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Attachment A:

Public Meeting Transcripts

COPY OF TRANSCRIPT

Reporter's transcript of electronically recorded:

DRC-2013-004489

PUBLIC HEARING

DIVISION OF RADIATION CONTROL

STATE OF UTAH

Conference Room 1015
195 North 1950 West.
Salt Lake City, Utah

October 9, 2013 - 2:00 p.m.

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October 9, 2013 - 2:00 p.m. - Salt Lake City, Utah

P R O C E E D I N G S

MR. ANDERSON: Welcome and good afternoon. My name is Craig Anderson. I'll be the presiding officer for the hearing this afternoon. This is the time and the place scheduled for the informal public hearing on Energy Fuels' application for an amendment to its 11e(2) byproduct license UT1900479. As noted in the public notice that has been posted on the DRC's Web site and also published, this is the time and the place to receive public comments and questions.

At this point in the hearing I would open the floor to anyone who'd like to make comments on the proposed amended license, and then we'll move on to the question part of the proceeding. So does anybody have any comments they'd like to make at this point.

Yes, Ms. Fields?

MS. FIELDS: I'm going to submit more -- some comments later, particularly after this proceeding, and we still have a couple of weeks. My name is Sarah Fields. I'm with Uranium Watch in

Moab, Utah, and I've had some interest in the White Mesa Mill for a number of years. And I just want to make a few procedural comments.

I think there was too little time between the submittal of the questions and the hearing. And just this morning I received a copy of the letter which indicated to me that some -- some of my questions were not relevant to the licensing action, vague, or maybe they didn't all fit -- fit this, these categories, but maybe were seeking legal interpretations or were not specifically relevant to the proceedings. So it would have been helpful to have that before.

It would be also helpful to have known and have had a little bit more information, because questions that were very relevant to me, or significant to me, have now been taken off the table for this, for this hearing. And I have some objections to that, but it will get us through some of this more quickly, and there's still some relevant things to go over.

One thing regarding making comments. I noticed that some of the documents, as they were posted on the DRC Web site, it was not possible to copy and then paste sections of the documents, or I had difficulty with that. And when you're making comment on a document, it's really handy to be able to copy a section, paste it into your comments so you can indicate that you're making a comment on the section so that the staff, or whoever's reviewing the comments, doesn't have to go back to the original document, and they know precisely what you're referring to. And it takes time to type that in, so having a PDF that you can copy -- copy from and paste in is really handy.

I think most of my comments would happen after this, and hopefully some of my issues will be -- I'll get some additional information to make more informed comments. Thank you.

MS. LOCKHART: Can I just respond to that a little bit? I know that this is a comment period, but I wanted to -- it's not in that letter that you received, Sarah, but we do plan on addressing some things, notwithstanding the -- I guess you would call them objections. So maybe the best thing to do on some of those is to hold off until the end and see what's left over for you.

And I would also agree that we learned that ten days was not enough. That's why we wanted to kind of experiment with this before we put it into rules. So that's the first lesson today.

MS. FIELDS: Oh, okay, good.

MR. ANDERSON: Are there any other comments? Well, I guess we can move on to the rest of the agenda in the proceeding today. As a preliminary matter, a 45-day public comment period began on September 5th, 2013, and notice was published on the DRC Web site, published in the *Salt Lake Tribune*, *Deseret News* and the *San Juan Record.* Copies of the amended license, proposed amended license, Statement of Basis and Safety Evaluation Report are also on the department's Web site and available for inspection at the department's office. In addition, written comments will be accepted until the close of business on October 21st, 2013.

This hearing is undertaken for the purpose of meeting the Nuclear Regulatory Commission's state delegation requirements under 10 U.S. Code, §2021(o)(3)(A), and the purpose of this informal hearing is to receive comments and questions that have previously been submitted in advance regarding the application for the amended license. Staff from the Division of Radiation Control, URS, the Division's contractor, and representatives of the Applicant, Energy Fuels, are present and available today to answer any questions that you may submit.

The scope and comments on the questions will be limited to the matters that are relevant to the application for an amendment, and any comments or questions and responses received this afternoon will be included in the record for the amendment. There has been a sign-in sheet that's been circulated around. I guess I'm the last to sign it, so -- I spoke too soon. So if you haven't already signed in, please do so.

This hearing is being recorded and a transcript will be made available at a time and date after the hearing and will also be included in the record for the amended permit. Are there any questions before we begin?

MR. ZODY: Could I make just a brief --

MR. ANDERSON: Yes. Mr. Zody?

MR. ZODY: -- comment? This is Michael Zody. I'm legal counsel for Energy Fuels. In responding to some of the procedural issues, in terms of the time frame, while ten days is -- is a somewhat tight time frame, Energy Fuels is here, is prepared to answer the questions. The questions have been submitted as the Agency had requested. There's ample time today to deal with the questions, and so we do not feel there's any prejudice to anyone resulting from the ten days, and we're prepared to go forward.

MR. ANDERSON: Thank you. Any other comments before we begin? Hearing none, I will now call the hearing to order and open the hearing to receive questions.

MS. LOCKHART: Well, in fact we do have the questions, and I think probably the procedure should be just to start through Sarah's. This isn't -- (inaudible) I'm sorry. Why don't you come on forward. I guess we'll just turn it over to John to begin answering questions. I think it's our hope that we have something of a dialogue here of not just reciting answers, but frankly, we're going to start with reciting answers because that's what the opportunity to review your questions presents for us.

MR. HULTQUIST: Thank you, Laura. My name is John Hultquist. I'm the licensing manager within the Division of Radiation Control for low-level waste in uranium mills in the State of Utah.

And Sarah, I believe your first question that was submitted as part of your packet was regarding the application, and your question was: "Are these materials 'ore,' as contemplated by the Atomic Energy Act of 1946, as subsequently amended by the AEA of 1954, and the Uranium Mill Tailings Radiation Control Act of 1978? If so, what is the basis for the DRC's determination?"

Originally, when I looked back at the licensing application for us to become an agreement state, these same questions were asked by you to the NRC. And so I'd like to refer you to Paul Lohaus, who is the Director of the Office of State and Tribal Programs, whose letter dated January 15th, 2004 to you in response to those two questions -- would you like to --

MS. FIELDS: Well, I don't have a copy of that.

MR. HULTQUIST: Okay.

MS. FIELDS: That letter with me, so --

MR. HULTQUIST: Okay. Would you like me to summarize it just briefly? Basically the NRC said no, the AEA does not (inaudible) Uranium Mill Tailings Radiation Control Act of '78, it was, and that alternate feed is ore, and as any natural or related material that may be mined and treated for the extraction of its constituents or any other matter for which source material is extracted, a licensed uranium or thorium mill, is essentially what it said. But I'll let you go back to that.

MS. FIELDS: So is that a regulation that interprets the -- the Atomic Energy Act?

MR. HULTQUIST: You'll have to ask the NRC.

MS. FIELDS: Okay, so you're relying solely on the -- whatever the NRC's interpretation is?

MS. LOCKHART: Sarah, I don't want to -- I don't want to limit it to that. I wanted to give you a preliminary response, but we will be treating your questions as comments, and I think that they do fit that.

MS. FIELDS: Okay, because I didn't think you were going to respond to that.

MS. LOCKHART: I realize that.

MS. FIELDS: I mean, the first question I have that you indicated you'd respond to would be 1.3, so maybe we can just go to the questions that --

MS. LOCKHART: And we can get to those documents.

MS. FIELDS: After looking at your letter today, I just went through the comments and kind of indicated which ones you would not be responding to.

MS. LOCKHART: Today.

MS. FIELDS: In this.

MS. LOCKHART: We will be responding to them.

MS. FIELDS: In this hearing. And so I guess -- so we don't get it -- probably the best thing would be to stick to that.

MS. LOCKHART: I think it best just to concentrate on the ones that have factual matters anyway, so let's go forward.

MR. HULTQUIST: Okay, so we've got to push, yeah. Mr. Anderson, if I may just reiterate for everyone to please always speak directly into the microphone since we're recording this. And if you want a transcript that doesn't have a lot of gaps in it, please speak into the microphone so it's all going to be heard on the recording.

MS. LOCKHART: I'd like to add to that that you should say your name, too. My name is Laura Lockhart, which I failed to do. I'm with the Attorney General's Office representing DRC.

MR. LUNDBERG: And my name is Rusty Lundberg, the Director of the Division of Radiation Control.

MS. FIELDS: And my name is Sarah Fields with Uranium Watch.

MR. HULTQUIST: Okay. So back to question

1.3. It is: "Why has Energy Fuel Resources submitted an application for a license amendment to process uranium material from the Midnite Uranium Mine?"

Simply, the alternate feed request must be approved by the director in accordance with license condition 10.1(c), which is in the radioactive materials license.

MS. FIELDS: So although other ore this -- can be processed at the mill without a license amendment, this ore needs a license amendment?

MR. HULTQUIST: Correct. Conventional ores from mines do not require a license amendment. And that covers two questions that you had previously asked in this submittal document.

MS. FIELDS: Okay.

MR. HULTQUIST: But yes, all alternate feeds require approval from the director. You'll have to -- someone will have to help me as to which one's next.

MS. FIELDS: Just a moment. I think skipping through to 9, where I think the next questions are that have to do with the alternate feed amendment, I think the first question is at 9.1.

MR. HULTQUIST: Okay. I agree with you. 9.1 is: "How does the DRC monitor the shipments of alternate feed that are received at the White Mesa Mill?"

Typically, that's done through our inspectors, who go out to the site on a quarterly basis. And if a shipment happens to be there at the time they are there, they will often look at it, both by visual observations of the shipment coming in and then also the paperwork associated with that shipment. In addition -- I'm sorry, go ahead.

MS. FIELDS: Oh. Do you look at all the paperwork for all the shipments of alternate feed or just maybe what happens to be coming in at the time of an inspection?

MR. HULTQUIST: If the DRC staff are out there and a shipment comes in, generally -- a number of things, but generally they will look at the paperwork associated with that shipment. Other shipments that have arrived in between those inspection times, they might review some point -- at some point during the year when they go out and conduct some other inspections, or if they're looking at materials that arrive at the site in one of the inspection modules.

Do they look at all of them? No. We usually just look at a sampling of the paperwork for a few of them. Does it hit all of the alternate feeds or all the conventional ores? I'd probably have to say I seriously doubt it, but we do a spot check on just some of the shipments that come in, and if things look okay, then we move on to other items in the inspection. If there's questions, then that gets asked of the licensee.

I believe the next question is 9.2: "How does the DRC determine the amount of alternate feed that is being or has been received at the White Mesa Mill from any one source?"

And I'm going to say that for this particular Dawn Mining amendment request, the condition lists the amount that they will be able to receive from this license amendment, and the DRC, at future times, will inspect against that quantity. It will be the licensee's responsibility to track the amount that comes in their door as received and processed. We will look at it at future dates during the inspection process.

MS. FIELDS: But have you done that for other -- is that a consistent program that you have, that you know how much material has come from any one alternate feed source over the years?

MR. HULTQUIST: We have things we're

working on with the licensee currently with the renewal, the 2007 license renewal, is to actually get a quantity for those alternate feeds that will remain in the license after the license renewal application has been reviewed and out to public comment, et cetera, to put a quantity, or amount, in those conditions that the NRC approved prior to us becoming an agreement state.

The DRC feels it's important to know what that quantity is, and we think it's the licensee's responsibility to give us that information so we can put it in the license.

Okay. Your next question, 9.3: "How does the DRC determine whether the amount of material received and processed at the mill from a specific alternate feed source is less than or equal to the amount of material that was approved for receipt and process at the mill -- excuse me -- processing at the mill from that source?"

Again, NCR was the holder of this license, and I'm not sure if all the alternate feeds had a quantity value associated with them. And I might defer this to the licensee at this point, because they were the ones that were dealing with these previous license amendments with the NRC. But what we do, at the end of the year we ask them how much material has been processed. And they give us those numbers, and that gets put out on the State of the Environment Report that's on our Web page, and it usually comes out towards the end of the year.

Now, I'd clarify that it doesn't talk about any one source. It just talks about the amount of alternate feed in total that was processed for that year. So I don't know if Jo Ann or Harold or somebody wants to comment on that as far as the amount processed in quantities. We have those numbers because of the license renewal and the modeling that we're doing for the renewal process, so that information's going to be available here soon.

MS. FIELDS: Okay.

MR. ROBERTS: I will go ahead and respond to that. My name is Harold Roberts. I'm Executive Vice-President and Chief Operating Officer of Energy Fuels Resources. To the best of my knowledge, some of the earlier alternate feed amendments issued by the NRC during the early phases of the alternate feed program did not have specific maximum quantities of material assigned to those amendment requests.

The newer amendment requests that primarily had been authorized by the State of Utah, when we submit the applications we do specify a maximum quantity of material to be received and processed under that license amendment. So there are maximum quantities of material that are specified in the newer alternate feed amendments.

MR. HULTQUIST: Okay, thank you.

MS. FIELDS: As a follow-up question, has the DRC gone back and looked at the license applications and the license amendments to determine if there was a specific amount, whether tons, cubic yards or drums -- because some of the material comes in drums -- to see if there was a specific amount that was approved? Because I know some of them did -- some of the license applications or approvals did specify a certain amount of material that would be coming from a specific site, say Camco or Allied Signal, I think, now Metropolis. I think there were maybe some specific amounts identified. I just wondered if you have looked through those license applications and approvals -- which are part of the licensee approval, the applications are part of the source material license -- to see what was committed to in the applications.

MR. HULTQUIST: That's correct, they are part of the license, and some of it we will go back and look. Some of if we're asking the licensee to come up with those numbers and look themselves. Some of them go pretty far back, and the records that we were given from the NRC -- I'm not trying to make excuses, but the records that were given to us were not in very good shape. They're all by ML numbers. They have no topical things. They're just on CDs. And there's hundreds and hundreds of documents, and I can't tell which one goes to Amendment 19, 17, 2, 3, 5 or 6.

And so in 2007, in this license renewal amendment, we are asking them to give us those quantities, and if we -- some of them are going away. As you know, some of them they never received. They finished with the project, so they're getting taken off. So I don't feel it's necessary to go back and find out what those quantities were. But the ones that are staying on there, yes, we will know what those quantities are.

MS. FIELDS: Right, and some of the earlier documents, the pre-'99 documents, are -- yeah, they're paper copies in boxes. And some of those boxes are right there in your office today, so --

MR. HULTQUIST: Yes. We had to go get

them. Yes, we understand where they are.

MS. FIELDS: So I think maybe you'll be able to identify some of those early applications, particularly for the Camco and the Metropolis, to be able to follow up on that. Thank you.

MR. HULTQUIST: Okay, the next question, 9.4: "How does the DRC determine that the material received at the mill has the same physical and chemical characteristics as the material that was approved by the NRC or the DRC for receipt and processing? What type of verification is required? What kind of sampling of the material is required?"

Any material that's brought into that site is subject to sampling, either by the DRC or at the request of the DRC. If the samples are collected by the DRC, we would be looking at basically a grab sample from the material on the ore storage pad, and then we would analyze that for radiologics, RCRA constituents, metals and volatile organic compounds, VOCs.

MS. FIELDS: So you don't require any type of sampling?

MR. HULTQUIST: Well, the initial sampling is done with the characterization of the amendment request, as part of the amendment request.

MS. FIELDS: Well, when you have an amendment request in the '90s, 20 years ago, and you're receiving material right now, and perhaps there were a number of different types of materials that were approved, there -- a lot happens in 20 years at the facility. I'm specifically thinking about the ore -- I guess it's pronounced Cameco, but it's in Ontario, Canada. So it's possible that some of that material would not necessarily be exactly the type of waste that comes later --

MS. LOCKHART: Sarah --

MS. FIELDS: -- and I -- and I wonder, and this, I guess, has to do with cumulative impacts and how you approach the whole alternate feed program, because it is really a regulatory program. It's an NRC/DEQ program. And this, this new license amendment, is just another aspect of that program, so I'm trying to get an understanding, a better understanding of the program.

And as I went over it, just questions I should have asked a long time ago seem to pop up about how -- how the verification works over the years, because even this material they're going to ship to the mill over a period of at least ten years. And maybe at the source end there might be different processes, so you might end up with a little bit different material, and you would need to have at least sampling once a year or some kind of sampling program to verify that changes haven't been made over the years.

MS. LOCKHART: Are you talking about alternate feeds other than the one that's being proposed here?

MS. FIELDS: Well, I guess I was trying to get at your -- the program that you have and how you handle alternate feed, how you verify, how you sample the physical and chemical characteristics over time, because some of these approvals are over years. It's not like you approve it and then within the next year or two the material's been shipped, but it's over time. I'm wondering how -- how you verify that the material that was characterized and sampled originally may -- may change over the years.

Sometimes you get waste, and okay, you have a specific amount of waste from a specific site. But sometimes the waste is continually being generated, and that's what will be here with the -- with this Midnite Mine material. It's being generated throughout, for the next maybe ten years.

And some of the other material is

continually being generated. It's not like it's a cleanup of one site. You got your ponds, you got this, you sample the material and that's it. But some -- if you have a continual process of the waste being generated, then you need a continual sampling and verification program over time, you know. That's what -- that's just -- I was trying to get at, you know, what type of program, and you have given me some information about that.

MR. LUNDBERG: If I may just add to that. This is Rusty Lundberg. The standard actually is, in terms of the waste management arena, is that if you have an ongoing process that generates waste that's consistent in that process, and you don't do anything to adjust that waste generation process -- and this carries over into the RCRA world as well -- is that it's only if you go to change that waste generation process, if you're doing something different, that you would have relied upon that original characterization to work from, that's when you're required or it's more prudent to be able to go back and reevaluate whether the waste characterization, the makeup of the waste has changed enough that there would be additional considerations that need to be made for its ultimate disposition.

So it's actually more of the standard that when you have ongoing waste generation, you rely upon that original characterization and then look at any changes that happen in that waste generation process. And that's been a standard for 20, 30 years plus here.

MS. FIELDS: Okay. Okay, thank you.

MR. HULTQUIST: The next question, 9.5, I believe: "What information is received by the DRC regarding (1) the amount of waste from the processing of alternate feed from each source of material, and (2) the physical and chemical characteristics of the waste?"

Well, as you probably know, the license application for alternate feeds contain the physical, radiological and chemical characteristics of the waste. We receive, on an annual basis, the amount of conventional ore and alternate feeds that were processed during the calendar year. So that takes care of the amount of waste from processing of alternate feeds.

This information, again, is provided to the public in the State of the Environment Report put out by this Agency under the Land section, so that's where that information is.

MS. FIELDS: But you -- it's more of a generic thing. The amount of waste is just a total amount of waste -- I mean a total amount of waste, or the total amount of alternate feed that's processed.

MR. HULTQUIST: Okay, maybe we should clarify. When you say amount of waste from processing, are you talking about the amount of material that goes out to the tailing cells as waste or as byproduct material?

MS. FIELDS: Yeah. Do you -- do you --

MR. HULTQUIST: No.

MS. FIELDS: You just look at the amount of material that's being processed?

MR. HULTQUIST: That is processed, yes.

MS. FIELDS: And so more or less it's the same amount going out to the tailings?

MR. HULTQUIST: Harold? Jo Ann?

MS. FIELDS: The amount of material that's processed minus the amount of uranium plus the processing fluids equals the tailings; right?

MR. HULTQUIST: Correct.

MS. FIELDS: That's kind of the --

MR. HULTQUIST: You've answered your question.

MS. FIELDS: -- the general formula.

MR. HULTQUIST: Okay.

MS. FIELDS: But you don't keep track of all the physical and chemical characteristics of the waste that's being deposited?

MR. HULTQUIST: The byproduct material that goes out to the tails, we do take samples as part of the groundwater discharge permit on an annual basis.

MS. FIELDS: Okay.

MR. HULTQUIST: Those slimes are characterized for chemical constituents. I don't think it does RADs. It does gross alpha. Thank you.

MS. FIELDS: Okay, thank you.

MR. HULTQUIST: Okay, 9.6: "Does the DRC have data on the cumulative amount of radiological and chemical constituents in the tailings as a result of the disposal of wastes from the processing of alternate feed? If so, where is this information?"

Yes. Again, I just mentioned it's in the groundwater permit as required by part I.E.(10) of the Tailings Cell Waste Water Quality Monitoring. On an annual basis, the licensee collects samples and those are provided to us.

MS. FIELDS: Thank you.

MR. HULTQUIST: That information is in our office. 9.7: "Does the licensee keep track of where the tailings from the processing of alternate feed material are disposed of?"

As the licensing agent, I'm going to generally say yes, they do. The licensee knows which tailing cell is receiving tails. Therefore, when processing material, the licensee knows which cell is receiving the byproduct material.

MS. FIELDS: But not any specific part of the cell?

MR. HULTQUIST: Jo Ann or Harold? Will you -- I can't answer that, to be honest with you.

MR. ROBERTS: I'll respond to that. This is Harold Roberts. It's almost impossible to tell specifically in one of the active tailing cells to where a specific alternate feed would be disposed of. The tailings material goes out there normally in a form of a slurry, part solution, part solids, and that's discharged into the tailing cell. So there's a high degree of mixing in the tailing cell when those materials are discharged. So I guess the answer is no, we can't tell specifically, exactly where each alternate feed is disposed of.

MS. FIELDS: Thank you.

MR. HULTQUIST: Okay. On to Section 10,

which has to do with the Safety Evaluation Report, or the SER. 10.1: "Does the DRC believe that the required Environmental Analysis should be limited to the four items listed in the SER? If so, why? If not, what other Environmental Analysis should be undertaken?"

The SER has considered and evaluated the four items listed in 42 U.S.C.2021(o)(3)(C) in the Environmental Impact Analysis, and considers these items to constitute a sufficiently comprehensive framework for evaluating potential environmental impacts resulting from the proposed action. The DRC believes the list of items to be consistent with all available applicable NRC guidance State of Utah requirements, applicable environmental impact assessable protocols.

And notwithstanding those, the DRC evaluation includes other additional items such as the ability of the current mill operating and radiological practices to safely accommodate the temporary storage and processing of the alternate feed material, disposal of the process residuals in the design tailing cells without increasing potential impacts to the environment and/or increasing potential exposures to workers and the public. Also assessing the need for implementing additional protective measures, if any, to mitigate against such potential increases -- increased environmental impacts or exposures.

So yes, we consider those four as a starting point, but that's just the starting point. There might be other things we need to ask regarding environmental impacts or releases that we would like in addition to those four.

MS. FIELDS: Do you look at cumulative impacts? Like, this is another alternate feed material, so do you look at cumulative impacts of disposal of alternate feeds like --

MR. HULTQUIST: Well, it would be -- in part of the evaluation, when you're looking at that, you're looking at what they've currently disposed of, how are they compatible with what's in the tails, how are they going to handle this, if it's any different than what they would do with conventional ores or other alternate feed materials.

If this particular material is identical to, say, Colorado Plateau ore, then I would say that they have practices, procedures in place that are adequate for the protection of the environment and public health.

MS. FIELDS: But you're not looking at the cumulative impacts, environmental impacts from the processing and disposal of all the other alternate feeds?

MR. HULTQUIST: Well, that's not in the scope of this license amendment request, to go back and look at all the other alternate feeds.

MS. FIELDS: Well, in a way it is, because there are -- various statements were made in the application. And I'd have to go back specifically into the SER, but it said that this did not go beyond the environmental impacts associated with the processing of the other materials.

MR. HULTQUIST: Correct.

MS. FIELDS: But there's -- maybe this goes in the comment, or maybe I have an additional question about that, because the reality is, is that most of the alternate feed did not undergo any kind of Environmental Analysis. The vast majority of all the alternate feed was not subject to an analysis of the health, safety or environmental impacts associated with that because the NRC didn't do an analysis. So the cumulative impacts, I think, are important, but you can't really do that -- I guess this is more a comment, so...

MS. LOCKHART: Yeah, I think that's right, and I think we need to reserve it for the comment response document. But is there anything that Energy Fuels would like to add on that, on cumulative impacts generally? That's a repeated issue for Ms. Fields. Not now, anyway.

MR. HULTQUIST: We're on Section 11 now, or question 11. It still has to do with the Safety Evaluation Report. 11.1 is: "Why does Table 1 provide the uranium concentration in milligrams per kilogram and the other radionuclides in pico Curies per gram?"

The concentration units are typically used in the scientific community. Simple as that. When an analysis is done for uranium, it's usually done in a mass concentration. The other radionuclides are typically done in an activity or concentration. So that's the simple answer. Also, the results that the licensee provided to us were in those units, so we provided them as they were provided to us.

MS. FIELDS: I know in the letter from Ms. Lockhart -- oh, oh, sorry -- for 11.2, they didn't seem to -- the staff maybe didn't understand my question, so maybe I could go over about what my question was about Table 1. And I guess I didn't frame my question very well.

MR. HULTQUIST: Go right ahead.

MS. FIELDS: Okay. So I don't -- I'm looking at Table 1, which is the Range of Radionuclide Concentrations for DMC Uranium Material, 2010 Analytical Results. So I see for -- the minimum for thorium-242 is .66 pico Curies per gram, and then for thorium-228 it's .93 pico Curies per gram. So the thorium-228 is a little bit above that. And it's my understanding that -- that they are, if it's an equilibrium thorium, you can determine the thorium-232 content by measuring thorium 228.

However, when you go to the maximum, the maximum amount of thorium-232 is 21.4 pico Curies per gram, but the thorium-228 is only 1.50. So that is just way less than thorium-232, and it just seemed like there was a discrepancy. It seems like the thorium-228 should be equal to or greater, at the maximum levels, than 232, because you go to the minimum and it's a little bit above, but then you go to the maximum and it's just way, way down at the bottom. And I -- I -- it was hard for me to understand that. It didn't make sense to me why the minimum -- the maximum thorium-228 should be so low as compared to 232. That was my question.

MR. HULTQUIST: Yeah. I think the number on the -- at the table is incorrect, the 21.4 for the 232 for the max. We'll have to get back with you and make sure what it is from the laboratory results.

MS. FIELDS: Oh, okay, because one or the other is --

MR. HULTQUIST: It's probably -- my guess, it's probably 2.1, but I need to be clear. Let me go -- we need to go look at that. But looking at the other ones in the other table, they're in much better agreement. So I'm thinking that the 21.4 for the max on the thorium-232 on that table is incorrect.

MS. FIELDS: Okay, thank you.

MR. HULTQUIST: If you have the SER with you, there's a Table 2.

MS. FIELDS: Yeah.

MR. HULTQUIST: It also lists those thorium isotopes, thorium-228, 230 and 232, and those give you the lab results from those three treatment plant samples. And you can see the one is 1. -- for thorium-232, it's 1.14. The next one is .66, as you've mentioned, and then the other one is .71. So I don't think the average or the max can be 21.4, so we'll correct that.

Okay. Question 11.3: "Table 1 includes in lead-210, the product of uranium-238 decay. Why does Table 1 not include lead-208, the end of the thorium chain?"

Lead-208 concentrations in the mine is not considered because lead-208 is a stable isotope of lead, and is therefore not appropriate for reporting of this. We're not using this as thorium for -- it's the uranium we're retrieving. And I believe the analytical results for total lead are reported elsewhere in the SER, I believe Table 11, which, if it was stable lead, would report it as a metal, so therefore referencing you to the other table.

Okay. 11.4: "Table 1 fails to include the radon emissions from the uranium material. Why is that?"

Information on the radon emissions from the uranium material is not considered. The primary radionuclides parents for radon generation, assuming -- I'm assuming you're referring to radon-222. There are several radon isotopes out there, but I assume you mean radon -- when you say radon, you're assuming radon-222 from the decay of radium-226 in your question, and those are from thorium-230 and radium-226.

Concentration of these radionuclide

parents in the material are within the range of concentrations of the radionuclides in typical Colorado Plateau ore. In other words, they're at the same concentrations as what we would typically see in Colorado ores if they were coming in.

For this reason, previous environmental analyses take care of that issue regarding radon. We would assume to see the same amount of radon being generated from this material as we would Colorado ores, which have already been analyzed in the original EIS for this radioactive materials license.

MS. FIELDS: But you would have additional radon emissions from the thorium-232.

MR. HULTQUIST: Which has -- radon-219 has a 55-second half-life.

MS. FIELDS: Yeah. Yeah, I think it's radon-220.

MR. HULTQUIST: 220, excuse me. So its availability is very short. The impacts would be minimal.

MS. FIELDS: Okay, thank you.

MR. HULTQUIST: 11.5: "Why does the SER fail to identify the other radium isotopes that are included in total uranium?"

Again, the analytical testing of the four samples of filter press kick produced from the dewatering filter press pilot testing conducted in 2011 included the analysis for the following radionuclides: 226, radium-226, radium-228.

Analytical results reported in Table 6 of the SER indicate that the radium concentrations in the sample were low, ranging from .07 to .2 pics per gram, and radium-228 concentrations were also low, all reported concentrations below or less than .2 pico Curies per gram. And we've -- so those are reported. They're very low concentrations. These, again, are in typical ranges you would see in Colorado Plateau's -- Plateau ores that have been analyzed originally in the license. They're actually lower than what we would see typically in Colorado Plateau ores.

MS. FIELDS: Except that Colorado Plateau ores don't contain thorium-232 in their progeny, normally.

MR. HULTQUIST: They contain some.

MS. FIELDS: I haven't -- I don't think that they contain any appreciable amounts of thorium-232 in the progeny of thorium-232. They contain 230, but that's because of the uranium.

MR. HULTQUIST: Right, but we're talking

about the radium-226 and 228.

MS. FIELDS: Yeah.

MR. HULTQUIST: Here in this question. Those concentrations, the radium-228 concentration is very, very low.

MS. FIELDS: So it's not included, basically, because it's so low?

MR. HULTQUIST: Well, we've included them in the report.

MS. FIELDS: Under total? Under total?

MR. HULTQUIST: Well, we gave you the radium-226. I believe it's in the --

MS. FIELDS: So it would be included under total radium?

MR. HULTQUIST: Yes.

MS. FIELDS: So you have 226 and then you have total radium?

MR. HULTQUIST: Right. There's a difference of about 10 or 15 pico Curies per gram there.

MS. FIELDS: So the total would include -- but you didn't identify the other as -- when you go total radium, you don't say that includes 226 to, what, 228 and 224, I guess because that -- that information wasn't included in the application, because you probably took most of this from the application.

MR. HULTQUIST: John, would you like to add anything?

MR. LLEWELLYN: What we included in the Safety Evaluation Report was data submitted in the license application. There were radium-228 results reported from 2010 testing of the dewatered sludge from the centrifuge system, and those are in this response, 36 to 41 pico Curies per gram total radium, and radium-226, 22.8 to 25.7 pico Curies per gram. So that addresses total radium and radium-226, total radium encompassing all, all radium isotopes.

MS. FIELDS: Yeah, I just -- for someone -- a member of the public just looking at that, they wouldn't know where the other radium came from. Radium-226 you have identified, and then there is an appreciable amount of radium from the other material, because -- from the samples. So even though there doesn't seem to be a lot of thorium-232, the radium from that 232 is an appreciable part of the total radium. But you -- it just seems like you should throw that in. Well, that's a comment I can make in my comments. Thank you.

MR. HULTQUIST: Okay. 11.6: "Has the DRC

evaluated and compared the radionuclides that will remain in the uranium material and other alternate feeds after processing?"

The concentration of 226, thorium-230, thorium-228, thorium-232, are expected to be at the same as those present in the material resulting from the processing. Again, we're taking out the uranium, so these materials will go to tails, so I would expect them to be in approximately the same concentrations when they arrive as when they go out to the tails.

MS. FIELDS: Okay, thank you.

MR. HULTQUIST: Section 12, we're still on the Safety Evaluation Report. We're talking about Table 3: "Table 3 provides information regarding the concentrations of total uranium, radium-226, and thorium-230 in the uranium material versus average acid leached ore-derived uranium mill tailings in Utah."

Question 1 -- or excuse me -- 12.1: "Table 3 only considers radium-226 but does not include the radium concentrations from the decay of thorium. Shouldn't Table 3 also include the radium concentrations from 228, radium-228, and radium-224 and the total concentrations from all uranium isotopes in the comparison of the uranium material and the typical Utah uranium mill tailings?"

And I'm going to refer you back to our response to 11.5.

MS. FIELDS: Well, there is an appreciable amount of radium coming from the thorium, but you didn't compare that amount with -- I mean, this is in the uranium material, and this Table 3 does not compare that with the typical Utah uranium mill tailings. So I just wondered why that wouldn't be, because it does provide an appreciable amount of radium going into the tailing impoundment.

MR. HULTQUIST: Can you help me out with your question and what you mean by "typical Utah uranium mill tailings"?

MS. FIELDS: Well, you've -- you've -- someone else has identified the typical Utah uranium mill tailings with the thorium-230 uranium total, uranium-2 -- oh, 2308, and radium-226. And I wondered, well, why they didn't compare -- make the comparison with 232 with -- and then with the radium, because after all, there is a lot of radium coming from that 232. If you have total radium for one of the samples as 35.8 and the amount of radium from 226 at 22.8, you have, I guess, 13.

MR. HULTQUIST: Approximately 10 to 15 pico Curies per gram of radium-228.

MS. FIELDS: Per gram. But considering that you have a smaller amount, maybe, of thorium-228, I just wondered why you didn't compare that with typical Utah uranium mill tailings.

MR. LLEWELLYN: John Llewellyn, URS. That could be done. It certainly could be presented. The radium -- the radium issuing from thorium-232, it's -- the amounts and the activities would be dictated by the activities of thorium 232. And in Table 2 of the SER, thorium-232 levels are reported 1 to 1.14, maybe .7, pico Curies per gram. And I think the best way to review those concentrations is by comparing them to what you might find in thorium-232 in typical uranium ores. And that's addressed in the next question.

MS. FIELDS: Okay, thank you.

MR. HULTQUIST: Okay, 12.2: "Table 3 contains a comparison between the uranium material constituents in the average acid-leached ore-derived uranium mill tailings in Utah. Why has the DRC not included a comparison of the thorium-232 and thorium-228 concentrations for the uranium materials and the average acid leach ore in Utah?"

Information from the NCRP 1993 document indicates that thorium-232 concentrations in natural uranium ores vary with geographic location and typically range from approximately 8 to 80 becquerels per kilogram. And to convert becquerels to kilograms, we use a conversion factor of 0.027 pico Curies per becquerel kilogram. So therefore, this range is approximately equivalent to 0.2 to 2.2 pics per gram of thorium-232 for typical uranium ores, which is what we've shown in this material to contain. It's sitting right around 1.4, I believe.

Since most uranium ores are considered to be in equilibrium, secular equilibrium, uranium ores would be expected to exhibit similar ranges of thorium-228 concentrations. This range of thorium-232 and 228 concentrations is comparable to that reported for the DMC -- Dawn Mining Company -- uranium material. And that goes back to that Table 1 and Table 2 in the SER.

And our justification is that for -- regarding these concentrations, they've been previously analyzed during other ores or the EIS that was done in 1979 for the -- from the NRC with respect to this facility. So we're saying that this material is in the scope of something that was already analyzed, or within the envelope of something -- of an assessment that was already done. Therefore, it doesn't have to be done again.

MS. FIELDS: Okay, thank you.

MR. HULTQUIST: We're on to Section 13. Here we're referring to Table 5 of the SER: "Table 5 is a comparison of the radionuclide activity concentrations in proposed uranium material in previous alternate feeds. Table 5 summarizes the concentrations of the uranium material as compared with Colorado Plateau ores and alternate feed material. Table 5 relies to a great extent on the information in the W.R. Grace application. That application was submitted to the NRC in April of 2000, over 13 years ago."

Question 13.1: "Has the DRC reviewed the W.R. Grace application of April of 2000 and the licensee amendment approval documents? If so, when did the DRC review that application and approval documents?"

And the answer is no, the DRC has not reviewed the Grace application of April 2000.

The next question is 13.2: "Did the NRC conduct an Environmental Analysis of the receipt, processing and disposal of W.R. Grace material?"

The answer is yes, the NRC conducted an Environmental Analysis, documented in the December 20th, 2000 Technical Evaluation Report which accompanied the license amendment 17. The Technical Evaluation Report refers to the following environmental and technical information submitted by, at the time, International Uranium -- or IUSA during this evaluation process. And there's five letters here. April 12th, 2000, the W.R. Grace application amendment request; April 24th, 2000, IUSA letter transmitting -- help me out, who provided me this information -- the RMRP?

UNIDENTIFIED SPEAKER: Radioactive Material Profile Record.

MR. HULTQUIST: Profile Record, thank you. April 26, 2000, the IUSA response letter regarding thorium management and tailings; May 5th, 2000 IUSA response letter regarding tailings capacity; and last, December 18th, 2000 IUSA submittal of thorium management Standard Operating Procedure receipt through disposal.

MS. FIELDS: Maybe I didn't make clear what I considered to be an Environmental Analysis. I should have indicated Environmental Analysis under the National Environmental Policy Act, which the NRC is subject to. The NRC does Environmental Impact Statements. I mean, there's an Environmental Impact Statement for the White Mesa Mill, and then it does environmental assessments for, sometimes, for the license renewal and for some of the license amendments.

So when I meant [sic] Environmental Analysis, I didn't mean a technical analysis. It's my understanding from the documentation that the NRC did no environmental review and they -- it was categorically excluded under 10 C.F.R.§51.22(c)(11), and, in fact, most of the alternate feed material license amendments were categorically excluded. That means they did no environmental assessment.

MR. HULTQUIST: Okay.

MS. LOCKHART: Why don't you correct me if I'm wrong, but I think what you're saying is -- well, first, what John is saying, he identified the analysis that we looked at, which, I think, is probably the most important thing for the purposes of this license amendment. With respect to what is required under federal law, that's not something we can get into today.

MS. FIELDS: Well, what is required -- I'm not arguing whether -- or stating whether it was required or not. It's the question of whether it was done or not. If they get -- if they give themselves a categorical exclusion, that means they don't do an Environmental Analysis. They don't do an EA. So that means that they didn't do an Environmental Analysis, so...

MR. HULTQUIST: Maybe to help with this question in 13.2, let's just go to the next question.

MS. FIELDS: Yeah, okay.

MR. HULTQUIST: Because I think that's really where the heart is -- you're out on this one, is whether or not they received the material or not. In my understanding, the licensee has not received any W.R. Grace materials. So all of these questions about what the NRC did is kind of moot, because there's not any of that material at this facility. So can we move on?

MS. FIELDS: But the licensee is -- and in this table they're using that information as part of the range of material that -- it is in the range of Colorado Plateau ores and alternate feed rate of material concentrations as if it is applicable to the White Mesa Mill. And I question any reliance on that information because I -- I don't -- the mill has not received the material. It's never been -- so it's not been processed. And since it's been 13 years, I doubt if that material will ever come. It's probably already been cleaned up and sent to another facility.

So I really question using -- how that data is relevant to this license amendment. I think if you're looking for a maximum average and maximum amounts of various materials, whether it's radium, thorium, lead, U-natural, that it should relate to material that's actually been disposed of at the mill, such as the Linde and the Heritage.

MS. LOCKHART: Are we moving from question to comment here, Sarah?

MS. FIELDS: Well, yeah, that -- I mean --

MS. LOCKHART: I think we need to move along.

MS. FIELDS: And that was why I asked these questions, because I don't think it should be in the -- it is a comment, yes.

MS. LOCKHART: I expect we'll be seeing that again.

MS. FIELDS: Yeah, it goes to a comment. True.

MS. LOCKHART: Let's go on to 13.4.

MR. HULTQUIST: Okay. Well, it's kind of the same question in regards to the 2007 license renewal application, condition 10.1 that talks about the W.R. Grace materials being removed from the license. So some of these questions might go away or resolve your issue with us using W.R. Grace as an analogy. It was still something that was approved by the NRC, but I'm sure there's other ones that might be more appropriate.

13.5: "Has the DRC reviewed the applications and approvals for the license amendments and license conditions associated with the processing of alternate feeds? If so, which applications and approvals has the DRC reviewed and when did these reviews take place?"

As described in license condition 10.9, the DRC reviewed and authorized the licensee to receive and process source material from Ponds 2 and 3 of the FRMI-Muskogee facility located in Muskogee, Oklahoma. And Sarah, you're well aware of that because you provided comments regarding this. And then in addition, the DRC is doing this Dawn Mining amendment request. Those are the two that the DRC has reviewed and processed. One has been approved. One is currently under the public comment process.

MS. FIELDS: But I guess you've indicated before that you haven't reviewed all the applications and approvals for the NRC amendments?

MR. HULTQUIST: Is that what you were asking here? Did we go back and review the NRC's approval to alternate feeds material? The answer to that would be no.

MS. FIELDS: Okay, thank you.

MR. HULTQUIST: And then the last one that we're currently reviewing as well, which I'm sure you're aware about, is the Sequoia Fuels Corporation alternate feed request that's currently ongoing and is under the review process. That information is on the Denison -- or the DRC's Web page under IUC Denison/Sequoia Fuels.

13.6: "What is the justification for comparing the uranium material with materials that have not, and may not, ever be processed at the uranium mill -- at the White Mesa Mill?" Excuse me.

Whether or not the feed material was received and processed, the Environmental Analysis that takes place as part of approving these things is what we're looking at. Are there things there that need to be looked at, those additional requirements or SOPs or things that may be outside that we need to look at in addition to what -- those four items we talked about in an earlier response. And so whether or not the material comes into the site and gets processed is irrelevant to us. It's what was out there, what's been approved, and are they analogous to what they're asking for now or is it something different? And if it's really out of the ballpark, then are there things that we need to ask that weren't asked from other ones?

Okay. This is kind of a catch-all for Section 14. It's other questions regarding the SER, and this is 14.1. "The SER, page 12, indicates the thorium-232 specific activity. However, the total thorium activity for the thorium decay chain is usually the sum of the thorium-232 and thorium-228 activity. Why did the DRC not include the thorium-228 activity?"

