about 1 percent nickel equivalent. It's about a hundred miles east of Snow Lake. And it, too, has you know got potential for expansion.

So to us, that's another -- another core asset package within Wolfden. We look at Wolfden as having a large nickel asset package in Manitoba. We look at Maine as having the Pickett Mountain as their cornerstone and Silver project down near Pembroke as a long-term potential project. And then we have another package of assets in New Brunswick.

MR. TRUDEL: Didn't you say that you did not have any other operating mines or ventures at this point in time?

MR. LITTLE: Correct. Yeah, Wolfden doesn't have any operating mines. Yeah.

My comment was -- is there a problem?

Well, I'll just finish off. My comments all along through that questioning was, within Wolfden we have a lot of development and construction and operating experience. The counsel was alluding to the fact that Wolfden doesn't, but all of these companies, particularly juniors, are made up of people that have a lot of experience, particularly in operation and construction and development.

Does that answer your question?

MR. TRUDEL: Again, it's my understanding that you said you did not have any other operations at this time.

MR. LITTLE: Oh. Well, I -- my -- the question I heard from Peter was that do we have any operating mines at Wolfden? So I was saying, no, we don't have any operating mines. I thought that's what the question was. I've got a deaf left ear and maybe I didn't hear clearly, but Wolfden doesn't have any operating mines, but we do have other projects.

MR. TRUDEL: Thank you.

MR. LITTLE: Thank you for the clarification. I'm glad you asked the question.

MR. WORCESTER: Anyone else have -- Betsy?

MS. FITZGERALD: So I guess I'm confused. Wolfden doesn't have any other projects -- you have projects, but you don't have any other mines?

MR. LITTLE: Wolfden is an explorer development company, and all of our projects are either in exploration or development stage. We don't have any operating mines.

I think counsel here was trying to make the -- make the point that we don't have an operating mine in Wolfden and trying to make the point that we don't have operating experience in Wolfden.

And I'm trying to qualify that we have a lot of operating experience in other companies, but not within Wolfden. Wolfden was formed in 2012. Jeremy and I and Don have been working in other companies before we joined Wolfden in the last five years.

So we're bringing a lot of experience, but Wolfden has projects and we're trying to develop projects like Pickett Mountain, but we don't have an operating mine with revenue in Wolfden currently.

Does that clarify it?

MS. FITZGERALD: Yes, it -- kinda, sorta.

So that means that you would -- you're thinking to develop Pickett Mountain?

MR. LITTLE: Correct.

MS. FITZGERALD: But then somebody else is going to do the work?

MR. LITTLE: No. No. I mean, we've got all the experience to build this mine. You know, counsel has made a show and a comment of me talking about a takeover premium.

The junior mining sector is -- you know, we're trying to attract investors. Most investors that come into a junior space are there because we will either get through permitting and have a good market to build the project ourselves, or during that process another company comes along and says, let's merge with you or let's take you over because you've done all the work to get to building and now we'd like to come and partner with you to build it.

So that -- that is part of the finance ability of a junior company is that potential for a takeover because normally when junior companies are taken over, there's a premium on the stock, and that's what attracts investors like Sean and others in there.

MS. FITZGERALD: Thank you.

MR. LITTLE: You're welcome. Thank you for the question.

MR. WORCESTER: Perry? You have to hold it down. Keep your finger on the button.

MR. ELLSWORTH: All right. So what -- what I'm hearing, and I just want to clarify, there's been three questions here pertaining to pretty much the same thing, is that this could be the first mine that Wolfden actually is going to operate themselves unless someone else steps in?

MR. LITTLE: Yeah. Our two option are this team is going to build it or somebody takes us over.

And I was trying to make the statement that we have done this before in other companies, right?

I think everybody's focused on what is Wolfden, but it's the people who are in it have a lot of experience at building and operating mines.

MR. ELLSWORTH: Thank you.

MR. LITTLE: You're welcome. Thank you for the question.

MR. WORCESTER: Leo?

MR. TRUDEL: I like that concept of clarification.

Could I characterize this as you're all -- you have a lot of experience doing these things before, and you're like entrepreneurs who have started businesses and, for whatever reason, your -- maybe they didn't do as well as you wanted them to, but you're doing it over again and over again and over again; and hopefully -- maybe in the past you've sold some, maybe in the past some have failed, and maybe... we don't know what the next maybe is.

Am I pretty close in my characterization?

MR. LITTLE: In all due respect, I would say not even close.

My track record has been on building several mines. I've got into -- started a company named Orezone over 25 years ago in West Africa. Before we were bought out, I was able to buy out our major company as a partner, which was the fourth largest gold company in the world.

We -- I raised over 200 million to buy out their 40 percent interest. And once we consolidated into 100 percent, another company came along and then bought out Orezone.

As part of that, I spun out Orezone No. 2, started out with several million in value and a good asset still in West Africa. After about 10 years, that valuation went up to about 400 million, and it is now still building another mine. It's just finished building that mine about a year and a half ago, and that's what Sean was talking about in his investment.

MR. FIELER: Maybe if I could just say something about Ron. I mean, it's a big part of the reason why we're invested is his past success. And extraordinarily successful.

You're talking about two mines that are generating hundreds of millions of dollars of revenue every year today. Long life assets, highly economic assets. Ron has an incredibly enviable and unique track record as an entrepreneur in this space. And now he's doing it again.

The reason why he can do it again, and the reason why people like me will come up here and sit at this table and do this testimony is because of his past record. Because he's that good.

MR. LITTLE: Thank you. I'd also like to qualify that our team has got that kind of capability.

Jeremy's come from building mines in the Atlantic region with Trevali. He came to us because the project was so attractive on a financial basis, and that's why he's working with us because of his track record in the same kind of rocks.

Don Dudek has got five more years of experience with me and met him in West Africa. So his presentation should speak for itself.

And then the group of consultants that you're about to see are really some of the best in the world.

So I think the problem here is that you look at a small market cap company and think we're bunch of over promoters, but in reality, it's companies like us that come to jurisdictions like this with the highest risk of permitting because the major companies don't have the time to do it or the patience to do it.

And then maybe after five years we get through all this permitting hurdle, a major might come along and take advantage of a bad market, a weak stock price, and then say, hey, guys, we're going to bid for the company.

At the end of the day the shareholders own the company, not us. So when a takeover happens, it's up in the investors to make a vote, not what we want to do.

So in reality, we're all engineers and geologists that want to build this mine, but we're still a victim of where the market is the day we get the permit and we're ready to go. If it's a bad market and our shares are down, that's often when the takeover happens.

So very few junior companies make it all the way through to production unless it's a small mine like this. This -- being a small mine is not a really attractive asset to a major company.

MR. TRUDEL: You're not just engineers, you're all businessmen, correct?

MR. LITTLE: Sorry?

MR. TRUDEL: I said, you're not just engineers; you're all businessmen, correct?

MR. LITTLE: We're all professionals, either engineers or geologists, around this table, yeah.

MR. TRUDEL: Again, I would characterize you as a penny stock company, that's what you are, and if we invested in a hundred different penny stocks, there's a very good chance we'd have a couple of home runs and we'd have a number that fail.

MR. LITTLE: Well, I mean, I can't change your impression of us. I mean, that's -- the business is what it is, but your point about us being professionals -- we are engineers and geologists, and we're here because we honestly think we can build a mine of highest quality.

As I mentioned before, nobody has built a mine at this level because the requirements have never been that high, so there is nothing to compare. But the engineers will show you that this is only a -- a slight increase to high level standards out there in the world, and we -- because of the financial viability of the project, we can meet that high level standard.

So I don't think that's an over promote or an overstatement. We're here because we want to do this. And I mean, this is something I've never had to do in the world before, is face a commission like this, and even on just rezoning, and alls we want to do is get to the next level of study work to show you how good it can be.

MR. FIELER: Maybe there's just one other relevant point here is that if you look at the shareholder registry, right, you have Kinross, which is a billion-plus-dollar company in the share registry. You also have Altius, which is a royalty company.

These are not the typical shareholders you're going to find in a company that is -- doesn't have substantial expertise or isn't on the right path.

You have some -- you have a very interesting shareholder registry here that I think speaks to the expertise that you have in this management team, and you have a new jurisdiction, which is why the valuation is so low.

MR. OUELLETTE: If I could just -- sorry, I'm Jeremy Ouellette, and again, I'm the vice-president of product development of the company.

MR. ELWELL: Excuse me, Mr. Ouellette. I think another commissioner has a question and then I think we're going to move on to a different line of questioning.

MS. HILTON: Can I ask -- I think I'm asking you this question. Where in Western Africa are the mines that you're talking about you've got experience with?

MR. LITTLE: Burkina Faso.

MS. HILTON: And do you -- are the regulations in Burkina Faso anywhere close to -- as stringent as ours are?

MR. LITTLE: I can't comment on the exact...

These are -- these are open pits, so there's a big difference. They're gold deposits, not base metal, so we're dealing with cyanide.

We're not -- there's the water treatment level is not the same as here; however, I'd also qualify that we were Canadians designing an operation in Burkina. We also took it to Canadian and World Bank standards when we thought our standards were higher than those in Burkina Faso.

MS. HILTON: So is Burkina Faso, where the mine is, similar to Maine?

MR. LITTLE: No, it's -- it's Sahara. It's desert-like conditions over there. Yeah, there's not much wetlands. We avoid rivers and drainage, but there's really no wetlands to speak of over there.

MS. HILTON: Okay. Thank you.

MR. LITTLE: Thank you for your question.

MS. HILTON: So lighting, which is our -- actually, we will get to that in the next phase, won't we?

Okay. Why don't -- I want to...

How have you taken into consideration climate change? I mean, I -- with respect to the amount of volatile storms, the amount of water that we get, the possibility of forest fires similar as to what we've seen in Canada?

I mean, how do you figure that into all of this?

MR. OUELLETTE: So we actually have some testimony that's coming up that discusses that, and so there has been an evaluation and consideration of climate change.

And I guess the quick answer is, we've considered that through a very contingent style of designs. There's -- yeah, the designs have a lot of contingency built into them.

MS. HILTON: Okay. I'll wait to hear more.

There was a comment actually at the beginning about -- that you could not see this mine site from either Baxter State Park or Katahdin Woods and Waters.

Baxter State Park has the highest mountain in Maine, Mt. Katahdin.

Will you be able to see the site from there?

MR. OUELLETTE: No, not from Mt. Katahdin. And we do have a viewshed analysis that was completed and no, you won't be able to see it from Mt. Katahdin.

MS. HILTON: And then also on the diagram that you showed of the operations, there is -- between Phase 1 and Phase 2, it looks like maybe there's a road there.

I -- what's going to be happening to the material that comes out of Phase 2? Is it going to be hauled underground, or is it going to be hauled aboveground up to the areas in Phase 1?

MR. OUELLETTE: So between Phase 1 and Phase 2 there is an existing road. And so the way that the project is envisioned is there will be material transport along that existing road between the two.

Now, there is also a program that's proposed, and I guess it's not directly pointed out in our testimony. Essentially a management plan for that exact activity, the communication between Phase 1 and Phase 2 locations.

MS. HILTON: Okay. All right.

And another topic. So you haven't included anything here about the ore processing facility.

MR. OUELLETTE: Correct.

MS. HILTON: Right? Because it's going to be at another location. But you have taken into consideration the cost of that facility; am I correct or not?

MR. OUELLETTE: The preliminary economic assessment certainly includes all of the costs associated to the overall project, including the concentrator and tailings.

MS. HILTON: Okay. So if you don't know where it's located and you've got these trucks -- what are they, 80,000 pound trucks hauling ore?

MR. OUELLETTE: Correct.

MS. HILTON: There's quite a cost involved in doing that, right? Ongoing cost for the next 10 years or how long you're going to be operating this.

How can you -- how can you figure out all your numbers or are your numbers not that detailed with -- financial -- financially?

MR. OUELLETTE: So we -- we did do evaluations and sensitivity analysis. So a big part of economic assessment is to run sensitivities on various things.

Operating cost is a significant portion of that, so when you're considering cost versus revenue, a lot of the discussion around operating cost today, but also, you know, inflationary, you know, revenues as well because of metal prices.

But absolutely we run sensitivities on all of the costs, which would have included costs related to hauling it further away and that sort of stuff. So I guess in our preliminary economic assessment we've considered significant inflation of costs within those sensitivities and it's still a very robust economic project.

MS. HILTON: And that includes consideration for the processing facility?

MR. OUELLETTE: You got it, yeah.

MS. HILTON: Okay. You -- I mean, you must know where you're going to put this or have a pretty good idea where you're going to put it, right?

MR. OUELLETTE: So we certainly do have some -- some options there, and there has been a lot of considerations on where that might be. And Ms. Browne had spoke to that a little bit earlier on, but there's this -- this really tough balance between getting enough information and being able to make a decision.

And when we're looking at alternatives assessments for the concentrator and tailings locations, obviously one was in T6R6 and various other, you know, locations were built into that alternatives assessment.

And even though the project, the mine, has to be in T6R6 because it's associated to the deposit, that doesn't necessarily translate directly to the concentrator and tailings. So we really feel that we have to -- we have to get all of the data throughout the Chapter 200 process in order to really define the exact location. But to answer your question, we certainly do have some proposed locations -- or not proposed, I suppose, but we have some locations that we feel will work based on a high level desktop study that certainly need a lot of field study to back up and make a firm recommendation on where we'd like to put that.

MS. HILTON: Are you going to put it in UT?

MR. OUELLETTE: I think it's unlikely.

MS. HILTON: Are you going to put it adjacent to the UT?

MR. OUELLETTE: There is one option that is near the UT. There's other options that are a bit further away. Again, we've operated on a sensitivity basis analysis as well.

So you know, economics are a big part of that selection. And -- but also with that, the nature of the natural resources in these different areas is an extremely important driver.

And we've done sort of some field investigations of them, but there's a lot of work that has to go into it before we can really make the decision where we think is most appropriate and make that recommendation.

MS. HILTON: So you're assuming that's not important to our decision for the rezoning, apparently, because you're not telling us where it's going to be or if it's going to be adjacent to the UT or -- I mean, I -- it seems like we need to know that.

MR. OUELLETTE: Yeah, I think it's important, certainly, to make a decision that there is a -- you know, a proposed concentrator and tailings facility and that's why we kind of mentioned it in -- in various disciplines, you know, of the report.

And again, you know, coming back to sort of the process involved over the next few years, we do feel that it's important for the recommendation on location there is an accurate one. And the amount of data collection required for that, it just -- it just can't take place within -- within the limits of the rezoning. And all that information is requested under Chapter 200 specifically.

And I think it's worth pointing out that, you know, that it's not a small endeavor. I guess the studies associated are, you know, in the ballpark of 15 to $20 million worth of expenditures. And it's -- it's really tough for the company to make the decision to press forward if we're not even sure that the mining component of it can be rezoned.

MR. WORCESTER: I'm going to have to interrupt you, Gwen --

MS. HILTON: That's fine.

MR. WORCESTER: It's past quitting time.

We're going to end the morning session.

Thank you all. We begin again at 1:15.

MR. OUELLETTE: Thank you.

(Whereupon a recess was held at 12:18 p.m. and the hearing was resumed at 1:16 p.m. this date.)

MR. WORCESTER: Just to let you know, somebody is supposed to turn the heat off again so we get rid of the noise. I have mixed emotions about that. I was just about freezing this morning.

The other thing -- the staff was having some problems this morning keeping track of the exhibits, especially the ones that were on the video. So keep that in mind. When you're going to show a video, make sure they understand how it's marked because we have to enter all of this into the record and so we need some way of tracing it.

The other thing you may have noticed that we've done belatedly is to try to get you all to make name tags so when you come up, I'm not sure -- I hope my fellow commissioners' eyes are better than mine, but at least it's an attempt to figure out who you all are. And maybe before you speak the first time, you can just introduce yourself and that will help us as well.

I believe the afternoon session starts with the applicant with their second panel. So we're ready to proceed whenever you are.

MR. DUDEK: Good afternoon, commissioners, LUPC support, and ladies and gentlemen of the audience.

My name is Don Dudek, I'm a geologist. I've been practicing for more than 40 years. I have professional standing in Canada for 30-plus years.

This particular type of deposit I'm very familiar with -- with, I don't know, maybe 15 years of experience in this particular model.

And so today what I'm going to do is I'm going to describe the geological setting so that you can better understand what we're talking about today and then the technical -- other technical groups will take off after that.

And the other thing I want you to understand, the -- what I'm talking about today is the result of 45 years of work already, over 200 core holes, and I'll show you what that means. So there's a lot of data and a lot of information that goes into these presentations.

First slide. This is the general geological setting extending from Newfoundland in the right down to Vermont in the southwest or lower left. This is a thousand miles.

The Pickett Mountain Deposit lies in the center left of this image and it's a modest size, but a fairly high grade massive sulfide deposit.

And when I'm saying massive, it's not huge massive, it just means that the rock is mostly sulfide minerals.

Big deposits within the group, Bathurst, Brunswick, 128 million tons, Buchans, 16 million tons. So you get an idea that this package of rocks, again, which passes through New Foundland, New Brunswick, Maine, Vermont, and continues to the southeast, is a prolific metal belt.

A bit of a close-up of the geology. And the reason for this is I want to set the stage for some of the subsequent slides. So the Pickett Mountain Deposit is the star in the middle of the image. It's hosted in the yellow rocks. It's overlain by the purple rocks and it's underlain by the gray rocks.

So its time sequence in how these things are formed. This is a stratographic section, and so we're looking at just a narrow part of the stratigraphy the Shin Brook Formation. Basal sediments which are in the gray. That next package there which is orange and yellow and some reds, that is our target stratigraphy, and that is -- let's call it a volcanic arc that developed on the sea floor about 450 million years ago.

