
DOE/OR/21548-076

(CONTRACT NO. DE-AC05-86OR21548)

TRANSCRIPT OF:

**FEBRUARY 13, 1989
Mo DNR NPDES HEARING ON
PROPOSED DOE DISCHARGE PERMIT**

**For The :
Weldon Spring Site Remedial Action Project
Weldon Spring, Missouri**

**Prepared By MK-Ferguson Company
APRIL, 1989**



**U.S. Department Of Energy
Oak Ridge Operations Office
Weldon Spring Site Remedial Action Project**

**Transcript of
Missouri Department of Natural Resources
February 13, 1989 Public Meeting in St. Louis County
Ramada Inn, Westport, Missouri**

**Public Comment on
U.S. DOE's Proposed NPDES Permit
to Treat Water from the Weldon Spring Quarry
and Discharge Treated Water into the Missouri River**

Transcript Prepared By:

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April 1989

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Good evening. I would like to welcome all of you to the meeting this evening. My name is Celeste Kuhn and I will be serving as the moderator for this meeting on the proposed Weldon Spring quarry wastewater discharge permit. This meeting is being held to allow you the opportunity to ask questions about the proposed permit and to allow the Missouri Department of Natural Resources to receive comments on it. We will be proceeding as following this evening. First, there will be a brief presentation by the Missouri Department of Natural Resources and then a short presentation by the U.S. Department of Energy. Together this should last about 15 or 20 minutes. After that I will call on any elected officials who wish to speak and then I will be calling on people who have filled out cards. And then after that anyone else who wishes to speak. All speakers should confine their remarks to the proposed quarry draining operation and permit. Public meetings about other aspects of the Weldon Spring quarry cleanup will be held in the future. The meeting tonight is only about the quarry draining operation. If you do not wish to speak tonight but you have questions or comments that you want to send in later, you can send them to the Missouri Department of Natural Resources, Water Pollution Program, P.O. Box 176, Jefferson City, MO 65102. And the deadline for written comments is March 6. That address is also on the ivory-colored fact sheet that you have. If you have not signed in, please do so. The department keeps a record of attendance, and the sign-up sheet is out at the table in the hall. We also have extra cards out in the hall for anybody who would want to fill one out if you want to talk later. We will be collecting those throughout the meeting. I would now like to introduce the staff from the Department of Natural Resources that are here tonight. To my left is Bob Hentges, chief of permits with the water pollution control program. Also seated with him is Mr. Ron Burgess, environmental engineer with the department's public drinking water program. Over to the side is Dave Bedan, the department's radiological waste coordinator. And we also have Richard Lockes with the water pollution control program in the back of the room. To my right we have some representatives from the U.S. Department of Energy and Steve McCracken, deputy project manager for Weldon Springs, will be giving the presentation. Mr. McCracken, would you like to introduce the other people who are with you?

Steve McCracken

Thank you, Celeste. On my right is Roger Nelson. He is the manager operator of our environmental safety and health department at Weldon Spring. On my right is Dr. Margaret MacDonell. She is the person that is most responsible for drafting and writing the environmental document that we are here to discuss this evening. She works for Argonne National Laboratory. And on my left is Ivan

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Joya, who is the process engineer that was responsible for the conceptual design that we've laid out for treating the water in the quarry.

Celeste Kuhn

Okay. Thank you. Also on hand we have Gale Wright who is chief of the remedial section of the Superfund branch with the U.S. Environmental Protection Agency. Now that our introductions are through, I will call on Mr. Hentges to give an overview of the department's role regarding the wastewater discharge permit application.

Bob Hentges

Thank you, Celeste. We have out on the sheet, as you come in, this document which basically lays out the seven steps that we go through in order to get an NPDES permit for any discharge in the state of Missouri. We have completed steps one, two and three in this process and, because we are doing something slightly abnormal here in holding public hearings or public meetings during the public notice process, the meetings do not officially show up on this document. But, because we felt that there would be some public interest and we wanted to get some direct public input, we elected to hold two meetings such as this during the public notice process to receive direct input from the public during the public notice period. At the end of the public notice period which ends on March 3, 1989, we will make a determination whether to issue or deny the permit for this treated water to be discharged from the quarry. When that decision is made anyone who feels aggrieved by that action can appeal that action to the Missouri Clean Water Commission. This would actually be step six on the process chart or step five going to step six. This is the legal step that is required to get legal standing if someone wishes to continue the appeal of the permit. If you do not file an appeal with the Clean Water Commission, there is nothing that can be done with the permit from that point forward. So this is the point where you would have to gain your legal standing in the permit process. As I said, we are here tonight to listen to you. I don't want to spend a long time trying to explain to you the, everything's that's going on. I'd rather listen to you tonight and gather your input as to anything you have to say about this permit or if you have any questions, I will be willing to try and answer any questions that you have. Thank you.

Celeste Kuhn

We will now hear from the U.S. Department of Energy. Mr. McCracken?

Steve McCracken

Thank you, Celeste, and ladies and gentlemen. Speaking on behalf

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of the Department of Energy, we are certainly pleased to be here this evening. A very important part of the work that we do involves meetings such as this one where we take an opportunity to discuss with you the plans that we have to carry out at the Weldon Springs site. For those of you that are not familiar with Weldon Springs, the Weldon Spring remedial action project, the Department of Energy and our contractors certainly in cooperation with the Environmental Protection Agency and the state of Missouri are working to clean up an old uranium feed materials production plant that is located in St. Charles county and was shut down in the late '60s. Our task at Weldon Springs is quite complex. That requires very careful and sometimes unfortunately, time consuming planning in order to make the best decisions and the most accurate decisions regarding final cleanup. I think, fortunately, from our point of view, the DOE, the EPA and the state of Missouri believe that we should not delay in doing those things that can significantly reduce off-site migration of contamination and can thus improve public health and safety. We've already done a number of things at the site. We've removed the PCB oils that were at the site. We are carrying out asbestos removal activities. We are carrying out chemical cleanup activities and we have a number of other things planned. The quarry, there's a quarry that is south of our site, but it's a part of our project. And that's another of those areas that poses a rather significant potential threat to the public. There is contaminated debris that's in the quarry, there's also contaminated water in the quarry. That contaminated water is leaking to the ground water in the direction of the St. Charles county well field. Fortunately, it's not reaching the well field. However, the potential exists that it could. For that reason, we have concentrated our studies on that site and on that water, in particular, in order to move ahead and clean up the water. We've prepared a very comprehensive plan that we believe will allow us to remove that water in a very safe way. Our purpose is tonight to discuss with you any questions or comments that you might have about the plan. And with me, I've already introduced the people at the table. They are very familiar with what we plan to do and we will do our best to answer any questions that you might have. With that, Ivan Joya is going to talk just a very few minutes about the plan that we have laid out and then we'll turn it back over to Celeste.

Ivan Joya

Thanks, Steve. We have some slides to show. One of the first steps in planning this treatment plant was to look at the contaminants in the water. And starting from a very long list, a very comprehensive list of contaminants we tested for, we found four contaminants of concern. And the reason they are of concern is because they exceed certain state and federal standards. For example, the arsenic and manganese exceed the drinking water

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standard of .05 milligrams per liter. The 2,4-dinitrotoluene exceeds the ambient water quality standard of .11 micrograms per liter. And uranium exceeds the DOE's radiation protection standard of 550 picocuries per liter. So the treatment plant we've designed will treat these contaminants to meet standards. This is a process schematic of the operation and it consists of three main parts. We have an equalization basin, we have the treatment process itself, and we have effluent ponds. We'll pump water from the quarry pond into the equalization basin and combine it with other minor flows from the operation. And, therefore, we have a constant feed to the treatment plant. And the reason for this equalization basin is so that we get a better operation of the plant if we have a constant feed. Now the process itself is a conventional chemical-physical treatment process which employs chemical additions for precipitation, neutralizations, filtration, adsorption on activated alumina, ion exchange and adsorption on granular activated carbon. We've added an ion exchange step to be able to remove uranium to even lower levels than the standard of 550 picocuries per liter. In fact, with this ion exchange step we can comply with NPDES requirement of meeting a 30 picocuries per liter effluent, and not to exceed 100. Now, the treated water from the treatment plant will come into an effluent pond and when a pond is filled we will stop the process, we will sample the pond, test the water and compare it to the NPDES limits for the contaminants. If the limits are satisfied, we will discharge the water to the Missouri River. If there is any standard which is exceeded, we will return the water to the equalization basin for further treatment. Any wastes that are generated within the plant will be contained and kept at the site for separate disposal. So therefore, we will not discharge any effluent that does not meet the NPDES limitations. This is a layout of the facilities we are designing. The quarry itself is in this area and the pond is about 400 feet from the fence line. The equalization basin is approximately two million gallons and it will be lined with a synthetic membrane. The water treatment plant is about 2,000 square feet. Each effluent pond is about a million gallons and they also will be lined with a synthetic membrane. The pipeline from the river will come out at this direction and discharge about a mile and a half away from here. But in no case, will we ever discharge effluent that does not meet the limitations that are in the NPDES permit. Thank you.

Celeste Kuhn

Is that all, Mr. McCracken?

Steve McCracken

Yes, that's all.

Celeste Kuhn

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Okay. We have now reached the point in the meeting for comments and questions from the audience. I would ask each of you to come forward and speak into the microphone so that everyone present can hear you and so that we have a clear audio recording of your comments. Please spell out your last name and give the name of the organization that you are representing before you start to speak. We have quite a few cards and I will be calling on these people after elected officials, so I would request that you only ask one or two questions and then we can have you come back again later on, if time permits.

First of all, are there any representatives of U.S. congressional delegations here that would like to speak? Are there any state representatives or senators that would like to speak? Are there any county elected officials who want to ask a question or make a comment? Are there any city officials who want to speak? Okay, then we will go ahead and proceed with calling on the cards in the order in which they were given to me. Michael Waltz.

Michael Waltz

The name is Michael Waltz, W-a-l-t-z. I'm representing myself. As a resident of the city of St. Louis, I have a concern about the dumping of the effluent into the Missouri River where it would be taken into the city's water supply, dumped through our filter beds. I'm concerned about the contamination of the filter beds, and then come out our water taps. My question is if this, these ponds, if this water can be cleaned up to the extent that it is safe to dump it into the river, why cannot it just be left where it is? Thank you.

Celeste Kuhn

Okay. Mr. Hentges?

Bob Hentges

The reason it can't be left there is the volume of water is going to be several millions of gallons. There is currently three million gallons of water in the quarry and when that water comes out treated, there will then be other water that flows in that will also have to be pumped out and treated during the process and the volume of water all told will probably be pushing six to eight million gallons before it's over with. And they don't build that kind of storage. Do we need anything else?

Steve McCracken

Mr. Waltz, we're also concerned about the water, we're also concerned about the citizens of St. Louis and the intakes of St. Louis city and that's the reason we've designed and the reason that we're treating to the water quality limits that we are treating to. We cannot retain the water at the site for the reasons that Mr.

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Hentges mentioned. In order to finally clean up the quarry, we've got to remove the water and then we've got to remove the bulk waste that's in the quarry. You can't remove the bulk waste until you've first removed the water.

Celeste Kuhn

Okay. Thank you. Lee Swan.

Lee Swan

My name is Lee Swan and I represent myself and my son.

Celeste Kuhn

Can you spell your last name please?

Lee Swan

Yes. S-w-a-n. Now the question I had is, this proposed plan that you have, has it ever been tested in the field site and proven effective? In other words, are we an alpha pilot site for this kind of a scheme?

Celeste Kuhn

Okay. Mr. McCracken?

Ivan Joya

The processes that we are proposing to employ are well tested processes at other facilities and there is no new innovation or new technology here at all. We haven't been able to test it on this specific water, but as part of our design effort we will do what is known as bench scale treatability testing. So that's being done.

Bob Hentges

The most important thing to remember, Mr. Swan, is that there are two ponds at the end of the treatment process and that they will fill one pond and, while they are filling the other pond, they will go back to the first pond and they will analyze it. If the system does not work, and are not meeting the limits, then we'll have to go back through the system and be treated again. If for some reason it doesn't work, then we'll have to simply go back and start over and redesign something else. But the major safeguard, the most important safeguard is a dual equalization basin at the end of the plant with each basin being sampled prior to the discharge.

Celeste Kuhn

Okay, thank you. Ed Mahr.

Ed Mahr

May I speak later?

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Celeste Kuhn

Yes. Okay. Margaret Hermes.

Margaret Hermes

My name is Margaret Hermes, H-e-r-m-e-s, and I'm from St. Louis. I am a member of the coalition, but I am speaking for myself, Coalition for the Environment, excuse me. I have a statement that I would like to read that would inform my question if I may. The radioactive waste that ended up in the quarry at Weldon Spring originated at the Mallinckrodt plant in downtown St. Louis. The atomic bomb development race resulted from processing uranium ore that came from the Belgian Congo. That makes the waste at Weldon Spring very special. The Belgian Congo ore was the richest uranium ore in the world. The Atomic Energy Commission was at the time willing to purchase any ore that contained even one tenth of one percent pure uranium. The Belgian Congo ore was 60 to 65 percent pure uranium. The Post-Dispatch, in its recent series, said up to 70 percent. Because of that extraordinarily rich ore, we have here a range of waste that exceeds in toxicity what is found at other radioactive waste sites around the country. For example, uranium-235 which is present at Weldon Spring is very rare. It makes up only .7 percent of the uranium on our planet. At Weldon Spring we not only have uranium-235, but necessarily all of its daughter products, the radionuclides that are made in each successive step in the long process of radioactive decay from one radioactive isotope into another. So we have a range of uranium daughter products present that are not found at other radioactive waste sites. One of these daughters of uranium-235, is actinium-227. In a paper that I have attached here, originally printed in the American Industrial Hygiene Association Journal in 1965, actinium-227, its relative radio toxicity rating puts it in the subgroup of the planet's most lethal radionuclides, radionuclides - excuse me. Another daughter product of uranium-235 is radon-219, which will be continuously generated throughout centuries of decomposition. There are also two other kinds of radon present, and three different kinds of radium, but radon-219 is usually not even found at other weapons waste sites. What this means to those of us who are concerned about the proposed methods of treating the contaminated waters is that the Weldon Springs quarry contains radioactive wastes that pose problems that have not yet been dealt with, let alone not yet solved elsewhere. In the early 1950s, personnel from the downtown Mallinckrodt plant taught workers at the Fernald plant near Cincinnati how to process uranium ore. Today the legacy of this work is found in genetic deformities that have shown up in small animals living around the Ohio plant's waste pits. According to an attached article in the Columbia Missourian printed February 3, 1989, the local bird population at Fernald has decreased and abnormalities including problems with reproduction have been found in the animal population. There's a quote that the

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U.S. Environmental Protection Agency wants additional biological and water tests conducted at the site to determine whether contaminated water or tainted soil might be causing the mutations and putting nearby residents and plant workers at risk. The ore processed at Fernald was not Belgian Congo ore and contained a much reduced concentration of pure uranium than the ore that was processed here. So much about this project remains unknown. In September, 1975, ERDA report entitled The Weldon Spring Decommissioning Study: Quarry Supplement, there's a table that lists the radioactivity content of the waste stored in the quarry at a total of 2.25 curies. The current DOE engineering evaluation says in its table A-1 the summary of radioactive concentrations in inventories puts the estimated total at 133 curies. The estimates have changed and so too can the preferred alternative. I'm here because I'm concerned that too little is yet known about dealing with this unusually rich ore, about the technologies that are being proposed and about the amount of radioactive contamination to make a decision today that's going to effect tomorrow. My question is why are we proposing here to deal with reducing the contamination to the current standards when we should be I think trying to achieve a higher level of safety since the standards seem to be changing?