John, I'm going to put that one in your court. It goes back to question 12.2.

MR. LLEWELLYN: John Llewellyn, URS. It's the same content, the question, as 12.2. The 12.2 does give some context comparing thorium-232 levels in typical uranium ores to this Dawn Mining material.

MR. HULTQUIST: And I believe, if I'm right, doesn't the table have the thorium-228 activity? Table 3 does.

MS. FIELDS: Table 6 on page 12 does, and it's just...

MR. LLEWELLYN: Table 2 of the SER presents isotopic data for thorium-228, thorium-232 and thorium-230.

MR. HULTQUIST: So again, I think the thorium-228 activity is included in the SER.

14.2: "What is the amount and activity of alternate feed materials containing thorium-232 and its decay products from the -- from material that have actually been processed at White Mesa?"

The SER prepared to support the Dawn Mining uranium material alternate feed license amendment request evaluated and compared the ranges of thorium-232 concentrations in the Dawn Mining material in ores, uranium ores that have been processed at the mine. So we looked at the Dawn Mining uranium material and we looked at conventional ores, and these concentration ranges are similar.

And therefore we would assume that the evaluations for those, whether it be a technical evaluation report, environmental assessment or other documents prepared by the NRC, are adequate in the envelope or in the scope of this amendment request. The radionuclides, the constituents, the concentrations, the activities are very similar to conventional ores.

MS. FIELDS: So you did conclude that the thorium-232, 238 activity was similar to conventional ores at the Colorado Plateau?

MR. LLEWELLYN: John Llewellyn, USRA. I assume you mean thorium-228?

MS. FIELDS: Yeah, I mean 232 plus 228.

MR. LLEWELLYN: 232, right.

MS. FIELDS: Because it's usually added together as total thorium.

MR. LLEWELLYN: Right. Well, that's from the thorium-232 decay chain, and those values in Table 2 are, as John Hultquist stated, they are comparable to the range of thorium-228, thorium-232 levels you would see in typical uranium ores.

MS. FIELDS: In typical Colorado Plateau ores? Because you don't have that comparison in your table.

MR. LLEWELLYN: Thorium-232 and thorium-228 levels in ores will vary according to geographic location, geology, type of deposit. But typically, for the type of ores that we're processing, stratabound uranium deposits are all front deposits, and I would say even uranium Arizona ores, these levels are expected to be comparable.

MR. HULTQUIST: We indicated back on another answer that most of those ores have thorium somewhere between .2 and 2.2, maybe 2.5 pico Curies per gram for thoriums. And that's what these results show as well, that it's right in the middle of that, right around 1-and-a-half, 1.1, 1.2.

MS. FIELDS: Yeah, but when you -- but when you compared, there was a comparison Table 3 between the uranium mill material and typical Utah uranium mill tailings, you didn't give a comparison of the thorium-232 or the total thorium. You just -- it's not part of what -- any comparison. There's no -- I don't see any comparison in any of the tables.

And, I mean, my understanding is that Colorado Plateau ore really doesn't have much thorium-232. I mean, most of the thorium, the waste produced that has come to the mill, has come from -- with thorium -- has come from New Jersey because of the processing of monazite sands. And there were issues before because of the discrepancy between high thorium -- the content -- content waste 232 to 228 in Colorado Plateau ores. So it would be nice to have a table or better information, and actually, comparison with the kinds of Plateau ores that were processed at the mill.

MR. HULTQUIST: Okay. 14.3: "Has the DRC reviewed the White Mesa Mill Standard Operating Procedures for high thorium content ore management? Has DRC determined whether the uranium material will trigger the use of this SOP? If not, why not?"

The high thorium content ore management SOP is not relevant to this license amendment or applicable to the Dawn Mining uranium material, since the concentrations of uranium isotopes are well within typical conventional ores.

14.4.

MS. FIELDS: Could I have a follow-up question?

MR. HULTQUIST: Sure, go ahead.

MS. FIELDS: So is there a level of thorium content that would trigger the use of the SOPs for high thorium content ore management? Is there a specific cutoff point? I mean have you --

MR. HULTQUIST: I'd have to refer to the licensee because I don't have it memorized in my mind as to what the SOP actually says.

MS. FIELDS: I mean, have you reviewed those Standard Operating Procedures?

MR. HULTQUIST: Yes, we have seen them, yes.

MS. FIELDS: So you know --

MR. HULTQUIST: You're asking me if there's a specific trigger in the SOP. I don't recall. I would have to pull the SOP and look.

MS. FIELDS: But you've determined that that wouldn't be --

MR. HULTQUIST: It wouldn't be applicable to this license amendment because of the thorium concentrations in this material.

MS. FIELDS: Is low, that it wouldn't be considered high-thorium content material?

MR. HULTQUIST: Yes.

MS. FIELDS: Do you know what high would be?

MR. HULTQUIST: Well, if I'm looking at these materials, and typically thorium concentrations are around the 1 to 2 pico Curies per range, I'm not going to consider that high.

MS. FIELDS: Okay, thank you.

MR. HULTQUIST: Question 14.4: "The SER, page 12, states: "Demonstration that the uranium, radium and thorium activity concentrations of the uranium material are below the maximum range of previously-approved conventional ores and alternate feed materials indicates that radon levels resulting from the processing of uranium material are expected to be within the range for which the existing approved controls and monitoring programs are currently established and considered appropriate. Did the DRC also evaluate the range of materials that have actually been processed at the mill, not just the previously-approved alternate feed?"

John? (Pause) I'm going to say again, the concentrations that are provided in the application from Dawn Mining are within the range of conventional ores, whether it be Colorado or Arizona strip. Therefore, any additional analysis regarding alternate feeds aren't necessary.

MS. FIELDS: Thank you.

MR. HULTQUIST: 14.5: "The DRC refers to approved conventional ores. Does the DRC approve conventional ores for processing at the mill?"

No. That is, as stated in response to question 1.2, the DRC does not approve conventional ores. This statement was incorrect in the SER.

MS. FIELDS: Thank you.

MR. HULTQUIST: 14.6: "The UCA and the Atomic Energy Act require the assessment of the radiological impacts to the public health from the processing of the uranium material. However, I am unable to find such an assessment. There is no discussion of -- of how exactly the processed material will be regulated under the applicable regulations, or now, exactly the radon and other radionuclides will be controlled over the life and long-term care of processed uranium material. There is no discussion of the health risks from the radon and other radionuclides associated with the transportation, storage, loading, processing, disposal, perpetual care of the uranium material and its processing wastes.

"Where exactly in the SER does the DRC assess the radiological impacts to the public health from the transportation, storage, loading, processing, disposal and perpetual care of the uranium material and its processing wastes?"

Again, this material is very similar to conventional ores. We relied partially on the fact that the ranges are typical, are within the scope of what this facility does. The original EIS back in 1979 provided them with the analysis, with the environmental assessment of taking ores and processing them. These are in the same ranges as what you would -- that EIS would allow them to do. Therefore, those assessments have been made.

14.7, we're talking about the Safety Evaluation Report. Excuse me. The safety evaluation report at Table 7 provides information regarding derived air concentrations from ores and selected alternate feed. However, Table 7 does not explain what exactly the numbers in the table actually measure. Table 7 includes columns identified as UF4, K4 [sic], regen material and calcined material, but it does not indicate the source or nature of those materials.

"Please explain what DAC means and what the numbers in Table 7 measure."

In the R31315 definition, derived air concentration, or DAC, means the concentration of a given radionuclide in air, which, if breathed by the referenced man for a working year of 2,000 hours under conditions of light work, results in an intake of one annual limit of intake (ALI). For purposes of these rules, the condition of light work is an inhalation rate of 1.2 cubic meters of air per hour for 2,000 hours in a year.

So the DAC values in Table 7 are derived limits intended to control chronic exposure and are used in the analysis of airborne particulate exposures to workers. Table 7 presents DAC values for radionuclides developed for the uranium material from Dawn Mining based on applicable regulations and mill procedures and that take into account the specific radionuclide makeup of the Dawn Mining material. And the units in those DAC values are micro-Curies per milliliter.

14.8: "What is the source and nature of the UF4, K4 regen material and calcined material? How much of each of these materials has been processed at the mill?"

For UF4 material, the processing tons is 914. For the KF material, the total processed is 5,646. For the regen materials, total process is 535 tons, and the calcined material is 16,934 tons. And that's from '99 to present. These materials, the UF4 and the KF, are naturally uranium-bearing material residuals from Cameco Corporation's Port Hope facility. The regen material and calcined material are naturally uranium-bearing residuals from Comeco's Blind River conversion facility. The four materials were approved by NRC for processing as alternate feeds at the mill under amendment 9 to source material license SUA1358. Do I need to repeat any of those for you?

MS. FIELDS: No, I think I --

UNIDENTIFIED SPEAKER: It's in the transcript.

MR. HULTQUIST: Yeah, but let her have them if she needs them.

MS. FIELDS: Okay, thank you.

MR. HULTQUIST: All right. "Please identify the dates of the applications, license amendments and Environmental Analysis or analysis associated with the processing and disposal of the UF4, K4, regen materials and calcined materials."

IUSA submitted the license amendment application on June 4th, 1998. The NRC conducted an Environmental Analysis as documented in the November 2nd, 1998 Technical Evaluation Report which accompanied license amendment 9. The technical evaluation report refers to the following environmental technical information, and there's a bunch of dates. Do you want them or can you get them out of the transcript?

MS. FIELDS: Yeah, I think I can get that. I think I already have -- yeah, I can get that.

MR. HULTQUIST: Okay.

MS. FIELDS: But as a point, a TER is not an Environmental Analysis. An Environmental Analysis would -- and I'm sorry I wasn't more specific, because under the National Environmental Policy Act, where you do an analysis of the environmental impacts from the licensing action, and this also -- there was no Environmental Analysis for that, either. A TER is some -- they do -- the NRC often does a Technical Evaluation Report and then they do their Environmental Analysis, an EIS or an EA, or they do a categorical exclusion. But a TER is not an Environmental Analysis under NRC regulation.

MR. HULTQUIST: Okay, thank you. The only other thing I would add is the NRC issued license amendment 9 on November 2nd, 1998.

MS. FIELDS: Oh, yeah. I'm sorry, as I went through that, I was not more specific.

MR. HULTQUIST: No, I think you were very specific. You've asked for all of those details.

MS. FIELDS: Yeah, but as far as what constitutes an Environmental Analysis under NRC regulation, I was not specific. It's under their part 51 regulation.

MS. LOCKHART: And you're going to be providing information about why that is -- you believe that's the case? Because I don't want our silence to be interpreted as an agreement with that, that's all.

MS. FIELDS: Yeah, that -- that's true. I mean, it's a question.

MS. LOCKHART: That's all we need.

UNIDENTIFIED SPEAKER: If I may, that's what I was going to get to as well, to help us clarify what -- if you're identifying gaps or activities that were not conducted by NRC when they had the regulatory jurisdiction, it would be nice to know what kind of context you're expecting that for carryover for us as an agreement state. I don't want you to answer that now. We would need to look for that kind of context for what you're bringing up.

MS. FIELDS: Right, and we're all learning on this question-and-answer process as to how to write better questions and how to give good answers. So we're all -- this is our first, first experience with this. It's my first experience, so I'm learning, too.

MR. HULTQUIST: Okay. 14.9: "The SER, page 14, states the concentrations of thorium-232 and its decay products are negligible, and its decay products are negligible and can be ignored. What are the concentrations of thorium in decay products from the uranium material and other feed materials processed at the mill? Compare the half-lives and health impacts of the -- excuse me -- compare the half-lives and health impacts of the decay products of uranium with those of thorium decay products. What is the basis for discounting the health risks from thorium-232 and its decay products?"

Again, I'm going to say these concentrations of thorium-232 and their decay series are in line with conventional ores. That analysis was done in the EIS back in 1979, so it's already an analyzed condition with what the material consists of with this amendment requirement, or request.

MS. LOCKHART: Let me just say briefly, on 14.10, you'll remember that that's one of the ones that we said was not relevant. But John, nonetheless, has an answer for you.

MR. HULTQUIST: Yes, I still want to answer this one, because I think, Sarah, you should be able to answer this yourself. I don't mean to be blunt, but if you've got a vehicle that has 200 millirem per hour at any one point on the outer surface and you're right next to it, I'm assuming that person is right next to it, you have to make some assumptions that he, that that person, is right up against that contact, and that actual shipping container has 200 MR on -- per hour, and that person would only have to be there half an hour.

But that will never happen. That 200 millirem is a standard. It's a limit. It doesn't mean that's what's in the conveyance. All radionuclides are -- shipments are going to have different exposure rates. But if you want to take the theoretical aspect of your question, then it would be a half an hour that they would receive the 100 millirem if they were next to that, right next to it in contact with the surface. If they were right next to it and they were a distance away, then it's a lower number than 100. Does that make sense?

MS. FIELDS: Yes, thank you.

MR. HULTQUIST: But again, it's a transportation issue, and that's what DOT allows them to have on contact at the surface.

MS. FIELDS: Right, thank you.

MR. HULTQUIST: And most licensees or shippers don't even come close to that number, because if DOT stops them and it exceeds, then they get fined.

Okay, 14.11: "Were the White Mesa Mill tailings cells 4A and 4B designed contemplating the disposal and perpetual storage of wastes from the processing of material other than natural ores? If so, please identify the specific design elements in cell 4A and 4B that were developed in anticipation of the disposal of waste from the processing of materials other than natural ores from the Colorado Plateau."

Each amendment request submitted to the DRC includes an analysis of the compatibility of the proposed alternate feed with the tailing systems. The analysis considers the currently known chemical composition of the tailings, which we get from those annual sampling events, which reflects the presence of residuals from previously alternate feeds and compares that composition to the proposed alternate feed.

The design of the tailing cell is compatible with the radiological and chemical constituents of the uranium material from Dawn Mining. The evaluation to date has not identified any potential chemical reactions in the tailing systems.

MS. FIELDS: Thank you.

MR. HULTQUIST: 14.12. "Please identify and describe the specific design elements for the construction of the cell 4 and 4B that would anticipate the disposal of radiological and chemical constituents found in the uranium material."

I don't believe this is relevant to the -- to the amendment request. The design elements anticipated have been selected based on constituents and tailings waste fluids from the conventional mill at the White Mesa Mill. We know what's going in there, so those geomembranes, the liners, the leak detection systems, they're all best-available technology, state-of-the-art containment systems and bankments.

"How long after closure of the cells 4A and 4B will it take to move -- remove free-standing liquids from the cells such that the liquids would no longer provide a source of leakage from the tailings impoundments into the surrounding soils and groundwater?"

This question, I'm sorry, is outside the scope of this amendment request. We don't know how long those cells will -- the life will be, the dewatering of them, et cetera. It's outside the scope of this amendment request. They could fill up in two years and we could have them dewatered in six. They could take ten years to fill up. We don't know. That's why it's not relevant to the amendment request.

14.14: "Which radiological and chemical constituents present in the uranium material have been found in excess of groundwater standards in the monitoring wells at the White Mesa Mill?"

Again, the mill's quarterly groundwater monitoring reports are available on the DRC Web site, and they contain a tabulation of every analyte in any groundwater monitoring well that has exceeded its respective groundwater concentration limit for that monitoring period. Many of these analytes are found in natural background water as well as in natural ores and the uranium material. So I hope that answers your question.

MS. FIELDS: Yeah, I'll --

MR. HULTQUIST: They're out there.

MS. FIELDS: So I guess there's probably a number of them, I mean, because -- so it's just my -- my duty to take a look. Thank you.

MR. HULTQUIST: 14.15: "Has the DRC reviewed the amount and nature of contaminates in the previously-approved alternate feeds to determine whether groundwater discharge would need to be revised in order to detect the constituents in an alternate feed that are not found in Colorado Plateau's ores?"

Again, to me, this question is outside the scope of this license amendment. However, to answer your question, the answer is yes. The DRC, as part of its review of Fansteel, was an example. That material required the discharge permit to go out to public comment because we added some things and made some modifications to it. This one we do not have to. They are all already analyzed, or a surrogate is being analyzed, for the Dawn Mining material.

14.16: "Has the DRC determined the chemical compatibility of the contaminates in the previously-approved alternate feeds to determine the types of chemical reactions that would occur in the tailing cells as a result of disposing of the contaminates in the tailings impoundment?"

Again, each amendment request submitted to the DRC includes an analysis of the compatibility of the proposed alternate feed materials, both the chemical and radiological constituents in that feed material and what's already in the tails. So we look at that and we determine if there might be or could be a reaction with the composition. Is it neutral? Are they the same? Is there anything that's unusual about them? And to date, we have not identified any potential chemical reactions in the tailing cells.

14.17: "The SER states repeatedly that the radiological and chemical constituents in the uranium material are similar to ores in alternate feed materials previously processed at the mill. However, the SER often compares the constituents with those in alternate" --

MS. FIELDS: "Feed."

MR. HULTQUIST: "Alternate feed" -- sorry --

MS. FIELDS: I left out a word.

MR. HULTQUIST: -- "alternate feed approved for processing, but not necessarily processed at the mill. Why does the SER not limit its similarity analysis to feed materials that have actually been processed?"

Again, for this alternate feed material, the radiological chemical constituents are within the previously-analyzed condition from the assessment done in 1979, the EIS that was done in 1979 for conventional ores.

14.18: "The SER refers to the Occupational Safety and Health Administration regulations."

I'm just going to go on to the response. The reference, though, in the SER is in error. It should be MSHA, the Mine Safety and Health

Administration. The mill is subject to the regulation enforcement of the Mine Safety and Health Administration as a result of a tri-party agreement between USNRC, MSHA and OSHA. MSHA conducts inspections at least semiannually at the mill. The content and status of the -- excuse me -- the content and status of all MSHA citations from the previous licensed performance period have been provided to the DRC, or formerly to the NRC, with each license renewal application.

15. "The SER" -- can we just go to the question?

MS. FIELDS: I guess.

MR. HULTQUIST: "Has the DRC taken into consideration the fact that elevated levels of radionuclides have been associated with the disposal of wastes from the processing of alternate feed materials in a White Mesa Mill tailings impoundment?"

And the DRC is aware of the U.S. Geological Survey's published report of an assessment of potential migration of radionuclides in trace elements from the White Mesa Mill. We provided a preliminary review of our findings and we shared them with the public on July 9th, 2012. That meeting was held in Blanding. Currently, our actions are being taken. As part of the license renewal application, some of those things will be incorporated into the renewal, and those reviews and discussions are ongoing with the licensee at this point.

MS. FIELDS: Just a little follow-up. I think I -- one thing I was referring to was the recent Subpart W July 2013 Monthly Radon Flux Monitoring Report from cell 2 where they identified an area where waste from the processing of alternate feed material had been disposed of in cell 2, and they identified that as an area of increased radon emissions because cell 2 is releasing radon above the regulatory standard because it's being dewatered, so you don't have the waters attenuating the radon releases within the cell at this time.

So this is the first that I've known of any documentation or example or -- of an area in a tailings cell where the wastes from alternate feed was producing elevated levels of radon emissions as compared to other parts of the tailings impoundment. And this is something Energy Fuels has found.

And what that means to me is that this alternate feed that was disposed of, I mean the tailings, had radon -- radium and other radionuclides above the level of ordinary tailings from Colorado

Plateau ores. And I think a copy of -- I submitted a copy with my questions.

MR. HULTQUIST: Yes, did you.

MS. FIELDS: So I think that that is an issue with any processing with any material, any alternate feed application, including this, that sometime down the line the waste might be a source of increased radon emissions that would result in noncompliance. And this is the situation now. So there's obviously some difference between the radionuclides disposed of from this alternate feed and the radionuclides from the tailings from Colorado Plateau ore. And this is really a new issue that's come up because of the dewatering.

MR. HULTQUIST: Well, Sarah, could I ask you a further question about your statement there? Do you know for a fact that alternate feed materials that were processed and the tails that went out from that alternate feed are actually sitting within the top four or five feet of cell 2?

MS. FIELDS: I don't know. I'm just basing this --

MR. HULTQUIST: Well, you're making an accusation that --

MS. FIELDS: -- on statements -- no. This is what -- this is what Energy Fuels found, and it's the statements -- the statement is in their -- their document. I -- I didn't make this statement. I didn't go out -- I can't go out there and measure anything. I don't know the history of each. But they found elevated levels in that area. They found elevated levels where the slurry line was.

MR. HULTQUIST: Right, I understand. I'm just saying that conventional ores with the radium concentration can still produce a radon flux that is greater than the 20 pico Curies per meter per second that's required by Subpart W, so --

MS. FIELDS: Right, I'm aware --

MR. HULTQUIST: -- so the action that the licensee has to take --

MS. FIELDS: -- aware that --

MR. HULTQUIST: -- is to meet that compliance limit. Dawn Mining materials will not be going in cell 2 because it is closed. So that particular question regarding cell 2 and Subpart W and the radon flux coming off there is not relevant to this license amendment, because those tails are going to go into either 4B or 4A or some other cell down the road. And radium coming from conventional ores can still create a flux that is greater than what alternate feeds do. It depends on how it's handled, how much water is in the system, how close it is to the surface and how much cover they have.

So I would just like to say that because it's in cell 2 and that cell has an interim cover on it and it's being closed and dewatered, that is not relevant to this license application where this material is going to be processed and put in other tailing cells.

MS. FIELDS: Well, you may --

MR. HULTQUIST: And I hope the licensee gets those concentrations down.

MS. FIELDS: -- you answered my question. I asked you if you take that into consideration, and I guess you have considered that. Thank you.

MR. HULTQUIST: Which one are we on? I'm sorry.

UNIDENTIFIED SPEAKER: 15.2.

MS. FIELDS: 5.2, sorry.

MR. HULTQUIST: "Has the DRC taken into consideration -- taken into consideration the fact of the disposal of materials from the tailings impoundments by wind and other natural forces?"

Yes. The SER considers factors that -- the dispersal of materials from tailings impoundments. The facility has BAT operations monitoring and maintenance plans that are approved to keep the dust from being generated coming off the tails. They use best-available technology standards in their groundwater discharge permit. They're inspected on a daily basis. If there's -- if there's dispersal materials coming off there, there are certain requirements that they're to do out of their SOPs to water them down, put applicant water or salt agents, what have you, to minimize the amount of dust leaving the tailing cells. They need to do that on their ore storage pad as well.

MS. FIELDS: Thank you.

MR. HULTQUIST: So we feel that their current SOPs and their operation plans cover the release of materials both from the ore pad and the tailings cells.

"What are the radiological constituents that will be disposed of in the tailings impoundment from the processing of the uranium material that are different from the radiological constituents that would be disposed of from the processing of Colorado Plateau's ore at the mill" -- excuse me -- "Colorado ores at the mill?"

None.

MS. FIELDS: Thank you.

MR. HULTQUIST: "Do the EIS and Environmental Assessment (EA) for the White Mesa Mill operation evaluate the health, safety and environmental impacts from the receipt, storage, processing, disposal and long-term storage related to the processing of alternate feed materials? If so, please identify the documents and sections that contain such evaluation."

I think we've kind of kicked this one down a couple of times, but again, the license renewal application of 1991 contemplates the alternate feed material being processed at the mill, and so does the application of 2007. The NRC alternate feed guidance and the mill's radioactive material license anticipate the potential for processing of alternate feeds in conventional uranium mills specifically by requiring the submission of a license amendment containing an environmental report for the use in an Environmental Analysis specific to each proposed alternate feed. In other words, they have to come in and get a license approved -- license amendment approved from the director.

15.5: "Has the DRC conducted an evaluation of the cumulative impacts of the receipt, storage, processing, disposal and long-term storage related to the processing of alternate feed materials at the White Mesa Mill?"

Cumulative impacts are evaluated during inspections and sampling over the course of time by way of the licensee's environmental monitoring plan and the groundwater discharge permit.

MS. FIELDS: Thank you.

MR. HULTQUIST: Believe it or not, folks, we're almost done with her questions.

MS. FIELDS: Last question.

MR. HULTQUIST: 16.1: "Does the DMC" -- Dawn Mining Corp -- "have a general or a specific license to transfer the uranium material from the Midnite Mine to the White Mesa Mill?"

I'm going to let Energy Fuels respond to this one because I think I've done enough talking for the last hour or so. So if one of you wouldn't mind taking that.

MR. FRIEDLAND: David Friedland, Senior VP and general counsel at Energy Fuels. The answer is Dawn Mining has all the approvals required to transfer the materials. The Midnite Mine site is regulated under CERCLA management under EEP jurisdiction at this point, and no specific licenses are needed for -- in addition to that regulatory authority in order to transfer the materials from that site to the White Mesa Mill.

MS. FIELDS: I have a question. Is that an opinion of the EPA in Washington? I mean, has the EPA --

MS. LOCKHART: This is -- this is a legal question, but let's go with it. If you'll take a look at CERCLA §121(e), you'll see that there's an exemption from having to obtain any federal permits or licenses for CERCLA activities that are conducted on site.

MS. FIELDS: Because I did call the EPA and they said they didn't know and they would look into it.

MS. LOCKHART: I'm sure somebody in EPA knows.

MS. FIELDS: Okay.

MR. LUNDBERG: Sarah, this is --

MS. FIELDS: So I just wondered if you'd really looked into that and talked to the EPA or -- or the State of Washington.

MS. LOCKHART: My request to you would be that you provide, in your comments, some context that shows how that is an enforcement issue that we should be managing. I don't see that it is, so let's do it in that context.

MS. FIELDS: Okay, yeah, I'll do further. Thank you very much for your patience.

MR. LUNDBERG: Just if I -- this is Rusty Lundberg. Before you finish, just to clarify that last point, when you said you talked to EPA, are you talking EPA Region 10 --

MS. FIELDS: Yes.

MR. LUNDBERG: -- out of Seattle that has jurisdiction over the State of Washington?

MS. FIELDS: Right, right. Not Region 8, Region 10, yeah.

MR. LUNDBERG: But I wanted to make sure you weren't referring to the Department of Ecology, making them the EPA in Washington. You're talking about U.S. Environmental Protection Agency?

MS. FIELDS: EPA Region 10, yes.

MR. LUNDBERG: Okay, thank you.

UNIDENTIFIED SPEAKER: Do people want a break?

MR. HULTQUIST: Maybe we can -- next, in terms of order of proceedings, would be the questions from Grand Canyon Trust. So how do you wish to proceed? Would you like to go ahead or do you want to take a break before you start?

MS. TAPP: This is Anne Mariah. Either way is fine. I don't anticipate that these will take a long time.

MR. HULTQUIST: Do you have a preference, staff?

UNIDENTIFIED SPEAKER: Let's go.

MR. HULTQUIST: Okay, we're going to go ahead. So Anne Mariah, do you want to introduce yourself and proceed?

MS. TAPP: Yeah. I'm Anne Mariah Tapp. I'm an attorney for the Grand Canyon Trust, and again, I apologize for being late. My computer managed to die earlier today, and I've been trying to deal with that, so my apologies for that. But I am prepared to go ahead. It seems like several of the questions got folded into --

MS. LOCKHART: I think there's going to be a lot of similarities.

MR. HULTQUIST: Yeah, so --

MS. LOCKHART: You're pointing to that letter?

MS. TAPP: To this letter.

MS. LOCKHART: Really, only one?

MS. TAPP: One, okay, perfect.

MS. LOCKHART: I remember three.

MS. TAPP: Great, yeah, so we can just proceed with you all's response to those.

MR. HULTQUIST: Okay. Question number 1 is: "What testing did the Utah Division of Radiation Control perform evaluating the compatibility of the liners of cells 4A and 4B with the alternate feed material proposed to be accepted from the Midnite Mine site? What were the results of that testing?"

The -- I guess initially the answer to that general question is no, there was no specific testing to the materials. However, these materials, the radiums, the radiologic constituents, the chemical constituents, are very similar to what you would see in what byproduct material goes out to these tails.

So cell 4 and cell 4B were -- went through our process with the DRC, and they were constructed of 60-mill high-density polyethylene HDPE flexible geomembrane. Both cells include a double 60-mill HDPE membrane with a leak detection system. These liner systems are designed and consistent with BAT -- best available technology -- design criteria for waste containment facility liner systems.

In other words, when we spec these systems out, they're supposed to contain these types of materials. That's why they build them. Specific testing, though, again, regarding the chemical compatibility with the specific uranium material was not done on these liners.

MS. TAPP: Okay, thank you.

MR. HULTQUIST: And I have some more specifics here about that HDPE, so I don't know if it's really necessary to go into them.

Number 2: "What testing will be undertaken to determine whether the groundwater protection standards for barium contained in 10C FAR, Part 40, Appendix A, criterion 5(c) are being met at the mill?"

Currently, no analysis of groundwater samples for barium will be performed. The existing groundwater monitoring program conducted at the mill site is deemed adequate for monitoring the potential impacts of groundwater resulting from the disposal of residuals resulting from processing of the Dawn Mining uranium material.

MS. TAPP: To clarify, can I --

MR. HULTQUIST: Uh-huh.

MS. LOCKHART: He was going to add something. Isn't there -- I mean, there's something that stands in the place of barium, essentially.

MR. HULTQUIST: Yes. I'm going to get on to the issue about barium and the salt that it -- that's created in the solutions. But if you want to go ahead and ask your question.

MS. TAPP: Sorry.

MR. HULTQUIST: Also, as described in the SER, the DMC uranium material barium is present as barium sulfate. The solubility of barium sulfate is cold water -- excuse me -- in cold water is .022 milligrams per liter, and in concentrated, sulfuric acid is .025 milligrams per liter. Once in the mill circuit, barium sulfate would remain as barium sulfate due to its low -- very low solubility in concentrated sulfuric acid.

At the listed concentration of sulfide in the tailing solutions, 67,600 milligrams to 87,100 milligrams in cell 4A, a change in the ambient barium concentration in the tailings solutions to .02 milligrams per liter due to the placement of this uranium material would be expected to be very, very negligible.

Would that suffice, or would you like some more?

MS. TAPP: No, I think -- just out of --

this is kind of a practical question. Just out of curiosity, what would the burden on you all be to institute some kind of barium monitoring? Just what would that look like in terms of --

MS. LOCKHART: The difficulty that we'd have, according to what John just said, is that we would have to have a basis for that, and so -- for requiring them to do that. And if there is essentially zero expectation that it would end up in the groundwater, it would be pretty tough for us to justify that. And I'm saying that as an "if," so if you --

MR. HULTQUIST: Maybe, more specifically to get to your concerns, there's other surrogates or there are other analytes that we monitor for that's going to be out in front with the leak than barium, so it's the last of our worries. There's other things that we have in place that we can see long before barium would ever get there.

MS. TAPP: Okay.

MR. HULTQUIST: So we feel those are adequate to protect the health and safety and the environment.

MS. TAPP: And that appendix A, criterion 5 does impose a groundwater standard; correct?

MR. HULTQUIST: Uh-huh.

MS. TAPP: But I'm just, again, just clarifying for myself, but there is no --

MR. HULTQUIST: Right, but we did not include -- we did not include that table or all of those analytes in the groundwater discharge permit because that's a federal regulation and we have our state groundwater quality rules.

MS. TAPP: Right. Okay, thank you.

MR. HULTQUIST: I don't have 4. I thought we were --

MS. LOCKHART: You thought that was that?

MS. TAPP: Oh, it's not that many left.

MR. HULTQUIST: Sorry, I don't know why it's not there. Okay, 4: "What regulatory action has been taken to address and eliminate the off-site deposition identified in the USGS report dated February 8th, 2007?"

Again, practical steps. We're working with the licensee in the 2007 renewal application to implement some of those things, to revise them from our monitoring plan, a couple of additional air stations and things, and we're working with them to take care of those things. Our findings are out on the Web, and you can see what we've decided to include and some things we said well, we're not real sure about those. But there are some things that we can do with -- in the renewal that address the off-site migration.

MS. TAPP: Right, and the timing of the implementation of those steps is?

MR. HULTQUIST: Whenever we can get that SER done and the mill dose run done, and get the draft back to them, the addendum that should come out. I'm hoping by the end of this year we should have something out to the public and the draft license showing those changes and whatnot.

MS. TAPP: Okay, thank you.

MR. HULTQUIST: But if you want to see what the DRC looked at as far as that USGS report, that's on our Web page.

"How would the chalk-like composition of Midnite Mine material" -- or excuse me -- "Midnite Mine alternate feed materials exasperate the outside deposition problems identified in the USGS report?"

Again, the stuff going into the tails we feel the licensee has a handle on. One of the things we put in this new license condition 10.20 is that they cover this material when it's on the ore storage pad. If it's going to sit out there for anything longer than seven days, I believe is what the language says, that they will put a cover over it, because we realize this stuff is brick-like, and if it does decompose, it's going to be a very fine, light material. It's not going to be big chunks of ore typically sitting on the pad. So we've added that condition that they cover it.

MS. TAPP: And our concern is the seven-day -- I had 21 days in my head, but seven-day window doesn't adequately account for high winds that could occur in that seven-day period. So we're concerned about the adequacy of that in terms of protecting downwind communities and the environment from the impacts of that dust. So just to put that out there.

MR. HULTQUIST: Okay, point well taken. I know the Standard Operating Procedures for them is to water that material down. They have a water truck that goes around the ore storage pads, so if there's high winds, then they need to get their water truck out and get that moisture content out to minimize the dispersion.

MS. TAPP: Right, and I think that the language in some of the conditions in the air quality permit, again, if I recollect correctly, are a little bit loose in terms of "as deemed necessary," "as appropriate." And a little bit we're just also concerned about the ability -- about the practical enforceability of those types of language in the permit.

MR. HULTQUIST: Okay.

MS. LOCKHART: Did you say air quality permit?

MR. HULTQUIST: Yes.

MS. TAPP: Right, I understand that we're not in here for --

MS. LOCKHART: No, I just wanted to understand.

MR. HULTQUIST: I'm going to put that on the licensee. Do you want to talk about your practical operations out there and what you see when winds kick up?

MR. ROBERTS: Yeah. This is Harold Roberts again. Let me address specifically the Dawn Mining material. You know, we've got a requirement, once it is on the ore pad for a certain number of days, to cover that material. And initially, the material, when it's received on site, will have a very high or relatively high moisture content. So the possibility of any windblown material coming off of that until it dries out is very, very remote.

So the time period given before we need to cover the material will, you know, we feel, be adequate to ensure that the material is still relatively high moisture content, and thus not be susceptible to windblown material leaving the ore pad.

MR. HULTQUIST: I can't remember, did we have seven days or 14 days?

MR. ROBERTS: 14.

MR. HULTQUIST: 14, okay.

MS. TAPP: We're splitting the difference there, 7 and 21.

MR. HULTQUIST: Well, for some reason when I said 7, I thought that's not right. We agreed on something else, I think. And again, I think the Agency's being proactive here. They've never been asked to put a cover on there, and I think there's some justification to say they shouldn't have to. But it can sit out there for a fair amount of time, and this material is not in big chunks.

It can -- when it's dumped, it could break apart and become fines and then be transported. So we're sensitive to that issue, and that's why we thought 14 was reasonable. If winds pick up before then, then they should be applying water on it, get that moisture content back up to minimize the dispersion. Or they can just cover it before then if they want, if they know they're not going to process it. But we'd like to give them some flexibility as well.

MS. TAPP: Right, and just given that this isn't normal dust, it isn't road dust, we feel that there should be more stringent controls and that perhaps more than -- or less than a 14-day window is justified, given the content of the alternate feed material and the high-uranium content with them.

MR. HULTQUIST: Okay, thank you. "What periods of time can these tailings be exposed without a water cover? Will a 1-meter water cover be required at all times for these tails? Please describe dusting and radon emission impacts that can occur when the waste from processing these -- waste from processing these wastes are not covered."

Again, the liquid levels in cells 4A and 4B, there's a certain level in which we can't exceed for freeboard limits regarding storm events, et cetera. So they're typically maintained at a level of approximately 4.8 to 5.8 feet below the top of the geomembrane liner in each cell.

Now, right now, one's receiving liquids and the other one's receiving tails, so -- and they're very low down in the bottom of the cells, so to speak. The groundwater discharge permit also specifies a minimal freeboard of three feet, and so there, at certain times, maybe later, the tails or the beach areas might dry out. At that point, then they need to apply water to them to keep those dusts down. Again, part of their operating procedures are to, if they see visible dust, then they need to go apply applicants, either water or salt water type, to form a crust on those tails. But we can't just cover the whole thing in water, so to speak, or liquids, because there has to be a freeboard there for storm event calculations. We don't want to create a greater mess than what could happen if we overflowed the cells.

I think over the time, their Standard Operating Procedures that they have in place, whether it's this Dawn Mining material or alternate feeds or other alternate feeds or Colorado strip or Arizona materials, they're adequate. So unless Harold wants to add any more to the SOPs and what you guys do out there.

They do keep records of their dust

suppression, their water use, whether it's on the tails or whether it's in the ore storage pad area. We review those during our inspections to see that they are being applied. I don't -- I don't think the staff looks at whether it's a high-wind day or not, just that effort's being made to put water on those areas.

MS. TAPP: Thank you.

MR. HULTQUIST: I'll turn it back over to you. I think that's the end of the questions.

MR. ANDERSON: That concludes all of the written questions that have been submitted. So if at this point in the proceedings, again, we're proceeding informally, if there are any other questions or comments, I suppose they can be submitted. If not, we'll move to close the hearing.

John?

MR. HULTQUIST: I just wanted to add one thing. Sarah, do you know if the tribe is going to attend the meeting next week down in Blanding? I'm surprised they're not here, so I was just questioning whether or not you knew what the status is with them.

MS. FIELDS: I don't know. I think, like everybody, like many government agencies, they're -- they have --

MR. HULTQUIST: They're shut down?

MS. FIELDS: No, they're not shut down, but they have funding issues, so I really don't know. There's a possibility -- I will attend. I know I've tried to get other people out to attend, so I've made some efforts to get -- to encourage people.

MR. HULTQUIST: Well, we've sent it to them and we didn't hear a response, so I wasn't sure.

MS. FIELDS: Well, you might follow up with them and --

MS. TAPP: They're aware of the --

MR. HULTQUIST: Of the meeting?

MS. TAPP: They're aware of the meeting. I am unsure -- the shutdown has impacted them in odd ways, and -- but I believe that you can expect comments. And to be clear, I'm not speaking for the tribe in any way, but they're aware of the meeting. I don't know whether they're going to attend, but they are --

MR. HULTQUIST: Okay. Or they might just decide to provide written comments, which is fine. I was just used to seeing them around the table, so I was just wondering if something was -- something was amiss.

MR. ANDERSON: John, just for the record, it may be worthwhile to repeat the time and the date of the next meeting.

MR. HULTQUIST: Okay. The public meeting will be held October 16th at 5:00 p.m. at the Blanding Arts and Events Center, and we will be taking written as well as oral comments. It will not be a time for cross-examination. It will just be an opportunity for local residents to take -- to make oral comments or provide us with written comments if they so desire.

MR. ANDERSON: And then written comments will be accepted through the close of business through October 21st; is that correct?

MR. HULTQUIST: That is correct.

MR. ANDERSON: I think that concludes our business today, so with no further ado, I'll declare the hearing closed.

MS. FIELDS: Thank you.

MS. TAPP: Thank you all for your time.

(The proceedings were concluded.)

* * *

REPORTER'S CERTIFICATE

STATE OF UTAH)
) ss.
COUNTY OF SALT LAKE)

I, Kathy H. Morgan, Registered Professional Reporter and Notary Public in and for the State of Utah, do hereby certify:

That on October 22nd, 2013, I transcribed an electronic recording at the request of Shairose Falahati;

That the testimony of all speakers was reported by me in stenotype and thereafter transcribed, and that a full, true, and correct transcription of said testimony is set forth in the preceding pages, ACCORDING TO MY ABILITY TO HEAR AND UNDERSTAND THE RECORDING PROVIDED;

That the original transcript was sealed and delivered to Shairose Falahati for safekeeping.

I further certify that I am not kin or otherwise associated with any of the parties to said cause of action and that I am not interested in the outcome thereof.

WITNESS MY HAND AND OFFICIAL SEAL this 24th day of October, 2013.

____
Kathy H. Morgan, CSR, RPR
Notary Public

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Attachment B:

Public Comments on Dawn Mining Alternate Feed Proposal

Uranium Watch

76 South Main Street, # 7 | P.O. Box 344
Moab, Utah 84532
435-259-9450

via electronic mail

October 21, 2013

Rusty Lundberg
Director
Division of Radiation Control
P.O. Box 144850
Salt Lake City, Utah 84114-4850
radpublic@utah.gov

RE: Comments on Energy Fuels Resources Dawn Mining Amendment Request

Dear Mr. Lundberg:

Attached Comments on the Amendment to 11e.(2) Byproduct License UT1900479, Energy Fuels Resources (USA) Inc. White Mesa Mill, San Juan County, Utah. These comments are submitted on behalf of Uranium Watch, Living Rivers, the Glen Canyon Group of the Sierra Club, and the Information Network for Responsible Mining.

Thank you for providing this opportunity to comment.

Sincerely,

Sarah Fields
Program Director
Uranium Watch
and
Nuclear Issues Chair
Glen Canyon Group
Sierra Club
P.O. Box 622
Moab, Utah 84532

Jennifer Thurston
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John Weisheit
Conservation Director
Living Rivers
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Moab, Utah 84532

COMMENTS

Amendment to 11e.(2) Byproduct License UT1900479
Energy Fuels Resources (USA) Inc.
White Mesa Mill
San Juan County, Utah

Below are Comments on the proposed Licensing Action by the Director of the Utah Division of Radiation Control (DRC) to amend the Energy Fuels Resources (USA) Inc. (EFRI) 11e.(2) Byproduct License (RML UT1900479). EFRI proposes to amend the License for the White Mesa Uranium Mill in San Juan County, Utah, to authorize the receipt, storage, and processing of uranium-bearing materials (Uranium Material) from the Dawn Mining Company's Midnite Mine Superfund facility in Wellpinit, Washington. EFRI application documents is dated April 27, 2011, and supplemented by submittals of December 5, 2012, June 14, 2013, and August 7, 2013 (Amendment Request).