Above it, it's like somebody did a switch, the geology changed, totally different rocks, totally different setting. And so the Pickett Mountain Deposit sits at the transition between, let's say, a volcanic arc chain and later boring rocks for my purposes.

We're looking at mining the red within this image. The little dashed lines that you see on the left of the color part of the section, that reflects the alteration, but it also reflects that the alteration is not complete within the stratigraphy. And I'll tell you what that means as well.

And then we have one smaller zone that's a bit lower in the stratigraphy. And we may or may not do something with that. We don't have enough information.

A bit about massive sulfide. So these deposits form on or near the sea floor during active volcanism. So you've got to -- you have to have energy to create these things so really it's a hot spring that pushes up to the base of the ocean floor. Black smokers, people are seen these in the news, and the sulfides precipitate at the sea water rock interface. And they literally inflate, they grow, you know, just like a cucumber would kind of thing.

And so you need super heated sea water, and one of the factors why this deposit somewhat unique is the connection between the heat engine and the deposits are visual and close. And I'll talk to you about -- I'll present that as well.

This deposit formed about 450 million years ago, and so it's a long time. And it formed because the European plate and the North America plate collided and then they moved apart and eventually the Atlantic ocean was formed, but it's this collision process that created it.

Now, one of the other things that we'll talk about -- in the cross section I showed you, the geology was like layer cake, pancake, so that's how it's developed initially.

But because of collision, because of time, the rocks have been rotated so it can go from flat in the left-hand side to the red massive sulfide will be our target to almost vertical or vertical to the right. So this again is just a -- the collision of the geological plates rotating the geology, and you'll see this on the data subsequent.

So this is a section through the west zone of the Pickett Mountain Deposit. You're looking to the northeast. This is a vertical section. The target horizon for us is the red line that's near vertical through the middle of the image. Rocks to the left are the host felsic rocks. So these are quartz-rich rocks. Rocks to the right are -- again, the switch has been thrown; it's a different package of rocks. It's again, geologically or economically boring.

The stippling pattern that you see in the -- to the left of the sulfide or footwall, as we sometimes refer to it, is the alteration. And really that's the remnant representation of the hot springs that have pushed up through the rock package and created the massive sulfide deposit.

The orangey unit is the subvolcanic intrusion. So this is a magma that pushed up into the yellow rocks, probably contributed to the formation of the yellow rocks, but it also drove the mineralizing system that created the deposits we see today.

So when I look at something like this, when I see the alteration -- and again, we can document this visually -- there's 200 holes, 220,000 feet of drill core that have been described inch by inch for this area. So visually we can see the alteration and how the rocks are affected by the hydrothermal fluids. And chemically we can see that as well to back up that observation.

So some of the sampling that's been done, ABA sampling, acid-based accounting, and this is to get an impression of whether or not the rocks would be acid-generating or not. So the stippled rocks to the left of the massive sulfide horizon or ore zone probably would be acid generating.

And I have some samples up here in the front if someone wants to take a look at it of both footwall or left side rocks that could be acid generating and rocks that they look boring, there's no sulfides in them, there's probably not.

I have an example of the sulfide zone itself so you can see what it looks like. In this particular case, that sample runs 55 percent zinc equivalent.

There's so much economic sulfide within the rock, there's not much room for anything else like pyrite, iron sulfides.

The rocks to the right, again, different package of rocks, no sulfides, a lot more calcium. They are probably more acid neutralizing.

And so, again, this -- the details of the Pickett Mountain Deposit and how it figures out are really important. This is a section about 1,500 feet to the east. This is through the east zone. And what's important in this image is that in the footwall felsic volcanics, the yellow, or to the left, there's no stipple. There's virtually no alteration in these rocks. And so what I'm not seeing is I'm not seeing sulfides, I'm not seeing the minerals broken down, changed chemically from what they were originally. And so more sort of boring rock. There's a little bit, but nothing material.

Again, to the right, no sulfides, no mineralization. Exploration-wise or economically, boring rocks.

One other point I didn't make before is the HW which is that blue horizon. This is the debris flow. And the reason for bringing this up is that this thing was from another volcano somewhere off to the side. Earthquake or something triggered a landslide. The landslide covered the deposit and preserved the deposit through time. So it's an important component to the overall story is that preserves what we see today.

I made the point about, you know, logging the drill core inch by inch, 220,000 feet, and it's a big job and it's a lot of data. But we've also collected over 1800 liquid geochemical samples. So these measure major oxides, these measure trace elements. So we use this data in two forms. In this particular image, it demarcates the difference between the different rock types and we're using zircon and titanium, but we also use it to document alterations both on a sectional basis and in a 3D image. So we can understand in three dimensions how the alteration has affected the rocks around. And on a high level, I can say, well, in my opinion, that kind of stuff will be potentially acid generating, that kind of stuff will not.

And one of the reasons for making that kind of statement is that then we can plan our geological infrastructure, underground infrastructure, mine infrastructure based on those high level observations, but obviously you have to do additional sampling and you need to document this thoroughly, but on a first pass basis some things appear easier than others to work with.

MS. FITZGERALD: Can I --

MR. DUDEK: Yes.

MS. FITZGERALD: Can I interrupt you for a second? You said three -- the slide you just had, the three-dimensional? Help me out there. I see two.

MR. DUDEK: The data is collected from three dimension, so if I was to give you an isometric net, you'd see the scattering of points in three dimensions.

So here this is just a 2D representation of the data.

MS. FITZGERALD: Okay. Thank you.

MR. DUDEK: Yep. This is the -- the Pickett Mountain Deposit so the west zone to the left, east zone to the right. It's about 3,000 feet along strike and about a half mile to depth. This is color coded grade times width. And so the hotter the color the higher the grade. The hotter the color, the more metal-rich it is, generally.

And so when you get -- let's say there's 45 percent zinc equivalent over four meters, there's just not much room for anything else in that rock other than the economic sulfides. So there would be very little pyrite.

In the lower grade portions more in the east zone, there's more pyrite and so those rocks would be more -- have more potential for acid mine drainage ARD. But the major point, the west zone, is quite metal-rich. It's almost twice the grade of the east zone. And again, I think the east zone is a false slice of the Maine zone.

I wanted to bring this up when I was talking with someone earlier. So this particular image is core -- well, maybe I'll step back one more point here.

Those stripes that you see on there, here, those are the core holes. So if you're -- weren't sure what they were, that's where we gather our information from. And so they're like small little tubes of information, and then we build a geological story from that.

So the brownish color, or light tan color in this image, that's mostly zinc mineralization. This particular intercept is 45 percent zinc equivalent over about 15 to 20 feet. There's about 30 percent zinc about 10 percent lead, really no copper, and there's really no pyrite. So this is in the footwall of the massive sulfide. This is not part of the zone, but this is just part of the mineralization that we see.

It is important to note that the zinc mineralization is really, really pale-colored. That means it's iron-deficient, and overall this is sort of an iron-deficient system. And again, it contributes to its unique character.

One of the comments that we've gotten is that the Halfmile Deposit in New Brunswick is very different than the Pickett. That Halfmile is hosted by mafic volcanic rocks and Pickett is by felsic; and because it's in the felsics, it's bad, but Halfmile is good.

The point with Halfmile, it's 100 percent hosted by felsic rocks. It's in the same belt of geology as the Pickett Mountain Deposit and all the other major deposits within the belt. And, in fact, Halfmile is totally encased in the felsics whereas Pickett is at the felsic/mafic boundary.

Where that's important from an acid-generating potential idea is that the hanging wall rocks or the rocks above the Pickett Deposit stratigraphically are more likely to be neutralizing, they're more calcium rich, they're buffering compared to the rocks below especially in the alteration zones.

This is a bit of a section. So the red line on the section is the Halfmile Deposit. The pink, the orange, and the yellow are all felsic volcanic rocks so you can see Halfmile is well within the felsic volcanic rock package.

The gray are sulfidic sediments so they would be quite altered, probably metal enriched. And then the mafic rocks are off to the right.

If we were to compare Pickett, Pickett would be at the contact between the green to the right and the yellow. That's where Pickett would sit. So not a lot of difference, but again, the nuance and details of the deposit are important.

So from a high level, and again this is from a geologist's point of view, the rocks in the lower north side of the west zone contain some disseminated sulfide and stringer sulfide mineralization so there's a potential to generate acid if exposed to air and water.

The rocks on the south side of the west zone, which are to the right, the hanging wall, they're a different rock package. They're not part of the same alteration system. There is no alteration, there is no sulfides. And so the likelihood of them potentially producing acid are very low. And again, we have the chemistry to support that and the visual observations.

The east zone, because it is probably a slab that's been dislocated into another area, both above and below do not show any appreciable sulfide enrichment, in fact very little, with none above and just a bit below. And so there's limited to no potential for acid generation.

And again, this speaks to where we can put underground infrastructure, the drips, the declines, all of the stuff. Which rock comes to surface? It appears that we can choose, based on the rock character, what's possible.

So in summary, and I think this is really important, is each geological site has its own uniqueness. The Pickett site, and again I've looked at hundreds of massive sulfides. The Pickett site is an easier one compared to others based on the alteration of the footwall, the low iron content of the sulfides, the alterations associated with it and where it sits stratigraphically. So it gives us optionality.

Anyways, that -- that's my presentation.

Thank you.

MR. WORCESTER: Anyone have any questions? Okay.

MR. DUDEK: Come on, there's got to be a question.

MR. WORCESTER: They're sometimes slow after lunch.

DR. FINLEY: Good afternoon. My name is Jim Finley. I'm a principal geochemist with Stantec Consulting Services. I have a Ph.D. in geochemistry and I've worked in the hard rock mining industry for 27 years.

So I have conducted geochemical characterization programs, worked at pretty much all phases of the mine life from Greenfield's development, like Pickett Mountain, all the way through closure.

A lot of the work I've done has been associated with dealing with historical mining issues that have resulted in impacts and challenges in managing rock. So I have a lot of experience with that at well.

With that in mind, I just want to start by saying based on the available information, and really what Mr. Dudek just presented in terms of the geology of this specific deposit, and it's very important to understand that it is the details about the deposit that dictate and influence what potential effects of the mining could be from the standpoint of acid rock drainage.

But based on available information, I believe conditions are sufficiently favorable that they can manage this mine development in such a way to limit, minimize the potential for acid rock drainage.

And let me just walk you through why I feel that way, some of the information.

But first I want to set the table, which is to say: What is acid rock drainage? We've talked about it, you've seen pictures. Pictures are always quick remarkable in terms of what they convey.

Unfortunately, with iron, when iron is in the -- in the system, it takes a very tiny bit of iron to make a really red color. And so it's not necessarily a good metric in and of itself. It's a great indicator, but it doesn't tell you the entire story.

But acid rock drainage developed as a consequence of exposure of rock that contains a specific mineral, pyrite, to atmosphere and water.

So in the underground scenario, there's maybe water, because there could be groundwater, but there's no oxygen. And really in terms of influencing the potential for development of acid rock drainage, it's this triangle in the lower left corner just like the fire triangle that influences whether or not acid rock drainage can occur.

Okay. So you pull a rock to the surface, very hard to halt it from being exposed to the atmosphere, right, we're surrounded by oxygen. It's going to happen.

A little bit easier to manage water, but not that much easier. So when you bring rock to the surface that contains sulfides, and pyrite in particular, it's hard to -- to prevent acid rock drainage from occurring. It's possible to manage it and it's possible to limit the magnitude of development. It's hard to stop it completely. So that's an important thing to remember as well.

The other aspect is, once you bring it to the surface, there are other things that can influence this reaction. And what's shown here, again in the triangle in the lower left, bacteria can have a huge influence on acid rock drainage development. It turns out that there are some bugs who really like that chemical reaction to supply energy for their life, and they can enhance the speed at which the reaction occurs orders of magnitude. So that's also part of that detail that has to be accounted for.

So it's -- I guess the takeaway from this is, we know that there will be some rock that comes out of this mine that has the potential to generate acid.

What we also know is that -- and I'll talk about this a little bit more -- is that through the course of the development of the mine, not only from where they are now but through Chapter 200 process, and should that be successful, they open the mine, they will not stop doing geochemical characterization work. They will not stop understanding what the system really looks like in detail because that ultimately is really what influences whether or not acid rock drainage is an issue in the long term.

I'm also going to introduce some words because it's a lot easier sometimes to talk in acronyms than to say these words all the time. I've already talked about acid rock drainage and I use that had term on purpose. And the industry and international groups as a whole has actually used that had term on purpose and that is to say when these deposits are exposed to the surface, they oxidize. In fact, Pickett Mountain has outcrops that clearly show there's oxidization that's occurred. So acid rock drainage is a natural process.

In Colorado where I'm from, we have iron fens which are expressions of this natural oxidation process that has occurred. When it's associated with a mine working, it's acid mine drainage, that's the distinction.

Now potentially, acid-generating rock -- and we have to get to a place where we classify rock materials in their geochemical properties. Potentially acid-generating rock is rock that has the potential to generate acid. That -- it's actually self-defined.

Rock that does not meet that, and we'll talk about how you measure that in just a minute, but rock that is not is non-potentially acid generating.

So there's -- the next category is rock. Some people call it waste rock, some people call it mine rock. And this is rock that in -- now we're talking in terms of whether it's ore or not, it has an economic value or not. Mine rock or waste rock has no economic value. That doesn't say anything about the geochemical characteristics of the rock; it just doesn't have economic value in the context of what the target minerals are.

Ore is what it is. That's the material that can be milled and extracted for the metals of interest. In an underground mine like this, you leave behind mine walls. And both Dr. Maest and I talk about mine walls and the picture on the right shows an example of an underground mine and everything -- the floor, even the walls and the top are all part of this mine wall.

So not only do you have material that may be taken out and placed on the surface that you have to think about, you also have to think about the mine walls. And the reason is because the humidity in mine workings in an underground mine is about 100 percent.

So you have plenty of water. And not only that, you have atmosphere because they have to put ventilation in, in order to sustain people to work in the underground, right? So there's a period of time where there's oxygenation in the subsurface.

Temporary storage pile, some people call them waste rock piles. In different types of mines, the waste rock pile may be on the surface forever. These are call temporary stock piles because they actually run a deficit in terms of space comparing how much waste rock they remove versus how much ore. So they actually have space to put things back underground.

And one of the things about putting things back underground is that at some point in time, they will no longer be exposed to oxygen because the mining activity will lower the water level of the groundwater system to support mining, but once mining's finished, the groundwater's going to come back up and submerge everything that's been buried.

And we'll talk about -- there's details associated with that, and I'll touch on that.

So we have to distinguish between PAG rock and non-PAG rock, and we have to do -- there are standard -- industry standard geochemical tests to do that.

You heard Mr. Dudek talk about acid base accounting. And really what that is is it's a test to just say how much potential acidity do I have associated with a sample, and how much potential neutralizing capacity do I have? And it's just a balance between those two. And I'll show some of the data associated with that.

But that's just a -- that doesn't say anything about time because one of the details that's very important in this consideration, and certainly for Pickett Mountain Mine, is the time. How much time does it take before you get this reaction occurring? How much time before you may see acid rock drainage? It doesn't happen overnight. Some rocks are incredibly reactive and can react within a matter of months. But other rocks may not react for years even though they classify as PAG in the acid-based accounting test.

So we run another set of tests which is referred to as humidity cell testing. And the intent is to subject the rock material to conditions that enhance sulfide oxidation to the maximum amount. So lots of air, lots of moisture, and then we look at it over a period of time. And that gives us a lot of information about how the -- the rock reacts, how the sulfide minerals react, what kind of constituents come out of those, what metals may leach from that material, and how long does that reaction take before it occurs?

Again, it's important in the context of Pickett Mountain because when you pull rock out of the ground, put it in the temporary piles, and it is temporary, they're going to put it back underground. So that's important.

Okay. I'm going to have to step up my pace, aren't I? These -- this is very much schematics, but I wanted to give you a sense of several things: One is that in almost all metal ore deposits, you not only have the ore, which is shown in the orange, but you have a halo -- an alterations halo around it, and Mr. Dudek referred to the alteration that he's observed based on the drilling and his understanding of the geology of the Pickett site, right?

So this halo can be really huge in some kinds of metal deposits, porphyry ore -- porphyry copper deposits, for example, in the southwestern United States have really large sulfide alterations zones. It can be quite small.

And based on the information that's been observed today the alterations halo at Pickett Mountain is variable. On one side of the deposit it's fairly significant; on the other it looks to be small to nonexistent. And it's that detail again that's also important in the consideration of this mine development because on the right-hand side, I'll distinguish between an open pit mine and an underground mine first at the high level. It's just how much material do you have to manage in both of those situations.

In an open pit mine, the black stairstep line corresponds to the open pit. So all the material above that has to be removed before you can get to the ore, right? And that is a lot of material. And that's where you end up with mines with waste rock piles that, you know, are 300 feet tall and a quarter mile long, and those things will never go anywhere. They're going to be on the land surface forever.

So that's a big difference between an underground mine, again where the mine workings -- they're not nothing, but they're a lot less substantial than an open pit mine. And what that means, then, is the ratio of waste rock you pull out to ore is significantly different. It's much smaller in an underground mine than it is an open pit mine.

And not only that, but you can place your mine workings in such a way to minimize the potential or the chance of running into acid-producing rock.

Well, here's some of the data, and I don't expect you to think too much about the table so I just want to point out a couple things. One is, on the right-hand side is really the metric, that's the ABA metric. And it's just a ratio. It's a ratio of how much neutralizing potential is there, how much acid potential is there in a rock sample, and just understand that these are rock samples. I didn't talk about the rock body or the rock mass itself. These are the samples that are available.

So three of them, the ones in orange, would classify as potentially acid generating. All of those come from that felsic -- altered felsic rock zone that Mr. Dudek showed.

The other four are nonacid gener --

non-potentially acid generating, and those come from the other package of rocks. So these are indicative -- it's important to note this is not the -- all the data that would be collected. In fact, every single lithology has to be classified, categorized, on the front end. We run all the tests. I'm actually -- would need to confirm these results both for non-potentially acid-generating rock and the ones that classify as PAG.