Celeste Kuhn
Mr. McCracken?

Steve McCracken

Ms. Hermes, the level of safety that we will achieve is in the one in ten billion range to anybody that's exposed to that material. That is so, so low as to be just insignificant and of absolutely no concern. You stated that this site is more toxic than other sites. I could argue that either way. We are not trying to solve the problems - our team is working on the problem at Weldon Springs and we've done a very good job. We understand the material that's in that quarry, we understand that water, and we can treat that water and release it at very safe levels of and very safe quality in water quality levels. Do you want to address the actinium rate on it? I think that the bottom line is that there is no significant, at all significant health threat to anybody that will be downstream from the treated water that we would discharge to the Missouri River. We are not discharging waste into the river, we are discharging water to the river that is very, very close to drinking water standards.

Celeste Kuhn

Okay. I would like to remind you that if you'd like to submit your articles as part of the written comment period, that comment period does stay open until March 6. Tina Busch.

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Tina Busch

My name is Tina Busch, B-u-s-c-h, and I'm representing myself. I haven't heard any, I have just a few simple questions that I haven't heard anybody talk about. What happens to fish? What happens to the amount of radiation that fish seem to take into their bodies, especially catfish and sturgeon? What happens to the food chain? Is there any other means of taking care of the water that you're going to treat? Have any other ways been looked into? And what happens to the ground water downriver? What happens to the food chain? What happens to the water as it goes into plants, etc.? Has any of that been looked into or is that part of your study? Thank you.

Celeste Kuhn

Mr. Hentges?

Bob Hentges

A bunch of questions there. What happens to the fish? The level being left of 100 picocuries per liter, we have not put any fish monitoring requirements into the permit as we have done for the nuclear power plants, where the levels are slightly higher than this. Is there any other way to treat the water? There were many, many different things that were looked at by DOE. The studies show several different methods, land application and everything else and this is one that they selected as being the most practical way to proceed. And we do not anticipate any problem with the ground water downstream from the site after it has been released into the Missouri River. DOE?

Steve McCracken

I think that answered it.

Celeste Kuhn

Okay. Thank you. This could be either Allen or Eileen Sandler. Sorry about that.

Arlene Sandler

My name is Arlene Sandler, S-a-n-d-l-e-r. I am a member of the Coalition for the Environment, but I'm representing myself. I'm also concerned because there are so many unknowns about this project. It seems that we keep on learning about new hazards all the time. About ten years ago we learned that our assumptions about the adsorption of plutonium by the gastrointestinal tract were wrong. It turned out that soluble plutonium is oxidized by chlorine during water treatment and more is absorbed than previously thought. A study concluded that the maximum permissible concentration of plutonium in drinking water was thought to be too high by several orders of magnitude. Another example of what is safe today may not be safe tomorrow is something that I read about

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recently. Aluminum has for a long time been thought to be linked with Alzheimer's disease and there's been a new study by the British government that came out in the January 14, 1989 issue of Lancet. And it indicates a very strong link between the two. High aluminum levels in drinking water may cause Alzheimer's disease. The studies show that those who consume water with high concentrations of aluminum run a 50 percent greater risk of developing Alzheimer's disease than people whose water contains virtually no aluminum.

Celeste Kuhn

Could you relate this to this...

Arlene Sandler

I'm getting to that. In the blue book that describes what is going to be done at Weldon Spring, aluminum is mentioned in two proposed processes, adsorption into activated alumina and coagulation/precipitation. What I'd like to know is, is there any concern? Should we be concerned about using aluminum? I know that aluminum sulfate is used widely to clarify drinking water by water companies all over Europe and the United States. Should we be concerned by the addition of aluminum compounds, and will a higher level of aluminum end up in our drinking water as a result?

Celeste Kuhn

Mr. McCracken?

Steve McCracken

I'll let Ivan take that.

Ivan Joya

The unit process of activated alumina that we are proposing will not discharge any aluminum to the effluent. It is merely a bed of activated alumina which adsorbs arsenic, uranium. And it stays in place. It's removed, containerized and disposed of separately. We will not be discharging any aluminum. There is no alum being used also.

Steve McCracken

I would like to make one point, too, and that is that there is no, I don't know that you suggested there was, but I'd like to make a point. And that is that there is no plutonium in that quarry.

Celeste Kuhn

Also, for anybody here who is interested, if you do have questions on aluminum or any other type of health issue, you can contact the Department of Health, toll free at 1-800-392-7245. Bob Foster.

Bob Foster

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My last name is spelled F-o-s-t-e-r. I'm representing myself. I live in St. Charles. I was wondering, you had mentioned that the waste is travelling toward the well fields that supply drinking water to St. Charles. When would this process stop that flow?

Celeste Kuhn
Mr. McCracken?

Steve McCracken

We plan to, subject to this NPDES permit application, we would plan to construct and begin operation of the water treatment plant in about 18 months. It would take about a year then to treat the three million gallons, a year to treat the three million gallons of water that is in the quarry. At that time there may begin to be some back flow into the quarry which could in fact reduce the flow. We can't really know that until we begin, until we get to that point. However, that possibility exists. The main thing in my mind is that we need to get the water treated so that we can get the bulk waste removed and at that time we will have removed the source of contamination to the ground water. And then we can go back into the quarry and we can do some additional monitoring to assure that we have removed the source of contamination to the ground water and we can also decide whether or not the ground water needs to be remediated.

Celeste Kuhn
Okay. Thank you. Margarite Blanke.

Margarite Blanke

My name is Margarite Blanke, B-l-a-n-k-e. And I'm representing myself. And I'm concerned about the longevity of the radioactive material. One of the materials in the quarry water is uranium-238 and this has a half-life of 4 1/2 billion years, and another radioactive substance in the water is thorium-232 and this has a half-life of 14 billion years. And of course, if you absorb these radioactive materials into your body by swallowing them in your drinking water, they lodge, it will continue giving off radioactivity that could cause cancer and other life-shortening diseases. And for pregnant women, of course, it can cause birth defects to the baby. And of course, these materials cannot be retrieved once they are released into the river and so I'm concerned about that and how long will that be around? I mean, how long, it will go into the river and how long will it stay around, I wonder?

Celeste Kuhn
Is that a comment or a question?

Margarite Blanke

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Yes, it's a question.

Celeste Kuhn

It's a question. Mr Hentges?

Bob Hentges

Well, the thing that we need to remember about the treatment process itself is that we are requiring a treatment that will remove radioactivity down to a level of less than 100 picocuries and an average of 30. And this is a level which, this is prior to discharge to the Missouri River. It's our opinion that you will not be able to find it in the river once it's released into the river.

Celeste Kuhn

Thank you for your comment. Mike Garvey or Ganey.

Mike Garvey

Thank you. My name is Mike Garvey and I'm president of St. Charles Countians Against Hazardous Waste.

Celeste Kuhn

Will you spell your last name, please.

Mike Garvey

G-a-r-v-e-y.

Celeste Kuhn

Thank you.

Mike Garvey

Mike Waltz had mentioned why can't we leave the water in the quarry. I think it's important to understand that the hydraulic pressure is a potential contamination to the well field alluvium which supplies drinking water to 63,000 people in St. Charles county. And I believe that's the reason why the quarry was put on the NPL list. In, I'm convinced that it's a good plan that the Department of Energy has and I'm convinced also that the water treatment process needs to be initiated soon because I think it's the first step in an improvement of the situation. One question I might have is, are there any other contaminants which are not regulated for discharge in the quarry, which might be a potential hazard to public health? My concerns relating radon gas release and particulate airborne contaminant release to the people who are driving on Highway 94 and the people using the new parking lot there that's being advertised for the KATY trail and the fishermen. I forget the name but somebody who brought out fish. I think a question of mine has always been the public health ramifications of people who consistently fish in the Femme-Osage slough. Another

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question of mine is what point does remediation begin?

Celeste Kuhn

Mr. Garvey, would you like someone to answer some of your questions at this point? Or do you want to keep going and have them as a comment?

Mike Garvey

I'm almost done. Another question is the sludge from the treatment process, is that going to be stored in barrels and what all? How often is the monitoring going to be done? It's almost assumed that every time there's going to be a release there's going to be a monitoring of the ponds, the two different ponds. And some things about, and there's other things that we'll deal with later, but really the bottom line is that I think the main reason for the water treatment is to reduce the risk to the well field and I think it's a good plan. Thank you.

Celeste Kuhn

Thank you. Would either Mr. Hentges or Mr. McCracken want to answer some of his questions?

Bob Hentges

I'll take the easy ones and leave the rest of them for DOE. Monitoring frequency is set that's once per batch discharge. Every time one of those tanks is full, they will sample it prior to discharge. The sludge that's generated by the treatment process will be dried and stored on site and will be disposed of with the material that eventually comes out of the quarry. Other things I'll leave to DOE.

Steve McCracken

I will add one thing to the monitoring - what Mr. Hentges has described as the NPDES monitoring requirements. In addition to that, the DOE will routinely monitor the water that is in the quarry sump to assure ourselves that the contaminants in the water are the same as the contaminants that are in the water now. So we will be doing actually more monitoring than just that required by the NPDES permit. I think as far as the, let's see if I got the, when would remediation begin? That's a subject of another study that we're doing and I would suggest that we address that outside this meeting, Dr. Garvey, if you don't mind. It's just getting off the subject. But we would like to do it just as soon as we can, I can assure you. Any increase in radon, I think I'll let Dr. MacDonell answer that one.

Dr. MacDonell

Because the surface area that's covered by the quarry is so small we expect no measurable increases in radon at the quarry perimeter,

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but we will be monitoring and we will have contingency plans in place in case we do see any increase in that.

(Mr. Garvey starts to ask question away from microphone.)

Celeste Kuhn

I'm sorry. You need to come back to the microphone because we can't hear, we wouldn't have that question on the tape and we wouldn't know what the answer was. Thank you.

Mike Garvey

I'm sorry. But what about the treatment plans? Is there any increase in radon envisioned through the treatment process in the ...

Dr. MacDonell

No.

Celeste Kuhn

Byron Clemens.

Byron Clemens

I want to thank the DNR and the DOE for letting us speak this evening. My name is Clemens, C-l-e-m-e-n-s. I'm representing myself and my family. I've been interested in the problems with Weldon Springs for quite a while. In fact, I remember Mr. Hentges, he's has been around with this problem for a while and Mr. Bedan has been, but all of you folks are new faces. In January of 1980, I believe you wanted to dump the water untreated into the Missouri River. Is that correct? That was a question.

Bob Hentges

That was a different facility, that was the raffinate pits, that was not the quarry.

Byron Clemens

But they wanted a discharge permit to dump untreated water at that time?

Bob Hentges

That's correct.

Byron Clemens

And there was quite an uproar over that. This is a step in the right direction. But I also wonder, I've been on your mailing list for a while and I had to get this from someone else. The EE/CA, the Engineering Evaluation/Cost Analysis, has anyone else in here seen a copy of this? Not very many people. I wonder why we were cut off of your mailing list for this particular document? It was

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quite an education to look through it. At first I was really pleased. I also got a chance to see an article that, on these treatment processes that look pretty positive. Dr. Sword wrote a document or several documents about how the efficacy of these programs. And they look pretty good if you use all of them. But then when I looked through the EE/CA, it looked like like uh, it was sort of a wish list of what you hoped that you might get and then when I looked at the standards, they seemed entirely too high. And jumping back and forth between microcuries per liter and picocuries per liter, I also looked at some DOE standards that seemed higher than what you're going for, which I commend you for that. It looks like for soluble and insoluble uranium-238 it's 600 picocuries and 40,000 picocuries for uncontrolled areas and obviously you are going for a higher standard than that. And then I happened to run into a health effects guidance for uranium in drinking water, which I'll submit with my written comments by Dr. Kothern and in that it recommends a level of 10 picocuries per liter. And it has arguments that that may be too high. I think the EPA's standards may be somewhere, the draft standards may be in the neighborhood of 10 to 40 picocuries per liter. I'd like to recommend that you strive for 10. I think that's a reasonable compromise between 100 and five. And I hope that you do get to look at this, Mr. McCracken. It's got some reasons to believe that there are some reasons for concern with health risks at the levels that you mention.

Celeste Kuhn

Thank you for your comment. If someone wants to obtain a copy of this EE/CA document, Mr. McCracken, where would they go to get it?

Steve McCracken

The EE/CA document is available in the public repositories. We sent out around two or three hundred copies to people that had expressed an interest in it. We put it in the paper that it was available in these repositories. Certainly if you would like to have your own copy, we would be happy to send that to you. As far as all new faces, Mr. Clemens, I've been on the project four years. I may be new, but I'm not that new. The fact is true that at one point in the past, there was a proposal to release water from the raffinate pits untreated. The point I would make is that is not the proposal tonight. The proposal tonight is to treat that water to very, very close to drinking water standards, and talking some about your statement on risk, I think there is no question that our risk calculations are correct and it is extremely, extremely low risk, in the one in ten billion range which is very, very, very small.

Byron Clemens

That doesn't quite fit with the figures that I'm seeing here, but

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I'll make sure that you are aware of those. Probably the reason that I said new faces, I just have to mention this I had a little public argument in the Post-Dispatch with some DOE officials about whether or not the quarry was leaking. And at the time, the DOE denied that, and now you admit it. That's why my comment the new faces are a little better than some of the old ones.

Celeste Kuhn

Thank you for your comments.

Steve McCracken

Thank you. I didn't realize it was a compliment. I take it back.

Celeste Kuhn

Beatrice Clemens. (Tape ends.)

Beatrice Clemens

(New tape begins) ...to shut down plants in face of huge transgressions of safe operations.

Celeste Kuhn

Are you going to concentrate on the quarry draining operations?