The DRC authorization would also include the disposal and perpetual storage of the waste from the processing of these materials. These comments are submitted on behalf of Uranium Watch, Living Rivers, Glen Canyon Group of the Sierra Club, and the Information for Responsible Mining (INFORM).

GENERAL COMMENTS

1.1. The DRC documents associated with this license amendment should be in a PDF format that allows for the selecting and copying of any text in the document, in order to facilitate the inclusion of quotes from these documents in any comments provided to the DRC. For example, I am unable to select and copy the text from the DRC's Safety Evaluation Report. The selection tool on my computer selects large sections of text, rather than the text I want to copy.

1.2. The documents associated with EFRI applications should also be in a PDF format that all allows for the copying of any text in the document, in order to facilitate the inclusion of quotes from these documents in any comments provided to the DRC.

1.3. The Amendment Request submitted by the EFRI contains numerous citations or references to documents that are not readily publicly available. These documents should all be readily available for public review.

AMENDMENT REQUEST

2.1. In the April 27, 2011, Amendment Request (page 8), EFRI claims that the Uranium Material is exempt from the Recourse Conservation and Recovery Act (RCRA). EFRI claims that "any alternate materials that contain greater than .05% source material are considered source material under the definition of source material in 10 CFR 40.4 and hence exempt from the requirements of RCRA under 40 C.F.R. 261.4(a)(4)."

According to the Nuclear Regulatory Commission's (NRC's) redefinition, the term "ore" means "ore" or "any other matter from which source material (i.e., uranium and/or thorium) is extracted in a licensed uranium or thorium mill." [1] Therefore, for an alternate feed material like the Uranium Material to become "ore" it must be processed in a licensed uranium or thorium mill." Before the material is processed, e.g., when it is sitting in drums or on an "ore pad" at the Mill, it does not meet the Interim Guidance's redefinition of "ore," because it has not been processed at a licensed mill. It only becomes "ore" retroactively, after it has been processed in a licensed uranium or thorium mill. There is no claim in the Interim Guidance that alternate feed is "ore" before it is processed, or waiting to be processed. Based on the redefinition of "ore" there appears to be no specific point in time and space when the Uranium Material is actually "ore," due to this retroactive nature of the definition. The absurdity of this is apparent.

The Interim Guidance's redefinition of the term "ore" only applies to the issue of the whether the waste from the processing of that material can be defined as 11e.(2) byproduct material.[2] The NRC Interim Guidance does not state or claim that the Guidance's definition of "ore" in any manner applies to or in any manner alters the statutory or regulatory definition of "source material" (42 U.S.C. §2014(z)).[3] The NRC is not legally authorized to amend the Atomic Energy Act (AEA) definitions via a policy guidance.

Therefore, alternate feed material that contains uranium and/or thorium (in any amount) contains "source material," and meets the first definition of "source material." The uranium and/or thorium content, not the alternate feed, is "source material." Material that contains "source material" above .05% uranium and/or thorium and a listed or characteristic hazardous waste is called "mixed-waste." There is no statutory or

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[1] U. S. Nuclear Regulatory Commission, Office of Nuclear Material and Safety and Safeguards, NRC Regulatory Issue Summary 2000-23, Recent Changes to Uranium Recovery Policy, Washington, D.C., November 30, 2000.

[2] 42 U.S.C. §2014 (e)(2): "The term "byproduct material" means—
***
(2) the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content."

[3] 42 U.S.C. §2014(z): "The term "source material" means (1) uranium, thorium, or any other material which is determined by the Commission pursuant to the provisions of section 2091 of this title to be source material; or (2) ores containing one or more of the foregoing materials, in such concentration as the Commission may by regulation determine from time to time."

regulatory basis for determining that the Uranium Material ever meets the second definition of "source material" as an "ore."

2.2. The June 14, 2013, EFRI Response to June 22 and June 23, 2013, DRC Request for Information (page 2) states: "The storage and processing of the Uranium Material will not introduce new constituents or new constituent forms (dissolved, particulate or gaseous) or create significantly new human or environmental exposure risks that have not already been addressed by previous submittals and approvals by appropriate authorities (US Nuclear Regulatory Commission ("NRC") or DRC)."

EFRI has not identified the environmental exposure risks that have been addressed by previous submittals and approvals by the NRC or the DRC.

The 1979 NRC Final Environmental Statement (ES) Related to Operation of White Mesa Uranium Project only contemplated the environmental effects of the White Mesa mill receiving and processing uranium or uranium/vanadium "ores" from the Colorado Plateau region. New circumstances are associated with the White Mesa Mill receiving, stockpiling, and processing feed materials that are not ores and that are not from the Colorado Plateau, and disposing of those non-ore materials after processing.

The 1979 ES and Environmental Assessments (EAs) that supplemented the 1979 ES did not address the environmental effects from the processing of feed material containing source material thorium and the disposal of source material thorium in the tailings impoundments without the recovery of any source material thorium-232 and progeny.

Most of the requests for license amendments to authorize the the processing of alternate feed at the White Mesa Mill were not the subject of an environmental analysis, pursuant the National Environmental Policy Act (NEPA) and the NRC implementing regulations at 10 C.F.R. Part 51. Therefore, thousands of tons of materials (including toxic materials not found in Colorado Plateau ores and asphalt, concrete, and other rubble) were processed and disposed of at the mill without an EA and Finding of No Significant Impact (FONSI).

The NRC produced brief Technical Evaluation Reports (TERs), but in no way were these documents an a assessment of the environmental impacts, including cumulative impacts, from the receipt, processing, and disposal of alternate feed.

Further, the DRC has not reviewed all of the TERs and Amendment Requests associated with the License Conditions authorizing the receipt and processing of the various alternate feeds. The Amendment Requests are part of the White Mesa Mill License, yet, they have not been made readily available to the public and some of them are not even readily available to the DRC staff.

SAFETY EVALUATION REPORT

3. General Comments

3.1. The Safety Evaluation Report (SER) for the Amendment Request fails to identify all of the documents included in the Amendment Request.

3.2. The DRC has relied on documents related to the licensing and operation of the White Mesa Mill that are not readily publicly available in its review and evaluation of the Amendment Request. Some of these records are referenced in the Mill's Radioactive Materials License (RML) UT1900479, so they are part of the License.

The Mill's License Conditions (LCs) include a number of LCs for the approval of the receipt of alternate feed from various sources. These LCs reference the specific licensee applications, yet none of these applications are posted on the DRC website. Further, when I requested some of the applications associated with feed material that was still being received at the White Mesa Mill (from the Cameco and Honeywell facilities), I was initially told that the DRC was unable to locate those records. The requested records were actually in storage. I have located some of the requested records when I reviewed documents at the DRC office on October 8, but I have yet to receive them.

Additionally, during the public hearing of October 9, 2013, at the Department of Environmental Quality office in Salt Lake City, the DRC staff stated that they reviewed some, but not all of the records associated with the NRC's's approval and technical review of previous alternate feed license amendment requests and drew conclusions from those records. Again, those documents were not identified in the SER, nor are they readily available on the DRC website.

In sum, the DRC based its review of the Amendment Request, the SER, and proposed licensing action on documents that the DRC failed to identify and failed to make readily available to the public.

3.3. The DRC failed to characterize the radioactive content of the tailings, or wastes, from the processing of the Uranium Material.

4. Previous Alternate Feed Proposals and Alternate Feed Assessment Process

4.1. In the discussion of Previous Alternate Feed Proposals and Alternate Feed Assessment Process (SER, pages 2 to 3) the SER only references one previous alternate feed proposal, the one approved by the DRC for the processing of waste from the cleanup of the Fansteel Metals Resources, Inc.'s facility in Oklahoma. The SER should have included a description and status of all of the previous alternate feed proposals that are listed in the License.

4.2. The SER (page 3) states: "The Uranium Material is classified as 11e.(2) byproduct material." This statement is incorrect, and any conclusions derived from that statement are also incorrect. The SER and the Amendment Request already stated that the material contains "source material," and, since that material has never been processed for its source material content in a licensed uranium mill, it is not 11e.(2) byproduct material.

4.3. The discussion of the Alternate Feed Assessment Process is found the Section regarding the Alternate Fed Assessment Process, pages 6 to 23, below.

5. Radiological Impacts

5.1. Table 1 (page 8) provides data on the minimum and maximum range of radionuclide concentrations in the Uranium Material. The data for the maximum amount of thorium-228 is incorrect. The amount of thorium-228 does not correlate with the ratio of thorium-228 to thorium-232 for the minimum concentrations. The maximum amount of thorium-228 should be much higher, so that the ratio of the maximum levels of thorium-228 to thorium-232 is similar to the ratio of the minimum levels.

5.2. Table 2 (page 9) should include the radium isotopes that are decay products of thorium-232 and list them separately, before combining radium as "Total Radium."

5.3. According to the Amendment Request, the uranium content of the Uranium Material is estimated to be 1.4%, and the thorium content is .005 %.[4] Therefore, the ratio of uranium to thorium-232 is approximately 1:280. However, when considering only the radium content from uranium and total thorium the ratio of radium 224 and 228 (thorium progeny) to radium 226 (uranium progeny) is 1:1.6. So, the radium from the thorium is at much greater levels than would be expected from comparing the uranium and thorium-232 content.

None of the tables in the SER reveal how much greater the radium content from thorium is, in relationship to the amount of thorium compared to uranium. Nor, is their any discussion of the implications of this relationship.

Rather, the DRC has minimized the impacts from the thorium content of the Uranium Material, relying only on the thorium content, rather than the much larger radium content derived from thorium-232. The statement that the "Concentrations of Thorium-232 and its decay products are negligible and can be ignored" (page 14) have no basis in fact when it comes to the radium content.

U-MATERIAL CONTENT	PERCENT	AVERAGE	RATIO
Thorium	0.005%		1:
Uranium	1.4%		280
Radium 224 & Radium 228		15.0 pCi/g	1:
Radium - 226		24.1 pCi/g	1.6
Total Radium		39.1 pCi/g	

[4] It is not known if the percent thorium content stated in the Amendment Request is total thorium (thorium-232 and thorium-228) or just thorium-232. Additionally, the SER estimates that the thorium-232 content is .00076 % making the ratio of uranium to thorium-232 1:1,974. Neither the Amendment nor the SER are always clear whether they are considering total thorium (thorium-232 plus thorium-228) or why only thorium-232 is being measured and not thorium-228.

The SER must acknowledge and consider that fact that the radium content of the thorium is about 2/3 that from the uranium and, therefore, the radon emissions from the thorium will be almost as much as from the uranium and cannot be ignored.

5.4. Table 5 (page 11) compares the radionuclide activity concentrations in the proposed Uranium Material with other feed materials. Most of the previous alternated feed material identified in the table is from the W.R. Grace Application of April 2000, over 13 years ago. Since the W.R. Grace material was never shipped to the White Mesa Mill and it is unlikely that it ever will be shipped to the Mill, the W.R. Grace material and any other alternative feed that has never been processed at the Mill should not be used as a comparison with the DMC Uranium Material. Only feed materials actually received and processed at the Mill should be used for comparison.

5.5. During the October 9, 2013, hearing in Salt Lake City, DRC staff stated that the 1979 NRC NEPA environmental analysis for the White Mesa Mill[5] evaluated the processing of ores containing thorium-232 and thorium-228. I would assume that those ores came from the Colorado Plateau. The DRC should state exactly where in the 1979 ES the NRC states the thorium-232 and thorium-228 content of ores that would be processed at the Mill and where, exactly, the processing of ores containing thorium was evaluated.

5.6 The 1979 ES did not assess any of the environmental impacts from the processing of any feed materials other than "ore" at the White Mesa Mill.

6. Transportation and Storage of the Uranium Material

6.1. The discussion of the transportation of the Uranium Material fails to provide information about how well prepared the local, state, and federal agencies are to respond to a spill of the Uranium Material. The SER must evaluate the possible impacts from a spill of the Uranium Material and the ability of the appropriate agencies to respond.

6.2. The SER (page 17) states that EFRI employees will take actions within 30-minutes to stop the generation of visible dust. First of all, if the material has degraded to dust particles, a lot of dust could be dispersed within a 30-minute period. Additionally, winds also blow at night when it would be difficult to observe the dispersal of dust. Additional measures must be taken to assure that the Uranium Material would not be dispersed from the ore storage pads under any wind or lighting conditions. Additionally, if any materials are dispersed, whether on-site or off-site, the material must be promptly cleaned up.

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[5] Final Environmental Statement (ES) Related to Operation of White Mesa Uranium Project, 1979

ALTERNATE FEED ASSESSMENT PROCESS

7. Determination of whether the feed material is an ore.

7.1. The SER (page 2) states: "For the tailings and wastes from the proposed processing to qualify as 11e.(2) byproduct material, the feed material must qualify as 'ore.'"

The DRC errs in stating that the feed material must "qualify" as "ore." Based on the statute, the feed material must **be** "ore." Also, it must be "ore," as contemplated by the AEA (42 U.S.C. §2014 (e)(2)) and the regulations promulgated by the NRC (10 C.F.R. § 40.4) and the Environmental Policy Act (EPA) (40 C.F.R. Part 192) responsive to the 1978 Uranium Mill Tailing Radiation Control Act (UMTRA) (Public Law 95-604, 92 Stat. 3033 *et seq*.), which amended the AEA of 1954 (Public Law 83-703, 68 Stat. 919 *et.seq*.). The AEA of 1954 was an amendment of the AEA of 1946 (Public Law 79-385, 60 Stat. 755 *et seq*.)

7.2. The material must be "ore," because the AEA defines 11e.(2) byproduct material as "the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content." According to the White Mesa License Condition 10.1A: "The licensee may not dispose of any material on site that is not "byproduct material," as that term is defined in 42 U.S.C. Section 2014(e)(2) (Atomic Energy Act of 1953, Section 11(e)(2)). Therefore, the wastes from the processing of materials other than "ore" do not meet the statutory definition of 11e.(2) byproduct material and should not be disposed of at the White Mesa Mill.

7.3 The SER also states that in order to determine whether the feed material is "ore" the DRC can rely on a definition of "ore" that has been establish by the NRC. The SER references SECY 95-211, SECY 99-012, and regulatory issue summary 2000-23[6]. The DRC also relied on the NRC "Interim Guidance on the Use of Uranium Mill Feed Material Other Than Natural Ores" (Interim Guidance), dated November 30, 2000. The DRC did not make those documents available on the DRC website. The DRC should have made any documents relied on for the review of the subject license amendment available, and included the links in the SER and the DRC website Public Notice of the proposed licensing action.

7.4 . The NRC documents relied on by the DRC are from a policy guidance. A policy guidance is neither statute or regulation. The policy guidance has no legal force and effect. Nor, can a federal policy guidance be used to substantively amend a federal statute or regulation. Additionally, the State of Utah is not authorized to amend a federal statute or regulation.

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[6] U. S. Nuclear Regulatory Commission, Office of Nuclear Material and Safety and Safeguards, NRC Regulatory Issue Summary 2000-23, Recent Changes to Uranium Recovery Policy, Washington, D.C., November 30, 2000. "Interim Guidance on the Use of Uranium Mill Feed Material Other Than Natural Ores" (Interim Guidance), November 30, 2000.

7.5. The SER quotes the from the NRC Interim Guidance's new definition of the term ore: "Ore is a natural or native matter that may be mined and treated for the extraction of any of its constituents or **any other matter from which source material is extracted in a licensed uranium or thorium mill**." Emphasis added. In other words, the DRC is adopting a substantive change to a federal and statutory definition in order to facilitate the processing of radioactive waste in the guise of "ore." The State of Utah has no legal authority to make such change to federal statute and NRC and EPA regulation.

8. Definition of "ore."

8.1. The applicability of various environmental regulations to a great degree depends upon definitions. Congress, in their legislative function, often specifically defines words or phrases related to the application of a statute to a particular material or circumstances—when there is a need for explanation. However, when using words or terms with a common and accepted meaning, such as groundwater, mill, tailings, or "ore," no explanation or definition is necessary.

The word "ore" like the word "water," is a word of common and extensive usage with a clear meaning. It is not a new regulatory term, such as "source material" or "11e.(2) byproduct material," which have been established under the AEA. "Ore" is not simply a material definition, such as "waste" or "tailings." The term "ore" has an widely accepted plain meaning. Further, there has been a well understood and unchanged meaning of the word "ore" throughout the history of the Atomic Energy Act. That is why "ore" was not defined in the AEA or NRC or EPA regulation.

The word, or term, "ore," as defined in several sources:

- Ore—a naturally occurring solid material from which metal or other valuable minerals may be extracted. [*Illustrated Oxford Dictionary*, DK Pub. 1998.]

- Ore—A native mineral containing a precious or useful metal in such quantity and in such chemical combination as to make its extraction profitable. Also applied to minerals mined for their content of non-metals. [*The Compact Oxford English Dictionary*, Second Edition, Oxford University Press, 2000, p. 1224:915-916.]

- Ore—a. A natural mineral compound of the elements of which one at least is a metal. Applied more loosely to all metaliferous rock, though it contains the metal in a free state, and occasionally to the compounds of nonmetallic substances, as sulfur ore. . . . *Fay* b. A mineral of sufficient value as to quality and quantity that may be mined for profit. *Fay.* [*A Dictionary of Mining, Mineral, and Related Terms*, compiled and edited by Paul W. Thrush and Staff of the Bureau of Mines, U.S. Dept. of Interior, 1968.]

The Oxford English Dictionary points out that the current usage of the word "ore" goes back several hundred years. *A Dictionary of Mining, Mineral, and Related Terms* lists over 65 compound words using the word "ore," such as ore bin, ore body, ore deposit, ore district, ore geology, ore grader, ore mineral, ore reserve, ore zone. All of these terms incorporate the word "ore" as it relates to the mining of a native mineral. The term "ore," without explanation, has for many years been used in thousands, if not millions, of instances in thousands of mining, milling, geological, mineralogical, radiochemical, engineering, environmental, and regulatory publications.

9. Regulatory history of the use of the term "ore."

9.1. Feed materials other that natural "ore" are not "ore," nor can they be redefined as "ore" under existing State of Utah regulations or NRC statutes or regulations. There is no evidence that Congress in passing the AEA, as amended by UMTRCA, contemplated the use of the word "ore" to mean anything other than a natural material that is mined for its mineral content.

9.2. The regulatory history of UMTRCA, found in the two Congressional reports, provide information with respect "uranium mill tailings" and "ore." The Congressional Reports clearly state what was contemplated by Congress (i.e., the intent of Congress) when Congress established a program for the control of "uranium mill tailings" from the processing of "uranium ore" at inactive (Title I of UMTRCA) and active (Title II of UMTRCA) uranium and thorium processing facilities. House Report (Interior and Insular Affairs Committee) No. 95-1480 (I), August 11, 1978, and House Report (Interstate and Foreign Commerce Committee) No. 95-1480 (II), September 30, 1978.

Under "Background and Need," HR No. 95-1480 (I) states:

> Uranium mill tailings are the sandy waste produced by the uranium ore milling process. Because only 1 to 5 pounds of useable uranium is extracted from each 2,000 pounds of ore, tremendous quantities of waste are produced as a result of milling operations. These tailings contain many naturally-occurring hazardous substances, both radioactive and nonradioactive. . . . As a result of being for all practical purposes, a perpetual hazard, uranium mill tailings present the major threat of the nuclear fuel cycle.
>
> In its early years, the uranium milling industry was under the dominant control of the Federal Government. At that time, uranium was being produced under Federal Contracts for the Government's Manhattan Engineering District and Atomic Energy Commission program. . . .
>
> The Atomic Energy Commission and its successor, the Nuclear Regulatory Commission, have retained authority for licensing uranium mills under the Atomic Energy Act since 1954. [HR No. 95-1480 (1) at 11.]

The second House Report, under "Need for a Remedial Action Program" states:

> Uranium mills are a part of the nuclear fuel cycle. They extract uranium from ore for eventual use in nuclear weapons and power-plants, leaving radioactive sand-like waste—commonly called uranium mill tailings—in generally unattended piles. [HR No. 95-1480 (2) at 25.]

9.3. Atomic Energy Commission and the AEA of 1946. As indicated above, the domestic uranium mining and milling industry was established at the behest of the Manhattan Engineer District and the Atomic Energy Commission ("AEC"). The AEC regulated uranium mines and uranium processing facilities, established ore buying stations, and bought ore. Under the AEA of 1946 there was no commercial uranium mining and milling industry. The mining and milling of uranium was done under contract to the AEC. After the AEA of 1954 there was both a government and commercial uranium mining and milling industry. AEC purchased uranium ore under the Domestic Uranium Program. Regulations related to that uranium procurement program were set forth in 10 C.F.R. Part 60. Part 60 was deleted from 10 C.F.R. on March 3, 1975, after the establishment of the NRC.

The AEC published a number of circulars related to their Domestic Uranium Program. The Domestic Uranium Program—Circular No. 3—Guaranteed Three Year Minimum Price—Uranium-Bearing Carnotite-Type or Roscoelite-Type Ores of the Colorado Plateau Area" (April 9, 1948), an amendment to 10 C.F.R. Part 60, states:

> § 60.3 *Guaranteed three years minimum price for uranium-bearing carnotite-type or roscoelite-type ores of the Colorado Plateau—(a) Guarantee*. To stimulate domestic production of uranium-bearing ores of the Colorado Plateau area, commonly known as carnotite-type or roscoelite-type ores, and in the interest of the common defense and security the United States Atomic Energy Commission hereby establishes the guaranteed minimum prices specified in Schedule 1 of this section, for the delivery of such ores to the Commission, at Monticello, Utah, and Durango, Colorado, in accordance with the terms of this section during the three calendar years following its effective date.
>
> *Note:* In §§ 60.1 and 60.2 (Domestic Uranium Program, Circulars No. 1 and 2), the Commission has established guaranteed prices for other domestic uranium-bearing ores, and mechanical concentrates, and refined uranium products.
>
> *Note*: The term "domestic" in this section, referring to uranium, uranium-bearing ores and mechanical concentrates, means such uranium, ores, and concentrates produced from deposits within the United States, its territories, possessions and the Canal Zone.

10 C.F.R. Part 60—Domestic Uranium Program at § 60.5(c) states"

> Definitions. As used in this section and in § 60.5(a), the term "buyer' refers to the U.S. Atomic Energy Commission, or its authorized

> purchasing agent. **The term "ore" does not include mill tailings or other mill products.** . . . [Emphasis added.] [Circular 5, 14 Fed. Reg. 731 (February 18, 1949).]

The AEC was the primary mover in the domestic uranium mining and milling program. Under the AEA of 1946 and 1954, the AEC regulated uranium mining and milling and had an established a uranium ore-buying program. From the 1940's to 1975, the regulations in 10 C.F.R. Part 60 clearly indicted that "ore" does not include mill tailings or other mill products.

10. Statutory definition of source material.

10.1. The AEA of 1946, under "Control of Materials," Sec. 5 (b), "Source Materials," (1), "Definition," provides the definition of "source material." Section 5(b)(1) states:

> Definition. — As used in this Act, the term "source material" means uranium, thorium, or any other material which is determined by the Commission, with the approval of the President, to be peculiarly essential to the production of fissionable materials; but includes ores only if they contain one or more of the foregoing materials in such concentration as the Commission may by regulation determine from time to time.

The AEA of 1954, Chapter 2, Section 11, "Definitions," sets forth the current statutory definition of "source material " at Section 11(s):

> The term "source material" means (1) uranium, thorium, or any other material which is determined by the Commission pursuant to the provisions of section 61 to be source material; or (2) ores containing one or more of the foregoing materials, in such concentrations as the Commission may by regulation determine from time to time.
> [42 U.S.C. Sec. 2014(z).]

Responsive to this statutory definition, in 1961 the AEC established the following regulatory definition at 10 C.F.R. § 40.4:

> Source Material means: (1) Uranium or thorium, or any combination thereof, in any physical or chemical form or (2) ores which contain by weight one-twentieth of one percent (0.05%) or more of: (i) Uranium, (ii) thorium or (iii) any combination thereof. Source material does not include special nuclear material. [26 Fed. Reg. 284 (Jan. 14, 1961).]

Therefore, the AEC made a determination, in accordance with the mandate of the AEA of 1954, that ores containing 0.05% thorium and/or uranium would meet the statutory definition of source material. At the same time that they made that determination, the AEC had a regulation that clearly stated that "ore" does not include mill tailings or other mill products. Surely, the AEC, as the administrator of a uranium ore procurement program and the developer of the uranium mining and milling industry knew what they were talking about when they used the term "ore."

10.2. Additionally, the AEC set forth certain exemptions to the regulations in 10 C.F.R. Part 40. The proposed rule that was later finalized in January 1961 states, in pertinent part:

> The following proposed amendment to Part 40 constitutes an overall revision of 10 CFR Part 40, "Control of Source Material."
>
> With certain specified exceptions, the proposed amendment requires a license for the receipt of title to, and the receipt, possession, use, transfer, import, or export of source material. . . .
>
> Under the proposed amendment, the definition of the term "source material": is revised to bring it into closer conformance with that contained in the Atomic Energy Act of 1954. "Source Material" is defined as (1) uranium or thorium, or any combination thereof, in any physical or chemical form, but does not include special nuclear material, or (2) ores which contain by weight one-twentieth of one percent (0.05 percent) or more of (a) uranium, (b) thorium or (c) any combination thereof. The amendment would exempt from the licensing requirements chemical mixtures, compounds, solutions or alloys containing less than 0.05 percent source material by weight. As a result of this exemption, the change in the definition of source material is not expected to have any effect on the licensing program. . . .
>
> Section 62 of the Act prohibits the conduct of certain activities relating to source material "after removal from its place of deposit in nature" unless such activities are authorized by license issued by the Atomic Energy Commission. The Act does not, however, require a license for the mining of source material, and the proposed regulations, as in the case of the current regulations, do not require a license for the conduct of mining activities. Under the present regulation, miners are required to have a license to transfer the source material after it is mined. Under the proposed regulation below, the possession and transfer of unrefined and unprocessed ores containing source material would be exempted. [47 Fed. Reg. 8619 (September 7, 1960).]

Therefore, the AEC established, via a rulemaking, exemptions for source material as defined in Sec. 2014(z)(1) related to mixtures, compounds, solutions, or alloys containing uranium and/or thorium:

> (a) Any person is exempt from the regulations in this part and from the requirements for a license set forth in section 62 of the Act to the extent that such person receives, possesses, uses, transfers or delivers

> source material in any chemical mixture, compound, solution, or alloy in which the source material is by weight less than one-twentieth of 1 percent (0.05 percent) of the mixture, compound, solution or alloy. The exemption contained in this paragraph does not include byproduct material as defined in this part. [10 C.F.R. § 40.13(a), 26 Fed. Reg. 284 (Jan. 14, 1961).]

The AEC also established, via a rulemaking, exemptions for source material as defined in Sec. 2014(z)(2) related to "ore":

> (b) Any person is exempt from the regulations in this part and from the requirements for a license set forth in section 62 of the act to the extent that such person receives, possesses, uses, or transfers unrefined and unprocessed ore containing source material; provided, that, except as authorized in a specific license, such person shall not refine or process such ore. [10 C.F.R. 40.13(b), 26 Fed. Reg. 284 (Jan. 14, 1961).]

The definition of "source material" and the exemptions that are related to those definitions stand today, over fifty years later. These regulatory definitions and exemptions did not change when the NRC was established in 1975 and took on the regulatory responsibility for "source material." These regulatory definitions and exemptions did not change when the AEA was amended by UMTRCA in 1978. These regulations and definitions did not change when the NRC developed their policy guidances related to the processing of wastes from various mineral processing operations (including the commingled soils and wastes from other sources) at licensed uranium recovery operations.

11. Definition of 11e.(2) byproduct material.

11.1. UMTRCA, among other things, amended the AEA of 1954 by adding a new definition, the definition of 11e.(2) byproduct material:

> Sec. 201. Section 11e. of the Atomic Energy Act of 1954, is amended to read as follows:
>
> "e. The term 'byproduct material' means (1) any radioactive material (except special nuclear material) yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material, and (2) the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content." [42 U.S.C. Sec. 2014 (e).]

There is no evidence in the regulatory history of UMTRCA that Congress, in defining "11e.(2) byproduct material" intended to also amend the statutory definition of "source material." There is no evidence in the regulatory history of UMTRCA that the term "any ore" does not mean "any type of uranium ore" (e.g., ore containing **less than**

0.05% uranium and/or thorium and the numerous types of natural uranium-bearing minerals that were mined at uranium mines and purchased by the AEC under their domestic uranium ore procurement program or under the commercial "uranium milling" program). There is no evidence in the regulatory history of UMTRCA that Congress intended the term "any ore" to mean anything that the NRC, DRC, or EFRI wants it to mean (e.g., the wastes from mineral processing operations, including wastes mixed with soils and commingled with the wastes from other sources, even if those wastes are processed for their source material content at a uranium or thorium mill).

12. Regulatory Background

12.1. Although both the EPA and the NRC established a regulatory program for uranium milling and the processing of ores, neither the EPA nor the NRC contemplated the processing of materials that were not "ore." Neither the EPA nor the NRC considered wastes from other mineral processing operations (including contaminated soils and wastes from other sources) in their concept of "ore," and they did not address in any manner the processing of such wastes when promulgating their regulatory regimes for active uranium processing facilities. Further, during the various rulemaking proceedings, the public was never informed that wastes from other mineral processing operations (including commingled contaminated soils and wastes from other sources), no matter how they were defined, would be processed at licensed uranium or thorium mills. Therefore the public was given no reasonable opportunity to comment on such processing activities at uranium mills.

12.2. Responsive to UMTRCA, the NRC incorporated the UMTRCA definition of 11e.(2) byproduct material (with clarification) into their regulations at 10 C.F.R. § 40.4:

> "Byproduct Material" means the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content, including discrete surface wastes resulting from uranium solution extraction processes. Underground ore bodies depleted by such solution extraction operations do not constitute "byproduct material" within this definition. [44 Fed. Reg. 50012-50014 (August 24, 1979).]

The NRC also explained the need for the new definition:

> Section 40.4 of 10 CFR Part 40 is amended to include a new definition of "byproduct material." This amendment, which included uranium and thorium mill tailings as byproduct material licensable by the Commission, is required by the recently enacted Uranium Mill Tailings Radiation Control Act. [44 Fed. Reg. 50012-50014 (August 24, 1979).]

The NRC promulgated further regulations amending Part 40, in 1980, 45 Fed. Reg.

65521-65538 (October 3, 1980). In the summary, the NRC states:

> The U.S. Nuclear Regulatory Commission is amending its regulations to specify licensing requirements for uranium and thorium milling activities, including tailings and wastes generated from these activities. The amendments to parts 40 and 150 take into account the conclusions reached in a final generic environmental impact statement on uranium milling and the requirements mandated in the Uranium Mill Tailings Radiation Control Act of 1978, as amended, public comments received on a draft generic environmental impact statement on uranium milling, and public comments received on proposed rules published in the *Federal Register.* [Footnotes omitted.]

There is no statement in any of the NRC regulations in 10 C.F.R. Part 40 or in any of rulemaking proceedings promulgating those regulations that wastes from other mineral processing operations (including wastes from other sources) was "ore," under any circumstances, or that, under any circumstances, such wastes would be processed at licensed uranium or thorium mills and the tailings or wastes would be disposed of as 11e.(2) byproduct material in the mill tailings impoundments. The regulations promulgated by the NRC did not contemplate this kind of activity. The NEPA document in support of the promulgation of the NRC regulatory program for uranium mills did not contemplate this kind of activity. Also, in the rulemaking proceedings and NEPA proceeding, the public did not have an opportunity to contemplate and comment on this kind of activity.

12.3. The NRC Final Generic Environmental Impact Statement on Uranium Milling (GEIS) NUREG-0706, September 1980, includes a clear statement regarding the scope of the GEIS and its understanding of what uranium milling entails:

> As stated in the NRC *Federal Register* Notice (42 FR 13874) on the proposed scope and outline for this study, conventional uranium milling operations in both Agreement and Non-Agreement States, are evaluated up to the year 2000. Conventional uranium milling as used herein refers to the milling of ore mined primarily for the recovery of uranium. It involves the processes of crushing, grinding, and leaching of the ore, followed by chemical separation and concentration of uranium. Nonconventional recovery processes include in situ extraction or ore bodies, leaching of uranium-rich tailings piles, and extraction of uranium from mine water and wet-process phosphoric acid. These processes are described to a limited extent, for completeness. [GEIS, Volume I, at 3.]

12.4. Section 3.3 of the GEIS is entitled "Prospects for Unconventional Methods of Uranium Production." GEIS at 3-8. In the discussion of unconventional methods of uranium production, there is no discussion of the processing of the types of materials that have been processed at the White Mesa Mill as "alternate feed materials" as one of the types of "unconventional methods of uranium production."

12.5. The GEIS is very clear about what it considers "ore" to be and gives no indication whatsoever that materials other than ore, such as the tailings or waste from mineral processing operations (including commingled contaminated soils and waste materials from other sources) are considered to be "ore."

12.6. The GEIS includes a discussion of "Past Production Methods." That discussion makes reference to "ore," "ore exploration," "pitchblende ore," "crude ore milling processes," "lower-grade ores," "uranium-bearing gold ores," "high-grade ores," "ore-buying stations," and "ore reserves." GEIS, Volume I, Chapter 2, at 2-1 to 2-2. There is a lengthy discussion of "Uranium Mining and Milling Operations" that provides a description of the commonly and less-commonly "used methods of mining uranium ores." GEIS, Volume II, at B-1 to B-2. Appendix 1.

12.7. In Chapter 6, "Environmental Impacts," there is a discussion of "Exposure to Uranium Ore Dust," which states, in part:

> Uranium ore dust in crushing and grinding areas of mills contains natural uranium (U-238, U-235, thorium-230, radium-226, lead-210, and polonium-210) as the important radionuclides. [GEIS, Volume I, at 6-41.]

There is also a table giving the "Average Occupational Internal Dose due to Inhalation of Ore Dust." GEIS at 6-41, Table 6.16. Further, the GEIS discusses "Shipment of Ore to the Mill" (GEIS at 7-11), "Sprinkling or Wetting of Ore Stockpile" (GEIS at 8-2), "Ore Storage" and "Ore Crushing and Grinding" (GEIS at 8-6), "Ore Pad and Grinding" (GEIS, Vol. 3, at G-2), "Ore Warehouse (GEIS, Vol. 3, at K-3) and "Alternatives to Control Dust from Ore Handling, Crushing, and Grinding Operations (GEIS, Vol. III, at K-3 to K-3). In the NRC responses to comments there are discussions of "Average Ore Grade, Uranium Recovery" (GEIS, Vol. II, at A-12 to A-13). None of these references to “ore” contemplated wastes from mineral processing operations. The GEIS gives no indication whatsoever that such wastes are "ore," even if they were processed at a uranium or thorium recovery facility for their "source material content." Clearly, the GEIS did not consider that the wastes from the processing of such wastes would meet the definition of 11e.(2) byproduct material.

12.8. In sum, the GEIS, which was developed for the rulemakings associated with the regulation of 11e.(2) byproduct material, did not evaluate, and the public did not have an opportunity to comment upon, any of the possible health, safety, and environmental impacts of the processing of other mineral processing wastes at uranium or thorium processing facilities. They did not evaluate transportation issues related to the transportation of such wastes, nor were reasonable alternatives to the transportation, receipt, processing, and disposal of such wastes at uranium or thorium mills ever evaluated.

13. EPA standards.

13.1. UMTRCA directed the EPA to establish standards for uranium mill tailings and directed the NRC to implement those standards. That statute, as codified in 42 U.S.C. 2022, states in pertinent part:

> Sec. 2022. Health and environmental standards for uranium mill tailings
>
> ***
>
> (b) Promulgation and revision of rules for protection from hazards at processing or disposal site.
>
> (1) As soon as practicable, but not later than October 31, 1982, the Administrator shall, by rule, propose, and within 11 months thereafter promulgate in final form, standards of general application for the protection of the public health, safety, and the environment from radiological and nonradiological hazards associated with the processing and with the possession, transfer, and disposal of byproduct material, as defined in section 2014(e)(2) of this title, **at sites at which ores are processed primarily for their source material content** or which are used for the disposal of such byproduct material. If the Administrator fails to promulgate standards in final form under this subsection by October 1, 1983, the authority of the Administrator to promulgate such standards shall terminate, and the Commission may take actions under this chapter without regard to any provision of this chapter requiring such actions to comply with, or be taken in accordance with, standards promulgated by the Administrator. In any such case, the Commission shall promulgate, and from time to time revise, any such standards of general application, which the Commission deems necessary to carry out its responsibilities in the conduct of its licensing activities under this chapter. [Emphasis added.]
>
> Requirements established by the Commission under this chapter with respect to byproduct material as defined in section 2014(e)(2) of this title shall conform to such standards. Any requirements adopted by the Commission respecting such byproduct material before promulgation by the Commission of such standards shall be amended as the Commission deems necessary to conform to such standards in the same manner as provided in subsection (f)(3) of this section. Nothing in this subsection shall be construed to prohibit or suspend the implementation or enforcement by the Commission of any requirement of the Commission respecting byproduct material as defined in section 2014(e)(2) of this title pending promulgation by the Commission of any such standard of general application. In establishing such standards, the Administrator shall consider the risk to the public health, safety, and the environment, the environmental and economic costs of applying such standards, and such other factors as the Administrator determines to be appropriate.
>
> * * *

> (d) Federal and State implementation and enforcement of the standards promulgated pursuant to subsection (b) of this section shall be the responsibility of the Commission in the conduct of its licensing activities under this chapter. States exercising authority pursuant to section 2021(b)(2) of this title shall implement and enforce such standards in accordance with subsection (o) of such section. [42 U.S.C. 2022(b) and (d).]

Congress directed the EPA only to establish standards for "sites at which ores are processed primarily for their source material."

13.2. The EPA, as mandated by UMTRCA, finalized the "Environmental Standards for Uranium and Thorium Mill Tailings at Licensed Commercial Processing Sites" in 1983. 48 Fed. Reg. 45925-45947, October 7, 1983. In the "Summary of Background Information" the EPA provides a discussion of "The Uranium Industry" (i.e., the industry and the type of sites that the regulations apply to):

> The major deposits of high-grade uranium ores in the United States are located in the Colorado Plateau, the Wyoming Basins, and the Gulf Coast Plain of Texas. Most ore is mined by either underground or open-pit methods. At the mill the ore is first crushed, blended, and ground to proper size for the leaching process which extracts uranium. . . . After uranium is leached from the ore it is concentrated . . . . The depleted ore, in the form of tailings, is pumped to a tailings pile as a slurry mixed with water.
>
> Since the uranium content of ore averages only about 0.15 percent, essentially all the bulk or ore mined and processed is contained in the tailings. [48 Fed. Reg. 45925, 45927, October 7,1983.]

13.3. Clearly, when the EPA developed its standards for uranium and thorium mills, they stated, with specificity and particularity, what uranium ore was, what uranium milling consisted of, and what uranium mill tailings consisted of. EPA clearly stated that the standards applied to the processing of uranium and thorium ores at uranium and thorium mills. There is no reasonable evidence that would indicate that the standards promulgated by the EPA applied to the processing of wastes from other mineral processing operations at uranium and thorium mills.

13.4. Additionally, the EPA incorporated the 42 U.S.C. 2014(z) definition of 11e.(2) byproduct material, as clarified by the NRC in 10 C.F.R. 40.4, into their standards at 40 C.F.R. Subpart D, § 192.31(b). Since that time the EPA has not amended their definition of 11e.(2) byproduct material in a rulemaking proceeding, nor have they amended their definition via policy guidance. The EPA has not, in any manner, widened the use of the words "any ore" to include mineral processing wastes or other materials called “alternate feed.”

13.5. The EPA did not sanction the NRC's policy guidance with respect new definitions of "ore" and 11e.(2) byproduct material, nor has the EPA adopted the NRC Interim Guidance. Therefore, the EPA standards in 40 C.F.R. Part 192 do not in any manner apply to the processing of alternate feed or the wastes from the processing of alternate feed. The State of Utah has no legal authority to enforce EPA standards in the receipt, storage, processing, and disposal of alternate feed materials. There is no legal basis for applying those standards to the processing of feed materials other than “natural ore.” (Note that, by definition “ore” is a natural or native material.”)

13.6. Clearly, the EPA, as directed by Congress, has not in any manner contemplated the processing of wastes from other mineral extraction operations at uranium or thorium mills when establishing the "Environmental Standards for Uranium and Thorium Mill Tailings at Licensed Commercial Processing Sites."

13.7. When compiling that list of potential hazardous constituents that could be found in uranium mill tailings and incorporating that list into 40 C.F.R. Part 192, the EPA did not in any manner contemplate the processing of wastes (such as the Midnite Mine material) from other mineral extraction operations at the mills for which they were establishing standards. The EPA did not address in any manner effluents that might result from the processing of alternate feed materials.

13.8. In the various rulemaking proceedings that have taken place in the establishment of the EPA standards, the public was given no opportunity to consider or comment on the possibility that the EPA standards would also apply to the processing of wastes from other mineral processing operations (including commingled soils and waste materials from other sources) at uranium and thorium mills.

It is true that the EPA and the NRC, in establishing their regulatory program, contemplated the processing of ores at uranium and thorium mills. However, as shown above, processing of wastes from other mineral processing operations (alternate feed) at uranium and thorium mills is beyond the scope of the regulatory program established by the NRC and the EPA in response to UMTRCA.