And beyond that, then I want to know what kind of reactivity they have, and that's where the humidity cell tests come in. So that's the information.

In terms of carrying geochemical characterization programs, I think this is super important. Prior to the early 2000s -- and the bottom example from Nevada is a little bit special, but prior to the early 2000s, there was really no guidance with regard to how you carry out a geochemical characterization program.

It was everybody's best guess on how to do it. And at that time, and really I'm talking probably prior to 1990, mid-1990, people didn't really want to know that badly about the geochemistry. They had to understand it from a -- from a permitting perspective, but casting it in the context of a

40-year mine life, most of the time it got ignored after that initial look.

And people like me made the best effort they had to make predictions of what potential effects may be with a small set of data.

So the world of geochemical characterization has changed significantly from actually all the example mines except for a couple of them that have been put forward in testimony both by me and by Dr. Maest.

But just to point that out, Dr. Maest generated a document that was a fine piece of work that described what you need to do in order to carry out characterization. The other thing to remember here is that while we want to know what the geochemical nature of the rocks are, we want to know what is going to be the likely water quality, all right? Because from a geochem perspective, who cares if it makes acid, if the sulfides react or not? It's whether or not they're going to end up having an impact on water chemistry.

So the target of all this is to make projections of water chemistry through a geochemical characterization program, okay? So Dr. Maest and colleagues generated a document. The Canadians have been after this for a long time. The second one listed there is the Mend Document.

In 2009 an international group of mining companies, actually, got together, just like they have recently, for tailing management and acknowledged that, you know, they actually have to understand what's happening with acid rock drainage. And through that, they generated a living document called the GARD Guide that is only available on the web. And the reason it's only available on the web is so that it can be updated as new information is gathered.

So the GARD Guide is out there. The state of Nevada, of course, has a lot of mines in the state of Nevada, and they have just recently overhauled their entire program describing how you conduct these studies in support of a permitting process for mining activity. And I guess the point of this then is that, you know, for mining examples that predate, I'll say, 2000 -- I don't have an exact cut-off number, but for mining activities that occurred prior to the establishment of what I'll call the more modern geochemical characterization period, those aren't actually very applicable other than to say that they are precautionary tales.

And also that it's -- this is not simple to do.

So -- so it's -- there's two parts to that.

This is a table, which I know you cannot see even though you have the monitor in front of you. There's a large example of this over on the posterboards and we'll make sure that's put up, but this is a table out of GARD Guide. And basically what it does is it runs from top to bottom through the life cycle of the mine development, from exploration down through permitting, mine development, and initial operations through operations and all the way to closure.

So in the old days, there was some geochemical work done in the exploration and kind of right after that certainly to get through permitting, and that was kind of it. A lot of times, no more work was done.

And then they would get close to closure, within a couple months, and go, you know, we've got -- better develop a closure plan here, and they didn't have any recent information, which made it very difficult to -- to actually come up with an effective closure plan. And there's plenty of examples of those in the mining industry.

But on the right-hand column, that's the AMDML, so ML stands for metal leaching program that the GARD Guide would endorse that carries out throughout the mining activity. So not only do we gather a lot of information on the front end to support permitting and mine development, but throughout the mining activity, information and data are being collected in order to update projections of potential water chemistry because it's an unknown -- you know, there's lots of uncertainties in the system both geochemically and hydrologically.

So if you gather information throughout the mining process, then you can go back and update your information when you get information that's significantly different from what you had before. It makes good sense.

So anyway, there's quite a lot of overlap between the GARD Guide table and some of the information that's required as part of the Chapter 200 process. It makes good sense.

Wolfden in their exploration and mine development program are just about in -- right where you would expect them to be in terms of the nature of the information that's available. The geology and ore deposit definition always is way out in front of geochemical characterization, and I think that's pretty evident based on Mr. Dudek's testimony as compared to the amount of geochem information that's available.

Again, we're using two pieces of information, seven samples for geochemistry, and a lot of ore deposit definition geochemistry and geologic understanding to make the assertion that I started this presentation with.

So I just want to touch on these again. The examples of mines with no geochemistry or mitigation, well, you have an example from 5,000 years ago and no -- or 500 years ago. No one thought about geochemistry. Even to the mid-1900s, no one really spent any time.

For example, anyone who understands geology and geochemistry at all would never have endorsed opening the Iron Mountain Mine in California. That is one gigantic chunk of iron pyrite, and it's -- they developed tunnels throughout that whole thing and it -- I'm telling you, it is one of the worst places you can see. And they'll never be able to turn that off, ever. So there's a water treatment plant there that will be there through perpetuity.

Okay. So Holden Mines, similar. 1800s to the early 1900s, mine. And, again, in the early days of mining if there was an ore, and if wasn't high enough grade ore, it was waste rock and it went down the hill. There was not much thought given to where it was placed, how it was placed, and what kind of management occurred afterwards, mainly because when you were done, you just walked away, right? There were no regulations at that time.

From the Kuipers document in 2006, I think I made this point earlier, but, you know, 18 of those 25 mines are open pit mines and the minute -- even though Flambeau is not that large of an open pit, but as soon as you talk open pit that's going to be there forever and in most of those cases, you end up with a wet tailing impoundment as you saw in the second example of Jeremy's along the coast. And, sorry, I can't remember the name, Callahan, I think it is, where wet tailing is placed on the ground. In almost all those instances in those old mines and some of those mines are still operating to this day, there are no liners under the waste rock, there's no liner under the tailings impoundment. So there's no consideration at that time.

Again, when these mines started in the 1940s, '50s and '60s, that was not what was done. So I think that's important.

And again, all of those mines listed predated what I would consider the more modern era of geochemical characterization.

It's not to say that we don't need to think about those or pay attention to that information, but to make a direct comparison between those and what the Pickett Mountain project is, I'm not convinced that's a fair comparison.

Yes, ma'am?

MS. HILTON: So I've heard a lot -- not a lot, but quite a bit about unsuccessful mining operations, but I haven't heard very much about ones that have been successful, particularly in dealing with the acid mine runoff.

Do you have any examples?

MS. FINLEY: Yes, I do. So part of the challenge also here is that we don't have a -- very many -- as many mines in the more -- that reflect a more modern area -- era, sorry -- than we do mines that predate that. So it's kind of hard if you look in the historical mining index to find a mine that was successful that way.

In the modern era, many of those mines are still operating. And I will just take this opportunity to point out that two of mines that are listed in the Kuipers document, Stillwater Mine and Greens Creek Mine.

Stillwater is in Montana, it's an underground mine. Greens Creek Mine is in Alaska, that's an underground mine. They're larger operations than Pickett Mountain, and they are ongoing operations.

Now both of those got listed, and I'm not arguing whether they should have been listed, but there's a difference between -- think of a mine as an industrial process, right, so it's like a paper pulp mill, it's like any kind of big industry. They will have issues. And it's whether or not, I think, the issue is a chronic issue that is not going to go away forever, or if it's a one-off issue or -- and this issue may last for five years, right, before they resolve it, but they resolve it and continue.

So I would contend both of those. I would also contend the Eagle Mine, which is in Dr. Maest's testimony, is also a successful mining operation.

Now, did they get exactly what they predicted in terms of water chemistry? They didn't. They're seeing different water chemistry show up than they predicted. And I'm going to tell you right now that if you ask me for a number from a water quality prediction, I cannot give you a number, I cannot tell you that the sulfate concentration will be 1,000 milligrams per liter. I can't do that. And the reason is, there are too many uncertainties involved with that process. I can tell you a range of probable concentrations. And where that fits in is whether or not the mining operation has the flexibility and capacity to adjust to those different conditions. Right? So I think that's important. So I guess those are ones that I would offer. It's hard to look in the past.

MS. HILTON: Are they open mined or underground?

DR. FINLEY: Those are all underground mines.

MS. HILTON: Underground?

DR. FINLEY: Yeah, they're underground.

I just will touch on the earth work study from 2019. Three of those mines of the 16, I think there were, Chino in New Mexico, Bagdad in Arizona, Bingham Canyon in Utah. I worked at all of those, but I will tell you right now, I'm not responsible for their challenges, because they started a long time before I was born.

But the point is that also, those are all very large open-pit operations, so they -- again, these are facilities that have 100 million ton waste rock dumps sitting next to a pit that's a thousand feet deep or deeper and a tailing impoundment that covers, you know, several hundred acres, all of which is unlined. So they're just not good comparables to what is planned for Pickett Mountain.

This is a table out of the Kuipers document, and I think it's a great summation of the challenges, which is to say, if you don't pay attention and continue to update any -- either the hydrologic characterization, the geochemical characterization, and also your mitigation measures throughout the mine life process, you're not going to have success because things will be different than what you think on the front end. That's the nature of this process.

Well, in summary, again, current understanding of the orebody is that you probably can access the orebody without having to manage a whole lot of PAG rock. Okay?

In the Chapter 200 process they're going to know that for certain and should they be successful with a permit, they're going to also know through the mining activity because again, geochemical characterization, hydrologic characterization is not going to stop.

During the mining operation, groundwater will flow into the mine, not out. And that's actually a good thing. It's fine. They may not make much water. They're talking 30 gallons a minute, which is really not very much water at all. And that's likely given the topographic location of the site. But again, I -- don't quote me on that, please. Relatively low water amounts. But the water flows into the mine. It's pumped out. If it needs to be treated, it's treated before it's discharged to the environment.

So -- and all of that treatment and discharge part is permitted as well, right. It's just not -- whoever thinks what's good, it's actually a permitted process.

Limited time on the surface for waste rock before being placed back underground. And again, this goes back to how fast does that reaction occur, is it months, is it years? And if the storage time on a surface is, let's say, five years and what you understand from geochemical characterization says 10 years, then you're in a better position than if geochemical characterization says four months and it has to be on the surface for five years, right?

So that's a moving part that has to be understood.

When the mine is backfilled, there's limited to no air in the backfilled areas, which is to say they backfill these stopes, and they pull all the ventilation, right? And there are other parts of the mine that are open and have ventilation in there, but that stope that's backfilled in there has no oxygen going into it.

Is there some that diffuses from the rest of the system? Yes it does. Most of it will be consumed pretty quickly by the rock. So that's important. That's a mitigation measure.

I have 5 minutes remaining. Thank you.

The rock fill is not expected to be -- it will be nonacid generating, so that's a mitigation measure as well that's baked in on the front end of the project. We'll understand much more about that, what does that actually mean, how much material is nonacid generating, what are the geochemical properties of nonacid generating material? Just because it's not acid generating doesn't mean it can't leach metals. That's another aspect of geochemical characterization that's important in this process.

After mine closure, they pull everything out and allow groundwater to rebound. It will take time for groundwater to rebound. That period of time groundwater is rebounding, we're going to have a good idea of what that water chemistry would be before they even turn off or stop pumping water from the underground.

But should there need to be something done to the water chemistry, there's a period of time to do that. And I'll just reemphasize, you all know this better than I do, that the Chapter 200 process is comprehensive. It requires essentially all the information that's available and suggested and all the guides for modern day geochemical characterization of these systems.

So with that -- yes, ma'am?

MS. HILTON: Another question for you.

So how do you neutralize acid mine drainage?

DR. FINLEY: So it depends on the amount. So if you -- your entire water flow is acid, then you have to neutralize it with something.

In the mining industry, and you'll hear my colleagues talk about a different kind of water treatment process, but in a -- in many systems -- sorry, I'm getting feedback here, but in many systems they use lime. So that's a commonly available chemical compound to raise the pH. And as you raise the pH, it actually causes minerals to precipitate from solution. And when those -- it's sludge. And when the sludge forms, it actually has the capability to absorb constituents, metals, contaminants from the solution.

So if you do it in a controlled water treatment process system then -- you know, it's an engineered process, you know exactly what's coming in, you know exactly how much to add, et cetera.

It's also used as a mitigation measure in backfilled material. It could -- that's one place. They're going to -- a portion of the backfill will be cemented, so that's another possible source of neutralizing material.

But we have to understand, you know, what are the consequences of all this in terms of resultant water chemistry that's in contact with that.

MR. WORCESTER: I understand this correctly, if you handle the ore once you've got it aboveground, there's minimal opportunity for acid to get -- escape, if everything goes well. But underground, the acid water forms on the walls of the mine; is that correct?

DR. FINLEY: So in -- that -- there's one of those details is when you're mining the ore, you know, there's a place where -- and I'm -- ore on this side is all ore. Ore, ore, ore, ore, ore, and then it's not.

And so what the nature of the wall rock chemistry and mineralogy is has everything to do with the question you're asking.

MR. WORCESTER: And let me ask you this: Is there some quick way to determine the percentage of acid in this water that leaks into the mine? Is there a simple test?

DR. FINLEY: Yes, pH.

MR. WORCESTER: Okay.

DR. FINLEY: Yeah, pH is a great measure.

MR. WORCESTER: If you monitor it on a daily basis, then you know what's going on?

DR. FINLEY: Like crazy. You know what's coming at you. And certainly because there will be no water discharge from this facility without having been treated. That's --

MR. WORCESTER: Well, you hope that -- fishers and things like that can give you trouble.

DR. FINLEY: Right. Yes, sir?

MR. ELLSWORTH: So the -- I heard you talk about the water table and refilling the mine and whatnot.

What's the impact within some distance to personal wells and/or other things while you're down there drilling and digging? Because it -- it would assume that you're pumping out the water to treat it so that you're not in the water while you're there.

DR. FINLEY: Right.

MR. ELLSWORTH: You can't go anywhere in Maine and not run into water. You dig a ditch, it's full.

So you're going to be treating water constantly, pumping water out which is then going to be filtered and whatnot. But what is to -- to anything that's a local well, let's say a thousand feet deep, you know, I've seen them that deep before --

DR. FINLEY: Sure. Sure.

MR. ELLSWORTH: -- you know, 4 or 500 feet is pretty common. Is there any effect going to be from this mining on local water production?

DR. FINLEY: It has everything to do with distance. Distance and the hydrologic properties of the bedrocks groundwater system.

So you know without knowing details, I can't answer. If it's really close, which my to understanding -- I was up at the site the other day -- there are no groundwater wells in that immediate vicinity.

But if it was close, you could dewater it. Right? But there's not going to be flow water out of the mine during the mining operation. All the groundwater is going to be coming into it. It's going to be deep.

MR. ELLSWORTH: Yeah, I understand that --

DR. FINLEY: Okay.
MR. ELLSWORTH: -- but you're going to have to pump some water because --
DR. FINLEY: Yes.
MR. ELLSWORTH: -- out of the -- out of it into the retaining pond --
DR. FINLEY: Correct. Correct.
MR. ELLSWORTH: -- because you're going to be generating water within those -- that space --
DR. FINLEY: Yes.
MR. ELLSWORTH: -- as you -- especially -- you're going to chase the water down, basically.
DR. FINLEY: So the other aspect of this that I haven't really talked much about is water balance. Right? Part of the mining operation requires water, so some of the water that gets pumped out may get treated and go back underground to support the mining activity, and how much gets discharged corresponds to the excess amount of water in the system. But you have to -- you have to have a water balance model that encompasses the entire facility and everything about it -- snowfall, right, rainfall input, extreme events. All those kinds of things have to be factored into that.
Okay. I'm pretty sure I -- oh, yes, sir?

MR. TRUDEL: Yes. What Peter brought up is a good point, but he was talking about the water coming out of the well.

DR. FINLEY: Yes.

MR. TRUDEL: My question is, what about -- you have the walls, the floors, the material that's being returned back in. There's going to be a considerable time period. Again, it's probably an unknown variable before there's no oxygen and the acidity process ends.

DR. FINLEY: Right.

MR. TRUDEL: That being said, you said that the water table will come back up and stop that process, but at the same time, what's to keep that water from leaching into groundwater down the road?

DR. FINLEY: That was one of -- thank you for that. That was one of the points I had, which is to say there is -- there will be a period of time between when you stop pumping water out of the mine and just let it start to fill before the groundwater will actually flow out.

So you know, again, through the hydrologic characterization at the end of that analysis, I can't tell you if that's going to be a month or if that's going to be three years. If it's a month, then there's not much time, right, so on the front end of that, there's going to have to be a plan to manage that wall rock because you're exactly right, the entire period of time that the mine's open and there can be reaction -- again, we need to understand what the mineralogy of the wall rock is, right? But if there's reactions going to occur, it will probably occur over that period of time. The products of that reaction are sitting there. And as the water comes back up, it will leach it up. So we need to understand that.

MR. TRUDEL: A follow-up to that, then, would be similar to what someone had asked earlier as it pertains to global warming.

DR. FINLEY: Mm-hum.

MR. TRUDEL: And as we see water tables start to drop, will the acidification begin that process again?

DR. FINLEY: Well, that's a -- that will be a function of what is the highest level of ore extraction that occurs relative to where the groundwater table is now and what would be a pre -- projection of what a new groundwater level would be under a climate change scenario.

Again, that's part of that characterization and detailed analysis, right, because all -- everything I've just talked about ends up being part of the economic analysis of the project as it develops through the Chapter 200 process.

MR. TRUDEL: Thank you, Dr. Finley.

DR. FINLEY: Yeah, sure. Thank you. I'll --.

MR. WORCESTER: Next item on the agenda is Intervenor 2's Cross Examination.

I get nervous when I see all these wires going back and forth. That's, like, under my desk in my office. I have no idea what those are plugged into or where they go.

(A discussion was held off the record.)

CROSS-EXAMINATION OF: DR. FINLEY

BY MR. BLOOM:

Q Thank you. I'll start -- I'll start with you, Dr. Finley, since we were just speaking.

So the hydrate sulfates within -- sulfides, I'm sorry -- within the Pickett Mountain Deposit have quite a bit of pyrite, don't they?