Beatrice Clemens

Yes, I am, because I think this is quite relevant. It is not an isolated incident. We cannot look at it as one. The New York Times has printed articles almost daily since October 1, showing mounting evidence of widespread confusion and indecision within the department towards safe cleanup. This concerns me, especially as the cleanup of inoperative plants is becoming less and less of a national priority. Our best example of imagining Weldon Springs actually getting cleaned up is to look at the Fernald Feed Materials Production Center which has stored many of the materials from Mallinckrodt and Weldon Springs and also learned its storage practices from Weldon Springs. As we all know, that plant has recently seen problems in storage and safety unlike any other. The sludge ponds and raffinate pits are similar to our own here at Weldon Springs and only recently has the public been informed of the extent of pollution at that plant. For three decades, the government allowed tons of the waste to seep out into the water basin, into the rivers and the wells without any notice to the public.

Celeste Kuhn

Excuse me. I'm sorry, but you do need to confine your remarks to the discharge permit.

Beatrice Clemens

Well, I won't comment on many of the other plants that I consider

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relevant because they also have the water problems and that's what we're talking about tonight. I'm trying to learn from the public record and from what's available. I can't look at Weldon Springs without looking at the entire department and the record on cleanup and the record on honestly setting out what their theories are and showing that they are trustworthy. I won't quote any more articles. I'll just ...

Celeste Kuhn

We would be glad if, you wouldn't want to send those in?

Beatrice Clemens

I will thank you. It seems to me that federal cleanup costs of radioactive waste from atomic bomb production are one more part of the wages of those same wars. I consider it a legitimate concern that the radioactive water once released or escaped cannot be recaptured. My overriding hope at this time is that the process be done carefully so as not to burden future generations. From examining the public record, it seems to me that the public has not yet seen a water treatment that is proven safe over even a briefly extended period of time. Thank you.

Celeste Kuhn

Thank you. Do any of you ...

Beatrice Clemens

Could I have some comments on comparing other...

Celeste Kuhn

I'm sorry. Please step back to the microphone.

Beatrice Clemens

I would like to hear some defense by the Department of Energy on how they feel that we can trust that Weldon Springs will be handled in any way different from other plants that have since come to the public record as not being safely cleaned. Thank you.

Celeste Kuhn

Sure. Mr. McCracken?

Steve McCracken

I think that it's a very difficult thing to ask me to describe for you how you can trust us. I guess one way to try is to say that we aren't doing this - it's not simply the DOE that's making the decisions at all. In fact, it's very important to us that the things that we do be very carefully reviewed by the EPA, by the state of Missouri - that includes their Department of Health - and that they agree with what we are doing. And consistently, so far, in the things that we have done, they have agreed with what we are

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doing. And that's, I guess, as good as that's what we work very hard to assure that they are going to agree with us and they have agreed with us to date. In addition, there's been a lot of, we have a number of public meetings. At those public meetings, we've received a number of comments, we have incorporated many of those comments into the work that we do. Some of those comments that we've received from the St. Charles Countians, for instance, are incorporated into the water treatment plant that we are proposing tonight.

Beatrice Clemens
May I ask ...

Celeste Kuhn
Come to the microphone, please.

Beatrice Clemens
Do you personally have faith in the Department of Energy's record of cleanup at other plants?

Steve McCracken
I can't speak for other plants. This is one that I work on and this is my job - is the Weldon Spring plant.

Beatrice Clemens
And you're pleased with the progress made so far?

Steve McCracken
Yes, I am.

Beatrice Clemens
Thank you.

Celeste Kuhn
Daniel Romano.

Daniel Romano
I'm Daniel Romano, R-o-m-a-n-o, speaking for myself. I'd just like to briefly touch on this question of trusting the DOE to clean up the site. I don't know if you've seen today's Post-Dispatch. It talks about the, not only the Weldon Spring site, but Mallinckrodt downtown and the high levels of radiation and radioactive dust that workers, and of course the general public, but especially the workers have been exposed to since the 1940s. When we look at other plants as has already been mentioned, the Fernald plant and the Rocky Flats plant and what a mess they've been and how that's concealed from the public by the DOE for years, I have little trust in the Department of Energy. But I'd like to speak specifically to the issue of the workers who will be pumping this water out of

the quarry at the Weldon Spring site. The workers will be exposed to three hazards, one is radon gas. Despite what has been said earlier, radon gas will be emitted from the solid wastes as they are uncovered. Radon-219, radon-222 and radon-220 are all daughter products of uranium and thorium that is in the quarry. These have half-lives ranging from 4 seconds to approximately a minute and so with that we know that the general public won't be as threatened but the workers pumping the plant will be especially susceptible to damage from radon gas. Another hazard, the second hazard is radioactive dust, uranium, thorium, and also the asbestos that, dust particles that will be in the air as the quarry pit is pumped. And the third and most serious I think is the gamma radiation emitting from the solids as they are uncovered. And the reason that I'm most concerned about the gamma radiation is that with protective equipment and respirators of course, we can protect the workers from the dust and from the radon gas. But the gamma radiation would be able to penetrate protective clothing, and of course respirators would be useless. My question is then is, would the Department of Energy to really protect the workers be willing to use remote control equipment?

Celeste Kuhn
Mr. McCracken?

Steve McCracken
I'll try this just a little bit. You mentioned that there are three and then I'd like to get, let our manager of environmental safety and health handle the one question you had about protecting workers against gamma radiation. First of all, you mentioned that there are three hazards - radon gas, asbestos, gamma radiation. Without saying that I agree or disagree at what levels these are, I appreciate the fact that you agree that we can protect for radon gas and asbestos, because we can. I also, again, I appreciate your agreement that the general public won't be threatened, because they will not. I guess with that I'd like to have Roger talk some a little bit about, talk about the gamma radiation exposure that workers might be exposed to.

Roger Nelson
All the levels of gamma radiation that we have measured in the quarry are well below any occupational protection standards for gamma radiation. When the material is uncovered as a result of dewatering and/or the bulk waste excavation, those levels are not unpredicted to rise significantly. If any levels do rise, we will take appropriate time-distance shielding steps, but we do not believe that they will be necessary.

Daniel Romano
Do you know what the levels of gamma radiation are?

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Roger Nelson

Right now at the very base of the quarry and the very middle of it with all of the nuclides that are present right there at the surface, the levels are approximately ten times background, or about a thousand millirems per year.

Daniel Romano

Okay. That sounds like it's pretty high. And then would you address the remote control equipment, because that does indicate that they are high, if they are ten times background.

Steve McCracken

So that I don't try to dodge your question, I'll give you an opinion. We have not yet laid out the exact methods that we would employ to remove that material from the quarry, but given what we know about it today and the levels of radiation that people would be exposed to, we would not need to use remote control equipment nor would we propose to do that. Pardon? Okay. Let me, Margaret would like to talk about that.

Dr. MacDonell

I just thought maybe it was important to clarify that this treatment plant is not being built down in the quarry. It's up adjacent to the quarry and where the external gamma levels are not high. And in a sense it is a remote operation because the pumping from that quarry pond up to the treatment plant is not done by men. It's just a pipe with a pump.

Steve McCracken

You'll have to excuse me a little bit. I think about the whole quarry as a total thing. I tend to get off the subject sometimes. I'll have our moderator getting after me, if we begin to get into bulk waste disposal, I think, or removal.

Celeste Kuhn

Would you like to ask another question? Okay. Thank you.
Virginia Harris.

Virginia Harris

My name is Virginia Harris, H-a-r-r-i-s and I'm here speaking on behalf of myself and my family. And I have some audio visuals. All St. Louis should realize that the release of treated radioactive water into the Missouri River is not only Weldon Springs' problem, but also the problem of all St. Louisans. Everyone in the St. Louis area except for far south St. Louis county, drinks Missouri River water. I have a map here that shows the relationship between your proposed effluent pipes and the major drinking water plants in the St. Louis metropolitan area, or the

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St. Louis community. There are four main drinking water intake plants for the St. Louis community along the Missouri River and one on the Mississippi River. The city of St. Louis' Howard Beale plant is only 10 1/2 miles downstream from your proposed effluent pipes. And that is my understanding that your effluent pipes will be approximately here and this is the city of St. Louis' water treatment plant. And then a half mile down the river from that, at a point which is eleven miles downstream from your effluent pipes, is the St. Louis county's Hog Hollow treatment plant which serves the communities of Ladue, and Town and Country, and University City and Clayton, and that sort of middle area of St. Louis county. And then 18 miles downriver from your effluent plant is St. Charles city's water treatment plant and then 28 miles downstream is the treatment plant, the Charbonier treatment plant that serves the communities of Hazelwood, and Florissant and some of the north county communities. And then at this point on the Mississippi River which is about three miles south of the nominal confluence of the Missouri and the Mississippi Rivers is the city's Chain of Rocks treatment plant, which is a major treatment plant. And one thing I'd like to point about the Mississippi River plant or the one that's on the Mississippi River is that the Missouri and the Mississippi rivers do not actually commingle for a good eight to ten miles south of where their nominal point of convergence is. So since this plant, the Chain of Rocks plant, is only three miles south of that point, it's still using almost - because it's on the west side of the river of the Mississippi River, it's using almost entirely Missouri River water.

Celeste Kuhn

I was going to say, do you want this entered as a comment or a question?

Virginia Harris

I also brought some photographs taken from a park called Sunset Park in Florissant in January of this year showing the Missouri River on the other side, you know the other side of the river, the north bank of the Missouri River at about that point. And the river is shown to be quite low, so I have a couple of questions about your proposal. What assumptions are you making about Missouri River water depth when you calculate the dilution rates between your water release pipe and, for example, the two city and county public water treatment plants that are located 10 1/2 and eleven miles downstream? And secondly, do your calculations take into account the concentrations of radioactivity that will already be in the water coming by Weldon Springs as a result of effluent from the Callaway County Nuclear Plant?

Bob Hentges

Okay, let me answer this. First of all, those of you that picked

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up the fact sheet, the map that she referred to - we have one on the back of that and there are little asterisks on there pointing out those same water supplies. They are, we do want them identified on our handout. We did not calculate a dilution factor for the Missouri River. What we worked with DOE on was to get a treatment technology in place that would produce a near drinking water effluent prior to its discharge into the Missouri River. Any dilution in the Missouri River is just above and beyond what DOE is providing. Because what DOE is releasing is safe in itself.

Virginia Harris

Okay. Then you are saying is that 100 picocuries per liter that which is the maximum that you might propose to release the treated water. That meets the Department of Energy's standards for drinking water?

Bob Hentges

There are currently no drinking water standards for uranium picocuries. Okay? The only standard that's on the book is one that DOE has for 550. In dealing with the EPA, in trying to find out what number they think will eventually come out for uranium. And as other people have said before you the numbers are anywhere from 5 to 100. We have most commonly heard a low number around 30. So what we have asked, and what DOE has agreed, is to build a treatment plant that will average 30, never to exceed 100.

Virginia Harris

Okay. I've heard a figure of ten picocuries of uranium per liter that was proposed by EPA. So that's just one of many, you're saying?

Bob Hentges

Yes. There are no published standards or proposed standards at this time.

Virginia Harris

Why would EPA make a proposal of ten or five if they were willing to let you all establish a standard of let's say 30 or 100? In other words, if somebody at EPA, if there are enough people at EPA who feel that five or ten should be the standard, the maximum average, do you think that there are just some economic forces or maybe administrative forces inside the federal government that would allow other agencies to go beyond that?

Roger Nelson

I can't tell you what's going on within the EPA. The number the EPA would establish would be a number that when you turned the faucet on in your house, it would be five in your house or ten in your house, or 100 - I don't know. But there - I can't tell you

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what's going on within the EPA.

Virginia Harris
Thank you.

Celeste Kuhn
Mr. McCracken?

Steve McCracken
Yes. Although the DNR, we worked with the DNR to get what is a safe standard at our point of discharge. We, the DOE, certainly looked at the people downstream. I would like to have Margaret talk about that for just a moment.

Dr. MacDonell
I appreciate your concerns about the intakes downstream. Not only in the NPDES permit will we be monitoring for that, we took every one of the ones you mentioned, the Howard Bend plant, the Hog Hollow of Florissant and the Chain of Rocks on the Mississippi into account when we did our risk calculations that showed that the risks from, not only drinking water from the Missouri River all the time but also from eating fish from that river, will be in the one in ten billion range. So they are very, very low. And we've taken all of that into account.

Celeste Kuhn
Tom Marx.

Tom Marx
My name is Tom Marx, M-a-r-x. I'm a citizen representative to the local emergency planning committee for the City of St. Louis, but I'm speaking as an individual. To follow up on what some people have been saying, you say one in ten billion is the risk and I just wonder, have you tested this on ten billion people and that's how you come up with this? I want to know how you come up with this acceptable risk.

Dr. MacDonell
There are only five billion people in the world. So that's how low the risk is.

Tom Marx
So you're saying that there's no risk at all of increased incidents of cancer from this discharge?

Dr. MacDonell
Effectively.

Tom Marx

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And how long has the effect of low-level radiation exposure in drinking water been studied? Has it been studied over a period of thirty years to know what effect this might have on a population over a period of thirty years. Accumulation in people's tissues, accumulation in mother's milk, accumulation in plant life, because we're relatively new at this it seems to me and I...

Celeste Kuhn

Mr. McCracken, do you want to answer?

Steve McCracken

I don't know how long they've been studying it, but I do know that we are at levels that are below measurable health effects. Therefore, the calculations are an extrapolation of rather high levels of radiation and it's down into a range that's you can't measure health effects to have, to do it the way that you're talking about. At least they haven't been able to, to my knowledge.

Tom Marx

So, the way you derive these health effects is by exposure to high levels and then you extrapolate that to low levels. Is that what's done?

Dr. MacDonell

The reason for that is that it's very difficult to identify any risks at the low levels, so we've been most conservative by making a linear extrapolation. But it's important for you to remember that as Mr. Hentges has said, at the tap is the point at which we would be concerned if they were above 100 for example, and even then, we're not sure because uranium is naturally present in our environment. And, in fact, when we discharge at our very, very protective concentrations or low, low levels it will be indistinguishable from the uranium that's naturally in that river.

Tom Marx

Well, except that now you are increasing what's in that river.

Dr. MacDonell

No, I'm saying its indistinguishable, it would be immeasurable relative to the uranium that's just naturally present in our environment.

Tom Marx

But you're adding 10 or 30 or 100 picocuries per liter. So it may be indistinguishable, but you are adding radiation to the water, right? I mean that is what's happening.

Steve McCracken

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Mr. Marx, you will not be able to distinguish at the intakes that serve the city of St. Louis, St. Charles County, you will not be able to measure, you will not be able to measure anything above the background that's already there from our plant.