13.9 Furthermore, 10 C.F.R. Part 40, Appendix A, Criterion 8, states in part:

> Uranium and thorium byproduct materials must be managed so as to conform to the applicable provisions of Title 40 of the Code of Federal Regulations, Part 440, "Ore Mining and Dressing Point Source Category: Effluent Limitations Guidelines and New Source Performance Standards, Subpart C, Uranium, Radium, and Vanadium Ores Subcategory," as codified on January 1, 1983.

There is no indication that this NRC regulation and the regulation in 40 C.F.R. Part 440 (and the enabling statute) have in any manner been amended or altered by subsequent NRC Interim Guidance. Therefore, any shift in the usage of the word "ore" would conflict with these statutory and regulatory authority with respect this regulation.

14. Regulatory History of NRC's Alternate Feed Guidance

14.1. In the late 1980's the NRC was faced with a few requests to process material other than ore at licensed uranium mills. At that time and today, there are two statutes or regulations (implementing those statues) that are pertinent. First is the statutory definition of "source material" established in 1954 by the AEA, found at 42 U.S.C. Sec. 2014(z), and in the NRC regulatory definition of "source material" (established in 1961 pursuant Sec. 2014(z)), found at 10 C.F.R. 40.4:

> Source Material means: (1) Uranium or thorium, or any combination thereof, in any physical or chemical form or (2) ores which contain by weight one-twentieth of one percent (0.05%) or more of: (i) Uranium, (ii) thorium or (iii) any combination thereof. Source material does not include special nuclear material.

The second is the definition of "byproduct material" in Section 11(e)(2) of the Atomic Energy Act of 1954, as amended, (42 U.S. C Sec. 2014(e)(2)) and the regulatory definition of "byproduct material" found in 10 C.F.R. 40.4:

> Byproduct Material means the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content, including discrete surface wastes resulting from uranium solution extraction processes. Underground ore bodies depleted by such solution extraction operations do not constitute "byproduct material" within this definition.

The NRC had several options, one of which would have been to go to Congress and request that Congress change the definition of 11e.(2) byproduct material to read "the tailings or wastes produced by the extraction or concentration of any ~~ore~~ material processed primarily for its source material content." NRC Staff made a determination that they would not go to Congress to seek an amendment to the AEA of 1954.

Instead, what the NRC did was to manipulate the use of the word "ore" as it is used in the definition of 11e.(2) byproduct material. NRC proposed for notice and comment that a policy guidance be established for the purpose of interpreting the term "ore," as it is used in the definition of 11e.(2) byproduct material. 57 Fed. Reg. 20525 (May 13, 1992). Further, the NRC did not institute a rulemaking proceeding to amend 10 C.F.R. Part 40.

Based on the new use of the term "ore" as put forth in the proposed guidance, not only would the definition of 11e.(2) byproduct material apply to "any ore processed primarily for its source material content" in a licensed uranium or thorium mill, but the definition of 11e.(2) byproduct material would also apply to **any material** (particularly wastes from various mineral extraction operations and various commingled wastes and materials) processed primarily for its source material content in a licensed uranium or thorium mill. In other words, NRC altered the accepted meaning of the word "ore" as that word ore was used in a statutory definition.

14.2. On May 14, 1992, NRC Staff, sent a letter to the Environmental Protection Agency, enclosing a copy of the May 13 proposed rules and requested EPA comment on two proposed guidance documents and their associated staff analyses. Letter from Robert M. Bernero, Director, Office of Nuclear Material Safety and Safeguards, NRC, to Sylvia K. Lowrance, Director, Office of Solid Waste, EPA, May 14, 1992. The EPA did not submit comments on the proposed policy guidances. The only documentation of EPA's response to that request for comment is quoted below and is found in the Commission Paper that forwarded the finalized guidances to the Commission for their approval:

> There was an issue that delayed finalization of the guidance documents. In an October 1992, mixed waste meeting between the NRC, the EPA, and DOE staff, EPA identified potential inconsistencies in NRC's interpretation of the definition of source material in conjunction with the exclusion of source material from the definition of solid waste in the Resource Conservation and Recovery Act (RCRA). In making its point, EPA cited the May 13, 1992, *Federal Register* notice on the disposal of non-11e.(2) byproduct material. The staff had delayed finalization of the uranium recovery policy guidance documents, pending resolution of the source material definition issue. However, the staff has now decided that these two policy guidance documents can be finalized, independent of the source material issue, because the guidance is not dependent on the interpretation of the definition of source material. ["Final 'Revised Guidance on Disposal of Non-Atomic Energy Act of 1954, Section 11e.(2) Byproduct Material in Tailings Impoundments' and Final 'Position and Guidance on the Use of Uranium Mill Feed Materials Other Than Natural Ores,'" SECY-95-221, August 15, 1995.]

The Revised Position and Guidance and the Final Position and Guidance gave no indication that the NRC was amending, interpreting, or in any manner adjusting the accepted meaning of the term "ore" as that word is used in the statutory and regulatory definition of "source material." Nor was there any discussion in the various guidances related to the processing of material other than natural ore (i.e. material that is not ore at all) of how the exemptions set forth in 10 C.F.R. §40.13(a) and (b) would be impacted by guidance's new definition of "ore"

There is no indication that the "source material definition issue" has ever been appropriately addressed or resolved. It is an issue that has lain in some pretty murky regulatory waters for quite some time.

14.3. Again, It is plain from the AEA of 1946, the legislative history of the AEA of 1954 and UMTRCA, the regulatory history of the AEC, EPA, and NRC rules promulgated responsive to those laws, that the Interim Guidance's new use of the term "ore" goes far beyond the accepted meaning of that term and the clear intent of Congress.

Therefore, the DRC, which is authorized to administer and enforce the NRC and EPA regulations applicable to uranium mills cannot make use of a definition of "ore" to claim that the wastes produced from the processing of that material meets the statutory definition of "11e.(2) byproduct material. That new definition was not derived from statute or regulation, was not the subject of a federal rulemaking, was not the subject of NEPA associated with the applicable EPA or NRC rulemakings.

The NRC and DRC are not authorized to shift these accepted definitions at will as an expression of their "regulatory flexibility." This is especially so when such shifts result in direct conflicts with NRC's own enabling statutes and regulations, as is the case with the use of the newly defined term "ore." Additionally, NRC and DRC are not authorized to shift definitions at will when such shifts directly conflict with the statutory authority of another federal agency, in this case, the EPA.

15. Interim Guidance

15.1. The DRC staff reviewed the Amendment Request using "Interim Guidance on the Use of Uranium Mill Feed Material Other Than Natural Ores."

Prior to the use of the Interim Guidance, the NRC Staff relied upon the 1995 "Final Position and Guidance on the Use of Uranium Mill Feed Materials Other Than Natural Ores."

The Interim Guidance amended the 1995 Final Guidance in several important respects. For example, it removed previous prohibitions regarding the receipt and processing of materials subject to regulation under the Toxic Substance Control Act (TSCA) and the Resource Conservation and Recovery Act (RCRA). Yet the public has never had an opportunity to comment on the Interim Guidance.

The proposed "Position and Guidance on the Use of Uranium Mill Feed Materials Other Than Natural Ores" was published in the *Federal Register* for public comment on May 13, 1992. A notice of the Final Position and Guidance was published in the *Federal Register* on September 22, 1995.

The NRC never published the Interim Guidance in the *Federal Register* as a proposed policy guidance for public comment, nor did the NRC publish a notice in the *Federal Register* announcing Interim Guidance as a final policy guidance.

15.2. The law is well settled that a federal agency such as the NRC cannot rely upon policy statements and guidance to accomplish rulemaking under the Administrative Procedure Act.

15.3. Since neither the Interim Guidance nor the accompanying definition of "ore" has been finalized as an NRC regulation, the DRC's use of the Interim Guidance is without regulatory foundation.

The DRC is not authorized to make use of any policy guidance, no matter where it comes from, to make substantive changes to federal regulations that the DRC administers and enforces.

16. EPA Radionuclide NESHAPS

16.1. The EPA has established standards applicable to the emission of radon from licensed uranium and thorium mills at 40 C.F.R. Part 61 Subpart W, National Emission Standards for Radon Emissions From Operating Mill Tailings. The provisions Subpart W "apply to owners or operators of facilities licensed to manage uranium byproduct materials during and following the processing of uranium ores, commonly referred to as uranium mills and their associated tailings." 40 C.F.R. § 61.250. Subpart W also incorporates the AEA definition of byproduct material: "*Uranium byproduct material or tailings* means the waste produced by the extraction or concentration of uranium from any ore processed primarily for its source material content."

As discussed above, the EPA has never adopted the Interim Guidance new definition of the term ore, as a policy or a regulation. Therefore, there is no legal basis for the EPA or the Utah Division of Air Quality (which administers and enforces Subpart W) to regulate the radon emissions from wastes from the processing of feed materials other than natural "ore."

CONCLUSION

17. The DRC must deny the Amendment Request for the following reasons:

17.1 The processing of feed material other than natural ore at licensed uranium mills was not contemplated by the Atomic Energy Act, NRC and EPA regulations implementing the UMTRCA, the generic EIS's associated with the promulgation of the NRC and EPA regulations applicable to uranium mills, the White Mesa ES, and other federal regulations associated with uranium mills (40 C.F.R Subpart W and Subpart T).

17.2. The DRC does not have the authority to enforce EPA standards to mill tailings that result from the processing of feed material other than natural ore, because, under EPA regulations, those wastes are not 11e.(2) byproduct material.

17.3. The Utah Division of Air Quality does not have the authority to enforce 40 C.F.R. Part 61 Subpart W with respect radon form to mill tailings that result from the processing of feed material other than natural ore, because, under EPA Part 61 regulations, those wastes are not 11e.(2) byproduct material.

17.4. There is no statutory or regulatory basis for the DRC relying on a policy that substantively alters the statutory and regulatory intent of the federal laws and regulations that the DRC currently administers and enforces.

17.5. The processing of alternate feed material is a regulatory program that was established outside the statutory authority of the Atomic Energy Act and EPA and NRC regulation. The DRC does not have the statutory and regulatory authority to administer and enforce such a program.

17.6. The DRC based its review of the Amendment Request, the SER, and proposed licensing action on documents that the DRC failed to identify and failed to make readily available to the public.

17.7. The wastes from the processing of the Uranium Mill would not meet the statutory and regulatory definition of 11e.(2) byproduct material at contemplated by the AEA and NRC and EPA implementing regulations and the NEPA and other background documents in support of those rulemakings. The White Mesa Mill License does not authorize the disposal of materials that are not 11e.(2) byproduct material. Therefore the disposal of wastes from the processing of the Uranium Material would be a violation of the License Condition 10.1A.

17.8. And for other reasons outlined above.

Sarah M. Fields
October 21, 2013

"DRC-2013-003363"

Ute Mountain Ute Tribe

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VIA U.S. MAIL AND EMAIL

Re: Comments on Energy Fuels Resources (USA) Inc., Dawn Mining Amendment Request (Amendment to 11e(2) Byproduct License UT1900479)

Dear Mr. Lundberg:

The Ute Mountain Ute Tribe ("Tribe") submits the following comments regarding the above-noted license amendment ("License Amendment") and the Division of Radiation Control's ("DRC") environmental analysis conducted pursuant to Utah Admin Code R313-24-3 ("Environmental Analysis) [1] to allow the White Mesa Mill ("WMM") to process as alternate feed contaminated wastewater treatment sludge hauled from a uranium mining Superfund site located in the State of Washington. The Tribe notes that it is in the process of engaging the State of Utah (including the Utah Department of Environmental Quality ("DEQ") and its Divisions) in government-to-government consultation regarding the WMM. The Tribe submits these comments as public comments pursuant to Utah Admin. Code R313-17-2, R313-24-3, and R305-7-202.

The Tribe has organized its comments into five major sections. Section I provides DRC a quick overview of the Tribe's background and connection with the WMM facility. Section II provides the Tribe's overarching concern that DRC is proposing to amend a license issued in 2002 to allow a new source of alternate feed material, even though DRC has acknowledged that the 2002-era license is insufficient to address known environmental contamination and risks to Ute Mountain

[1] Because DRC tiers its License Amendment to the Request to Amend Radioactive Materials License, Energy Fuels Resources (USA) Inc , White Mesa Uranium Mill, San Juan County, Utah, and Environmental Report (May 2013) ("EFR Environmental Report") and later EFR submissions dated December 5, 2012, June 14, 2013, and August 7, 2013, the Tribe includes those documents with DRC's Safety Evaluation Report for the Amendment Request to Process an Alternate Feed Material (the "Uranium Material") at the White Mesa Mill (the "Mill") from Dawn Mining Corporation ("DMC") Midnite Mine, Washington State (the "Midnite Mine SER") in its analysis of DRC's compliance with Utah Admin. Code R313-24-3, and collectively refers to the environmental analysis contained in these documents as the "Environmental Analysis."

Ute Tribal member ("UMU Tribal Member") and public health. Section III addresses four broad Environmental Analysis deficiencies under Utah Admin. Code R313-24-3, including: (A) DRC's failure to adequately analyze impacts on UMU Tribal Member and public health; (B) DRC's failure to adequately analyze impacts on surface and groundwater resources; (C) DRC's complete failure to conduct an analysis of alternative sites; and (D) DRC's failure to adequately analyze long-term impacts of the License Amendment. Section IV provides the Tribe's concern that deficiencies in DRC's regulation of the WMM facility and in DRC's analysis of the addition of the alternate feed material from the Midnite Mine site ("Midnite Mine Material") will eventually result in the relocation of uranium contamination from the Spokane Indian Reservation to the Ute Mountain Ute Tribe's White Mesa Community. Section V provides a brief conclusion to the Tribe's comments.

I. <u>OVERVIEW OF TRIBAL BACKGROUND AND CONNECTION WITH THE WMM FACILITY</u>

The Ute Mountain Ute Tribe is a federally-recognized Indian tribe with lands located in southwestern Colorado, northwestern New Mexico, and southeast Utah. There are two Tribal communities on the Ute Mountain Ute Reservation: Towaoc, in southwestern Colorado, and White Mesa, which is located in Utah within three miles of the WMM facility. The lands comprising the White Mesa community are held in trust for the Tribe and for other individual UMU Tribal Member owners. The Tribe has jurisdiction (as a federally-recognized tribal government) over Tribally-owned lands, UMU Tribal Member-owned lands, and members of the Ute Mountain Ute Tribe who live in the White Mesa community. Under the Tribe's Constitution, the Tribal Council is responsible for, among other things, the management and protection of Tribal lands and for the protection of public peace, safety, and welfare.

UMU Tribal Members have lived on and around White Mesa for centuries and intend to do so forever. The community of White Mesa depends on groundwater resources buried deep in the Navajo aquifer for its municipal (domestic) needs. UMU Tribal Members continue traditional practices, which include hunting and gathering and using the land, plants, wildlife and water in ways that are integral to their culture. It is reasonable to expect that those resources are not contaminated with hazardous materials that have blown in the wind or traveled through the groundwater from facilities regulated by the divisions of DEQ.

The Tribe has serious concerns about the manner in which the WMM is currently operated and regulated. The Tribe has long expressed concern that the WMM operations (in particular, management practices that have allowed continued contamination of surface resources, groundwater resources, and surface water resources) pose serious threats to the health of the land and the natural and cultural resources within and around the Tribe's White Mesa community and to the health and welfare of its Tribal members and their future generations. The Tribe has also expressed concern that the poor quality of EFR's reclamation planning and surety estimations for the WMM facility will ultimately result in a legacy of environmental contamination and blight both in the White Mesa community and in surrounding communities.

Since 2010, the Tribe has spent a significant amount of resources documenting its concerns to Divisions of DEQ during licensing and regulatory actions for the WMM facility. These efforts include, but are not limited to, the following dockets:

- Challenge to the Utah Division of Air Quality's approval of the WMM facility's Air Approval Order (public comments, October 29, 2010/November 11, 2010, Request for Agency Action/Petition to Intervene, March 31, 2011 ("Air Approval Order RAA"));

- Public comments addressing the DRC's revision and renewal of the WMM facility's radioactive materials license (public comment, December 16, 2011 ("2011 RML Renewal Comments")); and

- Public comments and administrative challenge to the DRC's approval of the corrective action plan for USG12-04 (nitrate/chloride contamination plume) (public comment, August 17, 2012 ("Nitrate CAP Comments")), Request for Agency Action, January 11, 2013; Petition to Intervene, January 11, 2013 ("Nitrate CAP RAA").

The Tribe's submissions to the DEQ include extensive documentation of the Tribe's concerns that the DEQ's enforcement practices with the current set of licenses and permits at the WMM facility are allowing EFR to contaminate air, land, surface water, vegetation, and groundwater in violation of Utah State and federal law.[2]

The Tribe now faces the DRC's current proposed License Amendment, which would allow the WMM facility to receive and process wastewater treatment sludge produced during a Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA" or "Superfund") cleanup of groundwater and surface water contaminated by a former uranium mining facility located on the Spokane Indian Reservation. The Tribe believes that, given the status of the tailings cells, operations, existing and uncontrolled environmental contamination, and lack of appropriate regulation of the WMM facility, the proposed License Amendment will simply move the contamination from the Midnite Mine Superfund Site on the Spokane Indian Reservation to the lands, surface resources, surface water, and groundwater around the WMM facility and near or on Ute Mountain Ute Tribal lands in the White Mesa Community. Contaminated residues from the treatment of groundwater contamination at a uranium mining Superfund Site on one Indian Reservation should not be hauled hundreds of miles to a problematic uranium milling site with existing groundwater contamination that impacts another Tribal Community.

Accordingly, and for the reasons detailed below, the Tribe submits these comments to demand that the DRC deny the requested License Amendment at this time.

II. DRC SHOULD NOT AMEND THE WMM FACILITY'S 2002 RADIOACTIVE MATERIALS LICENSE TO ADD ANY NEW SOURCES OF ALTERNATE FEED MATERIAL

The overarching and most fundamental flaw with the License Amendment and the Environmental Analysis is that the DRC is proposing to amend a radioactive materials license that was issued to the WMM by the Nuclear Regulatory Commission in 2002. The DRC's decision to amend the 2002 version of EFR's radioactive materials license ("2002 RML") is problematic

[2] To avoid repetitive comments to the DRC, the Tribe requests that the documents referenced in this paragraph (including all exhibits) be incorporated by reference and made a part of the administrative record on the approval of this License Amendment.

because the 2002 RML does not address known contamination events and significant operational and regulatory deficiencies at the WMM facility. In addition, the DRC's decision to base its entire Environmental Analysis for the License Amendment upon the faulty assumption that the 2002 RML and the existing regulatory regime are competently managing existing ore and alternate feed material leads to a deeply flawed analysis of whether the WMM facility is a proper facility under Utah State or federal law to handle CERCLA waste.

A. THE 2002 RML IS INSUFFICIENT TO ADDRESS ONGOING AND UNCONTROLLED CONTAMINATION AND SERIOUS OPERATIONAL DEFICIENCIES AT THE WMM FACILITY

Under Utah Admin. Code R313-70-5(4)(a), the DRC is responsible for reviewing and issuing renewals of radioactive materials licenses for facilities like the WMM every five years. The last renewal of the WMM radioactive materials license was issued in 2002, and the DRC's review of the facility's 2007 renewal application has been ongoing for more than six years.

The renewal process for the WMM facility radioactive materials license has been difficult and time-consuming, in part because of serious ongoing violations of the WMM's groundwater permit and state and federal law. In the eleven years that have passed since the last renewal of the WMM facility's radioactive materials license, there have been several new groundwater enforcement actions taken to address contamination at the WMM facility. *See, e.g.*, Docket UGW12-04 (docket initiated in January, 2009 addressing co-located nitrate/chloride plume in perched groundwater aquifer); Docket UGW12-03 (docket initiated in July, 2012 addressing multiple violations of the groundwater permit, including a decreasing pH trend and exceedances of cadmium, manganese, selenium, thallium, uranium, TDS, sulfate, and fluoride, co-located with exceedances in nitrate, nitrite, chloride, chloroform, and dichloromethane). *See also* 2011 Renewal RML Comments § III(A)(1)(a) and Exhibit C; April 23, 2012 Letter to Rusty Lundberg ("April 2012 Groundwater Letter") (both explaining the Tribe's concerns about elevated levels of indicator parameters in monitoring wells near the southern/Tribal border of the WMM facility). There has been scientific documentation and DRC acknowledgement that the WMM facility has caused off-site contamination of land, surface water, and other surface resources. 2011 RML Renewal Comments § III(B)(1), Exhibit L (explaining the findings in the USGS Study that uranium and vanadium have migrated east of the WMM facility and into off-site vegetation, lands, and surface water); USGS Report: White Mesa Mill, Utah Division of Radiation Control Public Presentation, Blanding Utah (July 9, 2012). The WMM facility has caused at least two violations of the National Emission Standards for Radon Emissions from Operating Mill Tailings (promulgated as a National Emission Standard for Hazardous Air Pollutants under the federal Clean Air Act and published in 40 C.F.R. Part 61, subpart W ("Subpart W NESHAP"). *See* 2011 RML Renewal Comments III(B)(3) (explaining that the WMM is in violation of the Subpart W NESHAP work practice standard restriction to two tailings impoundments); Exhibit A (to these October 2013 Comments) (documenting the WMM's ongoing and uncontrolled violation of the radon emissions limit set forth in 40 C.F.R. § 61.252). Some of the existing contamination issues have been complicated or exacerbated by the presence of other alternate feed sources at the facility. *See, e.g.*, 2011 RML Renewal Comments § III(C)(1) (citing a technical report detailing that certain alternate feed material is incompatible with the PVC liners in Tailings Cells 1, 2, and 3); Energy Fuels Resources (USA) Inc., Tailings Cell 2 Monthly Compliance Report for July 2013, 6 (August 20, 2013) (noting that EFR identified areas of elevated radon flux (leading to the Subpart W NESHAP violation) from "specific alternate feed tailings disposal with elevated radionuclide content").

During the renewal review process, the DRC issued several rounds of interrogatories that indicate that there are serious deficiencies in the current reclamation plan and the surety estimate for the facility and that DRC has some concerns about how the WMM handles, processes, and disposes of alternate feed material. *See, e.g.*, Safety Evaluation Report for the Denison Mines White Mesa Mill 2007 License Renewal Application, October 2011 ("2011 RML SER") §§ 3.2.3.1; 5.5.4; 5.5.5. In 2011, the DRC issued a draft radioactive materials license renewal for public comment. *See* Draft License Renewal, October 2011 ("2011 Draft RML Renewal"). That draft contained significant revisions to the 2002 RML, which include, but are not limited to:

- A prohibition on "[n]ew construction of any mill process water, wastewater storage, and/or tailings disposal embankments" until DRC approval of several required reclamation plan items and a revised surety estimate. 2011 Draft RML Renewal § 9.1 (citing § 9.11).

- Requirements for a revised surety estimate to include the cost of groundwater remediation (from groundwater contamination events/dockets at the WMM facility). 2011 Draft RML Renewal §§ 9.5, 10.20.

- Heightened requirements for submission and DRC review of standard operating procedures (including, but not limited to, environmental monitoring programs); 2011 Draft RML Renewal § 9.6.

- Additional regulatory requirements on the release of ore trucks and intermodal containers from the restricted areas (additional requirements related to transport of material into the facility). 2011 Draft RML Renewal § 9.10.

- Additional restrictions on the receipt of new sources of alternate feed, and removal of some currently licensed sources of alternate feed. 2011 RML SER § 3.2.3.1.

- New provisions on the groundwater monitoring program and the leak detection systems, 2011 Draft RML Renewal § 11.3.

- A new provision required the WMM owner to conduct an annual survey of land use and to identify any potential routes of exposure of contaminates and dose to the general public. 2011 Draft RML Renewal § 12.3; 2011 Draft RML SER § 2.1.2.1.

In December of 2011, the Tribe submitted public comments supporting some of the more restrictive revisions to the Draft RML Renewal and demanding, among other things, that the DRC include additional provisions in the license to address surface/airborne contamination, require concurrent reclamation of the older tailings cells, and require additional surety to cover the facility. *See* 2011 RML Renewal Comments. Since 2011, the Tribe has urged the DRC to take immediate action on the new groundwater contamination plumes and on the two violations of the Subpart W NESHAP standards that pose significant risk to UMU Tribal Members and the health of the public near the facility. *See, e.g.*, Nitrate CAP Comments; Nitrate CAP RAA.

As of October of 2013, the DRC has taken no action to respond to public comments or to issue a radioactive materials license renewal for the WMM facility. This means that, while the DRC has identified the need to address existing contamination at or near the WMM facility, revise the facility's reclamation plan, raise the facility's surety estimate to include the cost of groundwater cleanup, and to address transportation and other operational issues at the facility, the 2002 RML still guides regulation and operation of the WMM facility and provides none of the protections provided in the 2011 Draft RML Renewal or requested by the Tribe in the 2011 RML Renewal Comments and related groundwater and air quality proceedings.

The Tribe asserts that both the License Amendment and the Environmental Analysis are fatally flawed because they fail to address numerous environmental, public health and safety, reclamation, surety, and operational issues identified during the DRC's license review process and through subsequent violations of state and federal environmental laws at the facility. The 2002 RML does not provide any heightened protections or restrictions to ensure the safe handling, processing, and disposal of any ore or alternate feed material—including the Midnite Mine Material—or to address existing and ongoing environmental contamination at the WMM facility.

B. THE DRC'S ENTIRE ENVIRONMENTAL ANALYSIS IS FLAWED BECAUSE IT IS PREMISED UPON AN ASSUMPTION THAT THE 2002 RML AND THE EXISTING REGULATORY SCHEME IS SUFFICIENT TO ENSURE THAT THE WMM FACILITY COMPETENTLY MANAGES EXISTING ORE AND ALTERNATE FEED MATERIAL AT THE WMM FACILITY

In the Environmental Analysis for the requested License Amendment, the DRC accepts EFR's environmental review that focuses on whether the receipt and processing of Midnite Mine Material would result in any potential "significant *incremental* impacts over and above previously licensed activities." EFR Environmental Report § 4.1 (emphasis in original). The DRC broadly bases its "incremental" review of the addition of Midnite Mine Material to the WMM facility on the assumption that existing operations, monitoring programs, and regulation of the WMM facility are functioning to competently manage ore and alternate feed at the WMM facility. *See, e.g.*, Midnite Mine SER at p. 27 ("The mill has previously managed chlorides, fluorides, and sulfates in the Mill circuit and tailings system with no adverse process, environmental, or safety issues"); *id.* at p. 33 ("there is no indication that the Mill is impacting surface waters"); EFR Environmental Report §§ 4.6-4.9; Letter from EFRI to Rusty Lundberg (June 14, 2013), Responses to General Comments 1, 1e, 1i. This assumption allows the DRC to repeatedly determine that, because the Midnite Mine Material is similar to other alternate feeds and natural ores already processed at the WMM Facility and it does not introduce new chemical constituents into the tailings cells, there will be no significant incremental environmental impact on the WMM facility. *See, e.g.*, Midnite Mine SER at p. 34 (finding that, because the Midnite Material is similar to other material at the WMM facility, the existing surface water and groundwater monitoring programs are sufficient to detect impacts to surface water); *id.* at p. 37 (noting that existing monitoring for chlorides, fluorides, and sulfate will identify any tailings cell leakage and any barium contamination)[3]; *id.* at § 4.8 (Findings 1-4, containing broad statements about the sufficiency of the existing air, groundwater, and

[3] The Tribe notes here that the DRC's emphasis on monitoring for chloride, fluoride, and sulfate as "early warning" indicators of barium or tailings cell leakage is disingenuous. DRC has already detected chloride, fluoride, sulfates (along with nitrate, nitrite, a decreasing pH trend, and an increase in other monitored constituents) in the WMM facility's groundwater monitoring system, but has refused the Tribe's demands that DRC require EFR to adequately investigate whether the tailings cells are the source of the overlapping contamination plumes. *See* Nitrate CAP RAA § III. Accordingly, it is very unlikely that future detection of chloride, fluoride, or sulfate in the groundwater monitoring system will offer any guarantee that releases of barium from the tailings cells will be promptly or properly remediated.

environmental monitoring systems to address environmental contamination from the Midnite Mine Material).

Because the 2002 RML (and/or existing monitoring programs and the current regulation of the WMM facility) has *not* ensured and *cannot* ensure that EFR competently manages the existing ore and alternate feed at the WMM facility, DRC cannot assume in the Environmental Analysis that the 2002 RML and the existing programs and regulation can ensure proper storage, processing, or disposal of the Midnite Mine Material. Therefore, both the baseline assumption and the broad conclusions drawn in the Environmental Analysis are fundamentally flawed. Section III, *infra*, will provide specific details on how this flawed baseline assumption repeatedly results in inadequate Environmental Analysis of specific environmental impacts as required under Utah Admin. Code R-313-24-3.

III. THE ENVIRONMENTAL ANALYSIS FAILS TO MEET THE REQUIREMENTS OF UTAH ADMIN. CODE R-313-24-3

A. THE ENVIRONMENTAL ANALYSIS FAILS TO ADEQUATELY CONSIDER IMPACTS ON TRIBAL MEMBER AND PUBLIC HEALTH

The Environmental Analysis fails to meet Utah Admin. Code R313-24-3(1)(a)'s requirement that it contain "(a)n assessment of the radiological and nonradiological impacts to the public health from the activities to be conducted pursuant to the license or amendment." As described in Section II(A), *supra*, the WMM facility has a history of unresolved environmental contamination events that include contamination of the perched (shallow) groundwater aquifer, contamination of surface water, land, and natural resources through airborne pathways, and violations of radon emissions standards set forth in Subpart W NESHAP. As described in Section II(A), *supra*, some of the environmental contamination issues at the WMM have been exacerbated by the presence of alternate feed material at the facility.

The Environmental Analysis fails to acknowledge any of the existing contamination events, and the Environmental Analysis fails to acknowledge that existing operations, monitoring protocols, and regulatory actions taken by the DRC have already failed to adequately protect UMU Tribal member health and the public health. For that reason alone, the Environmental Analysis fails to adequately consider important public health impacts from the acceptance of the Midnite Mine Material. In addition, the Environmental Analysis fails to adequately analyze specific public health impacts from airborne releases of Midnite Mine Material and public health impacts from surface and groundwater contamination.

1. <u>The Environmental Analysis Fails to Adequately Analyze and Address Public Health Impacts from Airborne Releases of Midnite Mine Material</u>

The portions of the Environmental Analysis that assess the potential air quality impacts (and the resulting two conditions in Section 10.20 of the License Amendment) do not sufficiently analyze or address impacts to UMU Tribal Member or public health from airborne contamination. In the Environmental Analysis, the DRC relies upon the current air approval order, air monitoring protocols, stormwater management plan, and standard operating procedures at the WMM to provide adequate protection of UMU Tribal Member and the public health from airborne releases of Midnite Mine Material. Midnite Mine SER § 4.4 at p. 32-33 (discussing airborne contamination and stormwater management); *id.* at § 4.8 (making findings regarding the existing dust suppression program, the existing air approval order, and the existing airborne effluent monitoring program). As the Tribe has exhaustively documented to the DRC since 2010, the results of the USGS Study confirm that the current implementation of the 2002 RML, the facility air approval order, and the monitoring protocols and standard operating procedures has not stopped the facility from contaminating surface water, land, and vegetation outside of the WMM facility. *See* Air Approval Order RAA § III(B)(1)-(3); 2011 RML Renewal Comments § III(B)(1). In addition, the WMM facility is currently in violation of both the Subpart W NESHAP work practice standard limitation on number of tailings impoundments and the Subpart W NESHAP Radon-222 air emissions standard, and EFR has failed to take action to undertake precautionary measures to protect public health of UMU Tribal Members and others living near the WMM facility. Section II(A), *supra*; Exhibit A (to these October 2013 Comments) (explaining the severity and the duration of the 16-month Subpart W NESHAP violation and failure by the DEQ divisions to require EFR to take immediate action to permanently control the Radon-222 emissions). Therefore, DRC's unquestioned reliance on the current air approval order, monitoring protocols, stormwater management plan, and existing standard operation procedures does not sufficiently assess whether those regulatory mechanisms and operations will protect the public from fugitive dust and other hazards associated with the receipt and processing of the Midnite Mine Material.

The fine-grained nature of the Midnite Mine Material, with its heightened potential for airborne release and its high U_3O_8 content, requires that EFR take adequate protective measures to prevent the release of radioactive dust into the environment. In the Environmental Analysis, the DRC properly recognizes that, due to the arid conditions at the WMM facility and the Midnite Mine Material's susceptibility to degrade into a finer dust particle, there is a heightened concern about airborne releases of fugitive dust during wind events at the WMM facility. Midnite Mine SER at p. 34; *see* Proposed License Amendment Conditions 10.20(A)(1)-(2). However, the two methods for controlling these airborne releases fail to provide adequate protection for UMU Tribal Member and public health for at least two reasons. First, DRC proposes a limitation that requires a durable geomembrane to be placed on material that is stockpiled on the ore pad for more than 14 days. Proposed License Amendment Condition 10.20(A)(1). This limitation is less restrictive (and less protective of public health) than the practices identified by EFR in 2011 when DRC undertook a more comprehensive review of the facility's storage and handling of alternate feed materials. 2011 RML SER § 3.2.3.1 ("High grade alternate feed materials typically with 1.0% U_3O_8 or greater[4] are usually received at the Mill and stored in drums or other containers"). This limitation also unnecessarily puts UMU Tribal Members and the public at risk of exposure during the first 14 days of storage or during catastrophic storm events that move the Midnite Mine Material from the ore storage area.

Second, the DRC proposes a limitation that requires a 30-minute response to stop generation of fugitive dust, "[i]f at any time, visible dust is observed to be originating from Uranium Material stored on site." Proposed License Amendment Condition 10.20(A)(2). To begin, unless this requirement is paired with a new requirement that EFR provide constant monitoring and documentation of dust events at the ore pad, the 30-minute response time provides no guarantee that EFR will observe fugitive dust events or properly respond to such events. *See* Air Approval Order RAA § III(B)(2) (noting the historic lack of on-site presence by the Division of Air Quality and that

[4] The average U_3O_8 content of the Midnite Mine Material is 1.4%. Midnite Mine SER at p. 10.

the Air Approval Order gives EFR too much discretion on how to comply with fugitive dust limitations); *id.* at § III(B)(3) (arguing that the current fugitive dust emissions control do not meet the Best Available Control Technology requirement). In addition, there is no guarantee that visual monitoring can detect the movement of very fine-grained particles or that EFR can monitor the movement of any particles at night or during other times when visual inspections cannot occur.

Given the existing, ongoing, and uncontrolled airborne releases from the WMM facility documented in the USGS Study and the Subpart W NESHAP violations, the Tribe asserts that both these license conditions are grossly insufficient to protect UMU Tribal Member and public health from releases of fine-grained particles contained in the Midnite Mine Material.

2. <u>The SER Fails to Adequately Analyze and Address Public Health Impacts from Surface and Groundwater Contamination</u>

In Section III(B), *infra*, the Tribe will comprehensively address deficiencies in DRC's evaluation of the potential impacts on surface and groundwater resources. In previous public comments, correspondence, and administrative actions, the Tribe has exhaustively documented its concerns that leakage from Tailings Cells 1, 2, and 3 and/or other activities at the WMM facility have already contaminated the perched (shallow) aquifer and will contaminate the deep aquifer that provides drinking water to the White Mesa Community. 2011 RML Renewal Comments § III(A); Nitrate CAP Comments. *See also* April 2012 Groundwater Letter (reiterating concerns that Deep Water Supply Well WW-2 will serve as a contamination pathway between the contaminated perched aquifer into the deep aquifer that supplies the Tribe's drinking water and reiterating the concern that the monitoring wells closest to the Tribal community are showing increasingly elevated concentrations of multiple indicator parameters of tailings cell leakage (including concentration of beryllium and cadmium exceeding Utah's ground water quality standards)).[5] The Tribe has also documented its concern that contamination of surface water will impact UMU Tribal Member health through indirect exposure to radioactive material and other constituents contained in alternate feed materials. 2011 RML Renewal Comments § III(B)(1)(a). Accordingly, the DRC's failure to adequately analyze impacts to groundwater and surface water is also a failure to adequately analyze important public health impacts raised by the License Amendment.

[5] Groundwater south of the tailings system at MW-22 bears a strong signature of pollutants originating from the WMM facility tailings impoundments. Specifically, analytical results for the groundwater samples at monitoring well MW-22 show elevated and increasing (decreasing for pH) levels of cobalt, nickel, zinc, manganese, beryllium, selenium, cadmium, copper, fluoride and gross alpha. Each of these constituents is present at high concentrations in the tailings system. The Midnite Mine Material analytical results show high concentrations of nickel, cobalt, manganese, zinc and beryllium; each of these constituents is currently present at abnormal and increasing concentrations in the groundwater south of the tailings system at MW-22, indicating that these particular inorganic constituents are currently being introduced to the environment and are mobile in groundwater at the WMM facility.

B. THE ENVIRONMENTAL ANALYSIS FAILS TO ADEQUATELY ANALYZE IMPACTS TO SURFACE AND GROUNDWATER

Utah Admin. Code R313-24-3(1)(b) requires that the environmental report contain an analysis of the impacts to surface and groundwater. The Environmental Analysis fails to adequately analyze impacts to both surface and groundwater, and also fails to meet standards for approval of alternate feed license amendments proposed by the DRC in the 2011 RML Renewal.

1. The Environmental Analysis Fails to Adequately Analyze Impacts to Surface Water

The Environmental Analysis' failure to adequately analyze and address anticipated impacts from the release of airborne particles from the Midnite Mine Material is explained in Section II(A), *supra*. Even though the USGS Study documented off-site releases of uranium and vanadium from the WMM facility through stormwater discharge pathways, the Environmental Analysis does not assess or address the possibility that the existing air monitoring and regulatory mechanisms and the existing stormwater management plan are insufficient to contain air deposition from the WMM facility from entering surface waters and polluting nearby land and natural resources. *See* 2011 RML Renewal Comments § III(B)(1)(a) (citing Exhibit L to the 2011 RML Renewal Comments). By failing to properly analyze deficiencies in the existing regulation of airborne releases, and by failing to require adequate control of the fine dust particles contained in the Midnite Mine Material, DRC has failed to adequately analyze or control impacts to stormwater and surface water.

2. The Environmental Analysis Fails to Adequately Analyze Impacts to Groundwater

The Environmental Analysis fails to adequately analyze impacts to groundwater for two reasons. First, the Environmental Analysis completely and erroneously fails to address the multiple, spatially overlapping groundwater contamination plumes that currently exist at the site. *See* Section II(A), *supra*. Instead the Midnite Mine SER falsely states: "The mill has previously managed chlorides, fluorides, and sulfates in the Mill circuit and tailings system with no adverse process, environmental, or safety issues," and then bases its entire analysis of the impacts of the new Midnite Mine Material to groundwater on a flawed baseline assumption that current practices and monitoring programs are not resulting in groundwater contamination at the WMM facility. Midnite Mine SER at p. 27. Accordingly, the entire analysis of potential incremental impacts to groundwater resources is fatally flawed, and the DRC has completely failed to identify real risks to both the perched and deep groundwater aquifers under the WMM facility from leakage from Tailings Cells and releases from other areas of the WMM facility.

A second and perhaps more critical deficiency in the Environmental Analysis is that it limits its tailings cell liner integrity analysis to potential impacts on Tailings Cells 4A and 4B. *See* Tetra Tech Technical Memorandum, Review of Chemical Contaminants in Dawn Mining Company Midnite Mine (DMC) Uranium Material § 3.0, 4.2.3 (June 14, 2013) (clarifying that the analysis of tailings cell liner material incompatibility was only conducted for Tailings Cells 4A and 4B). Tailings Cells 4A and 4B are not the only active tailings cells at the WMM facility. *See* 2002 RML § 9.1 (authorizing mill process and waste water storage and tailings disposal into Tailings Cells 1, 2, 3, 4A, and 4B); *see also* 2011 RML Renewal Comments § III(C)(1)(b) (demanding that DRC amend the 2011 RML Renewal to add a new License condition prohibiting disposal or storage of alternate feed material in Tailings Cells 1, 2, and 3). The 2002 RML allows for mill liquid wastes to be discharged into Tailings Cell 1. *See* Midnite Mine SER § 4.4 (noting that mill process effluent, laundry, analytical laboratory liquid wastes and runoff from the Mill and facilities go into the Mill's tailings impoundments); 2002 RML § 9.1; Ground Water Discharge Permit UGW370004, 6 (August 24, 2012). The current stormwater management plan also directs runoff from the Mill yard and facilities into Tailings Cell 1. Storm Water Best Management Practices Plan, Denison Mines (USA) Corp., Fig. 2; Appendix 1 § 1.4.5 at p.3 (October 2011); Environmental Protection Agency, NPDES Stormwater Industrial Inspection, at p. 2 (March 14, 2013). Because the single, 34-year old, 30-mil PVC liner on Tailings Cell 1 already poses a grave risk to the groundwater resources underneath the WMM facility, failure to analyze any additional impacts posed by the Midnite Mine Material (including, but not limited to, the analysis related to barium and beryllium) is a critical flaw in the Environmental Analysis.

3. <u>The Process for Evaluating Impacts on Groundwater Fails to Meet Requirements Proposed by DRC in 2011</u>

The Tribe notes here that the DRC's decision to revise the 2002 RML (instead of issuing a revised RML first) negatively impacts the process for analyzing the impact of the Midnite Mine Material on the tailings cells (and the groundwater). In the 2011 RML SER, DRC proposed an amendment of License Condition 10.1 that, in addition to meeting the criteria of the NRC Alternate Feed Policy, would have required EFR to demonstrate: (1) sufficient disposal capacity "such that the proposed alternate feed material and any liquid by-products, will be permanently disposed in tailings cells designed and constructed to meet the Best Available Technology requirements [of Tailings Cells 4a and 4b]; and (2) that the disposal of alternate feed material "will not lead to or cause a violation of the disposal cell performance standards [set forth in the requirements for Tailings Cells 4a and 4b]." 2011 RML SER § 3.2.3.1. Until Tailings Cell 1 is either relined or capped for final closure with major modifications to stormwater management from the Mill yard, EFR cannot demonstrate that the alternate feed materials will be disposed of in a tailings cell designed to meet the BAT requirements for Cells 4A and 4B. *See generally* 2011 RML Renewal Comments. Accordingly, the process that the DRC used to revise the 2002 RML does not even meet standards that the DRC set forth as necessary in 2011, and the DRC's failure to even identify that some Midnite Mine Material will enter a tailings cell that does not meet Best Available Technology requirements raises serious questions about the adequacy of DRC's review of whether this facility should be allowed to take any new sources of alternate feed material.