A As you heard Mr. Dudek say, that's variable.

Q Okay. But there is actually -- it's -- in the preliminary economic assessment, it stated that the high grade sulfides contain 45 to 60 percent pyrite; is that correct?

A That is stated, yes.
Q And those high grade sulfides contain the minerals that Wolfden seeks to extract from the deposit, correct?
A That constitutes the ore, correct.
Q Right, which is what Wolfden would seek to mine?
A Sorry?
Q Which is what Wolfden would seek to mine?
A Correct.
Q Okay. And so it also states within the preliminary economic assessment that the zinc, lead, and copper sulfides within that deposit are, quote, finely laminated and are overlain and in sharp contact with massive pyrite; is that correct?
A Sorry, I didn't read that section. I'll take your word for it.
Q Okay. Let's just -- we can bring up -- can we bring up Page 544 of the application, which is Page 28 of the preliminary economic assessment?
Let's just scroll down a little bit.
All right. Can we zoom into this -- where it says the high grade sulfides?
All right. So we have the high-grade sulfides typically include 45 to 60 percent pyrite there.
And then if we scroll down a bit below that,

I have to find the -- I'll find the finely laminated quote later, but you'll take -- you're willing to take my word for it?
A I will take your word for it.
Q That's fine. Thanks.
And so by finely laminated and overlain in sharp contact with massive pyrite, that means the zinc, lead and copper are basically finely interlaced or interwoven with the pyrite, correct?
A Correct.
Q And so now the rezoning application states on Page 289 of the application, quote: Within the project area, the potential sources of acid rock drainage are, quote -- are limited to mineralized rock from underground being temporary stored on the surface.
Do you agree with that?
A Yes.
Q You agree that the potential sources of acid rock drainage are limited to the rock that's stored on the surface?
A Well, okay. I will correct that to say that certainly I spent a lot of time talking about mine wall --
Q Right.

A -- as another possibility.
Q Correct. The mine walls are another source of acid rock drainage, correct?
A They are another potential source, yes.
Q Correct. Okay. And you state on Page 6 of your written testimony that, quote: The combination of air and humidity from groundwater seepage in the underground openings generates conditions that could cause production of acid rock drainage and metal leaching if the mine walls contain pyrite without accompanying minerals to contribute neutralizing capacity. Correct?
A Yes.
Q And you have no sampling right now to show that the mine walls would have minerals that would neutralize the acid, correct?
A I would -- yes, that's correct.
Q Okay. And the mine walls would be exposed to air and humidity throughout the time of active mining, correct?
A Correct.
Q And they would also be exposed throughout the time, you said, of the filling -- once the mining was done and the water was filling back into the mine workings, correct?

A That -- I believe I spoke to that in a lot of detail, yes.
Q And is it also possible that if water levels fluctuate so -- get drier or refill, that could also cause a time when there's reintroduction of oxygen into those areas?
A Maybe.
Q Okay. And also, we heard Mr. Ouellette talk to us earlier about the sequence of mining and that there will be some mining at upper levels -- I think even before some of the lower levels.
A Mm-hum.
Q So the upper levels are not going to get filled up with water until the mining of the lower levels is complete and then those get filled up first, right?
A Correct.
Q So those upper levels are going to stay exposed to air and water for the whole time until -- until Wolfden gets through with getting down to the bottom and mining all the lower levels, correct?
A Not necessarily. And the reason is, is once they finish a stoke, and that's one of those long cuts where they extract the ore, they backfill it. And when it's backfilled, it no longer has ventilation in there. It's -- the system is a -- not completely

disconnected from the air that's in the underground from ventilation, but it's significantly disconnected.

So I would contend that those upper layer -- the period of reactivity is the period of active mining --

Q Mm-hum.

A -- with some period following as they backfill them.

Q And you're talking about that upper layer. You're saying once they backfill it, it won't be -- there won't be as much room for oxygen to get in?

A Correct.

Q But there will be some room, it just will be less; is that --

A No, I'm saying it will very difficult to get oxygen throughout the entire length of that stoke once it's backfilled.

Q Okay.

A There's no driver.

Q There's no --?

A There's no mechanism for driving oxygen into the stoke.

Q Okay. And you talked to us -- you spoke to us earlier in your testimony about field tests and laboratory humidity cell tests that would, excuse me,

expose sample rock to air and water and determine how long it would take to -- for acid mine drainage to occur, correct?
A Correct.
Q But that testing has not started yet; is that right?
A Correct.
Q And you also talked about an acid-based accounting test, correct?
A Correct.
Q And that was done on seven samples; is that right?
A Yes, sir.
Q But more than 7,000 core samples have been taken from the Pickett Mountain Deposit, correct?
A I believe that's the number. I don't know it exactly.
Q All right. And those samples were used to determine the mineral resource estimate; is that correct?
A Yes.
Q You stated that -- I believe in your PowerPoint that we just -- we just saw that you would want to collect samples of all rock types and conduct laboratory testing on them, correct?
A Yes.
Q And the number of samples of each rock type is tied to the amount of each rock type to yield

representative results, correct?
A Correct.
Q And you're not contending that those seven samples that have been done thus far are enough to satisfy those things that you want to do, correct?
A I am not contending that.
Q You would want to take a lot more samples, correct?
A Correct.
Q And you would want to do a lot more tests?
A Yes.
Q And so -- and with regard to the seven samples that were tested with acid-based accounting, those samples were not from the orebody itself, correct?
A Correct.
Q They were from the parts on the side -- either side of the orebody?
A Correct.
Q So those samples don't tell us whether or not the orebody would be acid -- potentially acid generating, correct?
A To be quite honest, I don't need an ABA test to tell me the ore would be acid generating.
Q Because -- because you believe it definitely would be acid generating, correct?
A Yeah.

Q Okay. So there's no doubt that the orebody itself will be acid generating?

A Correct.

Q Okay. And so when we're talking about what those seven tests tell us, we're talking about -- they tell us -- if they tell us anything, they tell us something about what can be done outside of the orebody or what the potential acid-generating capacity is outside of that orebody, correct?

A Correct.

Q Okay.

MR. DUDEK: Can I have a comment?

MR. BLOOM: Well, I'm going to ask you questions, too, so I bet you will --

MR. DUDEK: (Inaudible) -- directly with that.

<u>CROSS-EXAMINATION OF: MR. DUDEK</u>

BY MR. BLOOM:

Q What would you like to say?

A We've collected, as I said, over 1800 samples that geochemically characterize the rock, not for ABA, but our data -- so the seven samples, three of which are potentially acid generating, are consistent with the geochemistry and the observations that we've made during the drilling programs and the cores that we've logged.

So the point is that we have a relatively good understanding of the surrounding rocks, and I don't disagree that the deposit itself will probably generate acid if left behind.

The second part is the bulk of the massive sulfides that are there are ore. So we will strip as much of that as we can out of the rock, we'll leave behind as little as possible because it will go through the mill because it's economic.

Q Well, and you were talking -- when you testified, you said, oh, this one is 55 percent zinc, right?

A Sure.

Q But we heard earlier, and I think it's stated in the application, that the overall deposit is around 9 percent zinc, correct?

A Zinc equivalent.

Q Zinc equivalent.

A The overall deposit based on the PA is about 19 percent.

Q 19 percent. But that's in the 55 percent?

A No --

Q And in fact, you don't dispute that the preliminary economic assessment says that the high sulfide material is 45 to 60 percent pyrite, correct?

A It depends on where you were on the deposit.

Q But that's what it says in the preliminary economic assessment?
A More average for the east zone compared to the west.
Q But that's what it says in the actual document? That's the only thing we have in the application that I've seen that talks about the pyrite levels.
A Understood.
Q Now, when we're -- when we're -- you mentioned this -- I'll turn to you so it's -- since you mentioned these 1800 samples, and I saw you mention that in your prefiled testimony, that's not presented in the rezoning application, correct? The description of those 18 --
A No, this is just part of the work that we would do, normal course, for our exploration programs.
Q Right. And that -- that hasn't been presented to the LUPC?
A No, because it doesn't directly apply. It is just visual reference and comparison.
And so when we collect the ABA samples, we see the connection between what is potentially acid generating and what is not and it matches our chemistry of the 1800 samples we collected.
So from a high level, we have a reasonably good understanding of what's potentially a problem and

what's probably not.
Q All right. I want to understand what's in the application is those seven samples, correct?
A Yup.
Q And those seven samples are not from the orebody?
A That's right.
Q And there were 7,000 samples that were taken to establish the mineral estimate?
A That's what you normally do.
Q Okay. And so now, I want to also -- let's -- I'd like to take a look at -- can we pull up Mr. Dudek's PowerPoint, actually? I just want to ask a couple questions about it because, you know, these are some new things. And we got a copy of this, I believe, Thursday night at like 9:00 p.m. So I'm going to have to do this a little bit on the fly with you because I don't think this has been submitted before.
So if we could go to the next -- next page. We go to the next page after that, the next slide.
So this regional geology -- I just want -- this wasn't -- you didn't put this in the application, correct, regional geology?
A That's relatively new.
Q Relatively new. Okay.
Can you go to the next slide?

And this -- or this diagram on stratographic section of the Pickett deposit area, that's also not in the application, correct?
A Yeah, we created that for a field tour that happened at Pickett a little over a week ago.
Q A little over a week ago. Got it.
Okay. So that wasn't also -- it couldn't have been in your prefiled testimony because that was a few weeks before that?
A Yeah. And we're just trying to -- the object of this is to bring understanding.
Q Bring understanding. Got it. But -- okay.
Can we go to the next slide?
All right. And here you're just talking about how -- generally how volcanic massive sulfides work, right?
A Yeah the deformation to create a steep deposit versus a flat one.
Q Okay. Can we go to the next one?
Okay. West zone -- I'm not sure. This one might have been in the application. I'm not sure. It looks a little familiar to me, so --.
Let's go to the next one. And the next one -- actually, can you go back?
And so you have a little note here, point low

alteration in the rocks, right?
A Yep.
Q That low alteration levels in the rocks, that wasn't discussed in the application, correct?
A That nuance, I'm not sure. It just -- there is a difference between the west zone and the east zone footwall or to the left in that diagram.
In the west zone there's more alteration, not consistently complete, but there's more. In the east zone, there's virtually none.
Q Yeah, and my question was just: Was that information provided in the application? So like me, as an attorney looking at this, I really don't know.
I have to send it to my expert, you know, who can tell me what to think about this. And so, you know, if it's not in the application, it's hard for me to ask a good question about it, but I was just going to ask, was it there?
A I am not sure.
Q You're not sure. Can we go to the -- actually, the prior one, quickly. Prior -- prior one.
Yeah, I see there's another note about low alteration in the hanging wall. Just the same question. As you said, you're not sure if the alteration was discussed in the application, right?

A (Nods head affirmatively.)
Q Can we go two slides down now? Now this slide is rock chemistry analysis to date.
Is that where you referenced that 1800?
A (Nods head affirmatively.)
Q And that's not in the application either, correct?
A Yeah, it's just characterization.
Q It's just -- so -- but it's not something I've had a chance to see or my expert has had a chance to see.
MS. BROWNE: So could I just comment that part of his testimony is rebuttal to what was presented by the intervenors, so that's why --
MR. BLOOM: I understand it's rebuttal. My point is just the LUPC hasn't seen this -- we haven't seen this. This is just new stuff that you're presenting here today and LUPC can do with it what it wants, but I'm just saying we haven't seen it.
BY MR. BLOOM:
Q Can we go to the next slide?
Do you know if this was in the application.
A I don't remember the details.
Q You don't remember the details? I don't remember seeing it, but that -- it was a thousand pages, so --
A But that image, or ones like it, have been presented by Wolfden many times.

Q Okay. So maybe that is -- I won't represent one way or the other. I'm not going to put words in your mouth.

Okay. So let me see. I have some -- I know my time is running short, so --.

Oh, Dr. Finley, I had a question for you.

CROSS-EXAMINATION OF: DR. FINLEY

BY MR. BLOOM:

Q You mentioned with regard to the acid-based accounting that you want to actually confirm those results with further tests, correct?

A Yes.

Q So you wouldn't just rely on the -- this -- what's called, I think, preliminary acid-based accounting at this, you know -- would you?

A Those I would consider indicative results.

Q But you would want to do more tests to understand the potential for acid generation, correct?

A Absolutely.

Q Okay. And you had a slide -- I can't remember which one of you had the slide of the stages of, you know, geochemical characterization and exploration. And you said that there was like the top stage, exploration, that's where you're at. And then there was a lot of other stuff that went below and you said

a lot of that's going to happen in the 200 -- Chapter 200 process, right?
A Correct.
Q So that hasn't happened yet?
A Correct.
Q So there's a lot of stuff we don't know at this point about the potential for acid generation, correct?
A Yeah.
Q Okay.
A I mean, we have a good indication.
Q But there's a lot we don't know?
A Yeah.

MR. BLOOM: All right. That's all I have.

MR. WORCESTER: I guess it's up to the staff to keep this game going. Anyone have any questions?

MS. HILTON: Oh, I'll ask one. I don't know how relevant it is.

So I believe that this material is going to be crushed underground; is that correct? I don't -- I guess, is it the ore or the rock? And I'm just wondering what effect that has on the generation of acid.

DR. FINLEY: So I can answer that question.

I'm not quite sure about the detail of the mining process --

MS. HILTON: Okay.

DR. FINLEY: -- but just in general, smaller is more challenging, bigger much less. But there are details in that as well.

So it's possible, in some deposits -- you collect a sample, send it to a laboratory for acid-based accounting, it comes back, it looks like PAG. But if you look in detail and then you put that same sample in a humidity cell test and it never makes acid over a very long period of time and scratch your head and wonder what heck is going on.

If you look at the mineralogy and thin section, the pyrite grains are actually encapsulated with other minerals. So even though it's a small piece the part of the pyrite that's exposed to react is even smaller and so it just can't really do much.

So, again, without having -- that's got to be part of the geochemical characterization is to understand the nature of the -- and the relationship of pyrite in the rock with the rest of the minerals and then these other standard tests that talk about reactivity. But yes, in general, smaller, more problematic.

MR. WORCESTER: So what's the size of the ore when it comes out of the -- on average?

DR. FINLEY: Sorry, one more time?

MR. WORCESTER: What is the size of the ore when it comes out of the mine?

DR. FINLEY: Again, that goes to the question whether there's any crushing that's done underground.

If it comes up as, you know, the material from the blast, it's going to be variable. But again, the ore doesn't stay very long before it's -- just for purposes of the Pickett project and that land surface, it does not reside there very long.

MR. WORCESTER: So when it comes out of the ground, it goes into these holding areas that are lined; is that the --

DR. FINLEY: No, I'm sorry, sir. Excuse me. They are lined. They actually have a double liner system designed for those.

MR. WORCESTER: That's aboveground?

DR. FINLEY: Yes. That's very unusual in the mining industry.

MR. WORCESTER: And then how do you get that ore off that double lining into a truck?

DR. FINLEY: That's for the engineers to tell you. Very carefully.

MR. WORCESTER: I wouldn't have the skill to do it without putting the liner in there, too.

DR. FINLEY: Well, there's probably what are called rub sheets, but, again, I hang out with a bunch of geotechnical engineers so I have words sometimes that I don't know what they were, Scrabble words.

MR. WORCESTER: Betsy?

MS. FITZGERALD: Don, would you talk a little bit about the core samples that you have in front of you, please? You referenced them, and I'd just like to know a little more.

MR. DUDEK: Okay. Thank you.

So there's four samples. These two samples are from below or to the left side of the deposit to the north. And so this one here is quite altered. It's got chlorite in it and it's good a fair amount of sericite, so these are broken down minerals in the rock as a whole, and it has about 2 to 4 percent finely disseminated pyrite.

If there was a rock that would create -- potentially create acid, it'd something like this, but you can have a look at it closer. It doesn't look like a lot. So it -- there's -- it's not a -- what I'd say a huge risk, but there is a risk associated with it.

This sample is from underneath -- so this is from underneath the west zone. This is from underneath the east zone. This one is weakly to no-altered rock. Same rock type. This is subjected to hydrothermal activities, hot fluids going through the rock. This one not.

The likelihood of this generating any acid is what I would deem low because there's no pyrite in it. There's no sulfite. There's no sulfur.

And so this is where the details really count on a deposit. The east zone, both left and right of the deposit, there's no appreciable sulfides. So, again, the likelihood of generating acid are low.

In the west zone, to the right or the structural hanging wall of the deposit, there's no sulfides. It's a different rock package, probably more acid neutralizing.

To the left of the footwall, it's variably sulfidic.

The degree of alteration associated with the sulfide really depends on the permeability of the initial rock. So there are areas in the footwall of the west zone where the rocks were really massive, like massive flows from a volcano. No fluids went through that at all. And so it's not altered. It's neutral rock.

The one in the middle, and again to feel the full impact is to lift it. This is a high-grade massive sulfide. This would be the ore. And again, one of the points I was trying to make is that the bulk of the sulfide mineralization is economic. We don't want to leave anything economic underground, so we will do the utmost we can not to leave something that could generate acid.

This particular one is 55 percent.

MR. ELWELL: Excuse me, Mr. Dudek. I'm just going to interrupt you for a second.

Are those examples going to be introduced as exhibits?

MS. BROWNE: Yes, we provided a photograph.

MR. ELWELL: Okay. If possible, could you try to refer to the rocks you're holding up as their exhibit name so that when people are looking back at the record, they know what you're referring to?

MR. DUDEK: I didn't give them a name in the photograph.

MS. BROWNE: Sorry. We'll pull it up so that we can come back and identify A, B, C and D.

And I don't know, Don, if you remember the order of the pictures?

MR. WORCESTER: These were considered pet rocks, so you have to name them.

MR. DUDEK: Well, this is Fred.

MR. ELWELL: To the extent you just want to describe them in a way that it would be easier for people --

MS. BROWNE: Yeah, I think if he describes it as the orebody, then we know which one it is in the photograph.