Tom Marx

Okay. Well, I guess another concern I have goes along with that and that's this notion that one person says 550 and another says 100 and another says 30 and another says ten picocuries per liter, and it just - basically what you're saying is we really don't know. This is new stuff, and you're telling me it's safe and I guess I'm just not convinced that what you're telling me has been studied or that people really know what's going on with low-level radiation and so I must say that I'm very concerned about this plant. Thank you.

Celeste Kuhn

Thank you for your comments. Michael Gutermis, I'm sorry, I said that wrong. It appears to be Gutermuth. Okay. Spirtlanson.

Marilyn Spirtlanson

S-p-i-r-t-l-a-n-s-o-n. I'm representing myself and my family. I want to talk a little bit about natural background radiation. I won't go into too much detail, because time is short. Since the discovery of radiation, people have recognized its harmful effects on living things. There is no radiation that's benign. Over the years, the experts have consistently revised downward the recommendation of what is a permissible level of exposure, as knowledge of the degree of hazard has increased. We are all at all times exposed to natural background radiation. We must examine the naturally occurring radiation and then ask whether we can afford to add to it, in the light of the knowledge that any increase in the exposure to radiation, alpha radiation especially, increases the risk of harm from cancer and genetic abnormalities. There are different sources of natural background radiation. There's the cosmic radiation and the terrestrial radiation. But basically, we're talking uranium-238 and thorium-232 and the radon byproducts, the daughter products.

Celeste Kuhn

Is this related to the quarry?

Marilyn Spirtlanson

It definitely is. The drinking water contributes a substantial portion of uranium intake - five to ten times greater than food-derived uranium. There is, to my knowledge, no standard for uranium in water supplies as a radioactive element. You're talking about 550, where is that 550 coming from? There is no federal standard for radium in water. In addition to ingesting uranium and

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its radon daughters by drinking water, when water is used for cleaning, dish washing, bathing or washing clothes, the radon escapes from the water into the air where it decays into alpha-emitting daughters which we then inhale. One picocurie is the amount of a radioactive material that gives off 2.22 radiation particles per minute. Now according to a study in 1985, The Occurrence of Radioactivity in Public Water Supplies in the U.S., the uranium concentration in picocuries per liter for both surface and domestic water in Missouri is only .15. Another study, the Oak Ridge Report, has it as .29. You're suggesting a good deal more than that. It's your intention to reduce the 2,314 picocuries per liter of uranium in the contaminated water to 100 picocuries per liter. You're talking about 30, but I think in your blue report, I think it only said 100, if I'm not mistaken. And then you want to dump it into the Missouri River. According to Tom Burke of the Missouri River Kansas City District Corps of Engineers the river has a total flow of 272,800 gallons per minute at Hermann, which is mile 98 upstream of the proposed discharge pipe. The river is very low at present and at best he said using the target amount of flow for navigation the total flow would be 432,000 gallons per minute. Now you're banking on even dilution and I don't know if you get even dilution. You might be able to answer that, I don't know.

Celeste Kuhn

Would you like to ask that as a question?

Marilyn Spirtlanson

That would be one of the questions, yes.

Celeste Kuhn

Can I interrupt, just one second. They brought a message in that there's a phone call at the front desk for Martin Janowski. I'm sorry, please continue.

Marilyn Spirtlanson

Okay. With three million gallons of water even at your proposed 100 picocuries per liter and an additional 57 million plus gallons in the ponds that are waiting to be processed, I guess, how many picocuries per liter of water would we be consuming? And by how much will that 100 picocuries per liter increase our natural level which is only .15 or .29 depending which report you take, picocuries per liter? In short, we will be drinking the water, we'll be consuming foodstuffs affected by the water, we'll even be exporting it in the form of food, fruits from Missouri, Busch beer and Coca Cola. And I'm wondering whether we cannot find a safer, if more expensive, alternative?

Celeste Kuhn

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Mr. McCracken?

Steve McCracken

I'd like to say, I'd like to repeat something that Mr. Hentges said and that is we are not counting on dilution to release quality water to the Missouri River. You mentioned that a person in Kansas City said that 272,000 gallons per minute is the rate of the Missouri River.

Marilyn Spirtlanson

Right now.

Steve McCracken

That's correct. And in our calculations, in the calculations where we calculated this low number of something times in the ten billion range, we used 10,000 gallons . . . It was 272,000 cubic feet per minute. Well, we used 10,000. That relates to your 272,000. What that means is we used, I think Dave Bedan could answer this, but that may be the lowest level the Missouri River has ever recorded. So that adds conservatism to the number that is one in two billion in ten billion risk. In other words, if we used realistic assumptions other than conservative assumptions, the risk would be even lower. It's just so low.

Marilyn Spirtlanson

I guess I'm not either convinced about the risk factor.

Steve McCracken

We would be more than happy to sit down with you and anybody you'd like and go through how this is calculated. We'll spend whatever time you'd like to in understanding how this is calculated.

Marilyn Spirtlanson

I guess I have a problem with the fact that in natural occurrence it is only .15 to .29 and what will the picocuries per liter be then once this water is dumped into the river?

Dr. MacDonell

It would be about .2900001.

Marilyn Spirtlanson

It would remain the same?

Dr. MacDonell

Right. Unless you have a really good calculator that you can extend out to another ten decimal points. It's really insignificant relative to the natural uranium that's in the river. Uranium is just naturally present in our environment.

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Marilyn Spirtlanson

Yes, it is, but you're adding to it. And it doesn't go away, there are billions of years of half-lives.

Dr. MacDonell

It is insignificant relative to what's naturally present. You wouldn't be able to measure it.

Celeste Kuhn

Thank you for your comment. Ben Lanson.

Ben Lanson

My name is Ben Lanson, L-a-n-s-o-n. And I would just like to be able to go to any faucet and drink water without increasing my risk of cancer or having children with birth defects. And I may be only ten, but I'm sure if I was an adult I would be willing to pay extra taxes to clean up this water properly and not have it dumped into the river. We live in a high-tech society. We can send people deep into space, or deep below the sea. Shouldn't we be able to come up with a less dangerous solution to clean up this water? Can we only solve pollution by dilution and distribution?

Celeste Kuhn

Thank you for your comment. Terry Lanson. Oh, I'm sorry, I apologize. Would Mr. McCracken like to respond? Or Mr. Hentges?

Bob Hentges

Well, basically we are not using dilution as a solution. We are using treatment technology to treat it down to an acceptable level prior to any dilution.

(Comment from audience.)

Celeste Kuhn

I'm sorry, anybody that wants to ask a question needs to come to the mike. Terry Lanson.

Terry Lanson

I'm Terry Lanson, L-a-n-s-o-n and you said that the water that you were dumping is practically as radioactive as drinking water and the figure for the picocuries per liter in Missouri is .15. And you said 100 picocuries per liter and that's about 666 times that of Missouri, so I'm not sure where you are getting that. And also, I would like to address the alpha radiation which is emitted by uranium and other radioactive elements that you plan to dump into the water. Radioactive particles damage living things by disrupting the molecular and subsequently cellular structures through their transfer of energy. There are three types of radiation, alpha, beta and gamma rays. The alpha rays are the most

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dangerous to life. Alpha particles can be shielded and they do not penetrate skin. When inhaled or ingested, however, the alpha particles are deadly. They can cause 20 times as much damage as beta particles. Once a radioactive particle has been ingested or inhaled, it cannot be shielded. Even low doses of alpha radiation are extremely dangerous and one single particle of alpha radiation can pass through a cell and initiate a malignancy. Cell damage caused by radiation doesn't always result in cancer. Sperm and ovum cells can be damaged which could result in damage passed to sons and daughters. If a cell that was part of a developing fetus were damaged, birth defects could result. The body can sometimes repair damage caused by gamma and beta radiation; however, alpha particles inflict their damage so quickly that the body has almost no chance of repairing damaged cells. Our bodies cannot distinguish the fact that radioactive elements such as uranium are emitting harmful radiation. And these elements are processed based on their physical and metallic characteristics. Uranium is deposited primarily in bone and bone marrow is very sensitive to radiation. In the decay chain of radiation, which is an element which you plan to dump into the water supply, a good portion of the radioactive particles emitted are of the alpha variety. For the first 4.51 billion years of its half-life, uranium emits only alpha particles. Are we not at a great enough risk of cancer, birth defects, liver disease and all of the other horrible diseases caused by your chemicals without you dumping them into our water supply?

Celeste Kuhn

I guess that Mr. Lanson, did you want that as a comment or a question?

Terry Lanson

I'd like to address how you considered the water that your dumping just as clean as the regular Missouri water and also I'm not sure that there will be no risk because I'm not sure it'll first of all completely dilute and also it will raise the amount of picocuries per liter and as I said, one alpha ray can cause cancer.

Celeste Kuhn

Okay. Thank you. Mr. McCracken?

Dr. MacDonell

Sure. We've addressed that alpha activity issue and we're meeting federal alpha standards set by the EPA and by the state under this permit. And our water is going to be much, much cleaner to drink than that Missouri water when we release it.

Celeste Kuhn

Philip Sgroi.

Philip Sgroi

Thank you. My name is Philip Sgroi, S-g-r-o-i. Although a proud member of the Coalition for the Environment, tonight I speak on my behalf and on the behalf of my family. I was hesitant to speak tonight because I wasn't able to prepare in the way that many people have tonight. I have a real respect both for your allowing citizen input, but also for the time that people took to provide the expertise and the conscience that they brought to this meeting tonight. The reason I was hesitant is because my remarks are generic in nature and because they're extemporaneous and I felt that the issues were of such substance that they deserved careful preparation. However, the issues are great and I wanted to share briefly a comment and two questions. One of the things that I've seen in hearing after hearing after hearing in a long time as an activist is that what I hear is a discussion of technical problems for technical solutions and what I don't hear is a discussion of the value systems that we as human beings bring to the decision-making process. I have no quarrel with the personal integrity of anybody in this room. As a matter of fact, I respect the personal integrity of all in this room. But what I do have a concern about is that we too often as human beings forfeit looking at the value systems that should inform our decision-making processes. The reason I say that is what we're being asked to deal with tonight is the technological fix and my own perspective is that technology in our time is crippled and incomplete and not fully in our control. And what I'd like to suggest tonight is that perhaps what is happening is that we need to simply defer what it is we're doing now until we can be more self-assured that human beings which in their very nature are sacred can be protected. The figures that I've heard tonight are one in ten billion. When we first began to protest what we saw as the evident safety hazards in nuclear power plants, the government used the Rasmussen studies which were quoting figures of about one in a billion at that time as assuring our safety. I don't think any of us feel that comfortable any longer with the safety of nuclear power plants, even though the figures were one in one billion. Matter of fact, the one in one billion figure was used by the government to discuss the safety of a dam which when it broke and took human life, we had been assured would be safe because the figures were one in one billion. And what I'm concerned about is what we may be seeing tonight as simply the sin of hubris that we have a pride in our technology that tells us that we can have such a confidence that we can disregard the issue of safety to human beings. And I'm not quarreling with your integrity, merely with the process. We don't talk about values very often in hearings like this and I think that we should. I almost would like to see a value impact statement on every major issue that this society has to deal with. My questions I guess are somewhat rhetorical. At first they appear to be rhetorical, but

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in reality I think they are questions - could we number one, not simply wait and not simply commit the sin of hubris again? We didn't, when we created nuclear weapons and God forbid that we ever do it again. And secondly, what I would like to know is what is the role of values in the decision-making process related to the issue of releasing these radioactive effluents into our water system? I'd like to leave you with a quote, if I may. The quote is from Bertrand Russell and relates to what I said earlier about the sacredness of human creation, of human life which is simply what I hope you do tonight is take one giant step away from your technology and simply remember your humanity and forget the rest. Thank you.

Celeste Kuhn

Okay. Thank you. Mr. McCracken, did you have a comment?

Steve McCracken

Yes. Just very briefly. I don't want to seem flippant, but and I'm not, but, if your comments are extemporaneous, they're very good. A person has to sit up here and answer questions that I don't know what the questions are going to be. I wish I were as good at it as you are. Talking about a value system, we do employ a value system in the work that we do. Whether it's a value system, you know it's judgmental as to whether our value system is the system that you would accept. But the DOE standard for uranium discharge to surface waters like the Missouri River is 550 picocuries per liter. With our value system, we looked at what we could reasonably do to get that number down, even though 550 is very protective. And by looking at that value system we said it's worth it to reduce that down to within a range of 30 to 100 and then we would extend that value system during the operation to try to get that number just as far down and as close to 30 as we can get it. And that's the value system we applied. You asked if we can wait. I don't think that the correct decision is to wait. That's the reason we're moving on with this, we're trying to move on with this activity. It's leaking to the ground water. That does pose a potential threat to humans and to the St. Charles county well field, and we believe that it's time to get on with that work.

Celeste Kuhn

I'm sorry. I'd have to ask you to meet at the end because we've got other people that need to speak. (Question from audience) Oh, there's an address on the yellow fact sheet. (More exchange between members in audience) Fran Sontag. Excuse me. We can't have this talking back and forth or not everyone will get an opportunity to talk. Fran Sontag. Thank you.

Fran Sontag

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I'm Fran Sontag. That's S-o-n-t-a-g. I represent myself. First, let me say that I am very happy that you did listen to the people a few years ago when you were proposing to release this water in an untreated way although very slowly. What I'm concerned about right now is how it's going to be monitored. I assume that there will be some provision for monitoring the releases. I would hope every time you release. And I would hope that whatever you do that we eventually agree upon, I'd like to know about any and all accidents or discrepancies that occur and if it should be monitored by interested citizens who are well trained for their time and that it should also be, they should represent St. Louis and St. Louis county as well as St. Charles and Weldon Springs. I just also feel that very strongly that we need to be very careful that we do as good a job as is technically possible, because we are dealing with the water supply of future generations. (tape ended)

Bob Hentges

(Beginning of tape.) ...monitoring is quite expensive. But there will be some people who, some organizations, that will periodically want to monitor and there will be a provision where these people can also split samples with DOE.

Fran Sontag

I guess I'd feel better if it were just ordinary citizens and if they would monitor really all the time.

Bob Hentges

Well, anybody could - I'm sure we could work out a provision where anybody could monitor at any time, but it does get quite expensive. That's why...

Fran Sontag

Don't think that should be a consideration.

Bob Hentges

I mean for you to do.

Fran Sontag

Who has to pay ...

Bob Hentges

Going to do it. We're going to pay the money to the state. They're going to pay the money for them to do it. If Charles Countians Against Hazardous Waste elect to do it, I'd pay to have their samples split, whatever. If you would have a sample, then it would be up to you to have it

acknowledged

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Ms. Sontag, we have frequently split samples with, on other water monitoring activities and we will do that with anybody that wants to do it, because we have, we are confident that the analyses we do is correct, and when people take samples of their own and analyze it and it agrees with ours, then it adds credibility to what we do, and we like that.