C. THE ENVIRONMENTAL ANALYSIS COMPLETELY FAILS TO ANALYZE ALTERNATIVES

The Environmental Analysis completely fails to analyze alternative sites and engineering methods as required by Utah law. Utah Admin. Code R313-24-(3)(1)(c) requires DRC to consider alternatives, "including alternative sites and engineering methods" during the environmental analysis of the proposed license request. In the Midnite Mine SER, DRC acknowledges its responsibility to consider alternate sites and engineering methods during its analysis of EFR's request for the License Amendment, but then fails or refuses to undertake that analysis, stating, "[t]he UDRC has concluded that there are no significant environmental impacts associated with the proposed action. Other alternatives need not be evaluated." Midnite Mine SER § 4.6.

DRC's explanation for its failure to analyze alternate sites and engineering methods is erroneous for two reasons. First, because DRC is required to consider alternatives during the environmental analysis of the proposed license request, it cannot make any final determinations on environmental impacts of the proposed action without first undertaking the alternatives analysis. Utah Admin. Code R313-24-(3)(1) (including subsection (c) as a component of the requirements of the environmental report). Second, nothing in R313-24-3(1)(c) allows an exemption from considering alternatives if DRC (preliminarily) concludes that the proposed action poses no significant environmental impacts. Accordingly, DRC's refusal to consider alternatives is a significant deficiency in the Environmental Analysis.

DRC's failure to consider alternate sites for the Midnite Mine Material compounds other deficiencies in the Environmental Analysis. As discussed in more detail in Section IV, *infra*, the United States Environmental Protection Agency's ("EPA") plans for managing the Midnite Mine Superfund cleanup on the Spokane Indian Reservation specifically mandate that that the Midnite Mine Material "must be disposed of in a facility that is designed to limit human exposure and migration of contaminants in surface water and groundwater to acceptable levels." *See* Midnite Mine Superfund Site Record of Decision at p. 2-75 (September 2006); Midnite Mine Superfund Site Proposed Cleanup Plan (September 2005). *See also* 2011 RML Renewal Comments § III(C)(3)(a) (explaining limitations on transporting CERCLA waste to facilities that are operating in compliance with applicable federal and state law pursuant to Section 121(d)(3) of CERCLA and 40 C.F.R. § 300.440 ("CERCLA Off-Site Rule")). As discussed in Sections II-III, *supra*, the WMM facility has several serious and ongoing violations of its Utah state groundwater permit and two current violations of the federal Subpart W NESHAP radon emissions limitations. By failing to compare the risk of receiving Midnite Mine Material at the WMM facility to other facilities that could process or dispose of the Midnite Mine Material, the DRC has missed a critical step in evaluating the risks of moving the Midnite Mine Material to the WMM facility.

D. THE ENVIRONMENTAL ANALYSIS FAILS TO ADEQUATELY ANALYZE LONG-TERM IMPACTS TO THE WMM FACILITY

Utah Admin. Code R313-24-3(1)(d) requires that DRC consider the long term impacts, including decommissioning, decontamination, and reclamation impacts, associated with the activities conducted pursuant to the License Amendment. The Environmental Analysis on long-term impacts to the WMM is deficient for two reasons.

First, the deficiencies described in Sections II-III, *supra*, bleed into the conclusions drawn in the Environmental Analysis' assessment of long-term impacts to decommissioning, decontamination, and reclamation at the facility. In its analysis of the long-term impacts, the DRC relies on the faulty assumptions that: (1) existing operations, monitoring systems, and regulatory enforcement are sufficient to contain both existing ore and alternate feed material at the WMM facility; and (2) the Midnite Mine Material will only enter Tailings Cells 4A and 4B. *See* Sections II(B), III(A)-(B) *supra*; Midnite Mine SER § 4.8 at p. 42-43. These assumptions lead the DRC to the general faulty conclusion that, because the Midnite Mine Material is not expected to be significantly different from conventional ores at the WMM facility, DRC does not anticipate to have incremental long-term impacts from adding the Midnite Mine Material. Midnite Mine SER § 4.7 at p. 40. As explained above, because the current operations are not sufficiently controlling air, surface, surface water, or groundwater contamination at the facility, and because the Midnite Mine Material will enter Tailings Cell 1, DRC cannot assume that EFR can store, process, or dispose of the Midnite Mine Material without creating additional contamination at the WMM facility. Section II(B), *supra*. By failing to evaluate how that contamination might affect the decommissioning, decontamination, and reclamation at the WMM facility, the current long-term impacts analysis is deficient.

Second, the Environmental Analysis' assessment of the potential long-term impacts also relies on a faulty baseline assumption that there is an adequate reclamation plan and sufficient surety in place that can address long-term environmental remediation at the site. Midnite Mine SER § 4.7. Because Section 9.11 of the 2002 RML is so outdated, is unclear which version of the Reclamation Plan applies at the facility. However, as the Tribe documented to DRC in the 2011 RML Renewal Comments, even more recent versions of the facility's Reclamation Plan[6] contain deficiencies in the plans for disposal of demolition materials into Tailings Cell 1 and in the tailings cell cap design. *See* 2011 RML Renewal Comments § IV(A). The Tribe has also exhaustively documented to DRC that the DRC's minimum surety estimates for the facility have been grossly insufficient to ensure adequate decontamination and decommissioning of the WMM facility.[7] *See* 2011 RML Renewal Comments § IV(B) (citing Exhibit H to the 2011 RML Renewal Comments). Accordingly, the DRC's reliance on the existing reclamation plan and the existing surety at the WMM facility to address any contamination or direct disposal of the Midnite Mine Material makes the long-term impacts analysis deficient.

IV. BY ISSUING THE LICENSE AMENDMENT, DRC IS SUPPORTING THE RELOCATION OF THE LEGACY OF URANIUM CONTAMINATION FROM THE SPOKANE INDIAN RESERVATION TO THE UTE MOUNTAIN UTE RESERVATION

During the 2011 RML Renewal review process, the Tribe submitted public comments articulating a concern that groundwater, surface water, and soil contamination (and uncontrolled continuing releases of such contamination) at the WMM facility rendered the facility ineligible or at least inappropriate for the receipt of alternate feed material at the facility. 2011 RML Renewal Comments § III(C)(3)(a). The Tribe explained that the CERCLA Off-Site Rule limits the transfer of CERCLA material to facilities operating in compliance with state and federal law and that the Tribe was concerned that DRC's failure to find EFR in violation of state and delegated federal laws was making it difficult for the EPA to determine whether the WMM facility was eligible to continue receiving alternate feed material. *Id.* Since 2011, the contamination problems noted by the Tribe have continued with little or no regulatory controls by DRC, and the DRC has identified additional violations of state and federal environmental laws at the WMM facility. *See* Section II(A), *supra* (describing ongoing violations of state and federal law caused by groundwater contamination and the Subpart W NESHAP violations). Accordingly, in October of 2013, the Tribe still believes that the existing uncontrolled and continuing releases of contamination at the WMM facility render the facility ineligible or at least inappropriate for the receipt of the Midnite Mine Material.

The history of contamination at the Midnite Mine site and the similarities between the Midnite Mine facility and the WMM facility provide a compelling and troubling illustration of why

[6] Section 9.11 of the 2002 RML still contains references to Revisions 3.1 and 3.2 of the Reclamation Plan for the facility. The DRC website indicates that DRC and EFR are still working to finalize Revision 5.0 to the Reclamation Plan.

[7] In the 2011 RML Renewal Comments, the Tribe's expert, using built-up, benchmarking, and per-ton calculation methods, estimated between $51 million and $407 million to pay for a government cleanup of the WMM facility. *See* Exhibit H to the 2011 RML Renewal Comments for the full details of the Tribe's analysis.

the CERCLA Off-Site Rule and the DRC should prohibit the transportation of the Midnite Mine Material to the WMM facility. The Midnite Mine site is a CERCLA cleanup site located on the Spokane Indian Reservation. EFR Environmental Report § 2.1. The uranium mining activities at the Midnite Mine facility resulted in contamination of important tribal water resources, and the EPA required the facility owner, Dawn Mining Company, to install a water treatment plant to pump and decontaminate water under and around the Midnite Mine facility. *Id.* The water treatment at the Midnite Mine site will likely continue for years or decades after the EPA finishes construction of containment measures at the Midnite Mine site, and it is unclear whether the Spokane Indian Tribe will be able to safely use Tribal groundwater around the Midnite Mine site for human consumption in the future. *Id.*; *see also* Midnite Mine Superfund Site Proposed Cleanup Plan at p. 11 (September 2005).

At the WMM facility, spatially-overlapping plumes of chloroform, nitrate, nitrite, and chloride contamination in the perched (aquifer) have already led the DRC to require EFR to begin pumping contaminated groundwater and placing it in the facility's tailings cells. *See* Final Stipulation and Consent Order, Docket No. UGW12-04 § B (requiring near-term active remediation of groundwater nitrate contamination during Phase II). These plumes, along with new data showing an increase in heavy metals and a decreasing pH trend in the same monitoring wells, suggest that the perched groundwater aquifer is being contaminated from a source similar to the facility's older tailings cells. *See* Nitrate CAP RAA § III; Nitrate CAP Comments, Letter to Rusty Lundberg § B (October 4, 2012). Because the DRC refuses to require the WMM to identify the source of the several, overlapping plumes of contamination, and because a likely source of these overlapping contamination plumes is the older Tailings Cells 1, 2, and 3, the Tribe can anticipate that groundwater pumping will occur for as long as the WMM facility is in operation. In addition, the Tribe can anticipate that, during and after decontamination and reclamation of the WMM facility, there will be ongoing groundwater remediation efforts at the WMM facility that may look very similar to the existing water treatment plant operations at the Midnite Mine facility. If the Navajo aquifer is contaminated by the WMM operations, there will be no municipal water supply for the White Mesa Community.

The documents associated with the Midnite Mine cleanup clearly state that the Midnite Mine Material "must be disposed of in a facility that protects human health and the environment." Midnite Mine Superfund Site Proposed Cleanup Plan (September 2005). This reiteration of the CERCLA Off-Site Rule is particularly poignant and relevant to the DRC's Environmental Analysis of the WMM facility because both sites involve legacy contamination from the uranium industry on Tribal lands, water supplies, and other resources. It is a gross violation of the intent of the CERCLA Off-Site Rule to allow EFR to transport and process the Midnite Mine Material in a facility that will likely allow that material to harm another Tribe's members, lands, and water resources. Accordingly, DRC's continued failure to require EFR to remove the sources of the ongoing and uncontrolled contamination at the WMM facility and DRC's failure to properly analyze the environmental and public health impacts of bringing the Midnite Mine Material to the WMM facility will likely result in the License Amendment relocating the environmental contamination from the Spokane Indian Reservation to the White Mesa Community.

V. CONCLUSION

For the reasons stated above, the Tribe urges DRC to reject EFR's application to amend the RML license at this time and to instead re-initiate the process for renewing the 2002 RML for the facility (along with other related permits) and addressing the concerns outlined in the Tribe's Air Approval RAA, 2011 RML Comments, Nitrate CAP Comments, Nitrate CAP RAA, and other correspondence.

The Tribe appreciates your time and attention to these comments. If you have any questions, please contact Special Counsel H. Michael Keller at (801) 237-0287, Associate General Counsel Celene Hawkins at (970) 564-5642, or Scott Clow, Environmental Programs Director, at (970) 564-5432.

Sincerely,

Celene Hawkins
Associate General Counsel
Ute Mountain Ute Tribe

H. Michael Keller
Special Counsel
Ute Mountain Ute Tribe
Utah Bar # 1784

EXHIBIT A
SUBPART W NESHAP RADON-222 VIOLATION

In June of 2012, Radon-222 emissions from Tailings Cell 2 exceeded the Subpart W NESHAP emissions standard. *See* White Mesa Uranium Mill National Emissions Standards for Radon Emission from Operating Mill Tailings, Transmittal of 2012 Annual Radon Flux Monitoring Report (and Report) (March 29, 2013) ("March 2013 Report") (reporting to DAQ that radon emissions from Tailings Cell 2 exceeded the Subpart W NESHAP standard for the 2012 annual monitoring conducted by EFR's consultants; with average values 29.5 percent higher than the regulatory limit). The radon emissions from certain areas in Tailings Cell 2 exceeded 200 pCi/m^2s, which is more than 40 times the emissions goal set forth in EFR's ALARA Program (standards adopted by the Mill to protect worker safety and others located near the WMM facility). *See* Tellco Environmental LLC NESHAPS 2013, Cell 2, Sample G45 (204.5 pCi/m^2s); DUSA White Mesa Mill Environmental Report Vol. IV, 117 (February 28, 2007) (the ALARA emissions goals are 25 percent of the applicable regulatory standards).

EFR hired a consultant to evaluate what level of additional cover would be necessary to mitigate the Radon-222 emissions, and that consultant found that a two-foot random fill cover would reduce the surface radon flux below the emissions standard in perpetuity. *See* March 2013 Report, Letter to B. Bird 7. Instead of immediately placing the recommended two-foot cover over Tailings Cell 2, EFR proposed an experimental 100-foot-by-100-foot plot to test the effectiveness of a less robust and less protective cover. *Id.* at 8. Currently, the DAQ is waiting for the DRC to provide an opinion on how this will affect the final reclamation specifications for Tailings Cell 2 and what "credit" will be reflected by EFR's efforts at this time in adding additional cover. Personal Communication with Jay Morris, Compliance Activities, Utah Division of Air Quality (October 16, 2013).

The Tailings Cell 2 Monthly Compliance Report for July 2013 indicates that EFR has done nothing to successfully mitigate the radon emissions and protect public health or to provide adequate worker safety. *See* Energy Fuels Resources (USA) Inc., Tailings Cell 2 Monthly Compliance Report (August 20, 2013) ("August 2013 Report"). The August 2013 Report confirms that the July 2013 monitoring results were 21.5 percent higher than the regulatory limit. *See id.* This means that UMU Tribal Members have been exposed to high Radon-222 emissions for more than 16 months while EFR, DRC, and DAQ are evaluating whether a cover less than two feet might suffice to control a significant human health risk.

"DRC-2013-003361"

G R A N D C A N Y O N T R U S T

October 21, 2013

RECEIVED
OCT 24 2013
Division of Radiation Control

Rusty Lundberg
Director
Utah Division of Radiation Control
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via Certified U.S. Mail and Email

Re: *Comments regarding Utah Division of Radiation Control's Proposed Licensing Action to Amend State of Utah Radioactive Material License No. UT 1900479 to Authorize the Receipt and Processing of Alternate Feed Material from Dawn Mining Corporation's Midnite Mine.*

Dear Mr. Lundberg:

The Grand Canyon Trust ("Trust") submits the following comments regarding Utah Division of Radiation Control's ("Utah DRC") proposed licensing action to amend State of Utah Radioactive Material License No. UT 1900479 to authorize Energy Fuels Inc. ("Energy Fuels") to receive and process alternate feed material from Dawn Mining Corporation's Midnite Mine. The Trust incorporates the technical comments of Jim Kuipers submitted on behalf of the Trust into this document. As the following discussion indicates, the Trust is concerned that the proposed license conditions do not adequately protect public and environmental health from the hazards of fugitive dust from the Midnite Mine alternate feed material. The Trust looks forward to working with Utah DRC to ensure that the conditions ultimately placed in License No. UT 1900479 protect public and environmental health to the maximum extent possible, and fully meet the standards set forth in the Utah Radiation Control Rules.

I. Identity of Commenting Party

The Grand Canyon Trust is a non-profit corporation with offices in Flagstaff, Arizona, and Moab and Salt Lake City, Utah. The mission of the Trust is to protect and restore the Colorado Plateau – its spectacular landscapes, flowing rivers, clean air, diversity of plants and animals, and areas of beauty and solitude. The Colorado Plateau includes the town of Blanding, Utah, the White Mesa Mill site, and the larger area surrounding the site that is impacted by the Mill's operation. One of the Trust's goals is to ensure that the Colorado Plateau is a region characterized by vast open spaces with restored, healthy ecosystems, and habitat for all native fish, animals, and plants. To accomplish this, the Trust advocates for adequate regulation of existing industry across the Colorado Plateau. The Trust's board, staff, and members use the area that is impacted by the White Mesa Mill for quiet recreation (including hiking, biking, fishing, rafting and camping), scientific research, aesthetic pursuits, and spiritual renewal. Many of the Trust board, staff, and members live in Utah, and thus pollution in Utah adversely affects their health, quality of life, recreational pursuits, and aesthetic sense. The Trust and its members have a protectable legal interest in ensuring that Utah DRC regulates the White Mesa Mill to the maximum extent required by law.

II. The Existing Fugitive Dust Controls at the Mill Are Insufficient

A. The Fugitive Dust Controls Do Not Satisfy the Best Available Control Technology Standard

In violation of the Utah Air Quality Rules, the Approval Order does not contain best available control technology to control fugitive dust from the Mill. Utah Admin. Code R307-401-8(1) states that the Director will issue an approval order if "the degree of pollution control for emissions to include fugitive dust emissions and fugitive dust, is at least best available control technology (BACT")". The Utah Supreme Court has found that if a control technology is operating or permitted for similar operations, the permitting authority should consider the technology available and consider it in its BACT analysis. *Utah Chapter of the Sierra Club v. Air Quality Board*, 2009 UT 76 ¶ 46.

In 2011, Utah DAQ was presented with evidence of industry standards for controlling fugitive dust that far exceed the controls currently in place at the Mill. In its comments on Utah DAQ's Approval Order to Add a Baghouse, to Allow Alternate Fuel Usage, and to Incorporate Work Practice Standards, DAQE-AN0112050018-11, the Ute Mountain Ute Tribe submitted the fugitive dust control plans for both the Moab Project and the Crescent Junction Project as evidence of technology that should be considered as BACT in Utah DAQ's fugitive dust control technology for the Mill.

Utah DAQ's subsequent unjustified decision to not adopt controls as stringent as those in place at the Moab Project and the Crescent Junction project – both of which were demonstrated as "available" by the Ute Mountain Ute Tribe – violates the BACT requirements, is basis for the vacature of the Approval Order, and indicates the inadequacy – both legal and practical – of the current fugitive dust controls in place at the Mill. The inadequacies of Utah DAQ's approval order does not satisfy Utah's duty to implement the authority derived from the its Agreement State authority. Technology properly identified as BACT must be required in order for License No. UT 1900479 to be amended to allow receipt, storage, processing, placement, and permanent disposal of the alternate feed materials from Midnite Mine.

B. The Fugitive Dust Controls Do Not Satisfy the Low As Reasonably Achievable Standard

The fugitive dust emitted from the Mill contains radioactive elements and thus risks exposing the public to doses of radiation. Pursuant to Utah Admin. Code, each licensee "shall use, to the extent practical, procedure and engineering controls based upon sound radiation protection principles to achieve occupational doses and doses to members of the public that are as low as reasonably achievable ("ALARA"). Utah Admin. Code R313-15-101(2). ALARA is defined as:

> "making every reasonable effort to maintain exposures to radiation as far below the dose limits as is practical, consistent with the purposes for which the licensed or registered activity is undertaken, taking into account the state of technology, the economics of

improvements in relation to state of technology, the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to the utilization of nuclear energy and licensed or registered sources of radiation in the public interest." Utah Admin. Code R3013-12-3.

The ALARA standard is similar to the BACT standard in that both require regulators to ensure available technologies are implemented. *See Utah Chapter of the Sierra Club v. Air Quality Board*, 2009 UT 76 ¶ 46. Where available technologies are actually being used at the Moab and Crescent Junction Project sites that could reduce fugitive emissions, the current fugitive dust controls in place at the Mill do not meet the ALARA standard. The use of more stringent fugitive dust control plans at both the Moab Project Site (Attached as Exhibit 1) and the Crescent Junction Project Site (Attached as Exhibit 2) indicate that emissions reductions based on these technologies are "reasonably achievable" at the Mill. Utah Admin. Code R3013-12-3. Thus, it is incumbent upon DRC to perform a meaningful analysis of the benefit that requiring similar technology would have on public and environmental health, and of the economics of requiring such technologies to be instituted at the Mill. DRC's failure to do so thus far is a violation of the Utah Rules designed to protect against radiation exposure.

III. Fugitive Dust From the Mill Threatens Public and Environmental Health

The U.S. Geological Survey (USGS) Scientific Investigations Report 2011-5231 ("USGS Report") documents off site, downwind deposition of fugitive uranium dust emissions originating from uncovered stockpiles at the White Mesa Mill. Exposure to those emissions and that deposition by people, plants, wildlife and livestock threatens public health, safety and the environment. By documenting deposition of fugitive dust from the mill, the USGS report demonstrates that existing, ongoing operations of the White Mesa Mill lack requirements necessary to protect public health, safety, and the environment from exposure to fugitive uranium dust emissions and deposition originating from uncovered stockpiles at White Mesa Mill.

The USGS Report documents elevated uranium in soil sediment and vegetation near the mill. It reports "...U concentration(s) from the stream-sediment samples ranged from 1.5 to 16.2 parts per million (ppm). The highest U concentration measured in the local background samples (fig. 31), which ranged from 1.8 to 3.6 ppm, was equaled or exceeded in 8 of the 28 stream sediment samples." USGS Report at 51. It reports elevated uranium in big sagebrush located near the White Mesa Mill; "U concentration in the plant-tissue samples from sagebrush ranged from 1.3 to 171 ppm (dry weight)." USGS Report at 58. It reports elevated vanadium concentration in plant tissue; vanadium (V) would expected to be present in Colorado Plateau uranium ore delivered to the mill. USGS Report at 63. It reports "concentration in the plant tissue samples ranged from 9 to 582 ppm (dry weight), and its spatial distribution in the plant tissue samples was simi-lar to the U distribution." USGS Report at 63.

The USGS Report establishes that elevated uranium in soil and elevated uranium and vanadium in vegetation is highest downwind of the White Mesa Mill, indicating that windblown uranium ore is being transported and emitted off site from uncovered stockpiles onto downwind land and vegetation. For big sagebrush samples, "[T]he highest concentrations of U were found in plant tissue samples collected from regions north, south, and east of the mill site, and the lowest U concentrations were found west, northwest, and southwest of the mill site" and "[P]lant samples with elevated V concentrations consistently were found north-northeast east, and south of the mill site, indicating offsite transport in the predominant wind directions." USGS 5231 at 58 and 63. The report continues:

> Wind data collected from 2000 to 2008 at the Blanding airport (National Oceanic and Atmospheric Administration, 2010), located about 6 km north of the mill, offers insight into the likely U source for the observed spatial distribution of U in the plant tissue samples (fig. 40). The predominant wind direction during the nine-year monitoring period was from the south-southwest (SSW) at an azimuth of about 200 degrees (fig. 41). This could explain the anomalous U concentra-tions detected in plant tissue samples col-lected to the north and northeast of the mill site. Furthermore, some of the highest wind speeds, exceeding 4 meters per second (m/s) were from westerly directions (azimuth 200 to 340 degrees), providing an explanation for the anomalous U concentrations east of the mill site with the predominant direction from the SSW (205 degrees). USGS Report at 58, 63.

Uranium fugitive dust emissions and deposition from White Mesa Mill to areas downwind threatens public health, safety, and the environment. Potential human exposure pathways to uranium and other contaminates emitted as fugitive dust include (1) inhalation of uranium dust emitted from the mill, or deposited from the mill and re-mobilized through soil disturbance or wind; (2) ingestion of water contaminated by uranium dust deposited in ephemeral washes adjacent to the mill; (3) ingestion of meat from wildlife or livestock that ingest uranium contaminated vegetation and soil near the mill.

Uranium fugitive dust emissions from White Mesa Mill also present exposure pathways to wildlife. In its Scientific Investigations Report 2010-5024, USGS details biological pathways of exposure and ecotoxicity values for uranium and associated radionuclides for the Colorado Plateau near Grand Canyon, an area whose ecology and biological diversity is similar to lands near White Mesa Mill. The report states that

> "[T]he utilization of subterranean habitats (burrows in uranium-rich areas, burrows in waste rock piles or reclaimed mining areas, mine tunnels) in the seasonally variable but consistently hot, arid environment is of particular concern in the segregation areas. Certain species of reptiles, amphibians, birds, and mammals spend significant amounts of time in burrows where they can inhale or ingest uranium and other radionuclides through digging, eating, preening, and hibernating. Herbivores may also be exposed though the ingestion of radionuclides that have been aerially deposited on vegetation." USGS 5024 at 287.

Even non-uranium bearing fugitive dust threatens physical injury to the public as a cause of chronic lung disease, asthma, and other lung related illnesses; a cause of hazardous conditions on public rights of way; and a detractor of property values in areas nearby the emissions source. Each of these problems associated with fugitive dust is magnified by the fact that the fugitive dust in this case contains uranium, and thus poses an even greater threat to human and environmental health – one that will endure on the Colorado Plateau for years to come.

The inhalation of U_3O_8 bearing fugitive dust has caused systemic toxicity that can result in long-term damage to organs. *See, e.g.*, MH Henge-Napoli, E Ansoborlo, M Claraz, J-P Berry

and M-C. Cheynet, *Role of alveolar macrophages in the dissolution of two different industrial uranium oxides* in *Cellular and Molecular Biology* 42(3), 413-420, 1996; GN Stradling, JW Stather, SA Gray, JC Moody, M Ellender, A Hodgson, D Sedgwick, N Cooke *Metabolism of uranium in the rat after inhalation of two industrial forms of ore concentrate: the implications for occupational exposure* in *Human Toxicology* 6, 385-393, 1987 (Measuring 12% U_3O_8 deposit in lungs after 360 days following inhalation); H.B. Wilson, G.E. Sylvester, S. Laskin, C.W. LaBelle, J.K. Scott, H.E. Stokinger, *Relation of particle size of U_3O_8 dust to toxicity following inhalation by animals.* In *A.M.A. Archives of Industrial Health* 11, 11-16, 1955 (Documenting kidney and lung damages associated with inhalation of small particle sized U_3O_8 dust).

The ongoing problem of off-site deposition of radioactive materials, particularly in light of the adverse health effects of U_3O_8 exposure, confirms the need for DRC to address and mitigate the off-site fugitive dust deposition problem documented in the USGS report. Importantly, this problem will be exacerbated by Energy Fuels' proposal on how to handle the alternate feed materials from the Midnite Mine. Thus, the License Amendment at issue here represents an opportunity for Utah DRC to institute meaningful regulation and control of fugitive dust at the Mill as required by Utah law.

IV. Standards

A. Utah Radiation Control Rules

The general purpose of Utah's Radiation Control Rules is "to ensure maximum protection of the public health and safety to all persons at, or in the vicinity of, the place of use, storage, or disposal." Utah Admin. Code R313-12-2. Adhering to these principles, the Director shall approve an amendment to a radioactive material license if "the Director determines that... (b) the applicant's proposed equipment, facilities, and procedures are adequate to minimize danger to public health and safety or the environment...and (d) the issuance of the license will not be inimical to the health and safety of the public." Utah Admin. Code R313-22-33 (standards applied to license amendments by Utah Admin. Code R313-22-39). For this reason, the Utah Rules give the Director the discretion to "impose upon a licensee or registrant requirements in addition to those established in the rules that the Director deems appropriate or necessary to minimize any danger to public health and safety or the environment." Utah Admin. Code R R313-12-54. Moreover, each licensee "shall use, to the extent practical, procedure and engineering controls based upon sound radiation protection principles to achieve occupational doses and doses to members of the public that are as low as reasonably achievable ("ALARA"). Utah Admin. Code R313-15-101(2). Each of these standards governs Utah DRC's decision of whether to amend Utah Radioactive Material License No. UT 1900479, and what controls to require that the licensee institute, which includes the management of fugitive dust at the Mill.

A. Prior Fugitive Dust Standards Instituted at the Mill

To meet its ALARA standard of 1250 mrem per year, Denison instituted specific controls to protect Mill workers, the general public, and the environment from unnecessary exposure from alternate feeds stocks placed on the ore pad. Specifically, as part of the license renewal process, Denison informed Utah DRC that it had instituted the following controls for fugitive dust from alternate feed material with U_3O_8 content that exceeds that of Colorado Plateau-derived ore: first, "[h]igh grade alternate feed materials typically with 1.0% U_3O_8 or greater are usually received at the Mill and stored in drums or other containers;" second, "(a)lternate feed materials that are received in bulk and that have higher risk of public or occupational exposure than Arizona Strip ores such as may result from high radioactivity and/or fine dry particles relative to Arizona Strip ores have been covered by less radioactive materials while stored on the Mill's ore pad." Utah Division of Radiation Control, *Safety Evaluation Report for the Denison Mines White Mesa Mill 2007 License Renewal Application*, October 2011 at 10. These two control measures – neither of which allows for alternate feed material to be left uncovered on the ore pad – are a component of fugitive dust control technology that should be considered ALARA for the Mill.

V. The Characteristics of the Alternate Feed and Climate Conditions at the Mill Combine to Necessitate Strict Fugitive Dust Control Measures

As a primary matter, the high uranium content of the alternate feed material increases the threat to public and environmental health posed by off-site deposition of fugitive dust. The alternate feed material contains a higher percentage of U_3O_8 than is present in Colorado Plateau derived uranium ores. URS Professional Solutions, LLC, Safety Evaluation Report for the Amendment Request to Process an Alternate Feed Material at White Mesa Mill from Dawn Mining Corporation Midnite Mine, Washington State, August 2013 at 9 (hereinafter URS SER). In typical Colorado Plateau-derived uranium ores, the range of U_3O_8 contents varies from .015% to 0.30%. *Id.* at 10. The average U_3O_8 concentration of particularly high grade uranium mined at the Arizona 1 uranium mine in the Arizona Strip averaged between 0.56% and 0.66%. *Id.* The U_3O_8 of the alternate feed material is estimated to be 1.5%. *Id.* at 9.

The alternate feed material is vulnerable to wind blown deposition due to climate conditions at the Mill Site. The climate in the vicinity of the Mill is semi-arid with annual precipitation of approximately 12 inches, and a low average humidity. *Id.* at 16. Wind speeds at the Mill average approximately 13 miles per hour with the prevailing wind blowing to the south of the Mill. USGS Report at 64. High wind events of gusts over 25 miles per hour occur at the Mill site. Denison Mines (USA), *Environmental Report*, February 28, 2007 at 16.

The affidavit of Robert Nelson – the Site Manage from the Dawn Mining Company – does not consider the difference in climate and wind condition between the Pacific Northwest and Southern Utah. Mr. Nelson's assertion that the alternate feed "is not prone to degrading to fine dust sized particles" is unsupported by evidence, and does not account for the marked difference in humidity, and wind speeds between the two sites. Indeed, even URS notes in its Safety Evaluation Report for the Amendment that "weather conditions at the Mill Site are dryer than at the Midnite Mine Site, and possibly higher wind speeds coupled with low humidity levels may lead to differences in behavior of uranium material with regard to its susceptibility to degrade to a finer dust sized particle than would be expected from ores or other alternate feeds." URS SER at 16.

For this very reason, Utah DRC proposes to impose two license conditions that are intended to control fugitive dust from the alternate feed. Radioactive Materials License Number UT 1900479 Amendment #06 at 10.20. The first condition requires that "Dawn Mining Uranium Material stored (stockpiled) at the Mill Site longer than 14 days shall be covered with a durable geomembrane cover resistant to damage by ultraviolet (UV) radiation and sufficient ballast shall be placed over the cover to prevent wind uplift of the cover during peak wind conditions at the site. *Id.* at 10.20 (A) (1). The second condition mandates that "[i]f at any time, visible dust is observed to be originating from Uranium Material stored on site, the EFRI RSO or his or her authorized representative shall take actions within 30 minutes to stop the generation of visible dust." *Id.* at 10.20 (A) (2). The Trust applauds DRC for imposing conditions to attempt to address the fugitive dust issue. Regrettably, neither of these license conditions meet the standards established in the Utah Rules, nor do they even comport with prior commitments made by Denison to Utah DRC to control fugitive dust from the processing of alternate feed at the Mill.

VI. The Proposed License Conditions Do Not Protect Public and Environmental Health

Utah DRC's proposed license conditions are inadequate to protect public and environmental health from the risks associated with fugitive dust. First, license condition one, which allows the alternate feed material to be left uncovered for up to fourteen days, does not protect public or environmental health from fugitive dust resulting from high wind events occurring on days zero to thirteen. As discussed below, the monitoring provision does not compensate for this inadequacy due to (1) the lack of 24-hour monitoring at the Mill and (2) the fact that fugitive dust is not always visible to the naked eye, particularly at night. Moreover, the fourteen-day condition in the license amendment proposal is inconsistent with the SER for the mill, which suggested that the alternate feed material would be covered if left on the ore pad for any duration of time. *See* URS SER at 42 ("with implementation of the proposed new license condition requiring that: (1) Uranium Material stored at the Mill Site be covered with a durable, UV-tolerant geomembrane and ballast shall be applied over the geomembrane to prevent wind uplift of the geomembrane...the UDRC has determined that no significant adverse effects on public health or the environment are expected to result from implementing the proposed action"). Thus, URS's conclusion that the geomembrane provision is adequate to protect public health and safety cannot apply to the license conditions that now – without explanation – include a fourteen day window in which the alternate feed material can be left uncovered.

Under the ALARA standard, the public benefit of continuous cover in conjunction with meaningful monitoring would outweigh the economic burden on Energy Fuels. As discussed above and as the Trust's technical expert, Jim Kuipers, attests in his comments, fugitive dust from uranium operations has numerous adverse health and environmental impacts. Energy Fuels has recognized that the processing of alternate feed necessitates the stockpiling of those materials over time in order to accumulate enough material to justify processing. Given this, is likely that the alternate feed material will sit on the ore pads for more than fourteen days. Thus, it will not impose a significant additional burden on Energy Fuels to cover the material from the first moment it arrives on the mill site; indeed, Energy Fuels will have to cover the material eventually. In light of the public health and environmental benefits resulting from covering the material, an ALARA analysis will result in the conclusion that cover should be required immediately.

The second license condition is inadequate to protect public and environmental health and safety for three reasons. First, the Mill does not have a person capable of observing visible dust on staff twenty-four hours a day, seven days a week. In order to render this condition adequate to protect public and environmental health, the condition must be supplemented by a requirement that an air quality monitor be on the Mill site twenty-four hours a day. In the absence of such a condition, there is a possibility that visible dust could be present at the Mill for up to several days without any mitigation measures being instituted. Second, the license condition does not protect public and environmental health against the impacts of $PM_{2.5}$, which is not visible to the naked eye. As the Trust's technical expert, Jim Kuipers, attests, a percentage of the fugitive dust emanating from the alternate feed material will be fine grained, small diameter particles that are invisible to the human eye. This is precisely why air quality monitoring is an essential component of any fugitive dust control plan for the Mill. A standard based on visible emissions does not protect public and environmental health against the adverse effects of small diameter particle dust. Finally, even dust visible to the naked eye is not visible at night. Thus, the second license condition does not ensure protection from visible fugitive dust as soon as the sun sets.

The Trust suggests that Utah DRC utilize this opportunity to revisit its fugitive dust controls for the Mill. First, Utah DRC should mandate the fugitive dust controls suggested by Jim Kuipers in his technical comments. Second, Utah DRC should revisit the proposed license conditions in light of the Trust's concerns. Ultimately, the Trust looks forward to Utah DRC re-crafting the two license conditions to be protective of public and environmental health, and to fully comport with the ALARA standard as required by law. Thank you for your consideration of these concerns.

Respectfully submitted this 21st Day of October, 2013.

Ann Mariah Tapp

ANNE MARIAH TAPP
Attorney for Grand Canyon Trust *et al.*

Exhibit 1

GJO–2002–301–TAR
GJO–MOA 1.7–1

Moab Project

Moab Project Site Fugitive Dust Control Plan

March 2002

Prepared for U.S. Department of Energy Grand Junction Office
under DOE Contract Number DE–AC13–96GJ87335.
Approved for public release; distribution is unlimited.

GJO
Grand Junction Office

GJO–2002–301–TAR
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Idaho Operations Office
Grand Junction Office

Work Performed Under DOE Contract Number DE–AC13–96GJ87335
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X0005800

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End of current text

1.0 Introduction

The State of Utah, Division of Air Quality rules for the control of fugitive dust and emissions require that all sources whose activities or equipment have the potential to produce fugitive or airborne dust, must prepare and implement a Fugitive Dust Control Plan. Accordingly, this Fugitive Dust Control Plan (Plan) is prepared to address the control of fugitive and airborne dust emissions from the Moab Project Site (Moab Site) located in Moab, Utah. Specifically, this Plan complies with the State of Utah rules for controlling fugitive dust emissions as specified in the Utah Administrative Code (U.A.C.) R307-205, *Emission Standards; Fugitive Emissions and Fugitive Dust*. This Plan has been prepared to address activities and operations conducted by the U.S. Department of Energy's Grand Junction Office (DOE-GJO) at the Moab Site. The primary objective of this plan is to formulate a strategy for controlling, to the greatest extent practicable, fugitive or airborne dust emissions at the Moab Site. This will be accomplished by identifying specific sources and activities which have the highest potential to produce or generate fugitive or airborne dust emissions. This plan describes the engineering controls necessary to minimize and control dust emissions from those sources and activities. This plan is prepared to address the control of fugitive dust emissions at the Moab site which are a result of current DOE activities. As necessary, the scope of this plan will be revised to reflect changes in DOE's dust control strategy as site conditions or activities may change in the future.

1.1 Site Location

The Moab Site is a former uranium-ore-processing facility located approximately 3 miles northwest of the city of Moab in Grand County, Utah (Figure 1). The Moab Site is irregularly shaped; a uranium mill tailings pile occupies much of the western portion of the site. The Moab Site is bordered on the north and southwest by steep sandstone cliffs. The Colorado River forms the southeastern boundary of the site. U.S. Highway 191 parallels the northern site boundary, and State Highway 279 crosses the western portion of the property. Arches National Park is located adjacent to the northern site boundary, and Canyonlands National Park is located approximately 12 miles to the southwest. The Union Pacific Railroad traverses a small section of the site just west of Highway 279, then enters a tunnel and emerges several miles to the southwest. Moab Wash runs in a southeasterly direction through the center of the site and joins with the Colorado River. The wash is an ephemeral stream that flows only after precipitation or during snowmelt. The entire site covers approximately 400 acres of which 130 acres are covered by the tailings pile. Figure 2 shows the major physiographic features of the Moab Site.

1.2 Site History

Originally, the property and facility were owned by the Uranium Reduction Company (URC) and were regulated by the Atomic Energy Commission, predecessor agency to DOE. In 1956, URC began operation of the Moab mill. In 1962, the Atlas Minerals Corporation acquired URC and operated the mill until operations ceased in 1984. Between 1956 and 1984, uranium mill tailings were disposed of on site in an unlined impoundment. Decommissioning of the mill began in 1988; between 1989 and 1995, an interim cover was placed on the impoundment. In 1996, Atlas proposed to reclaim the tailings pile for permanent disposal in its current location. However, Atlas declared bankruptcy in 1998, and subsequently, the U.S. Nuclear Regulatory Commission (NRC) appointed Pricewaterhouse Coopers (PwC) as the trustee of the Moab Mill Reclamation Trust and licensee for the site. Ownership and responsibility of the Moab Site was effectively transferred from PwC to DOE by passage of the Floyd D. Spence National Defense

Authorization Act (H.R. 5408, 2001). This act further designates that the Moab Site undergo remediation in accordance with Title I of the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA; 42 U.S.C. 7912) (as amended). The DOE-GJO took possession of the Moab Site on October 24, 2001.

1.3 Climatology

The climate of the Moab region is semiarid. Average annual temperature is approximately 14 degrees Celsius (°C) (57 degrees Fahrenheit [°F]). January is the coldest month, averaging -1°C (30°F), and July is the warmest month, averaging 28°C (82°F). Extreme temperatures have ranged from -28°C (-18°F) in January 1963 to 44°C (111°F), which has occurred more than once (in July 1953 and on earlier occasions). Temperatures of 32°C (90°F) or higher occur about 100 days per year, with about 80 percent of those occurring during June, July, and August. Temperatures below freezing 0°C (32°F) occur on the average of 123 days of the year with about 80 percent of those occurring during November through February. The effects of high temperature on human comfort are moderated by the low relative humidity, which is often less than 50 percent during the daytime hours.

Average annual precipitation at Moab is 20 centimeters (cm) (8 inches), distributed approximately equally among the seasons with slight peaks during the spring and fall. Potential evapotranspiration (about 127 cm [50 inches] per year) greatly exceeds annual precipitation. Mean pan evaporation (about 140 cm [55 inches] per year) and lake evaporation (about 97 cm [38 inches] per year) also greatly exceeds the total annual precipitation.

Low humidity in the region limits fog occurrences (visibility less than 0.5 kilometer [km] [0.3 mi]) to fewer than 10 days per year. Thunderstorms occur about 40 days per year. Hail occurs approximately 3 days per year.

Prevailing winds in the Moab region are southeasterly. Cold air drainage at the Moab Site can occur from the northwest under very stable conditions. The probability of a tornado is very small. One tornado with wind speeds of 160 km/hour (hr) (100 miles/hr) would be expected only once in approximately 100,000 years (NRC 2001).