MR. DUDEK: Yeah. Well, this is the orebody.

MR. ELWELL: I think that would work.

MR. DUDEK: Yeah. And again, this is about 55 percent zinc equivalent. And as the comment was made, that isn't necessarily representative of the entire deposit, but it's more representative of the west lands versus the east lands. And again, details matter.

Most of the sulfide in here is zinc sulfide, then it's followed by lead, copper, and then there's a subordinate silver and gold. And very little pyrite in a rock like this because it's so metal-rich.

This one -- and again, it's more greenish colored. I don't think you'll see it from where you are, but it represents the geological switch where a different type of volcanism occurred.

The mineralizing system that altered this rock that created this massive sulfide is gone. It's like somebody snuffed out a candle and different package of rocks comes through.

So you had a landslide and it flowed down over top of the massive sulfides, and that's a good thing for us because it preserved the massive sulfide through time. If it was left on the sea floor, it would just oxidize away. It would just disappear over time. So I'm happy to see this rock because it preserved this rock, which is the one we want, which is the massive sulfide.

These rocks are more calcium-rich. They're sulfur-poor. They're more likely to be acid-neutralizing. And so backfilling with something like this would be another mitigation action that Jim would be talking about.

The other thing is that we probably can do the bulk of the underground excavation in this, you know, economically boring rock, and it will all go back down -- actually, we'll probably have a deficit of rock to put underground from the excavations because the ore will be more than we're excavating on the side. But would we want to use this stuff and does Jim need to characterize it? Absolutely.

I hope that helps.

MS. FITZGERALD: It does. Thank you.

MR. ELLSWORTH: 45 or 50 years ago, I did some drilling myself, core drilling, up in Bald Mountain, and I think I heard you say that you had drilled 4,000 holes; is that what I heard?

MR. DUDEK: Over 200 holes at about 220,000 feet.

MR. ELLSWORTH: And was any of that ever run through a plant or anything so that you could tell overall what the consistency would be of the core samples that you had?

MR. DUDEK: Well, the ore zone for mineralization was subject to metallurgy, preliminary metallurgy, and we have a general idea or a pretty good idea of what the recovery characteristics of this material would be. We need to do a bit more. You know, I don't like the gold recoveries, and I don't like the silver recoveries. I'd like to see more of that, so I want to tweak it.

And again, it -- it a hundred percent depends on the details of the mineralization within the sample. So you have to get really down and deep and into the -- into the weeds for this kind of stuff.

MR. ELLSWORTH: And just to clarify, how deep is the deepest point that you're going to go to, how deep did you drill that you found core?

MR. DUDEK: About a half mile.

MR. WORCESTER: Everett?

MR. TRUDEL: I don't know why I have a hard time with this.

DR. FINLEY: We're all -- we're all together on that.

MR. TRUDEL: Okay. Thank you.

Can I ask you -- we talked about pH, and at one point, you were talking about some of your acid rock running somewhere 8- to 9-plus pH; is that correct?

MR. DUDEK: So the -- the data that I showed for the seven samples that are discussed, one of the common tests that's run is called a paste pH.

MR. TRUDEL: Right.

MR. DUDEK: And the way you make it is you basically make a mud pie consistency of a crushed up sample and you put the pH prone in and look at it.

And so it's a great indication of the immediate nature of the rock material. If it's undergone oxidation, it will have a low pH. If it hasn't, that rock -- those samples all were 8 or 9.

MR. TRUDEL: Do either of you gentlemen know what the pH level is of the ponds or waterways even close by or even in Maine for that matter?

DR. FINLEY: I don't know for sure, but I'm going to guess based on what I've heard about that chemistry that -- okay. So first of all, take a step back, the pH of snowmelt, the pH of rainfall is about 5 and a half or lower. In fact, snowmelt can be lower than that.

So in a system where the -- a pond or a lake is predominantly influenced by surface runoff and not groundwater so there's not been interaction with rock, it can have a low pH. So some of those ponds may be lower pH.

MR. TRUDEL: How would the -- if there was runoff, it's my understanding that pH levels run exponential, correct?

MR. DUDEK: It's a logarithmic, so it's ten times the pH --

MR. TRUDEL: Correct, yes. So being said, if we're looking at nine, we're look at thousands of times or hundreds of thousands of times' difference?

MR. DUDEK: So -- yeah, pH of 9 would classify as basic --

MR. TRUDEL: Okay.

MR. DUDEK: -- not at --

MR. TRUDEL: I thought 7 was.

MR. DUDEK: So neutral pH is 7.

MR. TRUDEL: Correct.

MR. DUDEK: So anything above it classifies as basic, anything below.

So everybody knows about lye from their grandparents or, you know, whoever made soap in the day, right? And lye has a pH of around 12. And I'll tell you, you get that on you and it will burn a hole in you just like acid will.

So, again, most aquatic ecosystems function well in a pH range of 6 and a half to 9, something like that. It depends on the fish species.

MR. TRUDEL: So I guess my concern is, if there was runoff, how would that impact water supplies aboveground?

MR. DUDEK: Do you mean uncontrolled runoff, or --

MR. TRUDEL: Uncontrolled, yes.

MR. DUDEK: Yeah. So, again, it depends on the nature -- the bottom line is it -- it -- you've got water coming out of the underground, you've got runoff from temporary storage units, you have all these systems that are contributing water to the collection pond.

And so your question is two-fold.

One is, what if there's a release of water from the temporary retaining pile, right, so it doesn't get captured and go into the pond? What does that chemistry look like?

Well, it depends on what the rock is that's in the pile. If it's some kind of -- and you'll hear more about -- from a colleague about the design of that pond, but let's just say something happens and water is released from that. It depends on what are all these sources that fed into it.

So if it's poor water chemistry, it will have an impact on the receiving waters.

MR. TRUDEL: Thank you, Doctor.

MS. BEYER: I have the same problem. So for Dr. Finley, I have just two questions.

One is: In the situation where you have potential for acid-mine drainage on the mine wall, reactive, you said that there's something that can -- something would need to be done while the mine is filling up in that kind of situation.

Can you give an example for two -- you know, you've got to backfill, it's fill -- the mine's filling back up. What could be done to address acid drainage in that situation?

DR. FINLEY: Yeah, so what I would like to see before that, I want to know whether or not the mine walls are actually producing acidity or storing up acidity in the mine walls.

So during the mining operation, I would contend there should be a lot of work done to understand the nature of the mine walls.

Okay. Let's say we do all that. I also understand what the influence of the mine backfill and cemented backfill is going to have on -- on the chemistry because I can set up tests and run that, right? It's not going to be exactly what conditions in the underground would be, but it's going to be a good indicator.

Let's say I do that. So I understand mine wall, I understand the influence of backfill, et cetera. Turn off the pumps and the water level starts to come up and it's a different chemistry than we anticipated. Let's say it's acidic, which it more than likely would be if it's going to be something, and metal-bearing.

So I'll just give you an anecdote from another mine. And this is an open pit mine, but the Sleeper Mine in Nevada, gigantic open pit, has some of the worst mine wall rock chemistry you can imagine. They had incredibly high pyrite content in their mine walls. And when they turned off the pumps in Sleeper Mine, they knew they were going to have a problem.

So they did two things: They filled it fast, as fast as they could -- in fact, they diverted a river into the pit to fill it as fast as they could, because again, you turn off the oxidation reaction when you submerge it. And then they added lime at the same time. And I think I mentioned lime already.

And as a result of that, that's actually a recreational fishery for an open pit, which if you could see the size of this thing, it's, you know, three miles across and, again, a thousand feet deep.

It's a gigantic feature on the landscape. And they were able to manage the chemistry of the water as it filled up before there was any discharge. And that is -- would be one possibility.

The other is, if you had to, you could pump that water and treat it and return the treated water back in as it fills.

MS. BEYER: Thank you. And one more.

In asking for examples of mines that you felt were successful in capturing and managing acid mine drainage, you mentioned the Eagle Mine in Michigan.

Dr. Maest's testimony that was prefiled indicated that there was increasing concentrations in the groundwater down gradient of that mine.

So how does that equate with your

characterization that it's a successful mine?

DR. FINLEY: Yeah, so -- so -- and great point.

And it -- you can look at the same thing differently. And one is, do you have control over the -- the water budget of the mining operation?

And do you understand how the influence of the underground mine is on the surrounding system?

So -- and quite honestly, I think the -- for me, the question there is, is that an ongoing issue or was it something that they didn't anticipate the amount of water coming into the mine or a pump broke and they didn't control the water level properly?

My understanding -- I looked at the records that are submitted by Eagle Mine to the State of Michigan for their typical reporting, and they don't have any exceedances.

So a couple of things. One is there's a difference between exceeding a permit standard or a water quality limit on a chronic basis, which is to say it's happening and you clearly don't have any control, as opposed to a situation where concentrations are increasing; they haven't exceeded a permit limit or a water quality limit, but they're increasing.

And in your permit, somebody like me wrote a report that said the water chemistry will be X. So the way I take that information is to say, you know what, they need to not only exert control over however the water is getting to a well -- first of all, that shouldn't be happening because, like I mentioned before, you exert a control on the groundwater system as you lower the mine.

And, I'm sorry, I don't know the exact detail of the situation, but with the increase in concentration as well, that means you need to go back and revisit how you predicted water chemistry in the first place.

So, again, I would distinguish between something that happened as a course of the operation as opposed to something that happened and still is continuing to happen X years later.

Not to belittle exceeding a groundwater standard in somebody's water supply well. That's a significant issue.

MR. WORCESTER: We're taking a 15-minute break.

(Whereupon a recess was held at 3:00 p.m. and the hearing was resumed at 3:13 p.m.)

MR. WORCESTER: Let's see. Applicant Panel 3?

MR. PETERS: Good afternoon. My name is Mark Peters. I'm a senior associate engineer with WSP USA, formerly Wood Environment & Infrastructure.

And for those of you who have been in Maine for quite awhile, that is -- our legacy firm was EC Jordan in Portland Maine. Started in 1860s.

I'm a licensed professional civil engineer and currently a team leader of a group of civil engineers and civil designers within the Portland, Maine WSP Design Center.

I have nearly 40 years of civil engineering design experience and have extensive experience in expertise in stormwater management, expertise in watershed hydrologic and hydraulic modeling, flood plane assessment, determination and erosion control.

WSP was retained by Wolfden to develop the conceptual stormwater collection system, specifically the preliminary sizing and design of the pretreatment water storage pond associated with the stormwater runoff and melting snow from mine facilities that could be potentially impacted with contaminants from the mine activities.

In addition to the stormwater and snowmelt runoff from the mine facilities, a base flow of 30 gallons per minute was provided to WSP from the mine dewatering to include in the total volume of water to collect and store for treatment.

The collected surface water and mine water will be treated to appropriate background water quality standards and then returned to the environment, and that will be discussed with Mr. Danyliw and Ms. Turner.

This slide provides the conceptual mine site layout. Jeremy on his earlier testimony provided some detail on the mine facilities during his testimony. The blue shaded areas include the mine facilities where surface runoff water will be collected in the pretreatment water storage pond for treatment.

The areas where the surface runoff will be collected in treatment include the pretreatment water storage pond itself, which is shown as drainage area 6A, and is approximately 3.25 acres. It also includes some of the embankment slopes besides the pond itself.

The primary Phase 1 mine facility shown as Drainage Area 7A consists of about 22.2 acres, and that includes the ore and waste rock pads, backfill plant, mine access portal, mine roads and other associated facilities.

The Phase 2 mine facility shown as drainage area 13A consists of approximately three acres and that also includes pads for ore and waste rock and a head frame and hoist.

Mine traffic leaving the mine collection areas would be required to go through a washing pad prior to exiting those -- those collections areas.

This table just lists the mine facilities where surface runoff would be collected and stored in the pretreatment water storage pond prior to treatment and is shown on the conceptual mine site layout on the previous slide.

The major mine facility collection areas include the ore pads, waste rock pads, backfill plant, mine roads and the mine access portal as well as snow storage, and the total areas is approximately 28.4 acres.

The stormwater runoff calculations were conducted using USDA technical release 20 or TR20 methodology. Using HydroCAD software. TR20 is a fully accepted standard engineering method for calculating stormwater runoff.

This stormwater evaluation is relatively straightforward and the stormwater analysis is something conducted for our development projects, no matter what type. The main difference is how the stormwater is managed.

For this project surface water from the

collection areas will be stored, treated and returned to the environment. For this analysis in determining the required storage volume, it was assumed during the 24-hour storm event no discharge from the pond would occur. In other words, no discharge to the treatment plant during the 24-hour period. As well as ignored any additional storage in collections systems such as containment pads, sumps and collections trenches.

As required in the Chapter 200 analysis, the precipitation used a 500-year storm event in the analysis. The precipitation was taken from NOAA Atlas 14 and, for the mine site, the 500-year 24-hour storm event is 7.82 inches.

For context, the Chapter 400 Maine Solid Waste Management rules for landfills requires stormwater design be based on a 25-year storm event. This is also the case for other development projects that fall under Chapter 500, Maine Stormwater Management Standards, which also require just the 25-year storm event.

This conceptual layout includes the pretreatment storage pond with a preliminary area of 2.8 acres graded to a depth of 10 feet. This table provides the stage storage volume for the preliminary sizing of the pretreatment water storage pond.

The total pond volume is 7.95 million gallons, and the volume required for the 500-year storm is approximately 5.1 million gallons.

For this preliminary evaluation, the water depth in the pond for the 500-year storm event is 3.2 feet below the top of berm and below the goal of providing a 2-foot freeboard volume contingency.

You can also see on the pond section there, the water depth for a 25-year storm event from the runoff from the mine collections areas. As I stated previously, the required storage volume for the pretreatment water storage pond assumes no discharge from the pond as occurring for the water treatment and ignores additional storage volume that would be provided in the water collections system itself.

MR. ELLSWORTH: Question if I may?

MR. PETERS: Sure.

MR. ELLSWORTH: What are you going to do about sedimentation, how are you going to -- how are you going to -- while you're using the pond?

MR. PETERS: Typically what's -- what you do is you have -- you have a ramp and you go down and you clean it out.

MR. ELLSWORTH: Okay.

MR. PETERS: Intervenor No. 2 brought up the issue of climate change. The previous slide showed a storage volume contingency of more than 3 feet of freeboard is provided in the pond during a 500-year storm event; however, in order to validate the pond storage volume contingency, several conservative conditions were evaluated, including potential increase in precipitation due to climate change, as well as increasing the dewatering flows from the mine.

This slide shows the results of a future climate precipitation tool, ClimateEVA, developed by WSP. It can estimate a potential future precipitation event for a specific site. The prediction tool uses greenhouse gas concentration scenarios or representative concentration pathways, or RCP, adopted by the Intergovernmental Panel on Climate Change. The results show a potential increase in precipitation from 7.82 inches to 9.3 inches for the 500-year storm event in a -- 30 years into the future.

This slide shows the output from the HydroCAD stormwater runoff calculations used in the potential 500-year climate change precipitation of 9.3 inches.

In addition, with the concern that 30 gpm for the mine dewatering is too low, the volume for the mine dewatering was increased from 30 gallons to 300 gallons per minute, and the results show using the same size pond, that you still had a foot of freeboard for this increased flow condition.

This table provides the stage storage volume for the pretreatment storage pond with the increased surface runoff in dewatering flows described on the previous slide.

The final design and the sizing of the pretreatment water storage pond as well as the collections systems will be based on obtaining more detailed site-specific data as well as -- as such as refining the dewatering rates, detailed topographic surveys, geotechnical investigations that will be collected and developed as part of the Chapter 200 process.

I guess the bottom line is, if required, the sizing can be easily increased based on detailed design.

Concerns were raised about leak -- liner leaking and there would be bypass of impacted water. This is an example of a liner system -- a double liner with a leak detection layer that drains to a monitoring sump that is inspected on a regular basis.

This type of liner would be used for ore storage pads in the pretreatment water storage pond. Relatively recent innovations within the last 20 years in liner materials and leak detection methods have been made, and this allows for high quality liner system insulations and liner leakage can be essentially nondetectable.

This is done by selecting a liner material appropriate for the exposure, providing an appropriate protective cover to prevent damage during operations. Conducting stringent construction quality assurance, or CQA, during installation plays an important role in producing a high quality containment system, and this can include electrical leak integrity surveys.

These surveys are nondestructive CQA tests to locate leaks and defects during installation of the liner, and they can also be done once the liner is covered. And there are several test methods available depending on whether a liner is covered or not covered and are able to detect holes as small as a pin hole.

In addition, using a high quality electrically conducted gear membrane, or leak location liner, make it possible to detect leaks on wrinkles or other nonconductive surfaces, and it allows the liner to be retested as often as necessary.

That means during operation, you can -- you can test it to make sure that the integrity is maintained over the life of the project.

In the last 15 years I've had approximately a dozen projects where I have specified electrical leak integrity surveys for landfill, leachate ponds and process ponds, with most of these projects including double liners with leak detection systems. And during the construction for a lot of these projects, there would be some leaks detected using this method which were repaired before it went into operation.

The project will also require preparation of operations and a maintenance plan that would include regular inspections and monitoring such as inspection of the condition of the liner, protective covers for damage, monitoring of leak detection sumps, conducting electrical leak detection surveys, as well as testing monitoring wells and surface waters.

Also the project has a finite life, well below the durability and life expectancy of high quality geomembrane liner materials. The detailed design of liner systems would -- will be done as part of the Chapter 200 process.

Thank you.

MS. HILTON: I have a question.

MR. PETERS: Sure.

MS. HILTON: So what -- during closure, what happens to the liner when -- with the whole, yes, closer of the system -- of the facility?

MR. PETERS: Those -- those get pulled up.

I've had some projects where we've used temporary geomembrane liners and they were pulled up and then those were actually recycled.