Celeste Kuhn

Thank you. Ed Mahr.

Ed Mahr

Ed Mahr, M-a-h-r. I have a question, then a comment, and then another question. The first question is directed toward the man from Missouri. I was told about four or five years ago that the city of St. Charles, due to the well problem, was getting its water from the city of St. Louis. Now if that's correct, and I'm asking you if that is correct, then why is there an urgency to clean out this pit, since those well fields are no longer used? Would you care to comment?

Bob Hentges

Time out. Let me get my water specialist.

Ron Burgess

The well field that is under consideration here has nothing to do with the city of St. Charles. Specifically, they have their own water system. The wells that are down in that alluvium that are the point of discussion this evening are used by Missouri Cities Water Company which serve some 40,000 or 50,000 people in that area and then also Water District No. 2 of St. Charles county uses the water from that well field. The city of St. Charles itself does not. They, I believe now, have a hookup with St. Louis county and get the water piped in a pipe across the Missouri River to the city of St. Charles.

Ed Mahr

To understand what you said, did you say that the city of St. Charles and the surrounding area is now getting the water from St. Louis? Or is it not getting the water from St. Louis?

Ron Burgess

The city of St. Charles is, and I believe also, the city of St. Peters is getting some of their water, if not all. from the St. Louis county water companies.

Ed Mahr

Yes. So there should be no public safety involved with that well field then is that correct?

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Ron Burgess

I think you're using two different well fields.

Ed Mahr

Okay, that may be.

Ron Burgess

One in the city of St. Charles which, is to my knowledge, they are not using those wells anymore. The other well field which is these nine wells down in the alluvium that's directly south of the quarry, those wells are being used by Missouri Cities and by St. Charles County Water District No. 2.

Ed Mahr

Alright. And the comment is that I don't really understand all the technical things that have been said here this evening, but we're doing all according to the Post-Dispatch fish article here which I would enter into evidence so to speak, but there is a lot of pollution in the water throughout the rivers, lakes, the oceans, wherever it is. And it seems to me that the only solution of this problem is either to store this stuff for a while and not dump it into the water, no matter what source, no matter where the water goes, it still gets dumped into the water. And this can only happen for so long before you start getting fish contamination as evidenced of what's happening. Maybe you can clean it up like you say and maybe you can't. I don't know, but there is a wild idea which I had which I will toss out for someone who has the money or technical expertise. You've stored the water for a long time. And now you decide to get rid of it. Well, let's store it a little longer, like the portly gentleman said back there until we actually feel that we can handle it. And this is where I would store it. Ten or twenty years ago, the United States government decided to stockpile oil since there was a shortage. And they put it back into the ground down in Texas in various places near sea transportation. So possibly, there's some dirty area in the country, I'm sure we have some millions of acres that are dirty somewhere that might have some oil wells. And if they had oil wells, they've got to have a pipeline coming from the oil well. And if the government found some oil wells that they could dump this Arab oil into, then they must have completed studies that actually looked at all the possible sources in the country. And if you could get a computer man and maybe a security man to see which ones of these have the capacity in a dirty area, it wouldn't be very hard to build an end to the pipeline, let's say one pipeline out of all the lines that are in existence in this country, we could devote one which I'm sure some oil company would sell at a reasonable cost due to obsolescence we could just devote one pipeline and take the cleaned water after you've cleaned it up and instead of taking the risk that you're wrong, pump it into a

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pipeline, ship it out to an oil field, put some concrete in the bottom of the oil wells like they did down in Texas and wherever and store it there for a little while longer. Now I realize that none of you have an answer to this wild hair idea, but there could be some people that might be able to come up with an answer within three or four months or a year just through a use of computer studies and a little bit of oil drilling technology. Would anyone care to comment?

Steve McCracken

I'll try it, Mr. Mahr. I agree with you we haven't considered that alternative exactly. And I'm not trying to joke with you. The fact of the matter is, what we are proposing to do is to remove the waste from the water and store it on site in a solid waste form. That solid waste has got to still be the subject of the decision in the future as to the final disposition of that material and I can assure you that, that will be a time when people will be given an opportunity to come in again. But we're proposing to remove the waste from the water and store it as a solid material onsite. As far as addressing the issue of shipping this water to places like the Texas oil fields, we will be considering offsite alternatives for the solid waste. I can assure you if we considered that now for this water that we would not be getting rid of that water for a very, very, very long time. So what we propose to do because it's an issue that you just can't address in a very short period of time. It's been shown time and again. So what we're proposing to do is remove the waste from the water and store it as solid waste and address that as a future decision.

Celeste Kuhn

Thank you for your comment. (Question fielded from audience.) I'm sorry, but we have all these other people in line, but if you would like to fill in a card. Mr. Lockes can you provide him with a card and then you could ask a follow-up question. Louise Belt.

Louise Belt

Hi. That's Louise Belt, B-e-l-t. I'm representing myself here. I have read your EE/CA and I'm concerned there. You talk of the ion exchange program which will take the uranium out of the water and you dismiss the vapor-recompression distillation program process because it would cost \$2,150,000 over the five-year period. It seems that the ion exchange program would bring it down to 30 picocuries per liter, or below 100 picocuries per liter as much is as reasonably achievable. But I think there, there seems to be some concern about bringing the price up over two million dollars. And it seems to me that I wonder if you've gotten confused there, the two different kinds of Superfund jobs, one which you're going to cause the corporations to pay you back for which are over two million dollars and the one that the taxpayer funds evidently which

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is under two million dollars. So, this is going to be a taxpayer funded one. You don't have that two million dollar limit and I'm concerned that, that may have been forgotten there when you decided not to use vapor-recompression distillation, which does seem to be able to bring this down - I couldn't quite tell from the EE/CA, lower than 30 picocuries per liter? Well, heck, if we can afford it, why not do it? That's my question.

Celeste Kuhn
Mr. McCracken?

Steve McCracken

I can assure you that we did not consider the EPA limit of two million dollars. It never entered into our consideration whatsoever in the system that we would select. We are very confident that had the cost of this system been over two million dollars, I don't even think that a waiver is required. I believe that's for non, or Superfund funded work and this is not being funded by Superfund. It is a Superfund project, but DOE is using DOE money, they're not using Superfund money. So I think that, that does not apply and we did not consider it. Now as far as, why did we chose the ion exchange and not go to the vapor-recompression, vapor-recompression is an innovative technology. We think that it could reliably go below 30 picocuries per liter. But what we looked at, this is where we looked at the risk and how much we could reasonably reduce that. And if you look at that we're talking about reducing risk if you have 500 or whether you have 100 or whether you have 30 picocuries, the risk downstream is so very low, as to be just insignificant. Therefore, we said okay. But even then what can we reasonably do? And we felt that it was a reasonable thing to spend another couple of hundred thousand dollars to install a system that could allow us to move at, to treat, that it would be designed to meet 30 picocuries and that would be our goal to operate at that and never to exceed 100. To spend a million dollars we felt for the vapor-recompression system would not really reduce risk. Therefore, we didn't chose it.

Louise Belt
Can I ask another?

Celeste Kuhn
Yes.

Louise Belt
The other concern that I have is about the Femme-Osage slough. You say, I think, in three different places in the EE/CA that it appears to present a hydrogeologic barrier to further contaminant migration from the quarry toward the well field to the south. Well, this seems to be based on one sampling station, that WS259,

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which does have a background reading. That's between the slough and the river and the well field. It just doesn't seem that one well would give you enough information to base this conclusion on, particularly when the conclusion is repeated three times. It gets to be like a mantra. I mean, I really think you need more sampling between the slough and the well field or between the slough and the river. To be absolutely sure of this and stop talking about things that appear to present. It doesn't make sense.

Celeste Kuhn

Yes, Mr. McCracken?

Steve McCracken

I'm going to let Roger Nelson address that.

Roger Nelson

WS259 is a simple bore hole that was drilled just to look at the ground concentrations. Indeed, there are many other wells on the south side of the slough. I think there are ten of them on the south side of the slough that are sampled very routinely and all of those measurements have always come up at background levels or indistinguishably above background levels, with the exception of one anomaly which is a county well that was installed.

Louise Belt

Alright. I hear you but I don't want to think of an anomaly as an anomaly. I think that maybe that's an indication of future trouble.

Steve McCracken

Can I add one thing? We've got a very, very extensive monitoring system and in fact that monitoring system that is installed is one of the examples of what we have started and we have added to as a result of questions and comments that were raised that were good ones from the St. Charles Countians, for instance. We had a very extensive meeting one day and we talked about nothing except that monitoring system. As a result of that discussion, in fact, we added several more wells that would give us more information. So we've got a very extensive monitoring system down there that we think reliably tells us that the St. Charles county well field is not being contaminated.

Louise Belt

Hope you're right.

Celeste Kuhn

Thank you. Timothy Dunn.

Timothy Dunn

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Good evening. My name is Tim Dunn, D-u-n-n. I have a prepared statement. The reason why I bothered to be here tonight, I'm a small general contractor in the city of St. Louis, I have three grown daughters, one granddaughter and one on the way. I'm an avid bird-watcher and every spring I buy a fishing license, though I hardly ever catch a fish. Last year I won the, or got a Missouri camper award for camping in Missouri state parks for the year. So here I am yesterday, reading this series on the miracle with a price. As I was reading it, I got really angry about Mr. Mallinckrodt and also Mr. Arthur Compton deciding at lunch one day that they were going to process uranium. And now here we all are dealing with this problem. The main thing that I want to talk about is bio-accumulation, which obviously those two didn't know anything about, and I'm glad that science has progressed. Being a Missouri citizen, I too am affected by the accumulation of toxic chemicals like chlordane in fish in many rivers and riverways in Missouri. Here, we are treating and dumping water from a highly polluted quarry area into the Missouri River. And like that infamous lunch in 1942, you seem to be saving the wells of St. Charles but slowly killing the fish eaters and water drinkers in other areas. As the DOE's Weldon Springs site project report states on page 45 of its annual environmental report, "Accompanying these lower levels of exposure has been an increased knowledge of environmental processes, especially bio-accumulation which can result in additional exposure which may be greater than that arising from the intake of the environmental radioactivity in air and water alone." A real concern here is that poor people who come and fish these waters, especially lakes 35, 36 and 37 and who do fish the Missouri River. They grind up the whole fish, where we know the radioactivity is stored in the bones, but they grind up the whole fish to make fish cakes. They eat those fish cakes. In closing, let me say, that I am deeply concerned over this problem. I do not want to leave my grandchildren a world where the pleasures of camping and fishing and enjoying nature can only be seen on T.V. And I don't want to pass the contamination along to some other location to the grandchildren of some other nature lover. We have a responsibility to ourselves but also to the poor and future generations who are most vulnerable. To those who fish here regularly and to those who would someday fish here, they have a right to inherit a world that's clean and a nature that is pure. My question is, how about these people's safety, especially around where the pipes going to be, the water's going to be entering the river, and also in the area itself? Signs? Are people going to be warned? And also why does the, as I was reading some literature, why does the derived concentration guides keep fluctuating? It seems kind of like, why the picocuries and all of this sort of thing keeps fluctuating? But those are my questions. The safety.

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Celeste Kuhn
Mr. McCracken.

Steve McCracken
I'm going to let Roger Nelson take that.

Roger Nelson
First of all the concern that you have about the lakes at Burmeister Spring and lakes 34 and 35 and 36 are unrelated to the question here tonight. Tonight, we are worried about the water treatment plant at the slough area. Your questions concerning the slough...

Timothy Dunn
But it is connected in terms of safety. Are people being warned? That's the connection.

Roger Nelson
We've performed a number of biological uptake studies just to answer the questions that you've posed tonight and we've collected several hundred fish from all of those lakes, including the slough. And tested them for bio-accumulation. Uranium levels, PCB concentrations, heavy metal accumulations, things like that. In addition, we have done terrestrial mammal sampling as well, rabbits and squirrels living on or near the contaminated areas. All of the, and just one other thing that I'd like to point out is some of the mechanisms or means of operation, for example, fishcake preparation. We simulated that by crushing and grinding the eviscerated fish as if they were going to be prepared into fishcakes. And did analyses for the above mentioned species in that fashion. And in every case we found that there were no levels of uranium at the detectable limits. These limits were especially low and we attempted to make them even lower than what could normally be done in exceptional laboratory practice. Our conclusions were that there is no measurable bio-accumulation even in the mechanism like the fishcake preparation.

Timothy Dunn
So you're saying there's no reason to put signs up? There's no reason to say, like you know, like cigarette packs, that these fish are as good as Canada's? Is that what you're saying, that there's no concern here about this?

Steve McCracken
From the DOE's point of view, there is no concern.

Timothy Dunn
Okay. How about Missouri state? There's no concern about the fishing and - there's no concern at all? When we were using

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chlordane and when we got the warnings the last few years about not eating the fish, you know, I'm sure back when chlordane was considered safe or whatever, ten years down the road, we'll have to not eat these fish.

Bob Hentges

I can't answer your question on fish. The Department of Conservation has been participating with DOE on these and I don't know the results of the outcome.

Timothy Dunn

I don't think it would hurt to put this, to put some kind of sign, some kind of warning.

Steve McCracken

I smiled a little bit because in the paper this morning, Dr. Garvey had mentioned that he wanted us to put up additional signs and the fact is that around our quarry area we have put up signs. Every time we put them up, somebody steals them. We intend to pursue that and put them back up again. And whether or not signs are put up in the Department of Conservation land, certainly we don't believe that they need to be, but that's a decision that the Department of Conservation would make.

Timothy Dunn

Okay. Thank you.

Celeste Kuhn

Thank you. Roberta Gutwein. Is she still here, Roberta Gutwein. Oh, okay, sorry.

Roberta Gutwein

My name is Roberta Gutwein, G-u-t-w-e-i-n. I think if I had questions, they've probably already been answered, but I did want to make some comments. As the mother of three young children, I naturally have many concerns about their well-being. But all else seems unimportant when their health is in question. When I read of the Department of Energy's proposal to dump three million gallons of treated radioactive water into the Missouri River, just twelve miles upstream from the water intakes for St. Louis and St. Louis county, I felt terribly concerned. I have little trust in what officials say is safe. New proposed NRC standards say that alpha radiation, the kind of radiation that uranium gives off is twenty times more toxic than beta or gamma. Just a couple of years ago, alpha radiation was claimed to be only ten times more toxic. What will the NRC say next year? What will the DOE say next year about what is supposedly safe this year? When this supposedly safe level of treated radioactive water has already been dumped into our drinking water source, next year will be too late to tell us the

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standard should have been more stringent. Dr. Carl Z. Morgan who was the creator of health physics and set the standards for the Atomic Energy Commission starting in the 1940s wrote in 1980, "In the early '50s, thousands of studies began to show that there is no safe exposure level and no level of exposure that can be set so low that the risk of radiation induced cancer is zero." If studies from the '50s show there is no safe level of radiation exposure, why do we continue to expose ourselves and our children to this danger? Surely, there is no easy way to deal with this water at Weldon Spring, but I cannot believe that dumping it into our drinking water source, even though it is to be treated first, is the solution.