1.4 Regulatory Requirements

This Fugitive Dust Control Plan is prepared in response to State of Utah, Division of Air of Quality regulations for the control of fugitive dust, as found in Section R307-205 (U.A.C., September 2001). Dust control plans are required to minimize fugitive dust on-site from various types of pits, yards, and storage areas. The Fugitive Dust Rule (R307 - 309 U.A.C.) also addresses storage and handling of aggregate materials, construction / demolition activities, mining activities, and tailings piles and ponds. The portion of the Fugitive Dust Rule that specifically applies to the Moab Site is found at R307-205-6(1-2), and requires that "... any person owning or operating an existing tailings operation where fugitive dust results from grading, excavating, depositing, or natural erosion or other causes in association with such operation shall take steps to minimize fugitive dust from such activities." This site specific Fugitive Dust Control Plan will be submitted to the Executive Secretary for the Utah Air Quality Board in Salt Lake City, Utah, for approval, and will be updated and revised as necessary to reflect dust controls which correspond to current and on-going site activities and operations.

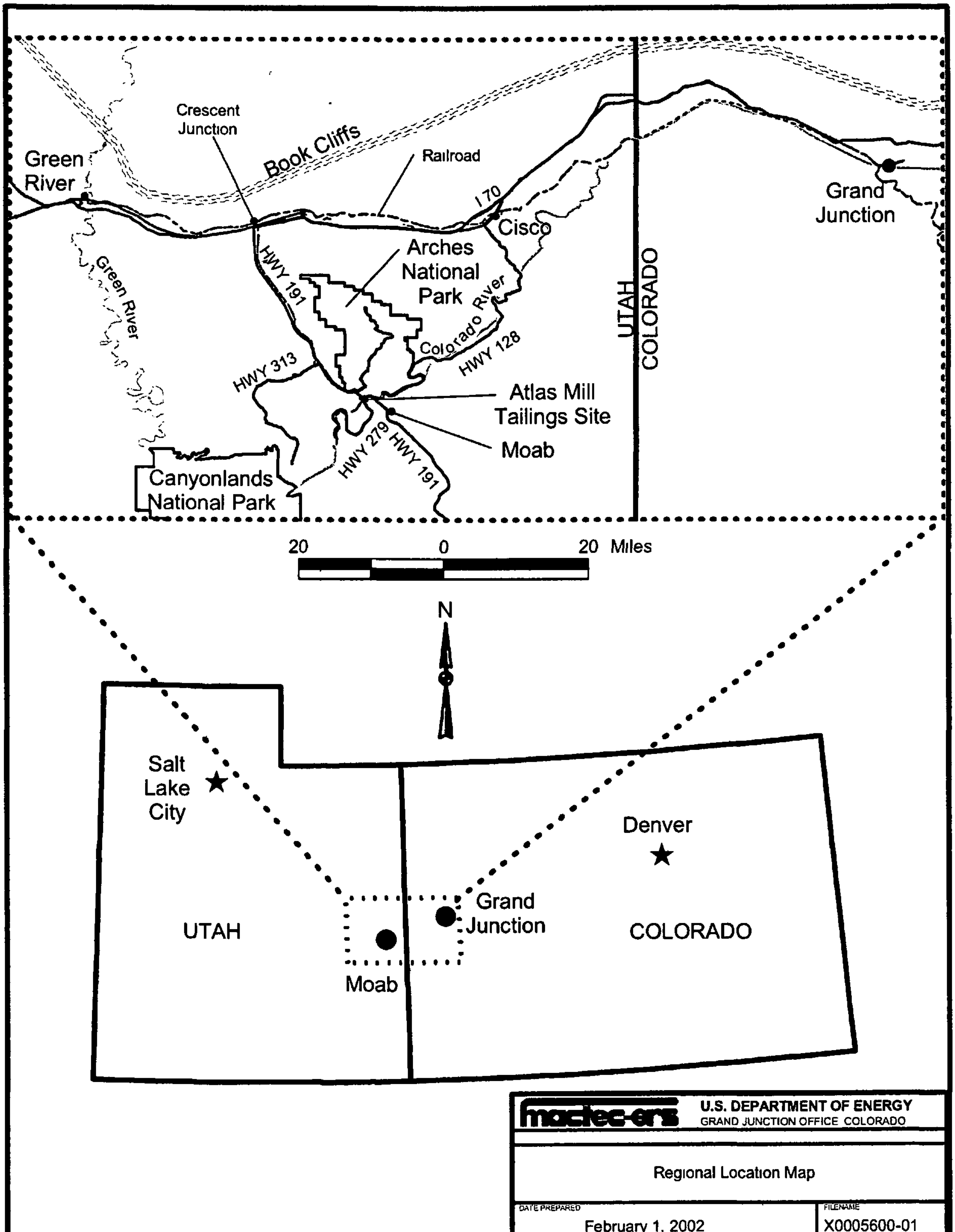

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Figure 1. Area Location Map for the Moab Site

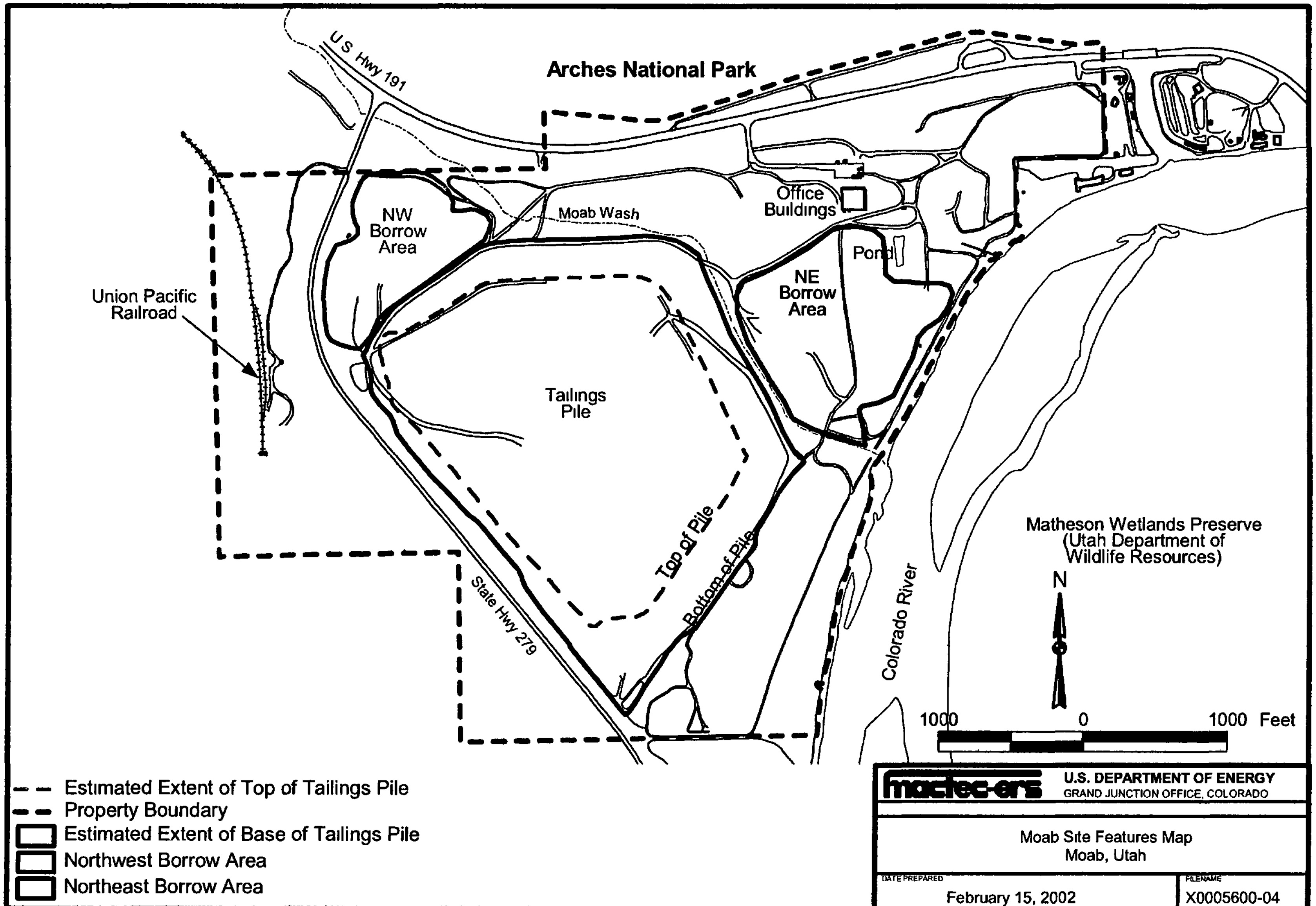

Figure 2. Site Features Map for the Moab Site

1.5 Environmental Monitoring

In addition to the implementation of physical dust controls, the DOE-GJO has developed and implemented an environmental air monitoring program for the Moab Site. This environmental air monitoring program consists of sampling airborne particulates, radon, and direct gamma radiation at various locations along the site perimeter and at various off-site locations. Background monitoring locations also have been established to provide ambient air quality data. The background or ambient air quality data will be compared to air quality data collected from the on-site monitoring locations, for the purposes of determining compliance with various DOE Orders, and Federal and State air quality regulations.

As part of DOE's environmental air monitoring and fugitive dust control strategy, a meteorological monitoring station has been established at the Moab Site. Wind speed and wind direction data collected from this monitoring station will be used to determine when site-specific action levels have been exceeded and specific dust controls (e.g., the application of dust suppression techniques) must be initiated. In addition, personnel certified in reading opacity measurements in the State of Utah will also be used to determine when active dust control measures should be initiated, and when specific dust generating activities (i.e., excavating, hauling, grading, etc.) should be discontinued.

In addition to complying with the State of Utah Fugitive Dust Rule, this Fugitive Dust Plan is consistent with the intent of complying with various DOE Orders. U.S. Department of Energy (DOE) Order 5400.1, *General Environmental Protection Program*, specifies that effluent monitoring and environmental surveillance be conducted to determine the effect of DOE activities upon "...on-site and offsite environmental and natural resources," and to "...verify compliance with applicable Federal, State, and local effluent regulations and DOE Orders." Similarly, DOE Order 5400.5, *Radiation Protection of the Public and the Environment*, requires that DOE control and monitor radiological exposures from its facilities and activities.

The physical form of the radioactive contaminants (i.e., uranium mill tailings) at the Moab Site is primarily best described as a fine-grained, sand-like material, which is highly susceptible to wind erosion. Consequently, one of DOE's major objectives at the Moab Site is to control and contain the off-site transportation of radiological contaminants resulting from the erosive forces of wind and storm water. This Fugitive Dust Control Plan outlines DOE's strategy for controlling airborne dust emissions and minimizing/controlling the off-site transport of mill tailings resulting from wind erosion.

2.0 Site Source Information

2.1 Site Ownership and Physical Location

As required by the Utah Division of Air Quality, the following site-specific source information is provided:

1) **Name of Operation**—Moab Site Project, formerly known as the Atlas Mining Corporation Uranium Mill.

2) **Owner/Operator Information**—U.S. Department of Energy, Grand Junction Office. 2597 B3/4 Road, Grand Junction, Colorado, 81503. DOE Contact: Joel Berwick (970) 248-6020. On-Site Contact: Irwin Stewart (435) 259- 5131.

3) **Physical Address of Operations**—1871 N. Highway 191, Moab, Utah, 84532.

4) **UTM Coordinates or Longitude/Latitude of Operations:**

Latitude:	38 degrees, 36 minutes, 17.53329 seconds - North
Longitude:	109 degrees, 35 minutes, 23.47893 seconds - West
Elevation:	3977.624 US feet above MSL

2.2 Source Information

Type of Material Processed or Disturbed—The materials of concern with respect to fugitive dust emissions at the Moab Site are residual uranium mill tailings and unstable native soils/sand. Although the former Atlas mill is no longer active, a total of approximately 11.8 million tons of uranium mill tailings and surface contaminated soils remain on site. The majority of the mill tailings are contained within an on-site tailings pile, the footprint of which covers approximately 136 acres. An interim cover of the tailings pile was completed in 1995. Soils from on-site borrow areas were used as the source of material for the temporary cover. Some of the soils used for the cover are contaminated with low-level residual radioactive contamination resulting from previous milling activities conducted at the site. A portion of the cover was seeded in 1999; however, presently, there is no established vegetative growth on the cell.

The majority of materials on the surface of the tailings pile consist of poorly consolidated soils, and therefore is considered to be a "high-potential" source of fugitive dust emissions at the Moab Site. Similarly, the two on-site borrow areas (i.e., the north west and the north east borrow areas) are essentially void of any plant or vegetation cover; the soils are poorly consolidated, and are considered to be major sources for fugitive dust emissions at the Moab Site (Figure 3). Combined, the tailings pile and the two borrow areas comprise approximately 40 percent of the total land surface of the Moab Site. The remainder of site is not considered to be a significant source of fugitive dust emissions due to: 1) The low level of past disturbances in these areas; 2) The low levels and quantity of contaminated soils identified within these areas; 3) The low levels of anticipated activity occurring in these areas; and, 4) A greater percentage of vegetative cover present within these areas.

Source areas identified as a "moderate-potential" consist of areas that have been partially disturbed in the past (approximately 20 percent of the total site area); however, soils and surface sediments in these areas are typically better consolidated and are more stabile due to varying degrees of vegetative cover. If these areas prove to be a source for fugitive dust emissions in the future, appropriate control measures will be implemented.

Most of the "low-potential" areas are found along the site perimeter and consist of steep, rocky terrain (i.e., sandstone slopes and cliffs) in the west, and wetland/river bottom areas along the south and eastern margins of the site boundary. Typically, there is little to no activity occurring or planned in these areas, nor have these areas been disturbed by past milling activities. The "low-potential" areas comprise approximately 40 percent of the total site area. Consequently, DOE does not anticipate that these areas will be a significant source of dust emissions from the facility, and no controls are planned for these areas.

Length/Duration of Construction Project—The DOE is in the process of evaluating remedial action alternatives for the mill tailings currently stockpiled at the Moab Site. Depending upon which remedial action alternative is ultimately selected, DOE's responsibility for monitoring and controlling fugitive dust emissions from this site will range in duration from approximately three to eleven years.

Description of Processes/Site Activities—Currently, the activities occurring at the Moab Site include: 1) Site characterization (including radiological assessments, surveying, environmental sampling and monitoring, biological surveys, etc.); 2) Site stabilization (securing unsafe conditions/structures/utilities); 3) Implementing fugitive dust and storm water controls; 4) Waste management activities (cleaning up oil spills, consolidating drums and petroleum products, addressing excess chemical inventory, etc.); 5) Site security (fence installation/repair, postings, barricades, etc.); and, 6) Installation of a Construction Office and an equipment staging area.

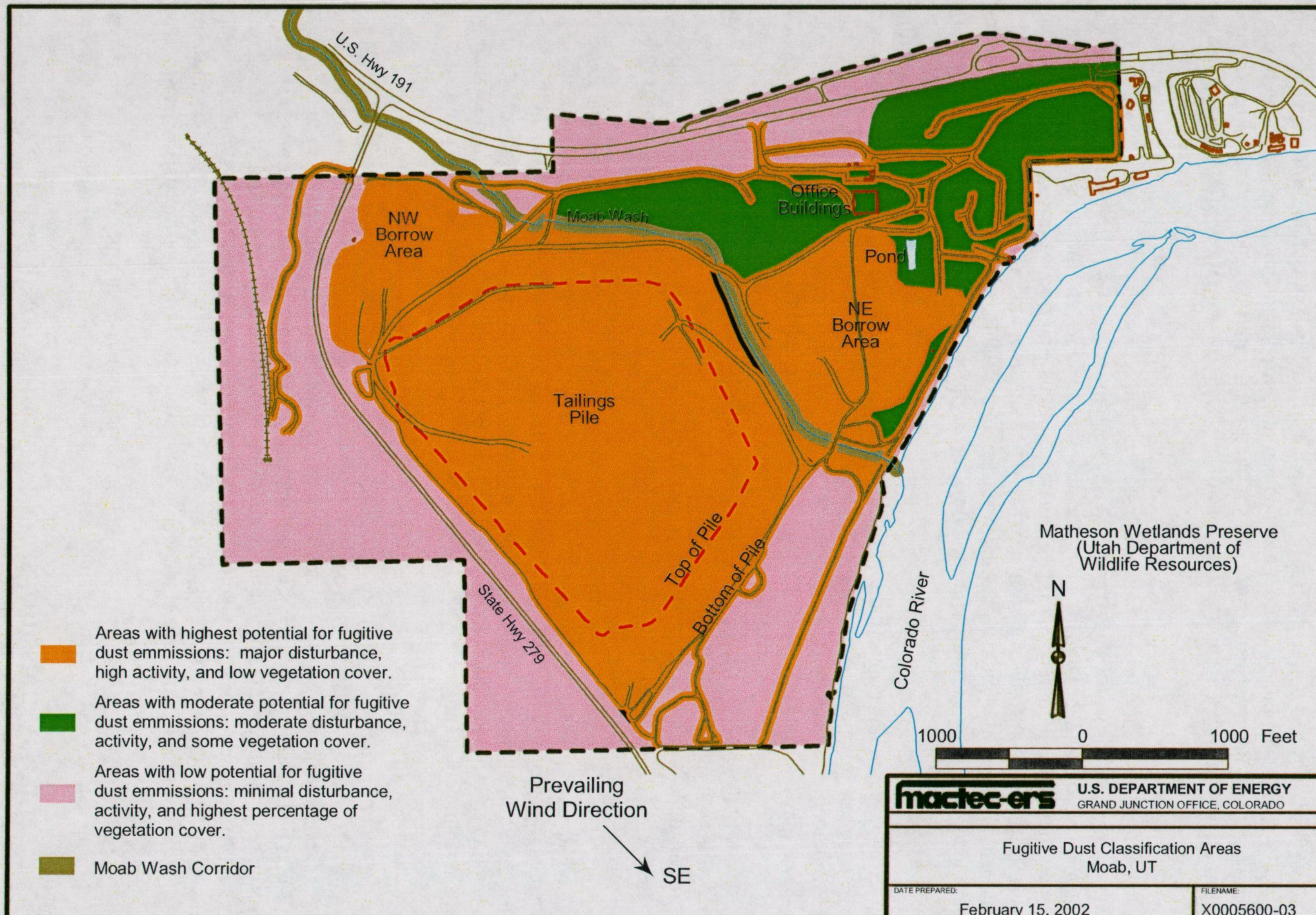

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Figure 3. Location Map for the Moab Site Fugitive Dust Sources

3.0 Description of Fugitive Dust Emission Activities

A description of the on-site activities which may contribute to, or generate fugitive dust emissions at the Moab Site are discussed below:

Site Characterization—DOE is currently in the process of performing various types of environmental characterization activities at the Moab Site. These activities include: radiological characterization, surface and ground water monitoring, radon and direct gamma radiation monitoring, environmental air/particulate monitoring, meteorological monitoring, floodplain and wetlands assessment and delineation, threatened and endangered species surveys and critical habitat identification, and various engineering studies and surveys. Most of these types of activities are non-intrusive and result in little to no fugitive dust emissions. Vehicles, used to transport personnel and equipment from one location to another, may result in minimal generation of fugitive dust.

Interim and Initial Remedial Actions—DOE will be engaged in various remedial efforts to mitigate immediate threats to the environment (i.e., ground water). Specifically, an Initial Remedial Action will be initiated during the summer months of 2002 while the Interim Action may be initiated in 2003. Activities associated with these remedial actions will necessitate the use of heavy equipment for clearing and grading purposes. These actions will have the potential to generate moderate levels of fugitive dust emissions.

Site Stabilization Activities—DOE will be securing a former mill building and associated structures (i.e., pump houses, electrical breaker panels, electrical transmission and distribution systems, etc.) that were left behind by the Atlas Milling Corporation. Many of these structures were left in an unsafe condition and need to be stabilized with the increased level of activity at the site. Although the mill buildings will be eventually demolished, all structures and appurtenances will simply be secured (i.e., buildings will be locked, live utilities will be de-energized, etc.) for the present time. These activities may also include the installation or repair of site fences, installing signs and postings, and setting up various site boundaries and barricades. The stabilization activities planned for the near future will not result in significant fugitive dust emissions.

Implementation of Fugitive Dust and Storm Water Runoff Controls—DOE recognizes that mill tailings and residual contaminated soils are especially vulnerable to wind and storm runoff. In an effort to contain these contaminants and prevent their migration off-site, establishing fugitive dust and storm water runoff controls is a priority for DOE. Implementation of these controls will necessitate the use of heavy equipment to construct or strengthen berms, construct sediment retention basins, dig borrow ditches, install culverts, apply dust suppressant materials, etc.; however, fugitive emissions expected as a result of these activities are expected to be minimal.

Waste Management Activities—DOE will be performing various housekeeping activities at the site, which will include the consolidation of various materials. These activities will consist of consolidating miscellaneous fuels, drums of used oil and lubricants, and cleaning up miscellaneous spills and leaks that have accumulated near the maintenance shop over the years. For safe storage and to prevent the spread of contaminants into the environment, petroleum contaminated soils will be excavated and placed into a Best Management Practice Area (BMPA) along with other consolidated waste materials. Any on-site wastes requiring special handling or management will be identified and addressed by DOE's waste management policy and procedures developed specifically for the Moab Project Site.

The BMPA will be a bermed temporary storage area that will be constructed with a polyethylene liner. Materials will be temporarily stored at this location until a permanent disposal option has been defined. The construction of this area and the removal and excavation of various petroleum contaminated soils will involve the use of heavy equipment. Moderate fugitive dust emissions can be expected from these activities.

Establishing Construction Office and Equipment Staging Areas—DOE is in the process of setting up construction office and support trailers, various storage facilities, a decontamination pad, and an equipment staging area. To complete this task, mobile office buildings will be set-up on-site, security fencing and gates will be installed, and utilities will be extended to the new facilities. This effort will require the use of heavy equipment; however, the duration is relatively short-term, and is not expected to result in significant fugitive dust emissions.

4.0 Description of Fugitive Dust Emission Controls On-Site

The fugitive dust emission controls to be used at the Moab Site are discussed for each of the potential source areas. All sources of fugitive dust emissions at the Moab Site are related to site activities and site conditions. The routine operation of heavy equipment (until remediation occurs) is not considered to be a significant source of emissions at this site.

4.1 High Potential Source Areas

Certain portions of the Moab Site are considered to be significant sources of fugitive dust emissions, and require more active controls than other areas. These areas are characterized by: loose, poorly consolidated sediments, poor vegetative cover, high levels of previous disturbance, high levels of future/anticipated activity or disturbance, or areas with significant residual radioactive contamination remaining. Because both the native soils and uranium mill tailings possess a sand-like texture, these materials can easily become airborne given sufficient climatic conditions (i.e., low soil moisture content, sufficient wind speeds, etc.). Consequently, DOE has designated these areas as having the highest priority in their dust control strategy. Cumulatively, these high-potential areas comprise approximately 40 percent of the total site surface area. The specific "high-potential" source areas and the planned dust controls to be implemented for each of these areas are summarized Table 1.

4.2 Moderate Potential Source Areas

Other portions of the Moab Site are considered to be moderate sources of fugitive dust emissions and will require a less aggressive approach to dust control. These areas are characterized my more stable soil conditions, a greater percentage of vegetative cover, lesser quantities of radiologically contaminated materials, and moderate levels of activity. As shown in Figure 3, these areas are found mostly in the north east and north central portions of the Moab Site. Cumulatively, these moderate-potential areas comprise approximately 20 percent of the total site surface area. A summary of the anticipated dust control measures to be used in these areas is found in Table 1.

4.3 Low Potential Source Areas

Approximately 40 percent of the site is considered to be a low potential source for fugitive dust emissions. These areas include the river bottom and wetland areas along the eastern and southern site boundaries; the Moab Wash corridor; the sandstone cliffs and rocky slopes along the southern and western site boundaries; and the Highway 191 and 279 corridors. These areas are designated as having a low potential for fugitive dust emissions because there is very little surface disturbances in these areas; some areas contain dense vegetative cover; these areas are relatively uncontaminated; and/or there is little to no activity occurring in these areas. No dust controls are planned for these areas, as shown in Table 1.

Table 1. Summary of Fugitive Dust Controls for the Moab Site

Fugitive Dust Source		Dust Controls								
		Water Truck	Sprinkler Irrigation	Vegetative Cover	Lignum Sulfate (Soil Conditioner)	WENDON (Surfactant)	Magnesium/ Calcium Chloride	Gravel	Other (Fiber Mat, Tackifier)	No Controls
High Potential Areas	Tailings Pile (Top)	X	X	X	X	X	X		X	
	Tailings Pile (Side Slopes)			X	X				X	
	Northeast Borrow Area	X		X	X					
	Northwest Borrow Area			X	X	X				
	Site Roads	X			X		X	X		
Moderate Potential Areas	North and east portions of Moab Site	X			X					
Low Potential Areas	Moab Wash Corridor									X
	River bottom/ wetland areas (south/east)									X
	Sandstone slopes/ cliffs (east/south)									X
	Highway 191 and 279 corridors (east and north)									X

4.4 Standards, Action Levels, and Response Actions

Table 2 outlines the applicable regulatory standards and action levels relative to controlling fugitive dust emissions at the Moab Site, and the appropriate response actions to be implemented once it is determined that standards or actions levels have been exceeded.

An air particulate monitoring network has been implemented at the Moab Site in accordance with DOE Order 5400.5, *Radiation Protection of the Public and Environment* and DOE's *Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance* (DOE 1991). As per the *Moab Site Project Environmental Air Monitoring Sampling and Analysis* Plan (DOE 2002), air quality monitoring data are routinely collected and reviewed to ensure compliance with DOE Orders and applicable federal and state air quality regulations. Air particulate sample locations are shown in Figure 4.

Table 2. Fugitive Dust Standards, Action Levels, and Response Actions

Standard / Site-Specific Action Level	Method of Determination	Response Action
Opacity cannot exceed 20 percent at any on-site location or source (R307–309 U.A.C.). DOE's goal at the site boundary is 0 percent opacity.	Visual observation by a Certified Opacity Reader (EPA Method 9 - Visual Determination of Opacity Emissions from Stationary Sources)	Initiate immediate dust control measures as outlined in Table 1. Cease all dust generating activities.
Sustained Wind Speeds Exceeding 20 mph (miles per hour). (EPA Method 9 - Visual Determination of Opacity Emissions from Stationary Sources)	Real time meteorological monitoring.	Monitor visible emissions, Cease all dust generating activities if necessary to maintain 20 percent opacity or less. If needed, initiate immediate dust control measures as outlined in Table 1.
Cannot exceed public exposure standards (DOE Order 5400.5)	Analysis of filters collected by continuous air samplers.	Reassess dust control plan and controls

4.5 Best Management Practices

The following Best Management Practices (BMPs) will also be followed to help minimize and control dust emissions at the Moab Site to the greatest extent possible:

Roads—All onsite traffic will be restricted to specific designated roads. Off-road travel will only be authorized on a case-by-case basis (e.g., access to a remote monitoring well, etc.). Traffic on the tailings pile will be restricted to designated roads to minimize disturbance of previously treated/stabilized areas. Traffic speed will also be restricted to an appropriate level on all designated roads. All designated roads will be considered as high potential dust source areas, and as such, will be a priority for dust controls utilizing magnesium/calcium chloride, watering, or gravel.

Hours of Operation—This Plan will be in effect during all hours of operation at the Moab Site. During non-business hours, there will be no activities generating dust; therefore, dust control actions will restricted to hours of operation only. However, as a best management practice, if high winds are evident at the close of a business day (or immediately prior to a weekend, holiday, etc.), site personnel should evaluate vulnerable areas and implement controls as appropriate to minimize off-hours emissions.

Use of Chemical Suppressants—Use of various chemical dust suppressants (e.g., surfactants, salt-based soil conditioners, etc.) shall be done in accordance with the recommended end-uses for those products. Site personnel shall not exceed the manufacturer recommended application rates. Material Safety Data Sheets (MSDSs) for all dust suppressant materials used at the Moab Site shall be reviewed and approved by the Environmental Services organization. Prior to application, site personnel shall determine and evaluate if the use of the dust suppressant could interfere with other site monitoring activities, or cause other harm to the environment (e.g., runoff into critical habitat for threatened or endangered fish). The MSDSs for dust suppressants to be used at the Moab Site are included in Appendix A.

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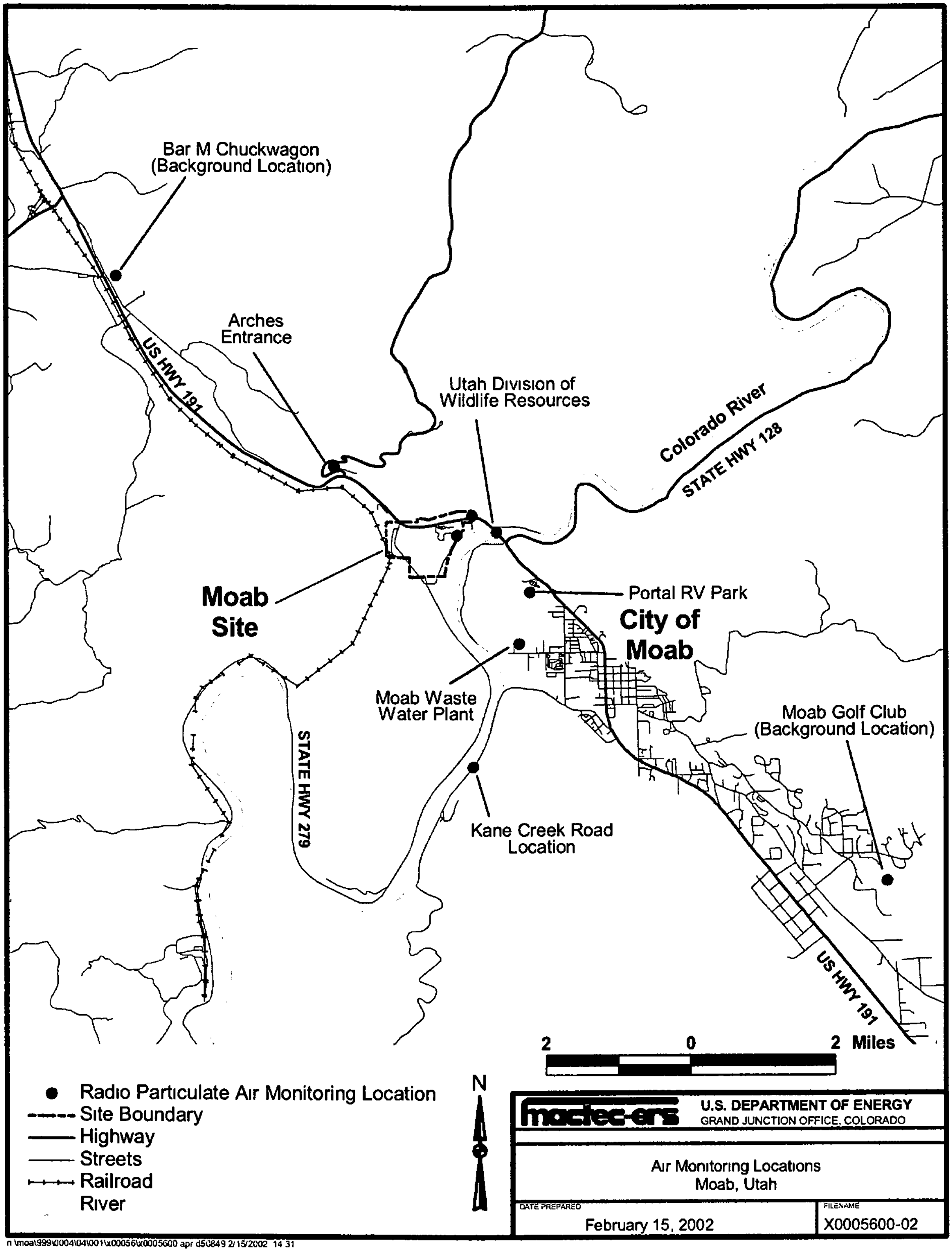

Figure 4. Air Particulate Monitoring Locations

5.0 Description of Fugitive Dust Emission Controls Off-Site

To minimize the potential for off-site releases or emissions, the following controls will also be implemented:

Decontamination and Tracking Pad—Prior to leaving designated contamination areas at the Moab Site, all vehicles and equipment will be thoroughly washed and decontaminated at a decontamination pad using a high pressure water wash. This practice should minimize the potential for any off-site tracking of sediment or contaminants.

Covered Loads—Any trucks hauling materials off-site shall be tarped and covered to minimize the loss of materials in-transit / off-site. All loads shall be inspected to ensure that they are properly covered prior to departure.

Spill Response—In the event of a spill or release of contaminated materials off-site, the spilled materials will be immediately contained and cleaned up. Emergency spill response actions are outlined in Section 13.0 of the *Moab Site Project Health and Safety Plan* (DOE 2001).

End of current text

6.0 References

Grand Junction Office, Moab Site Project Environmental Air Monitoring Sampling and Analysis Plan, February 2002, GJO-2001-274-TAR, MAC-MOA 1.6-1, Grand Junction, Colorado

———, 2001, Moab Site Project Health and Safety Plan, December 2001, GJO-2001-281-TAR, MAC–MOA 1.3 (continuously updated), Grand Junction, Colorado

U.S. Department of Energy (DOE) Order 5400.1, General Environmental Protection Program

———, DOE Order 231.1, Environment, Safety, and Health Reporting

———, DOE Order 5400.5, Radiation Protection of the Public and the Environment

———, Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance, DOE/EH–0173T, January 1991

U.S. Nuclear Regulatory Commission, Final Environmental Impact Statement Related to Reclamation of the Uranium Mill Tailings at the Atlas Site, Moab, Utah, NUREG-1531, Vol.1 C.2, March 1999, Washington, DC

Utah Administrative Code (U.A.C.), R307–205–6: Emission Standards: Fugitive Emissions and Fugitive Dust, September 2001, Salt Lake City, UT

______________, R313–15–301: Standards for Protection Against Radiation, Dose Limits for Individual members of the Public, September 2001, Salt Lake City, UT

End of current text

APPENDIX A

Material Safety Data Sheets for Dust Suppressants Used at the Moab Project Site

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MATERIAL SAFETY DATA SHEET

PRODUCT NAME: CALCIUM CHLORIDE, LIQUID

CAS NUMBER: 10043-52-4 HBCC MSDS NO. CC06000

hill Since 1923

HILL BROTHERS CHEMICAL CO.

1675 No. Main Street
Orange, California 92667

Telephone No: 714-998-8800
Outside Calif: 800-821-7234
CHEMTREC: 800-424-9300

Revision issued: 8/12/93 Supercedes: 5/27/92 First issued: 12/01/85

IMPORTANT! Read this MSDS before use or disposal of this product. Pass along the information to employees and any other persons who could be exposed to the product to be sure that they are aware of the information before use or other exposure. This MSDS has been prepared according to the OSHA Hazard Communication Standard [29 CFR 1910.1200]. The MSDS Information is based on sources believed to be reliable. However, since data, safety standards, and government regulations are subject to change and the conditions of handling and use, or misuse are beyond our control, HILL BROTHERS CHEMICAL COMPANY makes no warranty, either expressed or implied, with respect to the completeness or continuing accuracy of the information contained herein and disclaims all liability for reliance thereon Also, additional information may be necessary or helpful for specific conditions and circumstances of use. It is the user's responsibility to determine the suitability of this product and to evaluate risks prior to use, and then to exercise appropriate precautions for protection of employees and others.

SECTION I - PRODUCT IDENTIFICATION

SYNONYMS / COMMON NAMES: CALCIUM CHLORIDE, LIQUID
CHEMICAL FAMILY / TYPE: INORGANIC SALT
DOT PROPER SHIPPING NAME: N/A
DOT HAZARD CLASS / I.D. NO.: N/A
REPORTABLE QUANTITY: N/A
NFPA RATING: HEALTH - 1; FIRE - 0; REACTIVITY - 0
0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

SECTION II - HAZARDOUS INGREDIENTS

Chemical Name	CAS Number	%	Exposure Limits (TWAs) In Air ACGIH TLV	OSHA PEL	Other
CALCIUM CHLORIDE	10043-52-4	24-40	N/A	N/A	N/A

SECTION III - PHYSICAL AND CHEMICAL PROPERTIES

Physical State: LIQUID pH: 9-10 Melting Point/Range: N/A
Appearance/Color/Odor: CLEAR LIQUID, ODORLESS
Boiling Point/Range: N/A Solubility In Water: 100%
Vapor Pressure(mmHg): N/A Specific Gravity(Water = 1): 1.347 60° F
Molecular Weight: 110.99 Density(Air = 1): N/A
% Volatiles: N/A How to detect this compound: N/A

SECTION IV - FIRE AND EXPLOSION

Flash Point: Not flammable Autoignition Temperature: Not flammable
Lower Explosive Limit: N/A Upper Explosive Limit: N/A

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SECTION IV - FIRE AND EXPLOSION-CONTINUED

Unusual Fire and Explosion Hazards: N/A

Extinguishing Media: N/A Special Firefighting Procedures: N/A

SECTION V - REACTIVITY

Stability: Stable Hazardous Polymerization: Will not occur

Conditions to Avoid: N/A

Materials to Avoid: Metals will slowly corrode in aqueous solutions. Boric acid and calcium oxide are incompatible.

Hazardous Decomposition Products: None

SECTION VI - HEALTH HAZARDS

Routes of Exposure: Calcium chloride can affect the body if it is ingested or if it comes in contact with the eyes or skin.

Summary of Acute Health Hazards:

INGESTION: Causes irritation of mouth and stomach.

INHALATION: Causes irritation of nose and throat.

SKIN: Causes mild irritation.

EYES: Causes irritation and possible transient corneal injury.

Carcinogenicity Lists: NO NTP: NO IARC Monograph: NO OSHA Regulated: NO

Summary of Chronic Health Hazards: N/A

Effects of Overexposure: Possible superficial burns and transient corneal injury.

Emergency and First Aid Procedures:

INGESTION: If swallowed will cause nausea and vomiting. If victim is conscious, have victim drink water or milk. If victim is unconscious or having convulsions, do nothing except keep victim warm -- call for medical help.

INHALATION: Move to fresh air; if discomfort persists, get medical attention

SKIN: If necessary, remove contaminated clothing and shoes. Flush affected areas with plenty of water.

EYES: Promptly flood with water and continue washing for at least 15 minutes. Consult an ophthalmologist.

Medical Conditions Generally Aggravated by Exposure: N/A

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

Steps To Be Taken In Case Material Is Released Or Spilled: Dike the spilled liquid, and either pump back into original container or cover with clay-type substance for absorption.

Handling and Storing Precautions: Store at ambient temperature. Prevent possible eye and skin contact by wearing protective clothing and equipment.

Waste Disposal Methods: Add to large volume of water. Stir in light excess soda ash. (Add slaked lime in presence of fluoride.) Decant and neutralize in second container with 6M-HCL. Route to sewage plant. Use as landfill sludge. Notify local sewage plant and solid waste authority.

Other Precautions: N/A

SECTION VIII - CONTROL MEASURES

Respiratory Protection: N/A Ventilation: N/A

Protective Clothing: Employees should be provided with and use impervious clothing, rubber gloves, and rubber boots.

Eye Protection: Employees should be provided with and required to use splash-proof safety goggles where there is any possibility of calcium chloride contacting the eyes.

Other Protective Clothing or Equipment: N/A

Work/Hygienic Practices: Avoid contact with the eyes, skin, and mucous membranes.

N/A - Not Applicable

MSDS

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(Download/Print a MSDS copy from the References tab)

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Envirotac II®

SECTION 01 IDENTIFICATION

Manufacturer	Environmental Products and Applications, Inc
Address	10722 Arrow Route, Suite 116 Rancho Cucamonga, CA 91730
Date Prepared	07-30-87
Emergency Phone #	(909) 980-1422
Product Trade Name	Envirotac II®

SECTION 02 HAZARDOUS INGREDIENTS

Hazardous Components	This product is non-hazardous under OSHA Hazard Communication Standard 29 CFR 1910 1200
Chemical Family	Vinyl acrylic copolymer
Product Solids:	39 43% (active solids)

SECTION 03 PHYSICAL/CHEMICAL CHARACTERISTICS

State	Liquid
Appearance and Color	Milky White
pH	5 0 to 9 5
Boiling Point	212F/100C Water
Melting Point	32F/0C Water
Vapor Pressure	(mm Hg)17mg Hg @20C/68F Water
Vapor Density	< 1 Water
Solubility in Water	Dilatable
Specific Gravity	(H2O=1) 1 0 to 1 2
Evaporation Rate	(Butyl Acetate=1) < 1 Water

SECTION 04 FIRE AND EXPLOSION HAZARD DATA

Unusual Hazards	Material can splatter above 212F. Dried product can burn
Extinguishing Media	Use extinguished media appropriate for surrounding fire
Unusual Fire & Explosion Hazards	None Known
Specific Fire Fighting Procedures	Wear self-contained breathing apparatus and full protective gear

SECTION 05 REACTIVITY DATA

Stability	Stable (Avoid temperatures above 350F and open flames)
Hazardous Polymerization	Will not occur
Materials to Avoid:	None Known
Hazardous Decomposition Products	Thermal decomposition may yield acrylic monomers or vinyl acetate monomer

SECTION 06 HEALTH HAZARD DATA

ROUTES OF EXPOSURE:

Inhalation	Inhaling vapor or mist can cause headaches, nausea and irritation of the nose, throat and lungs
Ingestion	Yes
Eye Contact.	Slightly irritating to eyes
Skin Contact:	Irritating to skin upon repeated or prolonged contact.