MS. HILTON: Okay. Thank you.

MR. ELLSWORTH: I'd like to ask the same question again, because I -- maybe I didn't hear you last time.

I'm assuming in this pre-pond before the treatment system that there's going to be a lot of sedimentation, and I didn't hear exactly what you said. I'm sorry, I'm a little deaf in one ear.

MR. PETERS: Removal of sediment would be a regular maintenance activity, and typically what you do is you have a ramp that you can drive equipment down.

MR. ELLSWORTH: Yep.

MR. PETERS: You know, a skid steer or something, and scoop out the sediment.

MR. ELLSWORTH: And so you're -- you have -- that pond has no capacity while you're doing that, though; is that correct, you've got the single pond --

MR. PETERS: Yeah, you would have plan it based on the weather reports, definitely.

MR. ELLSWORTH: So if it's -- you're going to clean it when it's fairly low, I guess -- I keep -- I'm just -- I had -- I've actually been in charge of a landfill before, so I know about the detection and the liners and those type of things from paper -- when I worked for the paper mill.

But the -- the -- you know, usually you have a lagoon and another lagoon so that you can swap. Is that -- was that ever considered here so that you could split it so that you could drain the water out of one side, clean it?

MR. PETERS: Well, the design -- detailed design for that hasn't been done, but you certainly could have it petitioned in the mill so you could --

MR. ELLSWORTH: Well, I think --

MR. PETERS: -- fluctuate between the two.

MR. ELLSWORTH: I think it would be advantageous to the process of making sure that we're able to keep the sediment out of the pond because it -- if you're going to be pumping from down in the mine where trucks are running and everything else is running, you're going to have a lot -- a lot of sediment, which if it fills up 3 or 4 feet of the pond, you're got no capacity anymore.

MR. PETERS: Yeah, that would definitely have to be part of the regular maintenance.

Thank you.

MR. DANYLIW: Hello, everyone. My name is Brian Danyliw. I'm the principal consultant with Mine Water Service. I was responsible for the water treatment scoping study.

With me today is Dr. Paul Thoen. Paul has -- well, back up.

I have about 42 years of experience in the water treatment industry and specifically in water treatment in the mining industry throughout the world, at different types of mines, different water treatment challenges.

Sitting to my right is Dr. Paul Thoen. Paul has over 25 years of experience specifically in membrane filtration, which is ultrafiltration reverse osmosis plant design engineering, installation, and operation, including many plants in the mining industry.

So I'm going to do the presentation. Dr. Thoen is here to answer questions that are particularly in his area of expertise with respect to the plants.

So to begin with -- let's see if I can get this to -- just as a quick overview of the proposed treatment process. So it is what is referred to as membrane filtration. And that encompasses ultra filtration, nanofiltration, reverse osmosis. They're all based on membrane technology.

It's a two-stage treatment. The first stage is ultrafiltration, which is a pretreatment stage for the reverse osmosis step in the process. And it's designed to remove suspended solids, fine particles. To give you an idea of context, the size, it will remove particles down to sort of the size of bacteria or red blood cells. That's what the ultrafiltration stage takes out. It's a very fine filtration.

The next step is the reverse osmosis process. And so osmosis is a process of equilibrium of -- through a semi-permeable membrane. And so what that means is, if you have a semi-permeable membrane and you put water with contaminants in it on one side and pure water on the other side, they -- it will equalize. Okay?

Reverse osmosis, we use the same principle, but instead of allowing it to equalize, we put pressure on one side. And by putting pressure on one side of the membrane, we force pure water through the membrane, and we concentrate the contaminants or non water components on the pressurized side of the membrane. So that's how we separate water from other things that are in the water.

Yes?

MS. FITZGERALD: I don't want to -- can you equate that to landscape fabric?

MR. DANYLIW: Well, sort of. You can, actually, because it's a semi-permeable membrane because water will go through it, but large particles of dirt won't, right?

MS. FITZGERALD: Yes, but --

MR. DANYLIW: So it's the same type of principle except that the holes, instead of being very coarse and allowing a lot of different things to go through, are so tiny that basically only water can go through.

MS. FITZGERALD: Okay.

MR. DANYLIW: Okay? So it's like a really, really fine filter.

MS. FITZGERALD: Gotcha.

MR. DANYLIW: Okay. This just is a pictorial of what an actual RO membrane looks like. So they're round -- they're round wound membranes.

The feed water goes in one end, that's the raw water that's being fed into the process. And that osmosis takes place where the water molecules pass through the membranes and the contaminants are concentrated in a smaller volume that don't pass through.

Eventually the clean water makes it to the center and comes out in the center of the -- through the center of the membrane, and the dirty water is coming out through the side of the membrane. Okay?

So just some terminology as far as names. The -- so the feed water is the raw water that's going in. Permeate is basically treated water. So that's the clean water. And then the concentrate is often referred to as brine. So we'll hear -- we have comments and discussions about the brine being produced from the system; that's that concentrate of the contaminants.

So this chart just shows kind of the different types of filtration. And I just bring it up to show you kind of what the different stages in the process are going to remove. Okay? And if my animation works correctly, and it does, the first step is ultrafiltration. So you can see the types of things that -- and the size that get removed by ultra filtration. So that's down to about .1 micron.

So we're talking viruses, we're talking, you know, smaller than bacteria, as I mentioned. And then the next step is on the far left of the diagram, and that's reverse osmosis.

And so reverse osmosis is able to remove impurities in water down to essentially atomic radii. So atomic radii means atoms. Okay?

So any type of contaminant that's in the water is an atom or a molecule, and reverse osmosis is able to reject down to atomic sizes. Okay?

So essentially what you can create with reverse osmosis process is -- is pure water with all of the impurities removed. Okay? So this is used extensively, it has been for years, in places where they need ultra pure water, and that would include things like the pharmaceutical industry, semiconductors, feed water for high pressure boilers for power generation.

All of these processes require ultra pure water to function. And so reverse osmosis has been used in that capacity for many years.

MR. WORCESTER: I have a question for you.

MR. DANYLIW: Yes.

MR. WORCESTER: I would assume that this holding pond is going to have a lot of acidic runoff in it just because of the nature of the dust and the travel and the runoff and all of that.

So when this sediment is cleaned from the bottom of this holding area, how are you dealing with that?

MR. DANYLIW: That's -- the ultrafiltration is designed to remove any suspended materials that come into --

MR. WORCESTER: I understand, but there is a residue on one side of that filtration system, correct?

MR. DANYLIW: Yes.

MR. WORCESTER: And how's that being treated?

MR. DANYLIW: The solids from the ultrafiltration process step are treated internally in the treatment plant through one of side processes that is in the process flow diagram.

MR. WORCESTER: Okay.

MR. DANYLIW: Yeah.

MR. WORCESTER: I assume that that material was like mud when you take it out of the bottom of that holding area.

MR. DANYLIW: You're talking about the sludge that's dewatered from the --

MR. ELLSWORTH: Sediment. He's talking about sediment, I think.

MR. DANYLIW: Yeah. And I'm sorry, but I would have to defer to someone else on the team.

MR. WORCESTER: Okay.

MR. DANYLIW: That's -- my area of expertise is in the treatment of the water.

MR. WORCESTER: When the right person comes up, signal me.

MR. DANYLIW: Okay. So the only thing that reverse osmosis actually can't take out or doesn't take out is dissolved gases. And there were some questions about that in the prefiled testimony from, I think, Dr. Maest. And I'll address that later in this presentation.

I do want to, at this point, talk about the -- the pre-file testimony with respect to the claims that the data -- water data from the Halfmile Mine wasn't representative or not substantiated enough to provide a reasonable comparison and that there's a further assertion in the pre-file testimony that because of this lack of influent water quality information, the whole model is rendered useless.

I would propose that -- or I believe that the Halfmile Mine is a good example, actually, of the -- a good proxy for an underground mining operation.

We've heard from geology that there's a very -- it's a very similar orebody and very similar in nature. It's also, in my experience, a pretty good model for an underground operating mine, base metal mine.

So I believe that it is good data, and while not all of the parameters are available, I would say that the modeling still provides a very good example of an underground water quality that demonstrates the ability of the proposed treatment system to reach the required water quality for discharge.

And finally, as stated previously, the technology being used, which is reverse osmosis, is capable of removing any impurities from water. So anything that might be encountered, the RO system can take it out.

So from a design standpoint, we're talking about a two-pass RO system that will meet the water quality requirements dictated by background water quality.

The system is modular. So all RO systems are modular. You can add another train of RO membranes if required, so you can incrementally improve the water quality by adding additional trains. You can also handle additional volume if required by simply adding additional trains. So these are modular systems which are very easily expanded, and the cost associated with expanding is incremental, so it's not as if you have a cost to build an RO plant and when you add another train you have to double the cost. It doesn't double the cost. It's an incrementally small addition.

Again, volume can be increased without -- by adding another train. And again it's an incremental cost.

From an assurance standpoint point, all of these plants are very -- they're sophisticated, modern pieces of equipment. They're instrumented, there are monitoring of water quality throughout the process. So we have pH, monitors, we have conductivity monitors, we have instrumentation on those plants to ensure that they're operating properly at all times. They're alarmed. If something is out of spec, there are alarms. There are, you know, actions taken to ensure that the plant is run properly all the time.

In addition, the plan for Pickett Mountain is that the treated water goes to a treated water holding pond and that water is tested prior to discharge to the environment. So, again, there's an ongoing set of testing requirements to ensure that no possible contaminated water can be released to the environment.

The modeling -- RO modeling really does provide good quality information. Not only is it used to model the chemistry of the water that's going to be produced, but it also is valuable for us to model things like operating costs and capex costs and actually to select the process flow diagram, how many passes we need, that type of thing, to look at different membranes and the performance of different membranes.

So finally, the -- you know, the results that we're expecting to see, many of the parameters are below detection limits. I need to -- I would like to explain, because there are a lot of zeroes that show up in the tables, and Dr. Maest points out well -- well, they're all zero, how can this model be of any value when they're all zero?

What the zeroes in the model actually mean is that it's below the detection limits for modern analytical procedures. So you take a water sample and you bring it to any analytical lab and they can only detect down to a certain level. And so what those zeroes are telling us is that all of those parameters will be below the detection limits. Okay?

So I think it's important to understand that we're talking about water that's so clean that we can't even analyze most of the parameters down to the level it has to be.

So this is the proposed process flow diagram. I just want to point out mainly here is that -- to talk about brine. So Dr. Maest and others point out that there's going to be a huge volume of brine generated with this system, it's going to be 20 to 30 percent of the inflow. It's going to make the system impossible to use because of that amount of brine, which, if you look at systems 20 and 30 years ago, that was true. But things have come a long way, and this proposed treatment design, which is being used in many different industries including the mining industry, it uses a secondary treatment process, which is pointed out by this reactor here.

So in the type of systems that are referenced by the opponents, what they're talking about as brine is what we call our first pass RO brine, which you can see here is a -- is called -- is circled at the top there, concentrate 52 gpm. That's what old systems -- that would have been all the brine, that would have been all wastewater, and that's actually 25.4 percent of the influent water.

But in our design, and in modern designs, that goes to a reactor where lime is added and a majority of the contaminants are actually precipitated as a solid in that stage. And the overflow from that reactor goes through a secondary ultrafiltration RO process where we recover most of the water and send it back to the front of the plant and the actual amount of brine that's generated from the entire treatment plant is only 5 gallons per minute.

So we're talking about 2.4 percent of the influent water is what's actually waste brine coming out of the plant. And it should be noted that that 5 gallons per minute of brine is far less toxic than -- or potentially toxic than brine used to be from the old plants because that reactor process has taken most of the contaminants out.

That -- solids from that reactor go to a filter press and it creates a filter cake, and that filter cake is disposed of off site in a -- through a landfill system. Okay? So the filter cake is, you know, disposed of off site.

MR. ELLSWORTH: Where -- where would it be disposed of off site?

MR. DANYLIW: It would go to a hazardous waste --

MR. ELLSWORTH: To a hazardous waste -- where -- someplace they take hazardous waste?

MR. DANYLIW: Yes. Yep.

MR. ELLSWORTH: So another couple questions.

I see you add lime here possibly in a reactor?

MR. DANYLIW: Yeah.

MR. ELLSWORTH: And are -- that's where you're trying to control the pH, then; is that correct?

MR. DANYLIW: No, there could be pH control steps at different spots in the process. Okay?

So we will -- and I'll talk real quick about ammonia, but in order to -- if we need to handle ammonia, we do that through a pH adjustment prior to the RO membranes. So there can be chemical additions to adjust pH as we go through the process as well.

MR. ELLSWORTH: But it appears that this system that you have, and from what I gathered earlier, is basically taking the -- taking the grit out of it, if you may, but it's not -- it's -- there's not a lot of treatment of the water should there be a pH issue. If it's acidic -- happens to be acidic -- or does that take place in the pond before you pump it back out again?

MR. DANYLIW: No, the -- the final treated water -- because of the way the RO process works, if there is -- if the water is low pH coming into the plant, simply putting it through the RO membranes concentrates all of the things that create that low pH into the reactor. Okay?

So the permeate that comes out at the end of the plant so clean and so pure that any minor pH adjustment prior to discharge, if it's required, is done at the back end and it's literally -- I don't even know how to explain how small of an amount of adjustment it would require. It's a very small amount. It's similar -- it's the same as the surface waters.

MR. ELLSWORTH: I have a water plant in my present life as a town manager, also, so I'm -- I understand how the process works. And still, you know, wondering if we had this acidic water when we started that was in the pond, how are we going to treat it in a treatment plant portion of it before we blow it out through snow guns or pipes or whatever else you're going to use?

MR. DANYLIW: Well, that's the reverse osmosis process, and the reverse osmosis process removes the acidity.

MR. ELLSWORTH: Okay. I'll take that. Thank you.

MR. DANYLIW: Okay. Yes.

So I was just mentioning, just to close on this, that that reactor removes the majority of contaminants, metals, that sort of thing, all comes out in the reactor.

I mentioned earlier and Dr. Maest pointed out that there was a potential for ammonia. So RO removes all contaminants from water with the exception of dissolved gases. And typically in water there are a number of dissolved gases that are normally in all water. Oxygen, carbon dioxide, nitrogen, all at equilibrium with the air, they're all -- you know, a certain amount much those gases dissolve in water.

The ammonia is -- ammonia is a different potential contaminate -- contaminant in the mine water because if there is ammonia, it would be there from blasting agents. So the explosives that are used underground can contribute ammonia to water. And luckily for us, ammonia is actually fairly easy to remove with reverse osmosis, and that does require a pH adjustment.

In order to get ammonia out through a reverse osmosis process, you need to convert the ammonia gas to ammonium ion, so we need to ionize it. And you do that with ammonia by simply reducing the pH to near neutral or below.

So as you reduce the pH, the ammonia gas gets protonated, a fancy term for saying it becomes charged, so it goes from NH_3 gas to NH_4^+. It becomes an ion. And once it becomes an ion, it won't pass through the membrane.

So that's how we would manage ammonia, so the ammonia would end up in the waste stream and would be removed from the permeator treated water.

So this is just an example of -- to make it a little easier to understand, I guess, a visual of what a typical high rate membrane filtration plant looks like.

So this is -- that single train that you see there, that's a 200-gallon per minute UFRO train. So that's basically what the piece of equipment would be sized as for the Pickett Mountain project. It's around 200 gpm is the projected requirement.

So this type of configuration has become really quite common in the mining industry. It's kind of now becoming the standard for mine-impacted water. So there are many, many, many of these systems installed in mining operations around the globe. There are literally hundreds of thousands of gallons a minute of mine-impacted water being treated with UFRO systems for discharge into the environment.

In the last 15 years or so, this technology has improved and become so mainstream that the costs have been reduced, the operating parameters have improved, and it's really kind of become the industry standard now for -- and for treating mine-impacted waters and particularly for water that's being -- going to be discharged to the environment.

So it's -- not only is it now affordable, but it's also proven and it's practical for the mining industry. It's -- as was already mentioned, if additional volumes need to be treated, it's very easy to expand by adding another train.

So really, in closing, I would just say that UFRO systems are being utilized now in mining operations to ensure that effluent water meets very stringent environmental limits. In -- and in many instances in many industries, it's used to treat water to a level of purity that's even better than background water quality for this project.

So from a treatability standpoint and practical standpoint, we're very confident in the proposed treatment design.

MS. TURNER: Chairman Worcester, commissioners, my name is Lisa Turner. I'm a licensed professional engineer and a licensed soil scientist.

My experience includes landfill design. And, Mr. Ellsworth, one of our landfills that I'm the project manager for does have a split leachate pond with a little berm in the middle so we can clean one half and then the other. It's -- yep, we can do that.

Landfill designs, some borrow pit work, quarries and hydro geo work. Most recently my husband and I had a vegetable farm for 25 years. One of our major clientele were fine dining restaurants and we grew a wide range of vegetables for those that required a range of irrigation equipment for the different crops.

So I work for Sevee & Maher Engineers, and our task was to determine the best method to return to the treated water to the site, which I worked on with several other of our engineers and geologists.

We were given estimated flows for the -- that would be treated; the mine dewatering from Wolfden 30 gallons a minute, the collected precipitation from WSP of 57 gallons a minute.

So we thought about those mine water assumptions and Wolfden provided it based on previous mine experience. So we looked into that and evaluated what -- how they had calculated and said, yeah, that looks reasonable.

And then John Sevee, of our company, looked at it from an overall recharge and said, yeah, that looks like a reasonable number.

And I looked at it from the permeability of the rock and said, yep, that looks like a reasonable number.

So we felt pretty confident with that.

On the collected precipitation, WSP did that with HydroCAD. It's an industry standard. Everybody uses that. That's just how it's done. So we're not concerned about that number at all.