Celeste Kuhn

Thank you. Debra Storch.

Debra Storch

My name is Debbie Storch, S-t-o-r-c-h. At this time the treatment of the contaminated water preferred by the Department of Energy, as stated on page 116 of the engineering evaluation, is a method that has been insufficiently tested. This proposed solution includes lime addition, granular media and adsorption. To effectively evaluate the outcome of this projected treatment, I feel that it is important that the following measures be taken. Water from different depths of the actual quarry should be tested, utilizing these named technologies before any commitment is made to either construct a full scale plant or to put into use these various technologies. It is because of a lack of experience that we are here today attempting to ameliorate this present disastrous situation. We must not allow action for the sake of haste to take precedence over perhaps more time-consuming cautionary methods. Otherwise, dollars spent on insufficient techniques will only return us to our present situation.

Celeste Kuhn

Thank you. Do you have a comment, Mr. McCracken?

Steve McCracken

Yes. I would like to address how we sampled the water, if we could.

Roger Nelson

The influent numbers that the design of the treatment plant is based upon were estimated and measured by sampling. Over the course of the years, numerous samples have been collected and measured for a very large variety of parameters for the analyses for the priority pollutants which is the latest, most complete set of analyses. The water was sampled at several discrete depths I believe, at top, middle and bottom, composite samples. So, we're

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relatively confident that the measurements, the analyses for that influent are representative of the quarry sump water.

Steve McCracken

One additional comment, too, and we keep coming back to that. Mr. Hentges mentioned it too, and that we by the way that is that we are going to hold the water, the treated water in the effluent ponds and sample it before we discharge, we will know whether or not our treatment system has worked and whether or not we have met the water quality requirements before we release the water. So, it isn't as though something's going to slip by us and get into the river before we know it.

Celeste Kuhn

Okay. Charles Belt, Jr.

Charles Belt, Jr.

It's difficult for me to tell.

Celeste Kuhn

I'm sorry, can you spell ... thank you.

Charles Belt, Jr.

Yeah. I'm Charles Belt, Jr. from the St. Louis, Missouri area. I'm a member of the St. Louis Coalition for the Environment and the Sierra Club and I'm not representing either one. I have a PhD. in geology. I'd like to comment. First, most of you have ion exchange resins that remove the water, the soluble ions in the water to keep your ions from becoming clogged up with calcium and magnesium salts and they do an excellent job. I've had one in my laboratory where I did an analysis of water by atomic adsorption spectrophotometry and it made the water so pure that I couldn't detect any levels of potassium, sodium or other elements. It's an excellent method for removing trace quantities from water and I want to compliment you for the design of the plant. As far, in principle, it looks good. But I'd like to make some other comments. The median flow of the Missouri River is about 5,700 cubic feet per second. That occurred in 1940, before there were no upstream dams, that's true. But, you can get ice gorges in the winter time that can dam the river up in and cut the flow down appreciably. So for worst case scenario, you should use the minimum flow. Even though the dams are up there releasing water, you could have several years of severe drought like we had last summer. However, I do believe that you should make, even though you are not considering dilution as part of the solution, you should release your calculations on the concentrations that you expect to be in the river water at the closest water intake plant about 10 miles downstream. The total flow that you're releasing is very small compared to even a flow of 5,700 cubic feet per

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second per day is only about 115,000 gallons per day and that's quite a small proportion. However, I do think that it would be wise if you have not done so already to make a plume analysis. You've got, your plume is very small. It's not like the Missouri River trying to meet with the Mississippi. It actually takes over 20 miles. Those are two great big things meeting. Also, you should consider that actinide elements are adsorbed by the clay and silt particles in the river further reducing your concentration. And an analysis like this realistically would reduce - I would agree that the drinking water concentration's very low provided that the plume does not persist more than, is short of ten miles, particularly because you're going to get even at water temperatures of about 40 degrees fahrenheit, that you could in winter time where you would have less adsorption due to lower temperatures. So I do suggest that if you have not made those calculations, please try to do so and, if you have, I'd like to have you publish at least a number of them, so that we can get an idea about what water concentrations you expect to get at the nearest intake. Another comment. You can estimate biological magnification by a factor of a thousand or ten thousand and again, just like everything else, always calculations are estimations and unfortunately that's what they are. And I'd like you to, estimate biological magnification of the thing. I think you've tried to do that, but I'd like to see the calculations on that. So if there are any, if this is in terms of comment or question, I'd like to have anyone who'd like to respond to that. Thank you very much.

Celeste Kuhn

Thank you. Mr. McCracken?

Steve McCracken

I'd like to make a few comments. We appreciate your comments certainly that say that you believe that our system will work. Certainly we share your opinion. As far as the calculations at the nearest intake, we have considered that you get complete dilution. One of the important bases for that is that you must get dilution for the plume to get across the river to where the intakes are. I would, many of your comments were very good. I don't know that we have all the answers tonight. Certainly we will consider them and I'd invite you to give us a call or come see us and maybe we can talk about them some more in our responses. Perhaps we can take care of them.

Charles Belt, Jr.

Thank you.

Celeste Kuhn

Bud Deraps.

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Bud Deraps

My name is Bud Deraps, D-e-r-a-p-s. I'm from (garbled) speaking for myself. I have one short comment and a question. We are now reading reports of radiation releases at DOE plants that were said at the time to be safely operated by the DOE for the plant operators. My question is, originally I was going to ask, is it proposed that the DOE will be the only agency responsible to monitor the discharged effluent? Now we have heard that the Missouri Department of Natural Resources will monitor it part-time because it's expensive. But you would you kindly explain what that means?

Bob Hentges

What we anticipate is we will be doing a lot, or not a lot, but some analysis upfront when they first start the plant on line to make sure that it's working properly. And as we get into the system and get more faith in the system that it's going to work properly, we will do less monitoring.

Celeste Kuhn
John Gestrich.

John Gestrich

My name is John Gestrich, G-e-s-t-r-i-c-h. And I've got a few questions and, and comments. I was wondering after the water is removed and the sludge is in the bottom of the lake - what is going to happen to that sludge? Could somebody answer that?

Celeste Kuhn
Mr. McCracken?

Steve McCracken
Would you like to take that one?

Roger Nelson

The removal of the water is simply the first step in the overall removal of the bulk waste from the quarry site. In order to get to the bottom of the waste and remove that material safely, the water needs to be removed, so the treatment plant is just to do that. That aspect of the removal is a completely separate environmental decision which we are not prepared to discuss tonight. But there will be a complete RI/FS that will be occurring in the next year approximately.

Celeste Kuhn

Excuse me. I think the gentleman's question is what will happen to the sludge, at the treatment facility, is that correct?

John Gestrich

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Yes, I was wondering where you were going to go with this sludge.

Steve McCracken

Oh, yes, that's a good question. You mean the sludge that results from our treatment process that precipitates out?

John Gestrich

No, I didn't think of that. I was thinking of like, the bottom of the lake.

Steve McCracken

Oh, the quarry sump itself?

John Gestrich

You know, there's the quarry and the two lakes, raffinate pits?

Steve McCracken

Oh, the raffinate pits up at the plant site?

John Gestrich

Right. The quarry's a little farther away. Aren't you going to drain the raffinate pits, too?

Steve McCracken

Right. Up at the plant site there are four raffinate pits. Those pits contain about 250,000 yards of sludges and about anywhere from 50 to 60 million gallons of water. What we're talking about tonight does not address that problem. What we had planned to do, as a part of our overall decision-making process and we will address what to do with that water and then what to do with those sludges and I don't think that we're, we're not in a position tonight to tell you what we're going to do with them yet. We've got a lot of studies underway right now, looking at various alternatives of what to do with those sludges.

John Gestrich

Okay. Are there any guidelines, I mean we kind of said there are no guidelines, will there be guidelines set for the amount of picocuries that are per liter left in the water before you start dumping it?

Steve McCracken

Do you mean the raffinate pits?

John Gestrich

No, you know when you process the water, are you going to, is the Department of Natural Resources going to set as the maximum that you're allowed to put in the river.

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Steve McCracken

You want to take that Bob?

Bob Hentges

We've reached an agreement with them that the treatment process will treat it down to no more than 100 picocuries per liter and try to average 30 picocuries per liter.

John Gestrich

I wish it could be, well, I wish it could be nothing, but you see this is the largest river in this hemisphere and I'm concerned that any more radiation than what we're getting from background is dangerous and is accumulating in our bodies. And I hope that the Department of Natural Resources could establish a firm, a little bit firmer guidelines than 30 to 100, because you know that's quite a variation. The other thing that I wanted to comment on was there is something that can be done that doesn't require a lot of high technology and that is the fact that the school is so close and the radon gas that will be given off as a result of draining this quarry, I would like for you to move the school. The other question that I have is what is the projected cost of the water processing plant, do you know?

Celeste Kuhn

Mr. McCracken?

Steve McCracken

The water treatment plant cost is about a million and a half dollars in present work. That means that, as if we built it and operated it today. The cost will increase some due to inflation over the period that we operate.

John Gestrich

And what will the future plans for the plant be after the cleanup is completed? What will you do with the plant?

Celeste Kuhn

Mr. McCracken?

Steve McCracken

The water treatment will go on for a period of five to six years, that is to remove the water that's in the sump and then any water that flows into the sump and then any wash water that is generated as a result of our bulk waste removal activity. As far as what we would do with that plant after a period of five or six years, I, we haven't got any plans for that facility beyond that period of time. Our only plan for that is to use it in the quarry area and we don't have any plans beyond that.

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John Gestrich

I also would hope that the Department of Natural Resources would mandate that this plant would not be used to process water brought in from any other place after we're done with it here at Weldon Spring. I hope it doesn't become a processing plant for everybody's waste. That's basically all I ask, that wouldn't require a lot of technology and move the school too. Could I turn in a written testimony?

Celeste Kuhn

Certainly. Give that to Mr. Hentges. Thank you. Charles Englert.

Charles Englert

My name is Charles Englert, E-n-g-l-e-r-t. I represent myself. I have no planned talk. I just have some comments. I think one of the problems we face is that the DOE has almost zero credibility in the eyes of the American public. Let's face it. That's true. You have not justified our faith in your work. You may be doing good work but that your record over the years has been very poor. Many people have been hurt by their decisions. My concern is that if you started this program, what if it turns out to have problems? Are you prepared to stop it? That is a question. Are you prepared to stop if you can't reach your standards?

Celeste Kuhn

Mr. McCracken?

Steve McCracken

Absolutely. If we can't meet our standards then we will stop work and we will reassess and we'll do whatever we have to, to meet those standards.

Charles Englert

The other question I have relates to the Missouri Department. I think we should monitor much oftener than that. I think we should monitor after the plant is in operation. You suggested that you are only going to monitor in the beginning and that throughout that time you will very rarely check the water.

Bob Hentges

Okay. That's all we the state will be able to do. DOE will be required to take a sample out of every batch that's discharged.

Charles Englert

And will that be made public?

Bob Hentges

Yes. That data will be sent to me on a quarterly basis, and it will be public record.

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Charles Englert

And the public will be informed if it gets out of line?

Bob Hentges

As the data is available, yes.

Charles Englert

You will get that data and you will tell us if it's out, if the standards aren't being met? And you will help us close it down?

Bob Hentges

Yes.

Charles Englert

Okay. That's all I have to say.

Celeste Kuhn

Thank you. Kathy Lewis.

Kathy Lewis

I'm Kathy Lewis and I'm speaking as an individual. And I arrived late but I was wondering if anything has been done like this before anywhere else, if there's been a precedent for this decision?

Celeste Kuhn

Mr. McCracken? Would you care to repeat?

Steve McCracken

Do you mean the type of treatment system?

Kathy Lewis

This type of treatment system and being released into a water system such as the Missouri River where it's going to be as close as it is to a drinking water source?

Steve McCracken

Boy, if you hadn't, there are many treatment systems like this one. It is very standard industrial equipment. The ion exchange system certainly adds the capability to polish the uranium and other things that are in the water. As far as, has it been done in other places, yes it has. I doubt that it's the exact same configuration but systems similar to this have been employed. In fact, they are being employed in other places. Some of them do not have ion exchange, however, because they are not treating to levels of uranium as low as we plan to. And yes, they are discharging to a river.

Kathy Lewis

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Okay. My concern is, are there longitudinal studies going on at the same time about health factors? And I'm not just concerned about human health factors because I feel that human beings have so long disregarded the other living elements, the other living beings on this planet. I'm real concerned in terms of it getting into the food chain and I'm just concerned of it in terms of water as being one of the necessary ingredients for all life.

Dr. MacDonell

We have those same concerns, that's why we're being as most protective as we can in what we're doing.

Kathy Lewis

As an individual, I just get a very helpless feeling at meetings like this, because I feel like something that all of us need and rely on is being decided by a group of people, when we don't know what's really going to happen to us and to succeeding generations.

Steve McCracken

The gentleman earlier said that the DOE has zero credibility and that many people have been hurt. I would argue whether many people have been hurt but I don't argue that our credibility is not what I would like it to be, seeing as how I work for the DOE. However, that is one of the reasons that we are very happy to say... (end of tape).

(Beginning of next tape.)

Ms. Barnes

I have a short comment and question. My question is what can we as citizens do to lower the uranium levels? And I'd like a comment.

Celeste Kuhn

Mr. McCracken?

Steve McCracken

Are you asking what can you as citizens do to lower it below what we are already proposing to lower it?

Ms. Barnes

Right. You're saying between 30 and 100.

Steve McCracken

Yes.

Ms. Barnes

What's wrong with ten or five? Besides the money?

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Steve McCracken

The study that we have prepared in our minds indicates that there will be no significant improvement as far as risk to the public goes, if we treated to levels lower than what we are proposing and that's why we're doing what we're doing, but we are proposing to treat to levels that are far below what is even a current standard that is considered safe. So as far as what you as citizens can do, what we try to do is to listen to your comments and incorporate them where we can. And certainly, we listen to what you say.

Ms. Barnes

Okay. I have another comment. A friend of mine talked to the Envirodyne engineers who did the studies on the lakes and ponds around the site and they commented that the muskrats and frogs around these lakes and streams are so hot they could glow in the dark. I just was wondering if you had a comment on that?