EMERGENCY & FIRST AID PROCEDURES:

Inhalation Move subject to fresh air
Eye and Skin Contact Flush eyes with a large amount of water for at least fifteen minutes See a physician if irritation persists
Ingestion If swallowed, dilute by giving 2 glasses of water to drink Consult a physician Never give anything by
ACUTE/CHRONIC (or carcinogenic): None established

SECTION 07 PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be taken in case material is released of spilled Dike and contain spill with inert material (i e, sand, earth) Cov
Waste Disposal Method Coagulate by the stepwise addition of ferric chloride acid and lime Collect clear super materi
Precautions to be taken in handling and storage. Handle with protective gloves and store at temperatures above freezing

SECTION 08 CONTROL MEASURES

Respiratory Protection	None indicated under normal conditions of use
Local Exhaust	If needed to control mist.
Mechanical (General)	N/A
Protective Gloves·	Use gloves impervious to water and soap
Eye Protection.	Use chemical splash goggles
Other Protective Clothing	N/A
Work/Hygienic Practices	N/A

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Soapstock Soapstock Sod Soded Soding Soil Soiloc SOILOC-MQ Soils SoilSement Soil-Sement sokle

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10 - 49	550 - 2,695	$10.70
50 - 199	2,750 - 10,945	$10.40
200 and up	11,000 and up	FACTORY QUOTE

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Phone #	Phone # (800) 523-9992	
Fax # (970) 248-7682	Fax #	

6063.SS

Ref: January 1, 2001

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DUS-TOP® Dust Control Agent and Road Stabilizer

FIRE AND EXPLOSION HAZARDS

SECTION V

PHYSICAL HAZARD WARNING: Not applicable

SENSITIVITY TO > STATIC DISCHARGE: No ; MECHANICAL IMPACT: No

FLAMMABLE: No IF YES, UNDER WHICH CONDITIONS:

FLASHPOINT (METHOD): Not applicable

FLAMMABLE LIMITS (% BY VOL.): UEL: Not applicable LEL: Not applicable

AUTO IGNITION TEMPERATURE: Not applicable

HAZARDOUS COMBUSTION PRODUCTS: Not applicable

MEANS OF EXTINCTION: Water spray, carbon dioxide, dry chemical. As this material is virtually non-flammable, use proper equipment to fight surrounding fire.

UNUSUAL FIRE/EXPLOSION HAZARDS: None

SPECIAL FIRE FIGHTING PROCEDURES: Firefighters should wear full protective equipment and use normal firefighting procedures.

TOXICOLOGICAL PROPERTIES

SECTION VI

HEALTH HAZARD WARNING: Irritant.

ROUTES OF ENTRY > SKIN CONTACT: X SKIN ABSORPTION: EYE CONTACT: X INHALATION: X INGESTION:

EFFECTS OF ACUTE EXPOSURE: This material may be irritating to the skin and eyes on contact. If inhaled it may also be irritating to the respiratory tract.

IRRITANCY OF PRODUCT: Skin/eye irritant.

SENSITIZATION TO PRODUCT: Not applicable

EFFECTS OF CHRONIC EXPOSURE: Not applicable

CARCINOGEN: REPRODUCTIVE EFFECTS: } BRIEF DESCRIPTION: Not applicable

TERATOGENICITY: MUTAGENICITY: }

SYNERGISTIC MATERIALS: None known

MEDICAL CONDITIONS AGGRAVATED: None known

CODE 1

MATERIAL SAFETY DATA SHEET

REILLY INDUSTRIES, INC

SECTION I — PRODUCT INFORMATION

PRODUCT NAME: DUS-TOP™ Dust Control Agent and Road Stabilizer

CHEMICAL NAME: Not applicable

PRODUCT NUMBER: Not applicable

SYNONYMS: Not applicable

MANUFACTURERS NAME: Reilly Wendover a Division of Reilly Industries, Inc.

CAS NUMBER: Not applicable

MOLECULAR WEIGHT: Not applicable

ADDRESS: 1510 Market Square Center, 151 North Delaware Street, Indianapolis Indiana 46204

CHEMICAL FORMULA: Not applicable

DOT NUMBER: Not regulated

PRODUCT USE: Dust control.

IMO: Not regulated

EMERGENCY TELEPHONE NUMBER: 317-247-8141

HEALTH: 1 FLAMMABILITY: 0 REACTIVITY: 0

SUPPLIER INFORMATION: Reilly Industries, Inc

HAZARD CODE(0 = NONE; 1 = SLIGHT; 2 = MODERATE; 3 = SEVERE; 4 = EXTREME)

SECTION II — HAZARDOUS INGREDIENTS

HAZARDOUS INGREDIENTS	CAS #	CONCENTRATIONS (%)	EXPOSURE LIMITS: OSHA PEL	EXPOSURE LIMITS: ACGIH TLV	LD 50 (ORAL)/LC 50
Magnesium chloride	7786-30-3	28 - 34	Not applicable	Not applicable	2800 mg/kg (rat) ; Not available

SECTION III — PHYSICAL DATA

PHYSICAL STATE: SOLID LIQUID X GAS

pH: 7

VAPOR PRESSURE: Not applicable

ODOR & APPEARANCE: Clear liquid.

FREEZING POINT: -13 F

SPECIFIC GRAVITY: 1.30 @ 68 F

SOLUBILITY (WATER): Miscible

ODOR THRESHOLD: Not available

DENSITY: See specific gravity.

EVAPORATION RATE: Not available

VAPOR DENSITY: Not available

MELTING POINT: Not applicable

COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available

BOILING POINT: 244.6 F

SECTION IV — REACTIVITY DATA

PHYSICAL (REACTIVITY) HAZARD WARNING: Not applicable

STABLE: Yes IF NO, UNDER WHICH CONDITIONS:

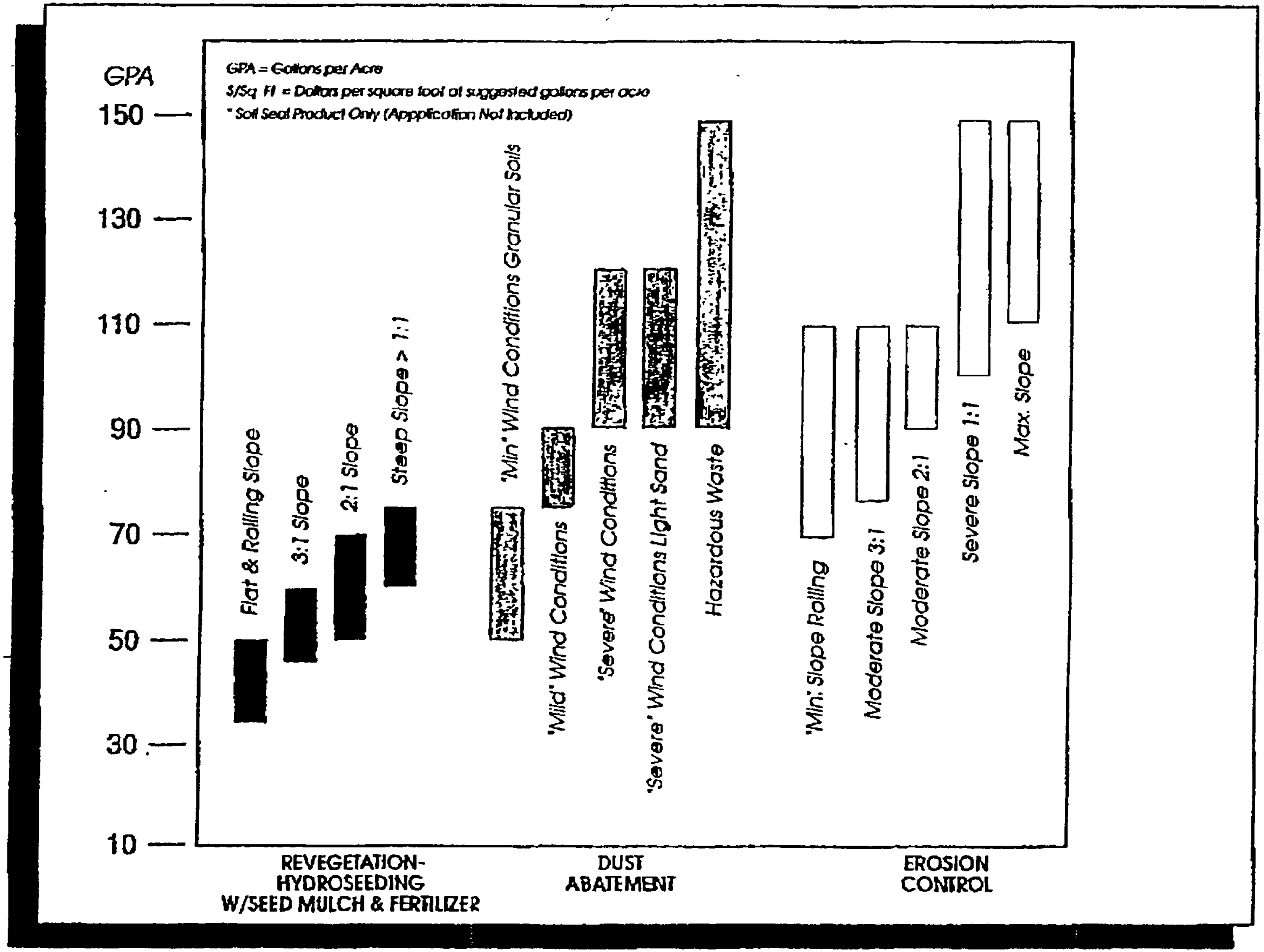
INCOMPATIBILITIES Mildly corrosive to metals.

REACTIVE: No IF YES, UNDER WHAT CONDITIONS:

HAZARDOUS DECOMPOSITION PRODUCTS: If evaporated to dryness, and heated to a minimum of 500 C, HCl vapors could be liberated.

Received Jan-29-02 04:26pm from 9702487682 -> MACTEC-ERS page 7
JAN.29.2002 3:41PM MACTEC-ERS NO.266 P.7/8

Suggested Application Rates of Soil Seal Concentrate



SOIL SEAL CORPORATION

Soil Seal Corporation has conducted extensive laboratory and field testing in order to determine the benefits of Soil Seal Concentrate. The information and suggestions presented in this brochure are based on those tests and the best technical information available at the time of printing. No representation or inducement is made guaranteeing results indicated in this brochure will be obtained by anyone using such information or suggestions. Further, the information and suggestions presented in this brochure are not intended to serve as any basis for warranties, express or implied, as to merchantability, fitness for purpose sold, description, quality, productiveness, or any other manner on Soil Seal Concentrate.

Distributed by:

SOIL STABILIZATION PRODUCTS COMPANY, INC.
P.O. Box 2779, Merced, CA 95344
(209) 383-3296 FAX:(209) 383-7849

SOIL SEAL APPLICATION

WHAT IS SOIL SEAL?

SOIL SEAL is a soil stabilizer which prevents erosion by creating a large mass of stabilized soil not easily disturbed by wind and water. SOIL SEAL penetrates the soil surface and forms an excellent cohesive bond between the soil particles. It can be used as a sole treatment in combating dusting and soil erosion, or it can be used as a tackifier in hydroseeding and hydromulching applications. SOIL SEAL is a non-toxic, non-corrosive, non-flammable auxiliary soil chemical formulated to provide safe and economical surface soil stabilization. The SOIL SEAL solution may be applied over vegetation or seeded areas without harmful effects.

APPLICATION PROCEDURES

SOIL SEAL can be applied by nearly all types of equipment designed to apply liquids, ranging in size from small garden sprayers up to large hydroseeding trucks and water trucks. In all cases, the equipment should be capable of distributing the material in a uniform pattern, applying the solution in large droplets instead of fine mists.

Once the application rate of the concentrate in gallons per acre has been established, the dilution of the concentrate with water can begin. The standard dilution ratio is 30 gallons of water per gallon of SOIL SEAL. The normal turbulence of adding water to the mixing tank will provide adequate mixing of the solution. Further agitation is not required. Pour the SOIL SEAL concentrate into the mixing tank with no more than 50% of the water required for its proper mixture already in the tank. Add the remaining water after the concentrate has been added. For loading material, you can use one of several methods: 5 gallon buckets, elevating the drum up to the height of the fill hole by use of a front-end loader or fork lift, or setting up a sump pump or trash pump that can move a fairly thick liquid. Always hose down any spillage that occurs while loading the concentrate into the truck.

Suggested clothing for your crew is disposable uniforms or old clothes and old shoes. If any of the crew wear eye glassses, safety goggles can be used to protect glasses from overspray. This is particularly important on windy days. For clean-up of clothing and equipment, use a water wash to clean up this water-base product.

When possible, try to schedule application of the product when wind conditions are below 5 mph. The SOIL SEAL product is applied in multiple spray passes to minimize runoff of the solution and to maximize penetration. The full amount of solution planned for application to a specific area should be applied in a continuous series of spray passes (it is not possible to apply part of the product on a second day to a partially treated area as the existing product would already be cured and would inhibit penetration of the second application). Curing time can range from a few hours in hot summer weather to 24 hours or more during periods of high humidity or cold weather. Allow a 24 to 36 hours drying period for the treated area to develop maximum crust strength.

<u>CAUTION</u>: Care must be exercised to prevent damage that can result from improper application of SOIL SEAL. Each site should be evaluated prior to application for factors such as wind speed and direction. Equipment, vehicles, buildings and other items on-site which require protection from overspray should be moved or properly protected prior to the SOIL SEAL application.

The proper application of SOIL SEAL is essential to its performance. The owner and consulting engineer should insure that the application crew is thoroughly familiar with all technical data and installation instructions for the SOIL SEAL product. The seller, The Soil Stabilization Products Company, is not responsible for product application or supervision of the SOIL SEAL application.

SECTION 05: REACTIVITY DATA

STABILITY	Stable under Normal Conditions
HAZARDOUS POLYMERIZATION	Will Not Occur
CONDITIONS AND MATERIALS TO AVOID:	N/A
HAZARDOUS DECOMPOSITION PRODUCTS:	If involved in a fire, dried film capable of burning giving off oxides of carbon/nitrogen.

SECTION 06: HEALTH HAZARD DATA

ROUTES OF EXPOSURE:

Inhalation	Vapor or mist can cause headache, nausea, and irritation of the nose, throat and lungs.
Absorption	Contact-yes; Absorption-unlikely.
Ingestion	Yes
Eye Contact	Slightly irritating to eyes.
Skin Contact	Irritating to skin upon repeated or prolonged contact.

EMERGENCY & FIRST AID PROCEDURES:

Inhalation	Move subject to fresh air.
Eye and Skin Contact	Flush eyes with a large amount of water for at least 15 minutes. See a physician if irritation persists. Wash affected skin areas with soap and water.
Ingestion	If swallowed, dilute by giving 2 glasses of water to drink. See a physician. Never give anything by mouth to an unconscious person.

SECTION 07: PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Keep spectators away. Floor may be slippery. Use care to avoid falling. Dike and contain spill with inert material (e.g., sand, earth) Transfer liquid to containers for recovery or disposal and solid diking material to separate containers for disposal. Keep spills and cleaning runoffs out of municipal sewers and open bodies of water.

WASTE DISPOSAL METHOD: Coagulate the emulsion by the stepwise addition of ferric chloride and then lime. Remove the clear supernatant liquid and flush to a chemical sewer. Incinerate the solids and contaminated diking material at a permitted facility in accordance with local, state and federal regulations.

PRECAUTIONS TO BE TAKEN IN HANDLING & STORAGE: Proper ventilation and keep from freezing.

SECTION 08: CONTROL MEASURES

RESPIRATORY PROTECTION	None should be required. Use OSHA/NIOSH-approved respirator in poorly ventilated areas.
LOCAL EXHAUST	If needed to control mist or vapor.
MECHANICAL (General)	Is expected to be satisfactory.
PROTECTIVE GLOVES	Use gloves impervious to water and soap.
EYE PROTECTION	Safety Glasses and available eye bath.
OTHER PROTECTIVE CLOTHING	N/A
WORK/HYGIENIC PRACTICES	N/A

Toll Free: (800) 523-9992

SOIL STABILIZATION PRODUCTS COMPANY, INC.

P.O. Box 2779, Merced, CA 95344
Phone: (209) 383-3296 or (800) 523-9992
Fax: (209) 383-7849 E-mail: staff@sspco.org

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Environmentally Appropriate Product Technologies for Pavements, Dust Control, Erosion Control & Soil Stabilization

MATERIAL SAFETY DATA SHEET
SOIL SEAL® CONCENTRATE

MSDS # 7701
Reviewed: 01/04/99

SECTION 01: IDENTIFICATION

INFORMATION FURNISHED BY:	Soil Stabilization Products Company, Inc.
ADDRESS.	P.O. Box 2779, Merced, CA 95344
DATE PREPARED:	01/04/99
EMERGENCY PHONE #:	(800) 523-9992 or (209) 383-3296
PRODUCT OR TRADE NAME:	**SOIL SEAL®** Concentrate

SECTION 02: HAZARDOUS INGREDIENTS

Components	% by Wt	CAS#	OSHA PEL	ACGIH TLV
ACRYLIC POLYMER +	46-48%	Non Haz	NE	NE
WATER	54-52%	Non Haz	NE	NE
AMMONIA	.2% Max	7664-41-7	NE	25 ppm

SECTION 03: PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING POINT	> 212° F
MELTING POINT	N/A
VAPOR PRESSURE (mm Hg)	Same as water
VAPOR DENSITY (Air = 1)	< 1
SOLUBILITY IN WATER	Dilutable
APPEARANCE & COLOR	Greenish Liquid with slight ammoniacal odor
SPECIFIC GRAVITY (H_2O = 1	1.06
EVAPORATION RATE (Butyl Acetate = 1)	< 1

SECTION 04: FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method Used)	None (TCC)
FLAMMABLE LIMITS	Not Applicable
EXTINGUISHING MEDIA	Not Applicable
SPECIAL FIRE FIGHTING PROCEDURES	Not Applicable
UNUSUAL FIRE FIGHTING PROCEDURES	Product will not burn but may splatter if temperature exceeds boiling point. Polymer films are capable of giving off oxides of carbon/nitrogen.

SOIL SEAL™ - A PROVEN PERFORMER

WHEN YOU NEED TO HOLD SOIL WHERE IT BELONGS

When you need to stop dusting, erosion and siltation.

For over twenty years, this unique copolymer formulation has been setting the standard for soil surface stabilization. SOIL SEAL® has been specified for the most environmentally sensitive sites by agencies such as the National Park Service, the Forest Service and the Environmental Protection Agency. When EPA remedial action clean-ups or Superfund sites need reliable dust control, erosion control or protection of hydroseeding and hydromulching applications, SOIL SEAL® fits the bill.

While the environmental acceptability of SOIL SEAL® is an outstanding attribute for projects where environmental cleanliness is carefully reviewed, the ***durability and cost - effectiveness*** of the treatment is equally important. For agencies or industries with a requirement to control large expanses of bare soil, partially vegetated land, mine and mill tailings, or newly planted seed on erosive soils or steep slopes, ***cost - effectiveness must be a priority concern.***

Why is SOIL SEAL® *Unique In Effectiveness and Unique In Durability?*

There are three primary natural erosive forces at work with which a soil surface stabilizer must contend - wind, water and sun. Whether the goal is to control dust or to stop wind and water erosion, an effective treatment must be well integrated with the soil to hold against high winds, rain impact and heavy sheet - flow of water. The treatment also needs to be resistant to the erosive force of the sun, ultraviolet degradation. The patented high grade copolymer formulation of the SOIL SEAL® product meets the three forces of nature head - on with three unique capabilities. Use of the high grade copolymer base allows SOIL SEAL® to be highly diluted with water for penetration during application, yet still able to polymerize and form a cohesive matrix within the soil once the water evaporates. Special additives further improve the ability of the SOIL SEAL® solution to first penetrate the soil materials and then to harden for maximum holding power. ***PENETRATION*** and ***HOLDING POWER*** - two of the three unique factors.

Cheaper polymers may briefly hold against wind and water, but the sun (force number three) passes final judgement. When it comes to an environmentally acceptable base material that is effective for soil surface stabilization, a pure acrylic copolymer is unsurpassed in its resistance to breakdown under ultraviolet exposure. SOIL SEAL® is formulated with a pure acrylic base, allowing for maximum dilution, maximum penetration and durability. We have single treatments still providing dust control and erosion control over four years after application.

SOIL SEAL® *PROMOTES VEGETATION!*

If you want to keep an area of bare earth "in control" and free of vegetation, first apply an appropriate pre - emergent herbicide. Otherwise, naturally dispersed seed will be given a major boost in effectiveness as the soil surface is held in place by the SOIL SEAL® treatment, providing a stable germination bed. SOIL SEAL® is formulated to reinforce the ability of the soil surface to shed sheet water flow, yet still be permeable to the gradual moisture infiltration needed to support vegetation.

For a more active approach to revegetation, SOIL SEAL® is state - of - the - art as a tackifier for seed, mulch and soil. SOIL SEAL® has been effective in promoting vegetation on near vertical, crumbling slopes turning them green with growing grass cover. When success of a revegetation program is critical, **SOIL SEAL® is your best insurance.**

DUST CONTROL AND WATER CONSERVATION

Federal PM₁₀ Regulations and local county and city regulations for the control of fugitive dust are putting pressure on anyone with a lot of disturbed ground to hold in place. Agencies, industry, developers and contractors can call on SOIL SEAL® to provide a dollar saving alternative to ineffective spray treatments and to provide a water - conserving alternative to daily dust control watering.

PRODUCT APPLICATIONS:

BARE EARTH

- ☐ Dust Control & Blow Sand Stabilization
- ☐ Erosion Control for Temporary & Permanent Closure Caps
- ☐ Maintenance of Easements & Right of Ways
- ☐ Maintenance of Test Ranges
- ☐ Mine & Mill Tailings Stabilization
- ☐ Protection of Desert Earthworks
- ☐ Runway Perimeter Maintenance
- ☐ Stabilization of Material & Topsoil Stockpiles
- ☐ Surface Stabilization of Berms & Dikes
- ☐ Temporary Stabilization of Contaminated Soils
- ☐ Winterization of Construction Sites

VEGETATION

- ☐ Promotion of Natural Revegetation
- ☐ Reclamation & Fire Restoration
- ☐ Revegetation for Slopes & Erosive Soils
- ☐ Tackifier for Hydromulching & Hydroseeding

WHO is using **SOIL SEAL®?**

Highway & Public Works Departments
Federal & State Land Management Agencies
Military Facilities & Military Contractors
Petroleum & Petrochemical Industries
Developers & Contractors
Mines, Mills & Quarries
Public Utilities & Power Plants
Landfills & Waste Containment Closures
Railroads & Port Facilities
Environmental Clean-up Contractors
Airports & Test Ranges
Hydroseeding & Hydromulching Contractors
Parks & Conservation Departments

SOIL SEAL® Easy to Apply, Environmentally Acceptable, Tenacious in Holding Soil in Place.

Soil Stabilization Products™ Co., INC.

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Soil Stabilization™ Products Company INC

State-of-the Art *ENVIRONMENTAL PRODUCTS* for the Protection of *SOIL, WATER* and *AIR QUALITY*

Featuring:

SOIL SEAL®

The Soil Seal Corporation

A patented high grade copolymer formulation for soil surface stabilization. This product sets the standard for durability, environmental acceptability and ease of application.

- Dust Control
- Blow Sand Control
- Revegetation
- Erosion Control
- Hydroseeding
- Water Conservation

HOT TOPIC
PM10 Regulations Ahead

- ✓ **Dust Control Products**
- ✓ **Erosion Control Products**
- ✓ **Stabilization Products for Soil and Aggregate Materials**
- ✓ **Liners for Liquid and Solid Waste Containment**

DUS-TOP™ Dust Control Agent and Road Stabilizer

SECTION VII — FIRST AID MEASURES

SKIN: Wash exposed area twice with soap and water. The exposed area should be examined by medical personnel if irritation or pain persists after the area has been washed.

EYE: Rinse eyes immediately with large amounts of water for at least 15 minutes, occasionally lifting the eyelids. GET MEDICAL ATTENTION.

INHALATION (BREATHING): Remove from exposure area to fresh air immediately. If breathing has stopped, give artificial respiration. Keep affected person warm and at rest. GET MEDICAL ATTENTION.

INGESTION (SWALLOWING): If conscious induce vomiting to prevent further absorption. Give oxygen if respiration is shallow. GET MEDICAL ATTENTION. Do not give anything by mouth to an unconscious person.

DECONTAMINATION PROCEDURES: Use emergency shower if available. Remove all contaminated clothing to prevent further irritation. Wash all clothing and exposed areas of the body twice with soap and water.

SECTION VIII — PREVENTIVE MEASURES

<PERSONAL PROTECTIVE EQUIPMENT> GLOVES (SPECIFY): Impervious gloves **FOOTWEAR (SPECIFY):** Boots

EYE (SPECIFY): Safety glasses or chemical goggles. **CLOTHING (SPECIFY):** Not applicable

RESPIRATORY (SPECIFY): NIOSH approved chemical cartridge respirator, if necessary.

OTHER (SPECIFY): Use protective equipment as conditions necessitate.

PERSONAL HYGIENE PRACTICES: Contact lenses should not be worn when handling this material. Do not smoke or eat in areas where this material is handled. Wash hands thoroughly before eating or smoking.

ENGINEERING CONTROLS: All operations should be conducted in well-ventilated conditions. Local exhaust ventilation should be provided.

LEAK AND SPILL PROCEDURE: For small spills use suitable absorbent material and collect for later disposal. For large spills the area may require diking to contain the spill. Material can then be collected (eg. suction) for later disposal. Wear protective equipment as needed during clean-up. After collection of material flush area with water.

WASTE DISPOSAL METHOD: Dispose of the material in accordance with standard practice for disposal of potentially hazardous materials as required by applicable federal, state, or local laws. Wear protective equipment as necessary.

HANDLING PROCEDURES AND EQUIPMENT: Protect containers against physical damage. Wear protective equipment as necessary when performing maintenance on contaminated equipment.

STORAGE REQUIREMENTS: Store in dry, well ventilated area. Keep away from strong acids.

SPECIAL SHIPPING INFORMATION: Chemicals, NOI (DUS-TOP™ Dust Control Agent and Road Stabilizer), Non-Hazardous

DUS-TOP™ Dust Control Agent and Road Stabilizer

SECTION IX — ADDITIONAL COMMENTS

Hazardous Materials Guide Number - Not applicable

No OSHA or ACGIH exposure limits have been established for this compound.

"FOR CHEMICAL EMERGENCY"
Spill, Leak, Fire, Exposure, or Accident
Call CHEMTREC - Day or Night
800-424-9300

Toll free in the U.S., Puerto Rico, Virgin Islands, and Canada. For calls originating outside the U.S.: 202-483-7616 (collect calls are accepted).

SECTION 313 SUPPLIER NOTIFICATION> this product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and of 40 CFR 372:

CAS #	CHEMICAL NAME	% BY WEIGHT
Not appl.	Not applicable	Not appl.

Based upon the criteria set forth in section 34 through 36 of the Controlled Products Regulations of Canada this Product is classified as:

Not applicable

PRECAUTIONARY STATEMENT: PLEASE NOTE that the information contained herein is furnished without warranty of any kind. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers.

SECTION X — PREPARATION INFORMATION

Prepared under the direction of Paul H. Rivers Ph.D., Director of Corporate Environmental Affairs

PHONE NUMBER 317-247-8141

DATE: December 7, 1992 - Original date of issue: April 18, 1990

Exhibit 2

DOE-EM/GJ1235-2006

Office of Environmental Management – Grand Junction

MOAB UTAH UMTRA

UMTRA Project

Crescent Junction Project Site Fugitive Dust Control Plan

July 2006

U.S. Department of Energy

Office of Environmental Management

Work Performed Under DOE Contract No. DE-AC01-02GJ79491
for the U.S. Department of Energy Office of Environmental Management.
Approved for public release; distribution is unlimited

DOE–EM/GJ1235-2006

Moab UMTRA Project

Crescent Junction Site

Fugitive Dust Control Plan

July 2006

Work Performed by S.M. Stoller Corporation under DOE Contract No. DE–AC01–02GJ79491
for the U.S. Department of Energy Office of Environmental Management, Grand Junction,
Colorado

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Appendix

Appendix A Material Safety Data Sheets for Dust Suppressants Used at the Crescent Junction Site

End of current text

1.0 Introduction

The State of Utah Division of Air Quality rules for the control of fugitive dust and emissions require that all sources whose activities or equipment have the potential to produce fugitive or airborne dust must prepare and implement a Fugitive Dust Control Plan. Accordingly, this Fugitive Dust Control Plan (Plan) addresses the control of fugitive and airborne dust emissions from the Crescent Junction Site of the Moab, Utah, Uranium Mill Tailings Remedial Action (UMTRA) Project, located approximately 1.5 miles northeast of Crescent Junction, Utah. Specifically, this Plan complies with the State of Utah rules for controlling fugitive dust emissions as specified in the *Utah Administrative Code* (U.A.C.) R307-309, "Fugitive Emission and Fugitive Dust Rule."

This Plan has been prepared to address activities and operations conducted by the U.S. Department of Energy (DOE) to construct a disposal cell and emplace uranium mill tailings at the Crescent Junction Site. The primary objective of this plan is to formulate a strategy for controlling, to the greatest extent practicable, fugitive or airborne dust emissions at the Crescent Junction Site. This will be accomplished by identifying specific sources and activities that have the highest potential to produce or generate fugitive or airborne dust emissions. This plan presents the engineering controls necessary to minimize and control dust emissions from those sources and activities. As necessary, the scope of this plan will be revised to reflect changes in DOE's dust control strategy as site conditions or activities change.

1.1 Site Location

The Crescent Junction Disposal Site is located approximately 1.5 miles east of the intersection of U.S. Highway 191 (US-191) and Interstate 70 (I-70) and north of the Union Pacific Railroad. It is about 30 miles north of Moab, 20 miles east of Green River, and approximately 6 miles west of Thompson Springs (see Figure 1–1).

The disposal site is located within portions of Sections 26 and 27, T21S, R19E, Salt Lake Principal Meridian (SLPM) (see Figure 1–2). The majority of the area that will be used for the repository and site activities is in the NE1/4 of Section 27 and NW1/4 of Section 26; a portion of the cell will extend into Sections 22 and 23.

DOE withdrew land from the U.S. Bureau of Land Management (BLM) for a mill tailings and contaminated material repository and ancillary facilities (e.g., construction management trailers, parking, vehicle wash, construction water pond). An estimated 400 acres will be impacted by disposal activities. Once the disposal cell is completed, DOE will retain permanent ownership of the repository, a buffer area, and access to the repository; the remaining acreage will be returned to the BLM. The area that will be permanently withdrawn from other uses is approximately 200 acres.

The Crescent Junction Disposal Site is surrounded on three sides by land administered by BLM. The talus slopes of the Book Cliffs delineate the northern boundary. To the east and west, the surrounding areas are basically flat, and drainage is generally to the south and west toward the Green River. To the south, the Union Pacific Railroad bounds the property. Farther south is County Road 175 (CR-175) and I-70. There are no active commercial establishments present in the immediate area. The former Crescent Junction gas station and restaurant, now vacated, are located approximately 1.5 miles southwest of the site at the interchange of I-70 and US-191.

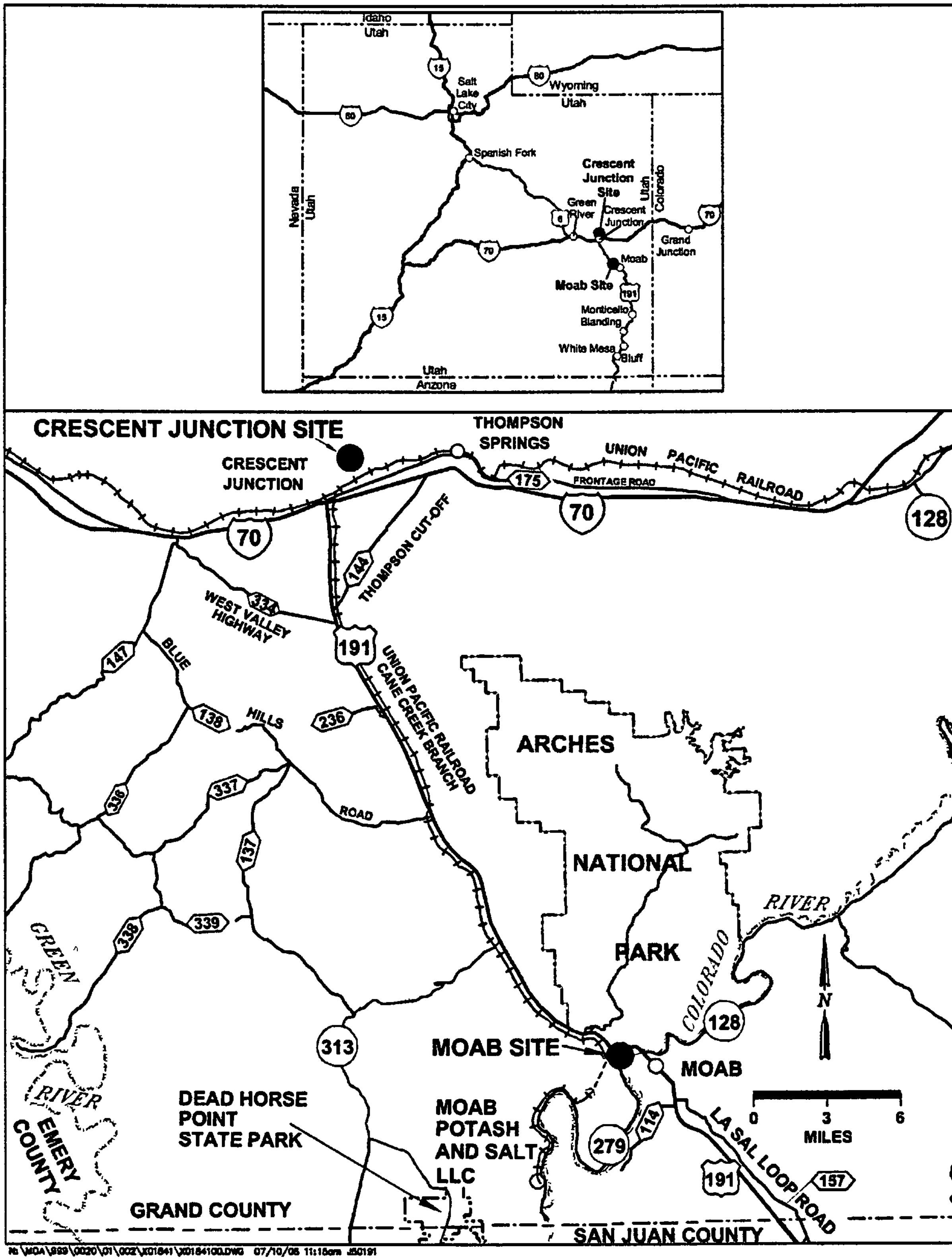

Figure 1–1. Location of Crescent Junction Disposal Site

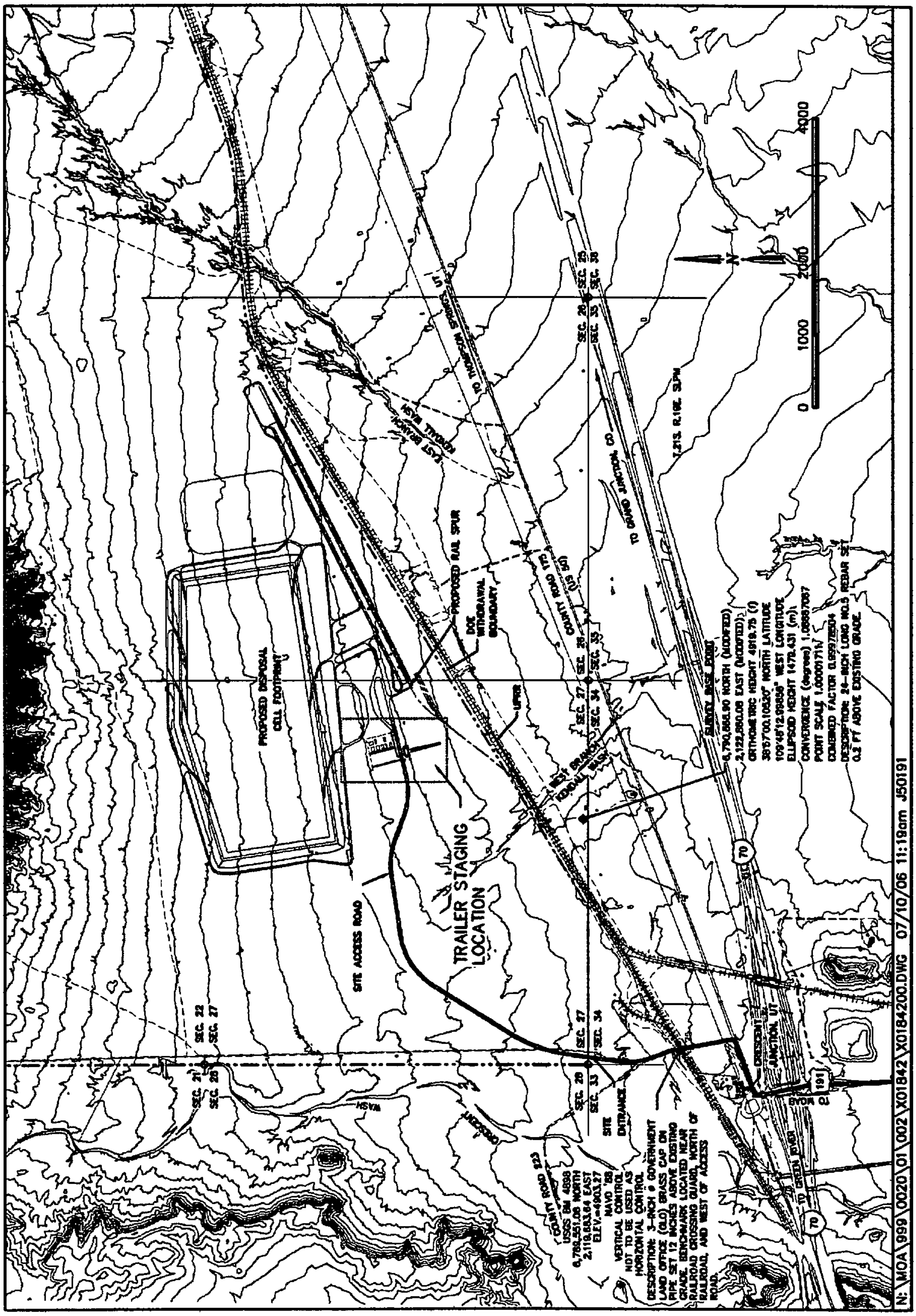

Figure 1–2. Site Map

One residence is located approximately 0.25 mile south of I-70. Thompson Springs, approximately 6 miles to the east, has fewer than 50-full time residents. No rivers or major drainages are present on the withdrawn disposal site property.

1.2 Site History

The Crescent Junction Disposal Site area was historically public land administered by the BLM. It contains a cattle grazing allotment that is currently used and oil and gas leases that are undeveloped. BLM has designated the area as access limited to existing roads. The general area is used by wildlife for forage, nesting, and hunting by various raptors and as a wildlife migratory corridor. Prairie dogs, raptors, bighorn sheep, antelope, chukars, and a variety of small mammals and birds (e.g., antelope squirrel, horned lark) remain in the area part of the year or migrate through the area.

The Crescent Junction location was identified as a disposal site during the Environmental Impact Statement and Record of Decision process in 2005. Ownership and responsibility of the mill tailings at the Moab Site were transferred to DOE by passage of the Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001 (Public Law 106-398). This act further designates that the Moab Site undergo remediation in accordance with Title I of the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA; 42 U.S.C. 7912, as amended).

1.3 Purpose and Need

Contaminated materials associated with the former Atlas Minerals Mill at the Moab UMTRA Site will be transported to the Crescent Junction Disposal Site and placed in a repository that will be secure from human intrusion. This action will result in the removal of tailings materials at the existing tailings pile, all surface contamination, and contamination from vicinity properties, totaling approximately 12 million cubic yards (16 million tons) of contaminated materials.

The majority of contaminated materials will be transported from the Moab UMTRA Project Site in containers by rail over the existing Cane Creek Branch of the Union Pacific Railroad. The containers will be offloaded adjacent to the southern border of the Crescent Junction Disposal Site, at which point they will be conveyed by truck to the disposal cell. Material that is too large for transport by container on rail cars will be transported to the disposal site by covered truck on US-191.

The disposal cell footprint will be excavated to a depth of approximately 20 feet. The final footprint configuration has not yet been determined. Contaminated materials will be placed and compacted in layers. Dust will be controlled through use of construction water. After all materials are transported, the pile will be covered with rock/soil materials. Surrounding areas will be reclaimed with native seed mixes approved by BLM, and all areas not necessary for future access or study will be released back to the BLM.

Typical site activities will include a controlled access area with active tailings deposition, vehicle washing and decontamination stations, a pond for construction water, temporary field offices, vehicle maintenance and storage areas, a radiological control area to check worker radiation levels, worker parking, and soil stockpile areas.

1.4 Climatology

The climate (based on Moab) of the Crescent Junction region is semiarid. Average annual temperature is approximately 57 °F. January is the coldest month, averaging 30 °F, and July is the warmest month, averaging 82 °F. Extreme temperatures have ranged from –18 °F in January 1963 to 111 °F, which has occurred more than once (in July 1953 and on earlier occasions). Temperatures of 90 °F or higher occur about 100 days per year, with about 80 percent of those occurring during June, July, and August. Temperatures below freezing (32 °F) occur on the average of 123 days of the year with about 80 percent of those occurring during November through February. The effects of high temperature on human comfort are moderated by the low relative humidity, which is often less than 50 percent during the daytime hours.

Average annual precipitation at Moab is 8 inches, distributed approximately equally among the seasons with slight peaks during the spring and fall. Potential evapotranspiration of 50 inches per year greatly exceeds annual precipitation. Mean pan evaporation (about 55 inches per year) and lake evaporation (about 38 inches per year) also greatly exceed the total annual precipitation. Thunderstorms occur about 40 days per year. Hail occurs approximately 3 days per year.