Looking at the site, we're concerned with depth to water table, soil permeability, the available permitted land, the depth to bedrock or other restrictive layers. We want to have minimal disturbance of the soil -- the site and the vegetation. The slopes are something to think about. We want to maintain the recharge to the wetlands. That was a criteria that was added to this project. And then there's the climate to consider, the frost depth is 6 feet, and we have to dispose of the water both summer and winter.

We looked at several methods and ended up deciding that spray irrigation and snow making were the best options, and here's some pictures of spray irrigation.

The -- the good things about spray irrigation is it allows for evaporation transpiration to get rid of some of the water. It's easily installed. The equipment is readily available and easy to replace. There's flexibility for seasonal water distribution, and it mimics the natural rain fall.

Snow making is the other half of that because we have winter. And it is equipment that's readily available, easily installed. It minimizes the winter storage requirements; if we weren't getting rid of some of the water as snow all winter, we'd have to have bigger ponds. It dovetails well with the spray irrigation, there's flexibility, and it also mimics the natural precipitation at the site.

So we looked at other sites in Maine that use these technologies, and you can see there's several of them there: Moosehead; Carrabassett Valley; Rangeley; Wolfeboro, New Hampshire; Pineland Farms Potato Processing uses it.

So what type of soil do they use? Well, they're all -- or do they have? They all have till soil, so that was good. And we looked at the amount of irritation. The total amount that would be spread on any of these sites, the smallest ones, Rangeley and

Wolfeboro, New Hampshire, are going to put out about a hundred million gallons per year of water. Pineland Potato Farms is using over 300 million gallons per year. And the Pickett Mountain site is a total of about 46 million gallons per year. So we're well within the range of what is done.

We said, all right, what are the application rates that they're using? And they're using anywhere from about 2 to 4 inches per week.

So we said, well, what happens at Pickett Mountain if we use 2, 3 or 4 inches per week, and we would need some where between 15 and 29 acres to dispose of the treated water. And that's not a problem at the site.

So then we thought about Pickett Mountain relative to the wetland recharge. So how do you recharge a wetland? Well, some of them are just from surface water. It's just a bowl -- if you think about a wheel rut, that's the smallest possible type of wet depression that you'd see. Some of them aren't much more than that, but on a larger scale. Some of them are recharged by the groundwater, so if you think about the groundwater coming in at the top of the hill and water runs downhill, well it runs downhill even underground. So it's running down.

It's going to hit a compacted till layer or bedrock and it's going to come out at the bottom of that hill into a wetland. So that's how the wetlands are recharged. And by looking at the overall recharge to the site and mimicking the natural precipitation, we're going to pick up both of those methods of recharging the wetlands.

So we looked at each watershed for each wetland and looked at the current condition and the condition during the active mining period.

So these are the watersheds that we drew around each of the -- the little dotted sections are the wetlands. The blue are some streams. And then the -- the heavy dashed lines are the wetland catchment areas.

So this is the current condition. And if you watch right in here, that's where we've got the -- the change, the area that's going to be collected during active mining. And so some of these wetland catchments get smaller, and those are the ones noted with the red hexagons around the catchment area. So those are going to need some extra water added back in. And you can see most of them are still just circled in black. Nothing changes on those.

So we wanted to think about each wetland area before and after. And so the precipitation that falls on the site is either going to be evaporation, and that's percentages that are pretty well established; transpiration, and that's the amount lost to plant growth, so that's usually about the same as the lost -- the amount lost to evaporation; infiltration, which is whatever will go into the soils depending on the permeability of the soils; and then runoff is what's left over, and that's how the precipitation is split.

So we also looked at the losses of evaporation from the spray irrigation, and there's a lot of science that's been done on this. If you can imagine irrigating out west, the loss due to evaporation is a pretty big deal so there's a lot of data on how to calculate that. And you know, it has to do with the climatic conditions, including rainfall temperature, wind speed, humidity. We looked at that for Caribou because there was a lot of data for Caribou. And it also depends on the number of nozzles used, the size of the nozzles, how small the droplet is. That evaporation is going to happen based on the surface area of the droplet of spray. So the finer the spray, the more that you're going to have evaporation from it.

So we looked at the different wetlands that are affected -- or the different catchments that are affected. Some of them have wetlands, some of them don't. We calculated the predevelopment area, the active area during mining, and the deficit of precipitation. And for the overall site, the precipitation deficit due to the collected areas is just under 11 percent.

Then we took that collected water plus the water from the mine and figured out how much to put back on each catchment. And that's just slightly under 12 percent. So we ended up with less than a 1 percent difference in the overall recharge to be added.

Then we said, okay, can we do it? Is there enough room in each catchment to do it? And here you can see in the little tan areas are where we designated as areas for the spray irrigation. The pink bars are places where we would put the snow. We didn't do that in every one of the -- yes?

MS. HILTON: Aren't you spraying them -- a portion that's going to be the solar facility?

MS. TURNER: There is some that that is -- that is -- that 1H --

MS. HILTON: Yeah, that --

MS. TURNER: Let me come to that one.

MS. HILTON: Okay. Sorry.

MS. TURNER: Yeah, no. No, no. You're good.

So these were just some places that we could put the water.

And then how much would we end up putting there? So if you look, we're going to put between .3 and 2.3 inches per week on each of these, which is well below most of the sites in Maine.

And that catchment 1H is the one that you asked about, Ms. Hilton, and we're only planning on -- it only ended up being .3 inches per week, so we could certainly put it on far less area and still be within the -- the possibilities. There's also different kinds of sprinklers you could use that would work probably between the solar -- some of the lower -- lower emitting. There's different things you can do.

And then we thought about the variability in flows. So we looked at the historic precipitation in Caribou, which -- there's 80 years of data. The lowest 10-year average was about 35 inches per year. The highest 10-year average was about 44 inches per year, so that's a 25 percent variability.

The lowest year was 1987 with 28 point inches. The highest year was 2011 with 55.4 inches. So 2011 was nearly double 1987. So there's a change that happens there just as a normal course of events.

So we can say the wetlands currently exist in a highly variable environment. The precipitation will continue to vary. So -- and this goes to the question about climate change. Whatever rainfall ends up falling on that site is going to fall on that site. If there's a mine there, we're going to collect it, treat it, and put it back on the site. But it will be the same amount of water that goes on whether or not there's a mine because we're just collecting it, treating it, and putting it back.

MS. HILTON: What about underground water? I guess I --

MS. TURNER: So we're losing quite of bit of that to the evaporation in the spray nozzles. Most of that gets lost in the evaporation.

MS. HILTON: Okay.

MS. TURNER: So we plan to maintain similar recharge to each of the wetlands, the number in size in nozzles will give us some flexibility if there are variations in that mine water. We'll size the spray and snow making so that it will accommodate both more than the most rain we've seen and less than the least rain that we've seen so that there's plenty of room in that.

And this is a low amount of spray irrigation compared to the other existing spray sites in Maine.

So I can answer any questions. I think I have time left over.

MR. ELLSWORTH: Yes, ma'am. The -- if you're going to make snow mountains --

MS. TURNER: Yes.

MR. ELLSWORTH: I was the town manager in Rangeley, so I'm pretty well --

MS. TURNER: Ah, there you go. Yes.

MR. ELLSWORTH: And Carrabassett, too, so -- for a brief period. I understand the snow mountain concept. It takes until about August to melt the mountain --

MS. TURNER: Yep.

MR. ELLSWORTH: -- so is there impact -- you're going to have a summer spray program, and I was trying to figure out exactly where everything was so that would one impact the other as far as runoff and certain -- more runoff in some certain areas than other areas?

MS. TURNER: So if you look at this picture, the little pink bars are where we're going to put the snowbanks. So they're at the top of each of the catchments. So whether that snow infiltrates or runs off, it's heading down the watershed. The little tan things are the spray irrigation.

MR. ELLSWORTH: Where -- which ones are the sprayers again? I -- I'm looking at this one right here, so you tell me where they're at.

MS. TURNER: They're hard to see. They're tan. They're these little tan ones.

MS. BROWNE: Lisa, you need to use the mic.

MS. TURNER: So for everybody else --

MS. BROWNE: Lisa, you need to have the mic.

MR. ELLSWORTH: So another question then.

MS. TURNER: Yeah.

MR. ELLSWORTH: So the -- the IR2 and the IR1, they're the sediment pond and the whatever treatment you're going to do --

MS. TURNER: Yep.

MR. ELLSWORTH: -- before you discharge it?

MS. TURNER: Yes.

MR. ELLSWORTH: So are you going to pump all the way from this pond out to these areas, the brown areas that you just --

MS. TURNER: From the clean water pond, yes.

MR. ELLSWORTH: So you're going to have a pump system to pump out there?

MS. TURNER: Yes. Yep.

MR. ELLSWORTH: And you're going to pump down from the pond also, from the treatment pond, to the snow areas, then, too?

MS. TURNER: Yes. So we didn't run the pipes that far on the snow. We kept the snow near the pond.

MR. ELLSWORTH: Yeah, I made snow, too.

MS. TURNER: Yeah, so you know why I'm doing that.

MR. ELLSWORTH: Yep. Okay. Thank you.

MS. FITZGERALD: Come back to me.

MR. WORCESTER: Thank you.

MS. TURNER: Okay. Thank you.

MR. WORCESTER: Next is Intervenor 2's cross-examination.

MR. BLOOM: Chair and commissioners, while she's getting set up, I have a question I just want to ask. I think we have 25 minutes for this session.

I don't -- I think -- while I have, and my other -- my co-counsel have questions for this panel that we could do, I think we could -- if -- we would like to also cross-examine Mr. Ouellette who was here in the morning and we didn't get a chance to get to his. If we can just finish up with our questions in, you know, five, ten minutes, can we use the remaining to question -- bring back Ouellette to question?

MR. WORCESTER: I think that's -- yeah.

MR. BLOOM: Will that be okay?

MR. WORCESTER: Yes.

MR. BLOOM: Okay.

MS. BROWNE: So I object to that. I thought there was a set schedule and didn't anticipate that people could do shorter cross-examination and then add that to another panel.

I think if -- if the Commission wants that to occur, one thing I would ask is there was a question about the sediment in the pond. I think he -- Jeremy Ouellette's probably the best person to answer that. So if he is going to be subject to cross, I ask that he be allowed to answer that question.

MR. WORCESTER: Okay.

MR. BLOOM: There is redirect for that question, I mean, but -- or if you want, after I finish my time, he could just -- they could do their minute of redirect, then. That would be fine, too.

MR. WORCESTER: Okay.

MR. BLOOM: Okay. Great.

MR. WORCESTER: Our goal is to get as much information as we can.

MR. BLOOM: I appreciate that. Thank you.
So I have some -- sorry -- questions for Mr. Danyliw.

CROSS-EXAMINATION OF: MR. DANYLIW

BY MR. BLOOM:

Q Okay. So you were one of the authors of the water treatment scoping study. And just -- and that study, you didn't identify in that study any comparable mines that use reverse osmosis and ultrafiltration to produce treated water that meets the same water quality standards that would be met here, correct?
A Not in the study, but certainly there are many.
Q Okay. And the -- and your report also doesn't specify any ore processing facilities, in the report itself, that use reverse osmosis and ultrafiltration to produce treated water that would meet the stringent background quality requirements here, correct?
A Again, not -- it wasn't part of the study, but there are many in the world.
Q Okay. And in your report, you present the results of computer modeling of water treatment using reverse osmosis and ultrafiltration. And you said you used input data from Halfmile Mine to stand in the place of water from Pickett Mountain, correct?

A Correct.
Q And that was provided to -- that data was provided to by Wolfden, correct?
A Correct.
Q And in your -- are you aware that -- well, strike that.
In a letter from Stacy Beyer, actually, of the LUPC to Wolfden in February of 2021, she wrote: It is our understanding, with regard to the Halfmile Mine, that the Halfmile Mine only operated on a trial basis and has not operated since 2012.
Is that statement correct?
A I have no knowledge of that.
Q You don't know? Okay. But -- all right.
And so you don't know -- do you know at what points in time the samples that you used as input values from the Halfmile Mine, what points in time they were taken?
A I have access to that data. I don't have it off the top of my head.
Q Okay. But you don't know -- you don't know where it -- where it -- you don't know if it was only operated on a trial basis where it was during that process?
A I do not.

Q Okay. And your water treatment scoping study doesn't provide information about where at the Halfmile Mine those samples were taken, correct?
A I -- unfortunately, I don't recall if it did or not.
Q Okay. All right. And you mentioned that a number of the analytes from -- or parameters from the Halfmile Mine input water quality were not -- were not measured, correct?
A Not all parameters were measured, that is correct.
Q That's correct. Okay. And then you used that input water quality to run a computer model, correct?
A Correct.
Q And in that computer model then it produced results of an assumed reverse -- reverse osmosis ultra filtration treatment, correct?
A Four different modelings --
Q Four different modelings?
A Yes.
Q Okay. And then you compared that to what -- a target value, which was what you were aiming for at Pickett Mountain, correct?
A Correct.
Q And when you took the target value, you took the -- those samples -- the sample target value was taken from surface water areas around -- around Pickett

Mountain Mine, correct?
A Correct.
Q Not from groundwater, correct?
A To the best of my knowledge, they were all surface water samples.
Q But the -- but as we just heard, the discharge is actually going to be into groundwater, correct? The discharge of the treated water is going to be in groundwater, correct?
A Well, it's going to start on the surface.
Q It's going to be -- but the samples that you took were from, like ponds and lakes around the site, correct?
A The sample data that was used to determine background water quality was provided to my be Wolfden resources.
Q Okay.
A So it was a map of where the samples were taken, and there was detailed analytical data from a certified analytical laboratory that provided the water quality.
Q Okay. And can we pull up the report -- the MWS report? I think that's No. 4.
And we can go to Page 28 of that report. It may be 29. There we go.

So that's the map you're talking about with the -- where the samples were taken, correct?
A Correct.
Q And so those stars represent the locations of the samples?
A To the best of my knowledge, yes.
Q And they're all in -- it looks like in the ponds and lakes sort of surrounding the Pickett Mountain project site, correct, and the streams?
A To the best of my knowledge.
Q Correct. And those -- they're labeled SW and then a number. I assume SW stands for surface water?
A I --
Q You don't know?
A I don't know.
Q Okay. And then just if we go back a page.
So that's the input water quality. That's a little hard to see, so I -- so I'm going to -- we'll skip that one. It's a little hard to see and you already answered my question about that anyways.
Okay. Now, you talked about the brine concentrate or brine, as you -- you --
A Yes.
Q -- discussed it. Now, one thing you said, which I wanted to understand, is you said part of the brine

is going to be run through a reactor and it will precipitate out -- the tox -- at least some of the toxic metals into what you call a filter cake?
A Yes.
Q And that's going to go to a hazard waste facility?
A Yes.
Q And were -- the costs of the hazardous waste treatment, were those included in the preliminary economic assessment for the project?
A I have -- I have no idea.
Q You don't know? Okay.
Did you provide information about costs of hazardous waste treatment to Wolfden?
A No, I didn't provide cost, but I did do an estimate of the volume.
Q Okay.
A And the volume is extremely small. I don't recall exactly the number, but I believe it was somewhere around 1 cubic foot per day.
Q Per day?
A Yeah. 1 cubic foot. So that's a very small volume of sludge.
Q Okay. Over ten years, though?
A Absolutely.
Q Okay. And you didn't provide a location of a

hazardous waste landfill?
A I did not.
Q Okay. And so also the -- so the liquid part of the brine, separate from the filter cake, that's going to be -- at least once backfilling starts, that's going to be used to mix into cement, correct?
A Correct.
Q And that cement is going to be mixed at least with part of the waste rock and backfilled into the mine, correct?
A Yes.
Q Did you do any testing on -- on brine mixed with cement mixed with waste rock to determine whether that combination will cause any metals to leach out?
A I did not. That's something that would be done through the Chapter 200 process.
Q Got it. And similarly, you didn't do testing to see whether that would cause leaching of acid, correct?
A No, but there's no scientific or chemical -- chemistry reason to believe that addition of brine as water for make down of cement would have any impact on acid generation.
Q Okay.
A The chemistry doesn't support it.
Q All right. But you said you didn't do the testing

with regard to the metals or the -- and that's going to be part of the next process?

A Yeah. My experience with a number of other backfilling operations indicates to me that that would not be an issue, but specific testing would be carried out.

Q Okay. And have you provided any information or regulations or citations to explain whether the Maine DEP would allow underground backfilling of that brine?

A I have not.

MR. BLOOM: Okay. Now, I think we're going to move on to Mr. Ouellette now.

MR. ELWELL: If I could just make a suggestion procedurally here. We set aside time for the LUPC staff and commission to ask further questions of these witnesses.

Rather than calling them back after Mr. Ouellette testifies, why don't we do that now, and then we'll return to the -- whatever is left of Intervenor 2's cross.

MR. WORCESTER: Betsy?

MS. FITZGERALD: Thank you. I remembered my question.

Lisa, this is for you and it is more a curiosity question, I think.

As I'm sure you noticed, we did not have the driest of summers, and so there was a lot of water.

And you talked a lot about, you know, irrigation. And we'll skip the snow stuff for right now, but just, you know, for spray irrigation.

How do you figure -- if the ground is already reasonably saturated, do you still spray or do you do something else? And if you do something else, what do you do?

MS. TURNER: So you wouldn't typically do it right after a large rainstorm, you'd wait. But to put out 2 inches of -- 2 and a half inches of water, it's quick, it's surprisingly -- you're not going to take a lot of time to do that. So you could do it on two separate days for a few hours and you'll have put out that amount of water.

That amount of water was going to fall on that site that week anyway. And so to continue to do what's going to happen to those wetlands, you would be putting more water than you would if you wanted to irrigate a farm, but that's what's charging the wetlands.

MS. FITZGERALD: Point taken. Thank you.

MR. ELLSWORTH: So in the capacity of the pond, which we discussed early on in presentation, we had -- a town adjacent to where I am had 8 inches of rain in one storm, had 4 inches three or four storms this summer.