(Asked to repeat question by someone in the audience.)

Ms. Barnes

Okay. A friend of mine talked to the Envirodyne engineers who did the studies in the lakes and ponds around this area and they commented that the muskrats and frogs were so hot they could glow in the dark.

Roger Nelson

I can assure you that, that is a false statement.

Ms. Barnes

How can you assure me of this?

Roger Nelson

Because I work and live there and I see muskrats and opossums and raccoons and geese and deer and turkey and they do not glow in the dark. They never have glowed in the dark, they never will glow in the dark.

Ms. Barnes

What if they were? What trust do we have in you?

Roger Nelson

They do not. In addition we have collected many of the samples of biological tissue and we've analyzed and never found any radiological levels above background.

Ms. Barnes

I'm not sure if you're informed about Sherman Reservoir, but one in five benthic samples at Sherman Reservoir exhibited radionuclides. It's in Massachusetts, the Yankee site. But how

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can you assure us, I'm saying that there's been no studies. There are studies yes, but we are not informed about this.

Steve McCracken

But there are studies. We have got ...

Ms. Barnes

But what's to assure us down the road? Like a man commented earlier, it took 30 years. You guys haven't done studies that long. How do we know? That's just a rhetorical question.

Steve McCracken

I think that what you're getting at says that you need to clean the site up and we couldn't agree more. We think that we should get on with the cleanup activity and that's what we're proposing to do. We don't propose to wait until April of 1991 when you're going to have a final waste decision or disposal decision. We're saying let's get on with those things that we can do that will significantly improve offsite releases that threaten human health or environmental health. And that's why we're saying get on with the work. And that's what we're trying to do.

Ms. Barnes

I'm just hoping we can trust you to do the right thing.

(Interruption by man in audience.)

Celeste Kuhn

The person who has the microphone is the one that can do the talking. We do have other people in line and if we have time you can do the talking some more.

Ms. Barnes

I'll address it. That my initial question was how do we lower the uranium rates? And you said they're low enough. Yeah, you're saying they're low enough per se. But what can we as citizens do to have it lowered? Because there is no standard. There is no standard for uranium in drinking water. We understand that you're saying 550.

Steve McCracken

That is correct. There is not a drinking water standard for uranium. There is a surface water discharge of 550 picocuries per liter to a river such as the Missouri River and we're proposing instead of that number to go much, much lower than that and to get into a range that is being discussed by the EPA for drinking water. So I don't know what more we can do. There isn't a drinking water standard but we are within a range that is drinking water. In fact for a discharge that is not a drinking water discharge.

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Ms. Barnes

But so in essence we can do nothing to have it lowered even more?

Steve McCracken

That's not correct. You as the public have a right to know what we're doing and a right to input to that process. And that's what this process is all about tonight. If you do not agree with our decisions, there are other ways that you can certainly respond.

Ms. Barnes

Thank you.

Celeste Kuhn

Allen Nemes.

Steve McCracken

Can I make one other comment? When a drinking water standard is proposed, it will be advertised by the EPA in the Federal Register and that will give you another opportunity to express your opinion about how low the uranium levels should be.

Allen Nemes

My name is Allen Nemes, N-e-m-e-s. I'm a member of The Coalition for the Environment but I'm here on my own behalf tonight. I have not had an opportunity to read your reports and studies, so I apologize if some of the questions that I ask are in there. I don't have any comments but I'd like to ask a series of quick questions. The first is I understand that there are several, there are some pits and some ponds in a variety of different locations within the Weldon Spring area. One of the things that I wondered about is, had any consideration been given to treating the water in one portion, sealing it off and attempting to recycle the treated water back into Weldon Spring, as opposed to them distributing it into the Missouri River or the Mississippi River?

Celeste Kuhn

Mr. McCracken?

Steve McCracken

There is no capacity on the Weldon Springs site to do that.

Allen Nemes

So it wasn't considered, but because of...

Steve McCracken

Because it's not feasible. You couldn't do it.

Allen Nemes

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You'd have to dig another hole, is that the idea?

Steve McCracken

Margaret corrected me. It was considered, but it is not feasible.

Allen Nemes

I see, and that's part of the report?

Steve McCracken

Yes.

Allen Nemes

Next question. What impact would a lower uranium standard have on your plans if during, you said that lowered uranium standards have been suggested, there have been different numbers bandied about. What if the EPA came along with a lower standard than what you're planning on? How would that effect your continued distribution of water out of the site. Would you have to stop? I guess I'll end the question there.

Steve McCracken

That's a good question and if you give us just a minute to figure out what our answer is. I'm not sure of what the law requires or what the rules and regulations require once you have a NPDES permit and you establish a discharge limit. However, if a different level was, that is appropriate to the things that we are doing, did come along, we would certainly look at that and look at modifying our system to try to treat to those levels, if they're appropriate. And that would be something that we would do in cooperation with the DNR and EPA.

Allen Nemes

Okay, just so I'll understand. Is the technology in place right now to make the uranium standards lower than what you've proposed. I mean if the EPA should come along and demand a lower proposal, or would you have to then create new technology to lower the standards?

Steve McCracken

I believe that the technology exists today to reduce the uranium levels lower than what we are proposing. It's, a matter of fact, that is outlined in the document that we have.

Allen Nemes

Can I ask a couple more quick questions?

Celeste Kuhn

One more.

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Allen Nemes

Alright. I have to chose.

Celeste Kuhn

Well, maybe two.

Allen Nemes

Okay, great.

Celeste Kuhn

You're the last one.

Allen Nemes

Oh, good. The gentleman in the red shirt had asked earlier about the wells from which people were getting drinking water and you explained that it did not impact certain cities but it did impact certain other areas, and certain other water companies. My question is a lot of people raised concerns tonight about waiting longer to see what the long-term effects of the radiation are and to perhaps consider other alternatives. Is it physically possible for these other water companies to buy their water? Let's assume we decided to put this whole thing on hold for another couple of years? Would it be possible for the water companies that now get their water from those wells to purchase the water from either St. Louis county water or other municipal water systems?

Unidentified Responder

Not without going to an awful lot of expense. There is no piping connection, as I understand it, between St. Louis county and Missouri Cities, so it would take a pipe of some sort from the county probably across the Missouri River to serve the Missouri Cities and St. Charles county customers.

Allen Nemes

I see. But that has already been done for St. Charles and for St. Peters. So it is conceivable, it's just a question of the price tag.

Unidentified Responder

Right. Well, there is one other consideration too, though that would be the capacity of St. Louis county to sell the water and I have no idea whether their current capacity is such that they could just add another 63,000 customers.

(Interruption from audience.)

Celeste Kuhn

I'm sorry. You'll have to step to the mike.

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Allen Nemes

Was that consideration a part of your calculus when you decided on this particular method?

Steve McCracken

An alternative water supply would not solve the problem that exists down at the quarry. It would simply take away the threat to the St. Charles county well field. Therefore, no, we did not consider that. We are looking for alternatives that will improve the condition in the quarry. And that's what we looked at.

Allen Nemes

The final question is a procedural one and I apologize because I came late. The comments that all the people have made tonight and my own. Are these a part of the record that you will have to address in coming up with your final plan or is the plan complete and now you're just giving us a chance to air our grievances?

Celeste Kuhn

Mr. Hentges?

Bob Hentges

They are all questions, they're all part of the record for the NPDES. And I will consider all of these in final determination on the permit.

Allen Nemes

Okay. Thank you.

Celeste Kuhn

Okay. I believe that there is a gentleman here earlier who wanted to ask a follow-up question about the pipeline to underground storage. Is he still here? He was wanting to speak. Okay, Mr. (garbled) I know that you had a couple of comments. Did you want to speak at this time? (away from microphone) We can't hear you.

Unidentified Questioner

Ms. Barnes comment and question I think was a serious one. Is there anything that we can do to urge the DOE to get that lower level, to aim toward 10 picocuries per liter instead of 100? Is there anything we can do to help that happen? Or can we urge the state of Missouri to help lower it even to 15? I heard you admit that the technology exists and some of the studies I've read say that they do, that we can get it down to 15 picocuries per liter. Is there something we can do to help that process along?

Bob Hentges

That's a difficult question to answer. We do not have the authority in the state of Missouri to regulate radioactivity. Its

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a preemption to the federal government. We have worked with the DOE and got down to reach numbers we feel very comfortable with. We do not have any authority to demand from DOE any numbers lower than that.

Steve McCracken

I wouldn't want you to think though, that the DNR doesn't influence what we do, even though it's not within their jurisdiction. Because we've talked about this quite a bit before we came here tonight. I can assure you. As far as what you can do as citizens, we try to demonstrate time and again that, by our actions, that your comments are important to us where we can. We have a mandate to achieve as low as reasonably achievable both in determining what our cleanup activities should be and then once we carry out that cleanup activity. What we're doing is committing to numbers that we think that are very, very, very reasonable. Certainly, under ALARA, we will clean up as well as we can as we go along. Our commitment is to always be below 100, our goal is to be at 30. Whether we would exceed that goal, I can't answer that. I guess I don't know whether I'm sounding evasive or not, your comments are important to us. They are a part of this process. We must respond to those comments in the best way we can and we will consider them to the extent that we can. The other, as a citizen, the other options that you have I'm sure that you're aware of and that's that you can talk with the other agencies and that you can express your concern and opinions and there are many other avenues for you to influence the system.

Unidentified Questioner

I just hope that this point in the process before you built the plant that we could go ahead and do the in-depth technologies that could bring the level down a little further. But that's what I'm urging. Anyway, thank you for your time.

Celeste Kuhn

The gentleman in the back.

Bill Thayer

Yes, my name is Bill Thayer, and I'm representing myself. I understand, I wasn't here in the earlier part of the meeting, so I don't know what was discussed about the sources of radioactivity, but the water does shield us somewhat doesn't it, from the other nuclides that are in the quarry? What protective layers would you replace the water shield with? I mean, doesn't the water absorb some of the nuclear particles that are emitted from those sources of material at the bottom?

Steve McCracken

I'm going to let our environmental safety and health manager

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address that. But, yes, we have thought about that and yes, there are things we can do.

Roger Nelson

I presume that you're talking or referring to gamma radiation from the materials at the base of the pond?

Bill Thayer

Also alpha, I believe alpha particles are slowed down tremendously by a little bit of water.

Roger Nelson

When the water is removed, the gamma radiation levels will go up marginally, very small, almost an insignificant amount. And that gamma radiation will only be seen or derived in the work place right in the quarry itself, not where the water treatment plant is.

Bill Thayer

What about birds and animals that are going over the top of the quarry. Will they absorb additional radiation?

Roger Nelson

There will be an increased dose to them but it will be indistinguishable above background.

Bill Thayer

And with respect to the alpha particles, won't the alpha particles actually be more free to travel?

Roger Nelson

The alpha particles have a mean free path in air of one centimeter, that's a half an inch. I doubt if the birds are going to be flying that low to the ground.

Bill Thayer

So you're going to keep the birds and worms and animals out of the area?

Roger Nelson

No more so than exists right now.

Bill Thayer

And what about air carriers? What about the air itself as a carrier?

Roger Nelson

There will be increased levels of dust due to dewatering, but remember that the water is not removed entirely. The moisture content is still probably 10 to 20 percent of the moisture

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saturation fraction.

Bill Thayer

So what you're saying, there's no plans at the moment for adding a shield once you remove the water? No paraffin, or any kind of shielding?

Roger Nelson

No, there are no provisions for adding a shield. But remember that the water removal which is what we're here to talk about tonight, is just for the water treatment. The quarry exhumation, the movement of the material in the quarry is going to be the subject of an additional environmental documentation process on which we're going to enter in the next few months.

Bill Thayer

It seems to me that you're opening a wound for additional things that you don't have any plans to cover. That the water shield that's there now, even though it's a danger to us, is acting as a shield to the general environment, and it doesn't seem like you've got plans to replace that shielding.

Steve McCracken

I'd like to make just a few comments. First of all, the sump really does not cover the waste pile. It is adjacent to the waste pile. We won't be uncovering significant amount of waste when we draw the water down. I think that the one shielding question that we did not answer is what does drawing the water down do to radon levels. We believe that it'll be, that the increase in radon will be very, very, very small. We're going to have a very extensive monitoring system to assure that that happens. If the radon levels were to go up to any extent that would cause us concern on the site, then we would take actions to reduce that radon level and there are things that we can do, if that occurs. But we really, we are virtually certain that they won't be required. But we are going to plan to do them, if we have to.

Celeste Kuhn

Okay. Would you care to come to the microphone?

Margaret Hermes

My name is Margaret Hermes, again. Mr. Nelson, I'm confused by what you said. Were you saying that the alpha particles can't lift or travel more than, less than an inch?

(Interruption from audience.)

Celeste Kuhn

I'm sorry. We can't hear you back there. Can he go ahead and

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answer the question, and then you can come back.

Roger Nelson

There are three types of radiation, I'm sure you're aware: gamma rays, beta rays, and alpha radiation. Each of those is the result of some nuclear disintegration process. Alpha radiation, in effect, is a helium nucleus emitted from an atom. When that helium nucleus is emitted, it travels approximately 1/2 inch in air.

Margaret Hermes

But, it can be carried in air many, many miles from its source.

Roger Nelson

The original nucleus, the parent nucleus can be carried many miles in dust and when it decays, it'll release an alpha particle which will travel 1/2 inch.

Margaret Hermes

But, in effect, the alpha particle can travel many, many miles if it's travelling in dust.

Roger Nelson

We will be doing real-time particulate monitoring to make measurements for the airborne radioactivity on dust particles and we will control the operations based upon the results of that monitoring.

Celeste Kuhn

Sir, would you like to return to the microphone? Please.

Bill Thayer

Once you've uncovered it, then it's open, it's got some exposure right? The sludge in the bottom, the radioactive material in the bottom of the quarry? If you did monitor it and if you did find out that some of the dust particles are travelling and giving off either or alpha or gamma or beta particles, how would you then cover it? How would you then prevent it from, the materials from moving through the environment?

Steve McCracken

Let me repeat one thing and then I'll... You have the waste here, and then the water's over here. The only thing that you will be uncovering is whatever sludge from rotted leaves and things like that, that has accumulated in the bottom of the quarry over the period of time that the sump has been there. Now, we would not allow that material to dry out and become airborne. If it posed a problem to us it's such a small area that we could put liners over it, we could do a number of things that would reduce radon and air particulate.

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Bill Thayer

One liner might be?

Steve McCracken

Hyphalon. The important thing to us is that we are going to have a very good monitoring system to assure us that there is not any material going offsite and if that happens, there are a number of things that we can do and will do to assure that that does not happen.