Is there a capacity of the pond to take both the water capacity such as that, you had 8 inches of rain, bingo, in three hours, and the effluent that you have coming from the mining operation at the same time and still be able to retain it to spray it at a better time than during the storm?

MS. TURNER: The pond is designed for a 500-year storm. So Mark, you want to take the rest of that?

MR. PETERS: Yeah, one of the things that we did because the intervenor asked about climate change, we actually looked at increasing the rainfall using the precipitation prediction tool as well as increasing the 30 gallons per minute to 300 gallons per minute and ran that through the same size pond, and we still had a foot of freeboard.

Now, this is all still a preliminary design. The detailed design for the pond will come during the Chapter 200 process. But you know, based on the, you know, analysis for this stage, we certainly have enough room, and there's enough room to provide more capacity if needed.

MR. ELLSWORTH: Thank you.

MS. HILTON: This is a follow-up to that, and I don't remember what I read. Are the soils in that area fairly well drained or -- for runoff, stormwater absorption?

MS. TURNER: They're pretty heavy tills so there's a lot of silt in them, so they're not particularly well drained; but again, they are what they are, and that's what's -- that's what's recharging those wetlands. And they're not going to -- most of those aren't going to change. We're just going to collect -- we're going to collect an area, treat it, and put it back on the same soils more or less that it was going to fall on anyway.

MS. HILTON: Right. The problem is, and I think you've already answered this question, is that we're getting rainfall amounts that are unheard of and that's going to probably happen more often.

And so what we used to have and used to see and depend upon is no longer likely to be the case.

And so I guess that's where, I think, people are concerned.

MS. TURNER: And, unfortunately, that's going to happen one way or the other, and the mine isn't going to change that. So that water is going to fall. If we have more rainfall, there's going to be more rainfall on that site.

MS. HILTON: So are you saying it's not the mine's fault that we're getting more rain?

MS. TURNER: It's not the mine's fault that we're getting more rain, yeah. We could put it that way if you want, but it doesn't change anything. It's the same amount of precipitation. We're collecting what falls and we're putting it back out, and the stuff comes out the mine mostly we're evaporating.

MS. HILTON: But we have to be prepared to deal with the situation.

MS. TURNER: So we'll size everything --

MS. HILTON: So you're sizing it to be larger.

MS. TURNER: -- for excess -- more than the 55 inches that's the most we've seen. We'll size for something greater than that.

MS. HILTON: Yeah, yeah.

MS. TURNER: So that we can -- because the goal is to maintain what's happening in the normal course of events in the natural environment.

MS. HILTON: Right. I'm a farmer. It was one heck of a summer.

MS. TURNER: I am so glad I was not a farmer this summer.

MS. HILTON: I never saw anything like it, really.

MR. WORCESTER: If there are no more questions, we'll move on.

CROSS-EXAMINATION OF: MR. OUELLETTE

BY MR. BRANN:

Q Good afternoon, Mr. Ouellette.

In your prefiled you say you spent eight years at Trevali and you point to that experience as important in this case, right?

A Correct.

Q And one of the things that you point to is the Halfmile Mine -- that's pretty hard to say quickly, I must say -- correct?

A Yeah, that's correct.

Q And that actually only operated on a trial basis in 2012, correct?

A So it was operated on about a 1-year basis, but has remained open since then.

Q It remained open, but it operated on a 12-year basis -- on a 12 -- on a trial basis, as the LUPC staff noted in the prior withdrawn application, correct?

A Yeah, that's correct.

Q Okay. And indeed, that was confirmed -- if we looked at -- if we -- one of the things that we've submitted was the Hearing Exhibit No. 26. We're not going to put it up, but I'm just going to reference it, is that it also refers to it as being done on a trial basis. (Microphone off.)

Never let a lawyer too close to a mic or --.

So the -- just to be clear, so it was a -- and that was confirmed in an article in -- in the Mining Weekly, right?

A It was used as a prime example because of -- it's a -- its similar size, type of deposit, type of method, et cetera.

Q Right. I understand what you're saying, but in terms of --.

Let me just move on to -- you say that you were part of the team that designed and -- daily alarm -- part of the team that designed and operated the Caribou Mine, right?

A So to --

Q But that was a direct quotation from your prefiled.

A Yeah, to -- Caribou was started, you know, half a century ago.

Q Okay. And if we could just put up the first page of -- of exhibit -- Hearing Exhibit No. 27.

Let's just talk for a minute about the Caribou

Mine. So let me just make sure -- we just have the headline for now, but what I want to do -- this article says, for example, that the mining was suspended there, correct?
A That's correct.
Q The cost of remediation was expected to be over $49 million, correct?
A Yeah, that's correct.
Q Okay. And that Trevali provided a $4 million bond in order to cover the cost of reclamation and closure, correct?
A So that was for Trevali's portion of the liability that's left behind because it was a historical --
Q Some of the other portion of it went -- was being paid for by New Brunswick, right?
A Majority of the operation was previously a liability that -- that the province still retained even after Trevali took over.
Q And what -- and the agreement that had been reached was to move that liability to the taxpayers of New Brunswick, correct?
A So the existing was still in the -- managed and owned by the province of New Brunswick.
Q Okay.
A And then the additional bonding or, I guess, moneys

that were bonded with the province with Trevali were associated to additional liabilities that were --
Q And if --
A -- brought into play by Trevali.
Q And if we could put up the -- just the first page of Hearing Exhibit No. 28, which discusses New Brunswick taking control of this particular mine.
All of the miners who worked there were laid off, right?
A Yeah, that's correct.
Q And then -- and that -- and that this mine was also being criticized in what happened with it. If we put up the hearing Exhibit No. 29, that, from an opinion piece, in which that all of the -- the public was left holding the bag for the cost of the reclamation and the closure and the remediation for that mine, correct?
A So that may be what the article says, but I guess the employees that were employed at Trevali, at Caribou, are still employed in the mining industry today. And the revenues by that employment are brought back home to New Brunswick, to Bathurst specifically.
And in terms of the liabilities, yes, the liabilities associated to Caribou are with the province, but they were preexisting liabilities that

the province already owned.
Q And Trevali, I take it you would hold them up as a good corporate citizen?
A During my tenure with Trevali, I would agree with that statement. Not so much today.
Q And not so much per -- if we put up Hearing Exhibit No. 29 -- No. 30, rather, would -- one of the reasons you don't agree with that now is that the exec -- couple of executives involved with Trevali at the Burkina Faso Mine were found guilty of involuntary manslaughter when eight miners died at that mine, correct?
A That's an extremely unfortunate event, and I want to note that that this article was in 2022, and my tenure ended in 2018.
And our record up until that point, and even afterwards, was very good. There was a senior executive change and obviously, you know, I'm not in agreement with a lot of the decisions that were made with Trevali post my tenure.
Q Well, let's take a look at Burkina Faso --
(Off the record. Microphone was off.)
MR. WORCESTER: You're on.
A You're on now, yeah.

BY MR. BLOOM:
Q And so from -- and also from --
Hearing Exhibit No. 31.
So in -- Burkina Faso shut down the mine following the deaths of the -- in that mine, too. They shut down the Trevali mine completely, right?
A Yeah, that's correct.
Q Okay. All right.
We're going to shift gears. We're going to talk a little bit about some of the economic assessments.
In terms of the jobs that were being discussed here, the -- the number of jobs that are currently being claimed that might be created at this mine, the Pickett mine that you're hoping to do, is 233, correct? In the mine itself.
A At the mine itself.
Q But you're telling the locals and local people, and as recently as last week, that what it's really going to do is create 275 mines [sic] because you're going to include the number of jobs from the processing and tailings facility that you've taken off the table for this proceeding, correct?
A So we've certainly discussed the project as a whole as well as the mining project as an independent one.
Q And indeed if we were to put up Page 316 of the

rezoning application -- and bring that up so we can see it nice.

So in terms of assessing the economic impact and why this is a good thing for the neighborhood, the -- what the application is pointing to are the jobs being created directly in the mine as well as these other jobs, the tailings and the processing, correct?

That's what the economic impact that's being considered is included, right?

A Yeah, that's correct.

Q And so what -- and so what you're asking the Commission to do is, let's consider the positive benefits of the processing, the positive benefits of the -- of the tail mine and -- and dealing with that in terms of jobs, but we aren't going to look at the trucking that we heard about this morning, or we're not going to talk about the possible deleterious effects of sending this off someplace else, correct?

A I don't necessarily agree with that, and I'd like to refer to that -- we do have testimony on the specific topic in the morning. And you know, we can certainly get into those details at that point.

Q Okay. The jobs that are going to be created -- for the first three years, they're going to be held primarily by contractors; is that fair to say?

A So the way the industry works is -- I mentioned earlier in my discussion, related to training for an environment, and I mentioned earlier this morning that we do have a little bit of runway, or quite a bit of runway, actually --
Q Mm-hum.
A -- to establish a training program, operate the training program, and try and develop a workforce pool.
Now, obviously you need experience in an environment, in an industrial type of environment. And so the idea is that yes, we would bring in a contractor to work with the local communities and the public that are interested in employment, take the training course. And we've said this from, you know, the get-go is over the first few years is how we would develop the workforce with both training and experience and take over, you know, the positions from that contractor.
Q Well, let's take a look at -- specifically at Page 651 the rezoning application. And in which -- in the -- what Wolfden tells the Commission is that initially for the first three years when the people are being hired, they're going to be contractors because you need qualified people and there's no

one -- there really isn't anyone who's qualified in this area because there are no mines, right?
A Right. Just as I explained, we just need to work on, you know, gaining that experience and translating the workforce over to the local communities.
Q And so -- but the -- and is it Wolfden's plan that after the three years you're going to just fire all the contractors and then hire someone local?
A So this is actually a very standard type of process for new mining project, and contractors -- mining contractors are very well aware of the duration of those contracts. And also, when we tender for those types of contracts, what takes place is a part of the tender process is the contractor's ability to work with training programs that are established in the state. So they will be helping us in a big way implementing those training programs with in-field training and that sort of thing.
Q And -- and those training programs are essential to be able to -- to be able to bring on people from the local area in order to work in this mill; is that fair to say?
A They're essential throughout the duration of the project because you need -- there's a continuous workforce pool. So through retirement or change of

position, different offerings, you constantly have to update your workforce. So absolutely.

Q And if in -- and so, let's just -- I think it's probably worthwhile just to bring up, if we can -- sorry, Ms. Pereira, I didn't tell you I was going to do this one. Let's bring -- let's bring up Page 275 of the rezoning application. Got it up?

Let's go to the bottom and just make that a little bigger, if you can, so -- I certainly can't see it. Yeah, right at the bottom.

Okay. So do you see on the bottom there where it says that the objective was to hire locally, but it will require training for that workforce since many unique skills are required for mining working underground.

Do you see that?

A Yes, I do.

Q And so training is going to be essential in order to be able to bring it along so you can hire local folks to work in this mine, correct?

A Yeah, I think that's the --

Q Okay. All right.

A -- general consensus.

Q Well, let's look at the training that's -- that's planned -- that Wolfden has in mind for this project according to the rezoning application.

And what I'd like to do is go to Page 696 of the rezoning application.

And let's make that a little bigger.

And so this is -- before we do that, could you just scroll down just so we can see?

The total ann -- these are annual administrative costs that are being projected for this mine of approximately $3.3 million; do you see that?

A I do.

Q Okay. Let's go to the top. Of the $3.3 in annual operating expenses, how much -- is it -- am I reading this correctly that $10,000 is allocated to training?

A That's correct.

Q And so -- and so the -- all of the training that you were talking about in your presentation this morning and -- and a few minutes ago is all going to be financed to the tune of $10,000 a year?

A So the way that -- and obviously the way that accounting tables are built, the allocation is extremely important to consider here.

And, quite frankly, most -- see the 2.2, roughly, million in salaries and overhead, that includes the salaries for trainers, that includes salaries of the trainees. So the majority of the cost, really, is the cost that goes into paying the employees who are taking the training and paying the trainers.

So what you're looking at here for training is like -- it's the supplies related to training and that sort of thing.

Q I see. Okay. Let's talk a little bit about your -- the educational -- your -- your meetings on education dealing with training.

A Okay.

Q If I'm understanding Exhibit E to your pre-file testimony, which appears at about Page 46, we're not going to put it up, but which appears there says that you had a number of meetings with some educational institutions in 2019 to 2021 and then there were a couple more this year; is that fair to say?

A Yeah. Correct.

Q Okay. And so that -- so there's a period of time when there was -- a couple years where there were no meetings at all, correct?

A That statement is not quite correct.

There was a -- I guess you could say that there was a lull in meetings with the education groups. There's no point where we stop having meetings with different communities and groups.

Q And Wolfden bought the land in order to set the --

you know, to start the -- start it in motion for this project in 2017; have I got that right?
A In 2017, 2018.
Q Okay. And so Wolfden has had five years to meet with educational institutions to help set up these programs, correct?
A Yeah, that's correct.
Q And as of today, there are no programs for any training having anything to do with this mine; is that correct?
A So the statement's correct, but in those initial conversations with different educational, I guess, groups, community colleges, vocational schools and that sort of thing, it's really, you know, kind of talk to us if you get the rezoning or when you've been rezoned. So what we've proposed is a syllabus, a training program that already exists, and it -- the response is really, how much time do we have to put this together. And when we say, there's three years, they say, oh, we're used to a month.
So, yeah, so we haven't really had to initiate these training programs yet. The trigger will ultimately be, I guess, if there's a favorable decision.
MR. BRANN: Thank you.

MR. WORCESTER: Time is by, and thank you.

Can you hold -- can you weave your question in tomorrow somehow?

Go ahead and ask it. Go ahead and ask your question.

MS. HILTON: I'm going to -- is it true that once you train these people, you're only going to be using them for about ten years? I mean, what happens after the ten years?

MR. OUELLETTE: That's a really --

MS. HILTON: This isn't like some of the other projects we look at where you're in a career for much longer than that.

MR. OUELLETTE: That's a really great question. And the project is technically a finite project, and I'm aware of that. Something that I feel is very exciting, and this isn't really drafted into the petition, but I think it's extremely exciting that we are -- you know, pending success, we will be upscaling a substantial workforce.

The skills don't disappear even though the project does, so I think what we're doing is actually introducing a brand new industry to the state of Maine, not just necessarily a single-use project.

And so if the employees are then taking their skill sets and then theoretically traveling abroad, and I think it's worth mentioning that the --

UNIDENTIFIED SPEAKER: Sorry. We were supposed to be done.

MR. OUELLETTE: That's okay. Sorry.

I think it's worth mentioning that the mining industry has converted their norm to, you know, developing projects in remote places as opposed to, you know, in urban areas. So the mining industry has heavily gone towards fly-in, fly-out type of operations, or commuting type of operations. So theoretically, I think these skill sets -- as long as there's an inherent interest -- can remain in the state, travel for work, just -- just like the example in New Brunswick, actually. Travel for work, bring the moneys home, own their homes here, pay their taxes here, and this could theoretically be a very perpetual industry in the state. A substantial perpetual industry, I think.

MS. HILTON: Thank you.

MR. OUELLETTE: Yep. Thank you.

MR. WORCESTER: Are you the one that's going to do that?

(Inaudible response.)

MR. WORCESTER: I had a question on -- the question came up, we have this holding tank that has sediment in it.

MR. OUELLETTE: Yep.

MR. WORCESTER: My concern was, there's also acidity -- acid issues there because of the dust and all that stuff, there's likely to be some of that. They say they're going to take the silt out, okay? I view it as mud.

MR. OUELLETTE: Yep.

MR. WORCESTER: Is that going to be treated somehow?

MR. OUELLETTE: So the texture of it will be a lot like mud, but I want to just clarify.

The water that's brought up from underground first undergoes a series of underground sumps. So a series of smaller ponds, let's call them, where a majority of the sediment is settled.

Now, you're absolutely correct. Water that's collected from precipitation on surface will have some sediment in it, but those are also reporting to first stage sumps, lined sumps, and then over to the pond.

So I guess the first -- the first offense against silting of our pre-water treatment storage pond are these primary collections areas. Now, in terms of what we do with that material, first, after it's been dewatered, we have to test it and identify whether it's heavily mineralized or whether it's just inert dust.

And frankly, if it's heavily mineralized or if it has the strong potential for acid, then we would end up concentrating it and removing the metals. What would be the final product of that would be tailings. And then otherwise we would end up taking the material if it's -- if it's not acid generating, we would take it and remove the rest of the water and run it through the plant, the water treatment plant, sorry, and then take that cake that's left over and, if approved by DEP, we would deposit it back underground.

And I think this is a good point to clarify. If -- any of the material that isn't approved by DEP to go underground, it would end up as a special waste unless it's tested and indicated as a hazardous ways. I just wanted to make that clarifying statement as well.

MR. WORCESTER: Okay. Thank you.

MR. OUELLETTE: Thank you.

MR. WORCESTER: The technical session of this hearing will be continued at 8:30 a.m. tomorrow morning here at Stearns Junior/Senior High School.

We have a public hearing at 6:30 tonight if anybody wishes to attend.

Thank you, people, for the day.

* * *

(Concluded this hearing at 4:51 p.m. this date.)

CERTIFICATE

I, Angella D. Clukey, a Notary Public in and for the State of Maine, hereby certify that this hearing was stenographically reported by me to the best of my ability and later reduced to typewritten form with the aid of Computer-Aided Transcription, and the foregoing is a full and true record of the hearing to the best of my ability.

I further certify that I am a disinterested person in the event or outcome of the above-named cause of action.

IN WITNESS WHEREOF, I subscribe my hand and affix my seal this 24th day of October 2023.

Angella D. Clukey

ANGELLA D. CLUKEY, NOTARY PUBLIC
Court Reporter

My commission expires March 17, 2024

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