Bill Thayer

What kind of wide-range studies have you done to find out what of the 1,300 nucleotides that exist also exist there. I mean, you've only talked about two or three particular nuclides that are radioactive. Is there a wide range, have you done a wide-range study of all of them?

Steve McCracken

They're debating who wants to answer this, I think.

Bill Thayer

Of the 1300, what ones, how many do exist of the 1300 possible?

Robert Nelson

All of the nuclides that are in the quarry are there as a result of the naturally occurring nuclides series. That's the uranium-238, the uranium-235 and the thorium-232 series. And every single nuclide in each of those series has been identified and exists at some concentration. Some higher than the other. The highest concentrations are the uranium-238 series. In the gamma scans that were performed to try and determine the levels of all of the naturally occurring nuclides, analyses were also performed for the other 1300 and whatever gamma emitting nuclides and all of those were not found in levels distinguishable above background.

Bill Thayer

Okay, thank you.

Celeste Kuhn

Thank you. Is there anyone else who would like to ask a question or make a comment? Yes, sir.

Don Lohrengel

Yes, my name is Don the last name Lohrengel spelled L-o-h-r-e-n-g-e-l. And I'm pretty much a layman when compared to all the terminology that's been dispensed tonight. I have a couple of questions though, and number one is, in this monitoring system, will there be a monitor at say the intakes of the water treatment

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plants?

Ron Burgess

I believe the water companies are currently monitoring and will continue to do that monitoring. The Department of Natural Resources will also do some monitoring of intake water.

Don Lohrengel

Specifically, for the contaminants that will be dispensed from the plant?

Unidentified official

Yes.

Don Lohrengel

I have a lot of comments most of them have been repeated, were already asked, but in the heart and soul of all of the panels, I would like for you to each time you pick up a glass of water and you drink it, ask yourself if you would drink this water being dispensed, as apparently it is not relying on dilution process. If you can't in your heart answer that you would drink that water, then I would challenge you to explore new technology. I'm sure it exists. Thank you.

Celeste Kuhn

Thank you. Mr Mahr?

Ed Mahr

M-a-h-r. A continuation of the question, all this is coming about because we're safeguarding some water of some Missouri towns according to the gentleman over there on my right. What total number of people's water are we safeguarding by cleaning out this probably one of the more dangerous pits in the country? How many peoples lives are we protecting as opposed to the number in St. Louis and St. Louis county? Is it a thousand, 10,000, a million? How many people in Missouri draw their water over what distance from this area?

Unidentified official

Well, I think the two populations you'd be dealing with there would be about 63,000, 65,000 people derive their water from the Weldon Spring well field, which is the one just south of the quarry. And then I believe that we have calculated something on the order of a million and a half to two million people draw their water and get their water from St. Louis county, St. Louis city combined. So those would be the two numbers.

Ed Mahr

Thank you.

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Steve McCracken

May I make one comment there and that is we are not, we are not sacrificing the safety of the people in St. Louis in lieu of the safety of the people in St. Charles. All of our calculations, all of our studies and the water quality that we are generating is to protect those people that are downstream and that's the people in the city of St. Louis.

Ed Mahr

Question. If this has never been done before, might not we start on a smaller scale rather than one of the more dangerous and concentrated areas? I mean, why did you particularly pick this one to work with? I'm sure there are others around the country, Hanford or down there in South Carolina.

Steve McCracken

I can tell you that there are a lot of priorities for the government. My priority and the priority of these people here is Weldon Springs and we picked the area on that site that we feel needs to be taken care of first, and that's the quarry.

Ed Mahr

No, no that was not the question. I mean, I asked why Weldon Springs rather than Hanford or South Carolina? Aren't there sites down there with the same type of problem?

Steve McCracken

Yes and there are other people down there looking at those problems too.

Ed Mahr

But they haven't started yet? I mean any type of cleanup down there?

Steve McCracken

They have started and they are treating water and discharging it frankly, they've got some problems down there that make the ones here look pretty easy.

Celeste Kuhn

Okay. Ms. Hermes?

Margaret Hermes

From my research over the past years about the releases of water from the Callaway Nuclear Power Plant, it is my understanding that there are no water companies in the St. Louis metropolitan area that test for uranium and I am wondering if Mr. Burgess could tell us which water companies do test for uranium?

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Ron Burgess

No, I meant that they were collecting samples which are then tested by the lab here in St. Louis county.

Margaret Hermes

And who will be paying for that since you said DNR will not be paying for ...

Ron Burgess

I have no idea. We have, we are doing testing at the present time, have done some testing and it's my understanding that also the St. Louis county water company has done some testing. Now there is only one certified lab, however, in the state of Missouri and so we have to both go to that same lab.

Steve McCracken

Ms. Hermes, we are going to be testing at the intakes for uranium.

Margaret Hermes

Thank you.

Celeste Kuhn

You would like to speak?

Jane Mendelson

My name is Jane Mendelson, M-e-n-d-e-l-s-o-n, speaking for myself. You say that you take into serious consideration the comments that are made in a hearing like this. I'd like to know, how we know how seriously you've taken the comments that have been made tonight? Is anything written up afterwards that we would have access to? That would tell us what changes you may have made in your thinking or your proposals. For example, I get a strong feeling tonight that there are many people here who would like to see the level of uranium lowered, since there isn't any agreed upon standard or carefully tested over a period of time standard for the amount of uranium that is safe for us to take into our bodies. Is there any way for me and the other people here tonight to find out whether in fact, you do consider lowering that level, whether you are going to lower that level or what your response is to some of the other major issues that have been brought up tonight?

Celeste Kuhn

I would like to point out that this is a Department of Natural Resources hearing on the Department of Energy's application, so Mr. Hentges will answer that first.

Bob Hentges

Thanks. If you've signed in and you've got your address legible,

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I'm not saying anything about your writing, but mine I can't read, you will get a notification as to the final outcome of the disposition of this permit action and we will make some changes as a result of some of the things that I've heard tonight. And I will spell those out when I write the actual letter that goes out to everybody who's on that sign-up sheet out there.

Margaret Hermes

So you'll make note of the changes?

Ron Burgess

Yes.

Celeste Kuhn

It is also our understanding that the Department of Energy is collecting comments on your EE/CA. Right?

Steve McCracken

That's right. What we will do is we will prepare for the record a responsiveness summary and those questions that we can answer or any changes that we would propose to make, any questions that we can answer better or any changes that we propose to make, will be a part of that record, and they will be available to you.

Margaret Hermes

And if the public isn't satisfied with the changes that are made after tonight, the next step is what?

Steve McCracken

Perhaps, ...

Celeste Kuhn

Mr. Hentges?

Bob Hentges

You can appeal my permit to the Clean Water Commission. There is a - were you here at the start of the session?

Margaret Hermes

No.

Bob Hentges

Okay. There's a document out there that shows you the permitting process, it's a legal sized piece of paper.

Margaret Hermes

Yeah, I have that.

Bob Hentges

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It tells you on the bottom that, what your steps are in the event that you're not satisfied with what happened, in step three and four.

Margaret Hermes
Okay. Thank you.

Celeste Kuhn
Yes ma'am.

Dollie Darigo
I'm Dollie Darigo, D-a-r-i-g-o. I was reading this paper that was on the table tonight that says "Draft" on it. It seems to have a disclaimer on the last page that if there is a ten- or twenty-four-year rainfall event then all this stuff that your planning would just go down the tubes. Do you have a way of handling that? Do you want me to read it to you: "except for any untreated overflow from facilities designed, constructed and operated to treat the volume of material storage runoff and construction runoff which is associated with a ten-year, 24-hour rainfall event, discharge"...and then it goes on to say what it can have in it. But I'm wondering have you planned for something like this, because in Missouri we've got a lot of these not only 10, 24-hour events or 10-year events, they may come every five years, two years, three years. Has this been taken into consideration?

Celeste Kuhn
Mr. Hentges?

Dollie Darigo
Page 4, number 4.

Bob Hentges
What is it. Oh, yeah, okay.

Richard Lockes
My name is Richard Lockes. I helped write this permit and I'm the person who added the section in question. And the section in question does not relate to their normal release from the treatment plant that they've designed. That's a standard clause that we put in a lot of permits that deal with material storage that isn't covered by the permit. So, if they had a temporary storage pile of some kind out there for whatever reason, say they build a road to get in or they're building the treatment plant itself, that clause is designed to make them control sediment during rainy months. That is unrelated to the other part of the permit where they have to, in the first few pages are the parts of the permit that deal with the permitted discharge. The other is a storm water clause that deals with site disturbances and those kinds of

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activities that are ancillary to the operation that has been permitted. It's a standard clause that's put in lots of industrial permits.

Dollie Darigo

Can you describe the fact to me is it high level, whatever.

Celeste Kuhn

Mr. McCracken.

Steve McCracken

I'm sorry, do you mean in elevation?

Dollie Darigo

Yes.

Steve McCracken

Tell you what, (to one of fellow panelists) can you talk something about that? I'm trying to - the elevation of the quarry - the quarry is a hole in the ground. It has high rims. There is no rainwater that runs into the quarry. Just adjacent to the quarry is where we would plan to put the water treatment plant. If you are concerned about an uncontrolled release, I can assure you that we are going to design this thing for no uncontrolled release, that we are very concerned that we will not have something like that happen. It would just bring down all the things that we try to build as far as credibility.

Dollie Darigo

Okay, that's what I wanted to know. Thanks.

Celeste Kuhn

Thank you. Is it Mrs. Belt?

Louise Belt

It seems to me that you mentioned putting the stuff that comes out of the filter press, in other words what's left after you take the ion exchange resins off that stuff, it's going to go into 55-gallon drums. Now Margarite Blanke talked about a 14 billion year half-life of thorium and something equally as long for one of the uranium. I don't see how your 15-gallon drum is going to last more than one billionth of that time - your 55-gallon drum. How long are those drums going to last, what are they making them out of, how thick are they?

Steve McCracken

I agree with you. Those drums will not last nearly the time that that material will be hazardous, but what we plan to do, we've got nearly a million cubic yards of material at our site that we have

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to deal with. The few cubic yards that will be generated as resins and sludges is very, very small in relation to the overall problem. Therefore, what we will do is to store that material in the quarry area itself until we come up with a solution for the overall problem. In fact, we haven't, quite often ion exchange systems, for instance, appear very uneconomical because the people that run those systems have to then pay to have the resins and the sludges dealt with. Because we've got this bigger problem and we can include them in that bigger problem, we did not assume that there would be any cost for that and that helped us to justify putting in the ion exchange system. That's not fair, but ...

Celeste Kuhn

Is there someone else who would like to ask a question or make a comment? Yes ma'am.

Eileen Lohrengel

I'm Eileen Lohrengel, L-o-h-r-e-n-g-e-l. And I have a question about the contaminated ground water that is now flowing toward the wells. Once you take the water out of the quarry, my question is this, is the aquifer where the ground water is flowing, is that contaminated at this point?

Celeste Kuhn

Mr. McCracken?

Steve McCracken

Yes.

Eileen Lohrengel

How is that contamination going to be removed?

Steve McCracken

That's a good question. What we've got to do, that's one of the reasons we are trying to get on with the quarry activity, we've got to... In order to determine exactly how the water is contaminating the ground water, we've got to remove the water and then we have to remove the bulk waste, and get to where we can examine the bottom of that quarry and get a good handle on how the contaminants were migrating to the ground water and whether or not we have actually removed all of the contaminants. Once we've removed that bulk waste, we'll go in and do a very extensive study of the ground water and of the slough and any residual material that might be in the bottom of that quarry and it will be then that we will decide whether or not the ground water needs to be restored.

Eileen Lohrengel

As the natural water goes into the aquifer and that contamination is there, I mean it's going to be there forever. Won't it

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continually continue to flow toward the wells?

Steve McCracken

What's happening right now is that it is being intercepted by the Femme-Osage slough. The fact of the matter is until we get the water out and we can begin to study it, we can't tell you exactly what that water would do over time and that's the reason we want to get the bulk waste out to where we can do the necessary things and monitoring that would allow us to decide exactly what's happening and what needs to be done.

Eileen Lohrengel

Okay. I had one more question. A lot of power plants use water to produce steam to produce electricity. My question is was that alternative looked into as far as getting rid of the treated water?

Dr. MacDonell

It's too low a rate of flow that we would be using to ever generate electricity. We'll be using electricity from the utility.

Eileen Lohrengel

You wouldn't need to generate the electricity, but could you not use the same technology to get rid of the water by evaporation, by turning it into steam once it's been treated?

Dr. MacDonell

In this area of the country evaporation, or at least, I was going to say in our climate that evaporation and precipitation pretty much balance out each other. So it's difficult to employ evaporation and again, the flow that we're operating at is so low that that's not a feasible option.

Eileen Lohrengel

Why would it not be feasible? I don't understand that? Why would it not be feasible to get rid of the water ...

Dr. MacDonell

Are you talking about the vapor-recompression option?

Eileen Lohrengel

No. You treat the water, and rather than discharge it into the river, you produce some type of a plant to get rid of the water, but you wouldn't necessarily have to produce the electricity.

Steve McCracken

The vapor recompression system that we have in our study is the system that addresses being able to reduce uranium to very low levels and nearly zero. That system is cheaper than what would be co-generation, I think.

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Eileen Lohrengel

So it comes down to the matter of money.

Steve McCracken

It comes down to the matter of two things, cost is not unimportant, but then it becomes a matter of what you gain by spending that money and what we're trying to say is that the risk is so low whether it is 500, whether it's 100, whether it's 30 that it's in the one in ten billion range and it's so very low that has to be insignificant and it should be of no concern to people downstream.

Eileen Lohrengel

Well, I would just like to comment that the word risk is still used and I think that if people understand what the meaning of risk is, then it should be of a concern to most people. Thank you.

Celeste Kuhn

Thank you. Is there someone else who would like to ask a question or make a comment? Mr. Hentges?

Bob Hentges

As I said earlier, if you haven't signed in, please do so we can get you, make sure we have got your address on it and make sure it is legible so we can figure out where to send you a reply to anything that we do.

Celeste Kuhn

I would also like to add that if you know someone that's interested that was not able to attend tonight, if they'd like information or that person would like to ask a question, you can contact the Department of Natural Resources toll free, at 1-800-334-6946 and the department will be accepting any comments until March 6. Mr. McCracken, would you like to tell people where to send comments to if they want to send them to you on the EE/CA engineering document.

Steve McCracken

Thank you. Hold on just a minute, let me see if - is Martin here? Is the fact sheet? Oh. The fact sheet that was handed out by the Department of Natural Resources lists our address at Weldon Springs. If you have any written comments that you would like to make that you did not make tonight, or if you want to make them twice, you can send them to us at that address.

Celeste Kuhn

Thank you all for coming. This concludes the department's meeting.