Prevailing winds in the region are southeasterly. Cold air drainage at the site can occur from the northwest under stable conditions. The probability of a tornado is minimal. One tornado with wind speeds of 100 miles per hour would be expected only once in approximately 100,000 years (NRC 1999).

1.5 Regulatory Requirements

This Plan is prepared in response to State of Utah Division of Air Quality regulations for the control of fugitive dust, as found in Section R307-205 (U.A.C., September 2001). Dust control plans are required to minimize on-site fugitive dust from storage and handling of aggregate materials, construction/demolition activities, mining activities, and tailings piles and ponds. The portion of the regulations that specifically applies to the Crescent Junction Site (R307-205), requires that "... any person owning or operating an existing tailings operation where fugitive dust results from grading, excavating, depositing, or natural erosion or other causes in association with such operation shall take steps to minimize fugitive dust from such activities." This site-specific Plan will be submitted to the Executive Secretary for the Utah Division of Air Quality in Salt Lake City, Utah, for approval and will be updated and revised as necessary to reflect dust controls that correspond to current and on-going site activities and operations.

1.6 Environmental Monitoring

In addition to the implementation of physical dust controls, DOE has developed and implemented an environmental air-monitoring program for the Crescent Junction Site. This environmental air monitoring program consists of sampling airborne particulates, radon, and direct gamma radiation at various locations along the site perimeter and at various off-site locations. Background monitoring locations have been established to provide ambient air quality data. The background or ambient air quality data will be compared to air quality data collected from the on-site monitoring locations for the purposes of determining compliance with various DOE orders and federal and state air quality regulations.

As part of DOE's environmental air monitoring and fugitive dust control strategy, a meteorological monitoring station has been established at the Crescent Junction Site. Wind speed and wind direction data collected from this monitoring station will be used to determine when site-specific action levels have been exceeded and specific dust controls (e.g., the application of dust suppression techniques) must be initiated. In addition, personnel certified in reading opacity measurements in the State of Utah will determine when active dust control measures should be initiated and when specific dust generating activities (i.e., excavating, hauling, grading, etc.) should be discontinued.

In addition to complying with the State of Utah Fugitive Dust Rule, this Plan is consistent with the intent of complying with various DOE orders. DOE Order 5400.1, *General Environmental Protection Program*, specifies that effluent monitoring and environmental surveillance be conducted to determine the effect of DOE activities upon "...on-site and offsite environmental and natural resources," and to "...verify compliance with applicable Federal, State, and local effluent regulations and DOE Orders." Similarly, DOE Order 5400.5, *Radiation Protection of the Public and the Environment*, requires that DOE control and monitor radiological exposures from its facilities and activities.

The physical form of the radioactive contaminants (i.e., uranium mill tailings) to be transferred from the Moab Site is primarily best described as a fine-grained, sand-like material that is susceptible to wind erosion. Consequently, one of DOE's major objectives at the Crescent Junction Site is to control and contain the off-site transport of radiological contaminants resulting from the erosive forces of wind and storm water. This Plan outlines DOE's strategy for controlling airborne dust emissions and minimizing/controlling the off-site transport of mill tailings resulting from wind erosion.

A summary of air monitoring program at Crescent Junction consists of

- Five air monitoring stations to measure radon and gamma.
- One residential monitoring location approximately 1.5 miles south of the disposal cell for radon, direct gamma, and radioparticulates (thorium-230, polonium-210, radium-226, and total uranium in microcuries per milliliter).

Off-site air monitoring stations for radon, direct gamma, and radioparticulates consists of

- A meteorological monitoring station near Crescent Junction.
- Residential and exterior air monitoring stations for radon, gamma, radioparticulates, and indoor direct gamma monitoring at one location in Thompson Springs.

Data collection instruments that will be used for the air-monitoring program are

- Thermoluminescent dosimeter (TLD) badges
- Radon TrackEtch cups
- Particulate sampler

Figure 1–3 presents the locations of air monitoring instruments.

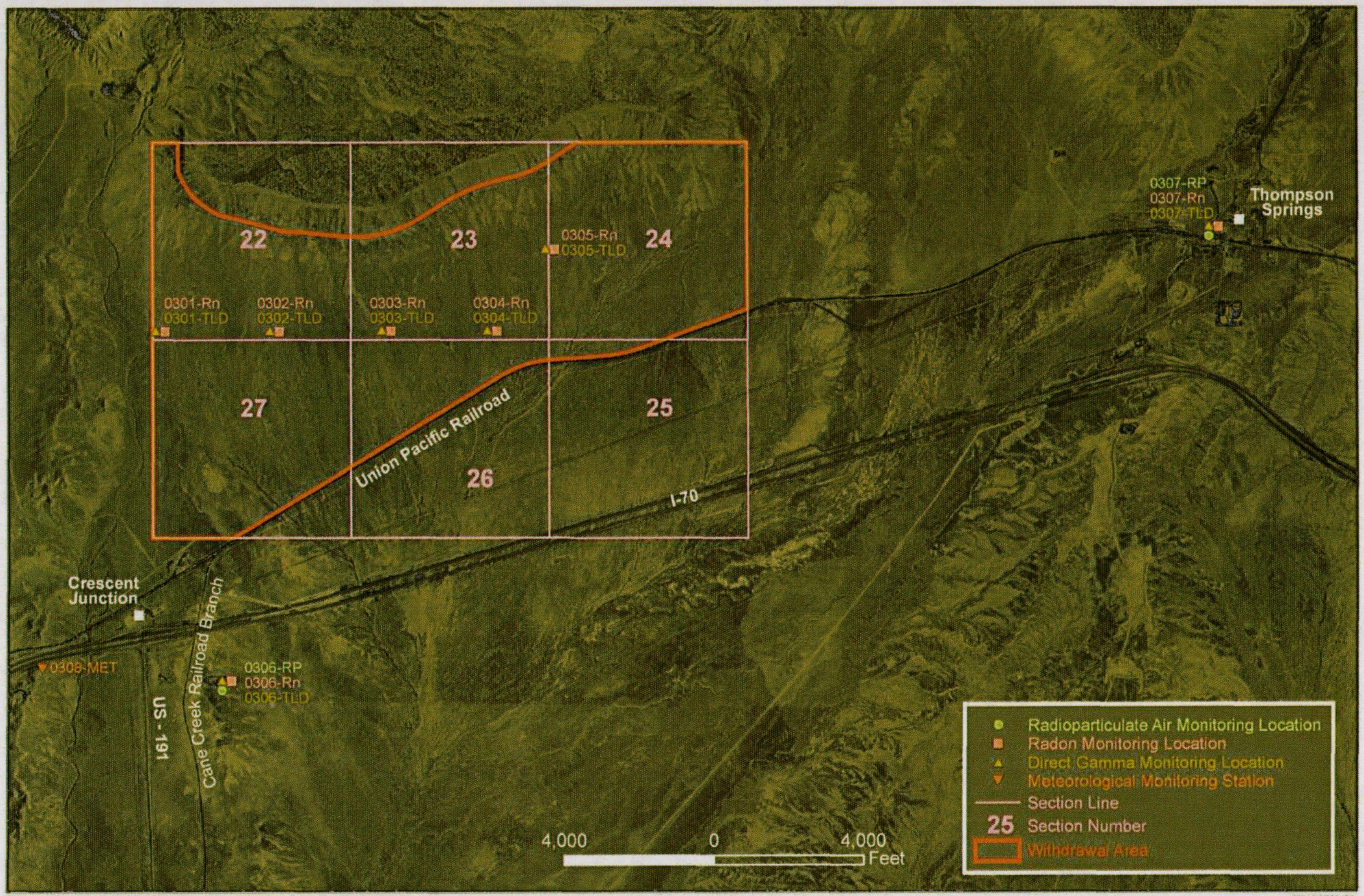

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Figure 1–3. Monitoring Locations at and Adjacent to Crescent Junction, Utah

End of current text

2.0 Site Source Information

2.1 Site Ownership and Physical Location

As required by the Utah Division of Air Quality, the following site-specific source information is provided:

1) **Name of Operation—** Crescent Junction Site of Moab UMTRA Project

2) **Owner/Operator Information**—U.S. Department of Energy Grand Junction office. 2597 B3/4 Road, Grand Junction, Colorado 81503. DOE Contact: Donald R. Metzler, Federal Project Director (970) 248-7612. Plan Contact: Ed Baker (970) 248-6566.

3) **Physical Address of Operations**—1.5 miles northeast, Crescent Junction, Utah.

4) **UTM Coordinates or Longitude/Latitude of Operations:**

   Latitude: 38 degrees, 57 minutes, 79 seconds - North
   Longitude: 109 degrees, 48 minutes, 0.1 seconds - West
   Elevation: 5,130 U.S. feet above MSL

2.2 Source Information

Type of Material Processed or Disturbed—The materials of concern with respect to fugitive dust emissions at the Crescent Junction Site will be residual uranium mill tailings and contaminated native soils/sand. Approximately 16 million tons of uranium mill tailings and contaminated soils will be removed from the Moab site and transported to the Crescent Junction repository site. The majority of materials will be poorly consolidated soils that are considered to be a "high-potential" source of fugitive dust emissions.

The points of potential emissions are the transfer point for transported material to site haul trucks, the dumping of material into the disposal cell, and the active disposal material surface in the cell. Another major point of potential emissions is the stockpiled soil removed from the disposal cell. Combined, the disposal cell and stockpiled native material will constitute approximately 80 percent of the total land surface of the Crescent Junction Disposal Site. The remainder of the site is not considered to be a significant source of fugitive dust emissions because of (1) The low level of past disturbances in these areas, (2) the low level of anticipated activity occurring in these areas, and (3) The percentage of vegetative cover present within these areas.

Source areas identified as a "moderate-potential" consist of areas that will be moderately disturbed and temporarily stabilized, such as the office trailer staging area, access road, rail spur, and construction water pond areas (approximately 10 percent of the total site area). Soils and graveled surface in these areas are typically better consolidated and more stable because of varying degrees of vegetation or rock cover. If these areas prove to be a source for fugitive dust emissions in the future, appropriate control measures will be implemented.

Most of the "low-potential" areas are located along the site perimeter and consist of vegetated rangeland on the margins of the site boundary. Typically, little to no activity is occurring or is planned in these areas. The "low-potential" areas constitute approximately 10 percent of the total site area. Consequently, DOE does not anticipate that these areas will be a significant source of dust emissions from the facility, and no controls are planned for these areas.

Length/Duration of Construction Project—DOE is in the process of evaluating disposal action alternatives. Depending upon which disposal alternative is ultimately selected, DOE's responsibility for monitoring and controlling fugitive dust emissions from this site will range in duration from approximately 10 to 20 years.

Description of Planned Activities—Contaminated materials associated with the former Atlas Minerals Mill at the Moab UMTRA Project Site will be transported to the Crescent Junction Disposal Site and placed in a repository of approximately 420 acres, which will be secure from human intrusion. The repository consists of the disposal cell (approximately 200 acres), soil stockpile areas, and support facilities for offices, rail road spur, roads, and construction water pond.

The planned action will result in the removal of tailings materials from the Moab tailings pile, associated surface contamination, and contaminated material from vicinity properties, for a total volume of approximately 12 million cubic yards of contaminated materials.

The majority of contaminated materials will be transported from the Moab UMTRA Project Site in sealed containers by rail over the existing Cane Creek Branch of the Union Pacific Railroad. They will be offloaded adjacent to the southern border of the Crescent Junction Disposal Site, at which point they will be conveyed in sealed containers by truck to the disposal cell. Material that is too large for transport by container on rail cars will be transported to the disposal site by covered truck along US-191.

The disposal cell footprint will be excavated to a depth of approximately 18 to 25 feet. The final footprint configuration has not been determined. Contaminated materials will be placed and compacted in layers. Dust will be controlled through use of construction water and/or dust palliatives. After all materials are transported, the pile will be covered with rock materials. Surrounding areas will be reclaimed with native seed mixes approved by BLM, and all areas not necessary for future access or study will be released back to BLM.

Responsible Individuals

Donald R. Metzler, DOE Federal Project Director	(970) 248-7612
Ken Karp, Contractor Project Manager	(970) 248-6464
Jim Erickson, Contractor Site Manager	(970) 248-6395
Ed Baker, Environmental Compliance Lead	(970) 248-6566

If a subcontractor is selected and assumes dust control responsibilities, the State of Utah will be notified.

3.0 Description of Fugitive Dust Emission Activities

Descriptions of the on-site activities that may contribute to or generate fugitive dust emissions at the Crescent Junction Site are presented in the following text.

Types of Activity—DOE is currently in the process of performing various types of environmental characterization activities at the Crescent Junction Site. These activities which will provide a baseline of conditions prior to construction, include surface and ground water monitoring, radon and direct gamma radiation monitoring, environmental air/particulate monitoring, meteorological monitoring, and various engineering studies and surveys. Most of these activities are non-intrusive and result in little-to-no fugitive dust emissions. Vehicles, used to transport personnel and equipment from one location to another, may result in minimal generation of fugitive dust.

Implementation of Fugitive Dust and Storm Water Runoff Controls During Construction—DOE recognizes that disturbed soils, mill tailings, and residual contaminated soils are especially vulnerable to wind and storm runoff. In an effort to contain these contaminants and prevent their migration off the site, establishment of fugitive dust and storm water runoff controls is a priority for DOE. Implementation of these controls will necessitate the use of heavy equipment to construct support facilities, construct the disposal cell, construct sediment retention basins, excavate borrow ditches, install culverts, apply dust suppressant materials, etc. However, fugitive emissions anticipated as a result of these activities are expected to be minimal in conjunction with extensive dust suppression activities. Whenever possible, construction will be phased, and each phase will include reclamation and/or permanent stabilization. Soils will be excavated and stockpiled.

Establishing Support Offices, Access Road, and Railroad Staging Areas—DOE plans to construct a potable water line, construction office and support trailers, and an access road in 2006. In the next 2 years power and construction water utilities will also be installed, and a railroad staging area will be constructed. To complete these tasks, mobile office buildings will be set up on the site, security fencing and gates will be installed, and utilities will be extended to the new facilities. This effort will require the use of heavy equipment for a relatively short-term duration and is not expected to result in significant fugitive dust emissions.

Preliminary Plans for Construction of Disposal Cell—The disposal cell footprint will be less than 150 acres in size. Approximately 12 inches of topsoil-like material will be stripped and stockpiled from the cell and support facilities. The cell will be excavated to a depth of 18 to 25 feet, and excavated material will be placed around the perimeter to construct the buttress area. Excavation and deposition of tailings material will proceed sequentially to minimize the size of the working area that will be exposed to wind and water erosion.

Disposal Cell Activities— Cell construction will be phased in subsections to minimize disturbed areas and the size of soil stockpiles at any given time. Figure 3–1 presents the disposal cell sequence profile. The cell cover will be an engineered mixture of various materials. Although more detailed information is available in the Final Environmental Impact Statement, and specifics may change as the design progresses, the following information is a general description of the planned cover structure. After the tailings are placed, a compacted heavy clay borrow

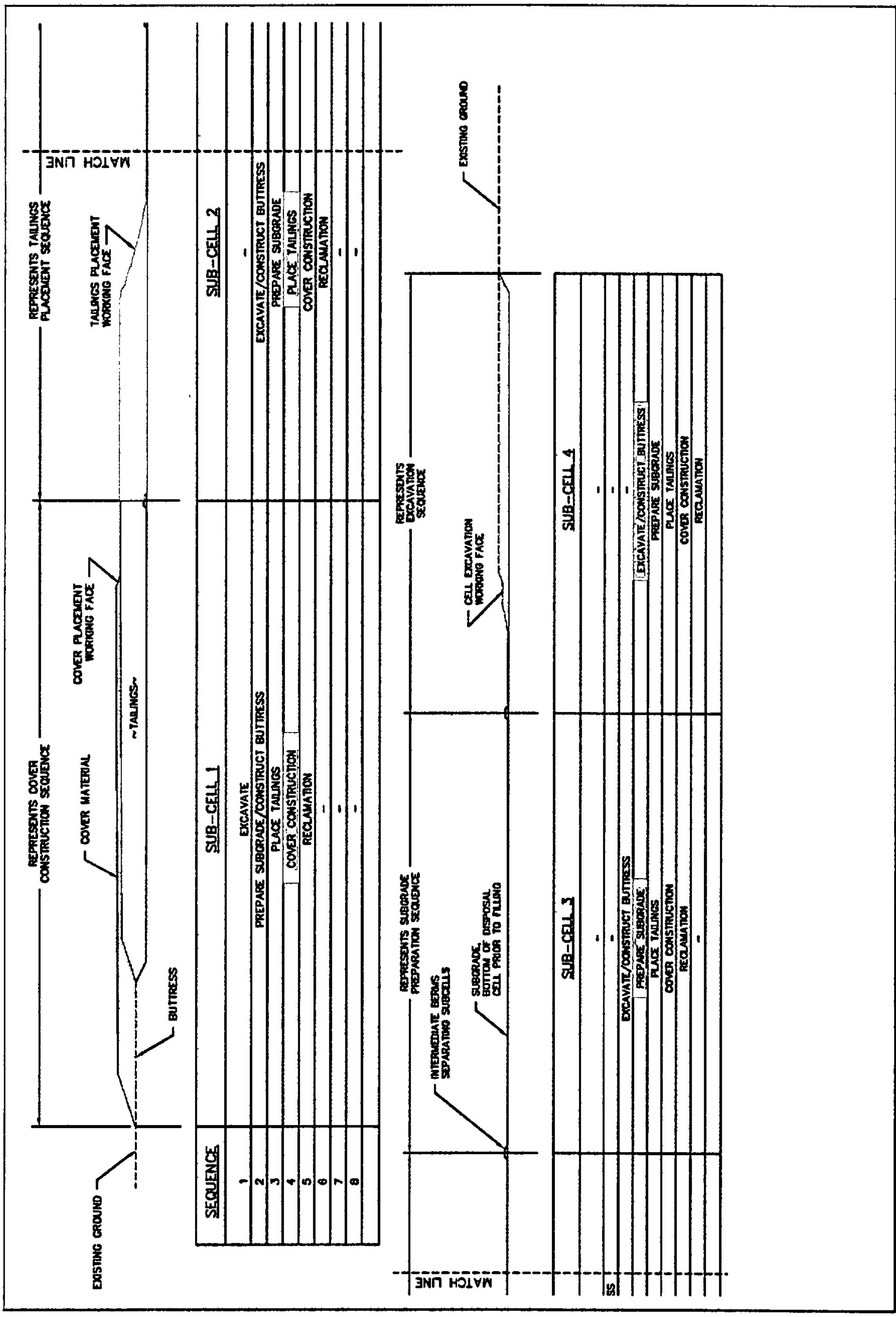

Figure 3–1. Disposal Cell Sequence Profile

layer (1.5 feet thick) will be placed over the tailings as a radon barrier. A capillary break, consisting of sand and gravel (0.5 feet thick) will be placed over the radon barrier. This would be topped with a soil water storage layer (3 feet thick on the sides; 3.5 feet thick on the top), then a vegetated layer. The vegetated layer on the top of the cell would be seeded in a 0.5-foot-thick soil/rock admixture; on the side slopes, it would consist of a 1-foot-thick rock layer with soil fill. Support structures, trailer staging areas, loadout areas, and most of the access roads will be removed and reclaimed following installation of the final section of the cover,.

Waste Management Activities—For safe storage and to prevent the spread of contaminants into the environment, petroleum-contaminated soils will be excavated and placed into a Best Management Practice Area (BMPA) along with other consolidated waste materials. Any on-site wastes requiring special handling or management will be identified and addressed by DOE's waste management policy and procedures. The BMPA will be a bermed temporary storage area that will be constructed with a polyethylene liner. Materials will be temporarily stored at this location until a permanent disposal option is defined. The construction of this area and the removal and excavation of various petroleum-contaminated soils will involve the use of heavy equipment. Moderate fugitive dust emissions can be expected from these activities.

End of current text

4.0 Description of Fugitive Dust Emission Controls On-Site

Fugitive dust emission controls to be used at the Crescent Junction Site are presented for each of the potential source areas. All sources of fugitive dust emissions at the Crescent Junction Site are related to site activities and site conditions. The routine operation of heavy equipment is not considered to be a significant source of emissions at this site because of planned mitigation measures.

4.1 High-Potential Source Areas

Certain portions of the Crescent Junction Site are considered to be potentially significant sources of fugitive dust emissions and will require more active controls than other areas. These areas are characterized by loose, poorly consolidated sediments; poor vegetative cover, and high levels of future/anticipated activity or disturbance. Because both the native soils and uranium mill tailings possess a silt/sand-like texture, these materials can easily become airborne given sufficient climatic conditions (i.e., low soil moisture content, sufficient wind speeds). Consequently, DOE has designated these areas as the highest priority in its dust control strategy. Cumulatively, these high-potential areas consist of approximately 40 percent of the total site surface area. Table 4–1 presents the specific high-potential source areas, generally associated with the disposal cell, rail/truck transfer station, and site work roads, and the planned dust controls to be implemented for each of these areas.

4.2 Moderate-Potential Source Areas

Other portions of the Crescent Junction Site are considered to be moderate sources of fugitive dust emissions and will require a less aggressive approach to dust control. These areas are characterized by more stable soil conditions, a greater percentage of vegetative cover, lesser quantities of radiologically contaminated materials, and moderate levels of activity. These areas are located mostly around the disposal cell in areas used for short-term stockpiling of excavated native material. Cumulatively, these moderate-potential areas constitute approximately 20 percent of the total site surface area. Table 4–1 presents a summary of the anticipated dust control measures to be used in these areas.

4.3 Low-Potential Source Areas

Approximately 40 percent of the site is considered to be a low-potential source for fugitive dust emissions. These areas include the trailer support area, railroad support area, main access road, construction water pond, and relatively undisturbed areas. These areas are designated as having a low potential for fugitive dust emissions because there is little continuing surface disturbances in these areas and some areas contain vegetative cover. After the initial construction and stabilization with dust palliative, gravel, or vegetation, the potential for fugitive dust is low. Minimal or no dust controls are planned for these areas (see Table 4–1).

Table 4–1. *Summary of Fugitive Dust Controls for the Crescent Junction Site*

Fugitive Dust Source		Dust Controls								
		Water Truck	**Sprinkler Irrigation**	**Vegetative Cover**	**Soil Conditioner (e.g., lignum sulfate)**	**Surfactant**	**Dust Palliative (i.e., magnesium/ calcium chloride**	**Gravel/Rock**	**Other (polymer, fiber mat, tackifier)**	**No Controls**
High Potential Areas	Active Disposal Cell	X	X				X		X	
	Rail/Truck Transfer Area	X	X				X		X	
	Tailings Pile (Inactive sites)	X	X				X		X	
	Buttress Material Area	X		X	X	X			X	
	Capped/Final Surface Area		X	X	X	X		X	X	
	Site Work Roads	X					X	X		
Moderate Potential Areas	Excavated Material Stockpile Areas	X		X	X				X	
	Utility Corridors	X		X	X				X	
Low Potential Areas	Trailer Support Area							X		
	Railroad Support Area							X		
	Main Access Road						X	X		
	Construction Water Pond and Vegetated Areas									X

4.4 Standards, Action Levels, and Response Actions

Table 4–2 presents the applicable regulatory standards and action levels relative to controlling fugitive dust emissions at the Crescent Junction Site, and the appropriate response actions to be implemented once it is determined that standards or actions levels have been exceeded.

An air particulate monitoring network has been implemented at the Crescent Junction Site in accordance with DOE Order 5400.5, *Radiation Protection of the Public and the Environment* and DOE's *Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance* (DOE 1991). Air-quality monitoring data are routinely collected and reviewed to ensure compliance with DOE orders and applicable federal and state air quality regulations. Air particulate sample locations are shown in Figure 1–3.

Table 4–2 Fugitive Dust Standards, Action Levels, and Response Actions

Standard/ Site-Specific Action Level	Method of Determination	Response Action
Opacity cannot exceed 20 percent at any on-site location or source (U.A.C. R307–309). DOE's <u>goal</u> at the site boundary is 0-percent opacity.	Visual observation by a Certified Opacity Reader (EPA Method 9, "Visual Determination of Opacity Emissions from Stationary Sources")	Initiate immediate dust control measures as outlined in Table 4–1. Cease all dust-generating activities.
Sustained wind speeds exceeding 20 miles per hour (EPA Method 9, "Visual Determination of Opacity Emissions from Stationary Sources")	Real time meteorological monitoring.	Monitor visible emissions; cease all dust-generating activities if necessary to maintain 20-percent opacity or less If needed, initiate immediate dust control measures as outlined in Table 4–1.
Cannot exceed public exposure standards (DOE Order 5400 5)	Analysis of filters collected by continuous air samplers.	Reassess Fugitive Dust Control Plan and controls

4.5 Best Management Practices

The following best management practices will also be followed to help minimize and control dust emissions at the Crescent Junction Site to the greatest extent possible:

Roads—All on-site traffic will be restricted to specific-designated roads. Off-road travel will only be authorized on a case-by-case basis (e.g., access to a remote monitoring well). The main access road will be gravel, treated with dust palliative or paved. Traffic on the active tailings pile will be restricted to designated roads to minimize disturbance of previously treated/stabilized areas. Traffic speed will also be restricted to an appropriate level on all designated roads. All designated roads will be considered as high potential dust source areas and, as such, will be a priority for dust controls using magnesium/calcium chloride, watering, or gravel.

Hours of Operation—This Plan will be in effect during all hours of operation at the Crescent Junction Site. During non-business hours, there will be no activities generating dust; therefore, dust control actions will be restricted to hours of operation only. However, as a best management practice, if high winds are evident at the close of a business day (or immediately prior to a weekend, holiday, etc.), site personnel should evaluate vulnerable areas and implement controls as appropriate to minimize off-hours emissions.

Use of Dust Palliatives or Chemical Suppressants—Various chemical dust suppressants (e.g., surfactants, salt-based soil conditioners, polymers) shall be used in accordance with the recommended end uses for those products. For temporary dust control, a polymer may be used for stabilization prior to revegetation. Site personnel shall not exceed the manufacturer recommended application rates. Material safety data sheets (MSDSs) for all dust suppressant materials used at the Crescent Junction Site shall be reviewed and approved by the Compliance and Health and Safety organizations. Prior to application, site personnel shall determine and evaluate if the use of the dust suppressant could interfere with other site monitoring activities.

5.0 Off-Site Fugitive Dust Emission Controls

To minimize the potential for off-site releases or emissions, the following controls will also be implemented:

Decontamination and Tracking Pad—Prior to leaving designated contamination areas at the Crescent Junction Site, all vehicles and equipment will be thoroughly washed and decontaminated at a decontamination pad using a high-pressure water wash. This practice should minimize the potential for any tracking of sediment or contaminants off the site.

Covered Loads—Tailings material will be transported primarily to the disposal site in sealed containers on flatbed rail cars. At the rail staging area, the containers will be transferred to haul trucks for final transport to the disposal cell. A minor portion of oversized contaminated material will be transported entirely by truck. All trucks hauling materials shall be covered with tarps to minimize the loss of materials in transit and on the site. All loads shall be inspected to ensure that they are properly covered prior to departure from both the Moab project Site and the rail staging area.

Spill Response—In the event of a spill or release of contaminated materials off site, the spilled materials will be immediately contained and cleaned up. Emergency spill response actions are outlined in Section 6.0 of the *Moab UMTRA Project Health and Safety Plan* (DOE 2006).

End of current text

6.0 References

DOE (U.S. Department of Energy), 1991. *Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance*, DOE/EH–0173T, January.

———, 2006 (continuously updated), *Moab UMTRA Project Health and Safety Plan*, DOE-EM/GJ1085-2006, Grand Junction, Colorado.

———, DOE Order 5400.1, *General Environmental Protection Program.*

———, DOE Order 231.1, *Environment, Safety, and Health Reporting.*

———, DOE Order 5400.5, *Radiation Protection of the Public and the Environment.*

NRC (U.S. Nuclear Regulatory Commission) 1999. *Final Environmental Impact Statement Related to Reclamation of the Uranium Mill Tailings at the Atlas Site, Moab, Utah*, NUREG-1531, Vol. 1, Washington, DC

Public Law 106-398, 2001. Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001.

U.A.C. (Utah Administrative Code), 2001. R307–205,: Emission Standards: Fugitive Emissions and Fugitive Dust, September, Salt Lake City, Utah.

———, R313–15–301, Standards for Protection Against Radiation, Dose Limits for Individual members of the Public, September 2001, Salt Lake City, Utah.

UMTRCA 42 *United States Code* 7912.

End of current text

Appendix A

Material Safety Data Sheets for

Dust Suppressants Used at the Crescent Junction Site

1. Calcium Chloride
2. Dust Bond
3. Envirotac II
4. Magnesium Chloride
5. Soil Seal
6. SoilTac

Material Safety Data Sheet

Revision Issued: 8/19/2003 Supercedes: 8/25/2000 First Issued: 12/01/85

Section I - Chemical Product And Company Identification

Product Name: Calcium Chloride, Liquid

CAS Number: 10043-52-4 HBCC MSDS No. CC06000

HILL BROTHERS Chemical Co.

1675 NORTH MAIN STREET • ORANGE, CALIFORNIA 92867-3499
(714) 998-8800 • FAX (714) 998-6310
http://hillbrothers.com

1675 No. Main Street, Orange, California 92867
Telephone No: 714-998-8800 | Chemtrec: 800-424-9300

Section II - Composition/Information On Ingredients

			Exposure Limits (TWAs) in Air		
Chemical Name	CAS Number	%	ACGIH TLV	OSHA PEL	STEL
Calcium Chloride	10043-52-4	24-40	N/A	N/A	N/A

Section III - Hazard Identification

Routes of Exposure: Calcium chloride can affect the body if it is ingested or if it comes in contact with the eyes or skin.

Summary of Acute Health Hazards

Ingestion: Causes irritation of mouth and stomach.

Inhalation: Causes irritation of nose and throat. Additional effects may include shortness of breath.

Skin: Causes mild irritation. Additional effects may include blisters or sores.

Eyes: Causes irritation and possible transient corneal injury. Tearing may occur.

Summary of Chronic Health Hazards: May cause perforation of the nasal septum and nosebleeds. Contact with heated product can cause thermal burns with resultant corneal injury.

Effects of Overexposure: Possible superficial burns and transient corneal injury.

Medical Conditions Generally Aggravated by Exposure: N/A

Section IV - First Aid Measures

Ingestion: If swallowed will cause nausea and vomiting. If victim is conscious, have victim drink water or milk. If victim is unconscious or having convulsions, do nothing except keep victim warm GET MEDICAL ATTENTION.

Inhalation: Move to fresh air; if discomfort persists, GET MEDICAL ATTENTION.

Skin: If necessary, remove contaminated clothing and shoes. Flush affected areas with plenty of water for at least 15 minutes.

Eyes: Promptly flood with water and continue washing for at least 15 minutes. Consult an ophthalmologist.

Section V - Fire Fighting Measures

Flash Point: Not flammable

Autoignition Temperature: Not flammable

Lower Explosive Limit: N/A

Upper Explosive Limit: N/A

Unusual Fire and Explosion Hazards: N/A

Extinguishing Media: This product is non-flammable.

Special Firefighting Procedures: Avoid breathing corrosive vapors; keep upwind. Dike area to prevent runoff and contamination of water sources.

Section VI - Accidental Release Measures

Dike the spilled liquid, and either pump back into original container or cover with clay-type substance for absorption.

Section VII - Handling and Storage

Store at ambient temperature. Prevent possible eye and skin contact by wearing protective clothing and equipment.

Section VIII - Exposure Controls/Personal Protection

Respiratory Protection: N/A
Ventilation: Use local exhaust in enclosed areas. Natural ventilation for outdoor areas.
Protective Clothing: Employees should be provided with and use impervious clothing, rubber gloves, and rubber boots.
Eye Protection: Employees should be provided with and required to use splash-proof safety goggles where there is any possibility of calcium chloride contacting the eyes.
Other Protective Clothing or Equipment: N/A
Work/Hygienic Practices: Avoid contact with the eyes, skin, and mucous membranes. Wash hands thoroughly with soap and water before eating, drinking, smoking or using toilet facilities. Do NOT place food, coffee or other drinks in the area where dusting or splashing of solutions is possible.

Section IX - Physical and Chemical Properties

Physical State: Liquid

pH: 5-9

Melting Point/Range: N/A

Boiling Point/Range: 113°C for 30% Solution; 115°C for 34.7% Solution; 118°C for 37.5% Solution

Appearance/Color/Odor: Clear to straw colored liquid, odorless

Solubility in Water: 100%

Vapor Pressure(mmHg): N/A

Specific Gravity(Water=1): 1.3 @ 60°F (for 30% Solution); 1.35 @ 60°F (for 34.7% Solution); 1.39 @ 60°F (for 37.5% Solution)

Molecular Weight: 110.99

Vapor Density(Air=1): N/A

% Volatiles: 70% for 33 Be: 65.3% for

37.4 Be; 62.5% for 40 Be

How to detect this compound : N/A

Section X - Stability and Reactivity

Stability: Stable **Hazardous Polymerization:** Will not occur

Conditions to Avoid: N/A

Materials to Avoid: Metals will slowly corrode in aqueous solutions. Keep away from galvanized iron, aluminum, and tin. Boric acid and calcium oxide are incompatible.

Hazardous Decomposition Products: If liquid completely dries from fire, thermal decomposition products may include toxic and corrosive fumes of chlorine and hydrogen chloride. Product may react with some metals (aluminum, zinc, tin, etc.) to release flammable hydrogen gas.

Section XI - Toxicological Information

N/A

Section XII - Ecological Information

N/A

Section XIII - Disposal Considerations

Add to large volume of water. Dispose of in accordance will local, state and federal regulations.

Section XIV - Transport Information

DOT Proper Shipping Name: N/A
DOT Hazard Class/ I.D. No.: N/A

Section XV - Regulatory Information

Reportable Quantity: N/A
NFPA Rating: Health - 1; Fire - 0; Reactivity - 0
0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme
Carcinogenicity Lists: No **NTP:** No **IARC Monograph:** No **OSHA Regulated:** No

Section XVI - Other Information

Synonyms/Common Names: Calcium Chloride-Liquid
Chemical Family/Type: Inorganic Salt
Sections changed since last revision: V, VIII, IX, X, XIII

IMPORTANT! Read this MSDS before use or disposal of this product. Pass along the information to employees and any other persons who could be exposed to the product to be sure that they are aware of the information before use or other exposure. This MSDS has been prepared according to the OSHA Hazard Communication Standard [29 CFR 1910.1200]. The MSDS information is based on sources believed to be reliable. However, since data, safety standards, and government regulations are subject to change and the conditions of handling and use, or misuse are beyond our control, **Hill Brothers Chemical Company** makes no warranty, either expressed or implied, with respect to the completeness or continuing accuracy of the information contained herein and disclaims all liability for reliance thereon. Also, additional information may be necessary or helpful for specific conditions and circumstances of use. It is the user's responsibility to determine the suitability of this product and to evaluate risks prior to use, and then to exercise appropriate precautions for protection of employees and others.

MATERIAL SAFETY DATA SHEET

PRODUCT NAME:

DUST BOND®

MANUFACTURER:
D & D EMULSIONS, INC.
270 PARK AVENUE EAST
P. O. BOX 1706
MANSFIELD, OH 44901

PHONE: (419) 525-4988
(419) 522-9440
FAX: (419) 522-8606

NFPA CLASSIFICATION

0 = LEAST	HEALTH	= 1
1 = SLIGHT	FIRE	= 0
2 = MODERATE	REACTIVITY	= 0
3 = HIGH		
4 = EXTREME		

SECTION I - COMPONENT DATA

CHEMICAL COMPONENTS	%WT
Petroleum Resin C.A.S.#64742-04-7 and/or 64742-11-6 and/or 64742-34-3	60+
Emulsifiers and Water	40

SECTION II - PHYSICAL DATA

CHEMICAL NAME: Petroleum hydrocarbon in water emulsion.
BOILING POINT (°F): 212°
VAPOR PRESSURE (mmHg @ 20°C): Same as Water.
VAPOR DENSITY (AIR = 1): Same as Water.
SOLUBILITY IN WATER: Readily dispersible.
SPECIFIC GRAVITY (H_2O = 1): Approx. 1.
VOLATILE (BY WT.): nil.
EVAPORATIVE RATE (WATER = 1): Same as Water.
pH INFORMATION: 4.5 - 6.5.
APPEARANCE AND ODOR: Yellow-brown color, no objectionable odor.

SECTION III - FIRE & EXPLOSION HAZARD DATA

FLASH POINT (°F): N/A
METHOD USED: C.O.C.
FLAMMABILITY LIMITS (% VOL): N/A
AUTO-IGNITION TEMPERATURE (°F): N/A
LEL: N/A UEL: N/A
EXTINGUISHING MEDIA: CO_2, Foam, Dry Chemical, Waterfog.

SPECIAL FIRE FIGHTING PROCEDURES: Dense smoke may result. Proper protective equipment including self-contained breathing apparatus should be worn.

SECTION IV - REACTIVITY DATA

STABILITY (CONDITIONS TO AVOID): Material is stable. Avoid temperature above 180°F and freezing.
INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizers such as hydrogen peroxide, bromine and chromic acid.
HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide and carbon dioxide from burning. Oxides of nitrogen and sulfur may also be produced.
HAZARDOUS POLYMERIZATION: N/A

SECTION V - HEALTH HAZARD DATA

PRIMARY ROUTE(S) OF ENTRY: Skin contact, eyes, inhalation, ingestion.
EFFECTS OF EXPOSURE:
INHALATION: Prolonged extreme exposure to high concentrations of mist may cause bronchial or lung irritation.
SKIN CONTACT: IARC has determined that base oils similar to those under the classification CAS number 64742-04-7 or 64742-11-6 or 64742-34-3 may cause carcinogenic effects in laboratory animals through direct contact with their skin for long periods of time. Our emulsified base oils, properly handled as outlined in this MSDS, are not expected to have any harmful effects to humans.
EYE CONTACT: May cause mild irritation.
INGESTION: May cause irritation of the digestive tract.

EXPOSURE LIMITS:

CHEMICAL COMPONENTS	OSHA PEL (mg/m3)	8 HOUR/TWA (mg/m3)	NTP LISTED	IARC LISTED
Oil Mist	5	.2	NO	YES

SECTION VI - EMERGENCY & FIRST-AID PROCEDURES

INHALATION: Remove exposed person to fresh air.
SKIN: Wash exposed area with soap and water.
EYES: Flush with water for 15 minutes. Call physician.
INGESTION: Call physician immediately.

SECTION VII - SPECIAL HANDLING INFORMATION

VENTILATION TYPE REQUIRED: Local if necessary to maintain allowable PEL (permissible exposure limit) or TLV (threshold limit value).
RESPIRATORY PROTECTION(specify type): Use NIOSH/MSHA certified respirator with organic vapor cartridge if vapor concentration exceeds permissible exposure limit.
PROTECTIVE GLOVES: Oil resistant.
EYE PROTECTION: Chemical safety goggles.
OTHER PROTECTIVE EQUIPMENT: None.

SECTION VIII - SPILL, LEAK & DISPOSAL PROCEDURES

ACTION TO TAKE FOR SPILLS (USE APPROPRIATE SAFETY EQUIPMENT): Absorb in vermiculite, dry sand, earth, or similar material and dispose of in accordance with Federal, State, and Local regulations.
WASTE DISPOSAL METHOD: Material is not classified as a hazardous waste.

SECTION IX - SPECIAL PRECAUTIONS:

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Avoid prolonged or repeated contact with skin or breathing of vapors, mists, or fumes. Launder contaminated clothing before reuse. Keep containers tightly closed. Avoid strong oxidizers. Eliminate all sources of ignition such as flames or sparks.

SECTION X - TRANSPORTATION DATA

D.O.T. INFORMATION: Not regulated.
HAZARDOUS MATERIAL PROPER SHIPPING NAME: N/A
HAZARD CLASS: N/A
IDENTIFICATION NUMBER: N/A
EPA HAZARDOUS WASTE NUMBER: N/A

SECTION XI - ENVIRONMENTAL/SAFETY REGULATIONS

SECTION 313 (TITLE III SUPERFUND AMENDMENT AND REAUTHORIZATION ACT): This product does not contain any chemical subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

Supersedes 02/01/01
Revised 02/01/06

Environmental Products & Applications, Inc.

PO Box 786, Gilbert, AZ 85299-0786
Phone (480) 659-4747 Fax: (480) 892-7755
Email Info@Envirotac com Website· www.envirotac com
"Protecting Our Environment From the Ground Up"

Envirotac II®

Material Safety Data Sheet (page 1/4)

Vinyl Acetate / Acrylic Copolymer

1. CHEMICAL PRODUCT AND COMPANY IDEITICATION

Envirotac II® Soil Stabilizer / Dust Palliative

MSDS Date: 3/22/00

COMPANY IDENDIFICATION Vermillion's Environmental Products & Applications, Inc. (EP&A, Inc.)
PO Box 786, Gilbert, Arizona 85299-0786

Envirotac® is a registered trademark of Vermillion's Environmental Products and Applications, Inc.

EMERGENCY TELEPHONE NUMBERS HEALTH EMERGENCY........(760) 774-8375
SPILL EMERGENCY............(760) 774-8375

2. COMPOSITION/INFORMATION ON INGREDIENTS

No.		CAS REG NO	WEIGHT (%)
1	Acrylic copolymer	Not Hazardous	39-43
2	Individual residual monomers	Not Required	<0.1
3	Aqua ammonia	1336-21-6	<1 0
4	Water 7732-18-5	57-61	

See SECTION 8, Exposure Controls / Personal Protection

3. HAZARDS IDENTIFICATION

Primary Routes of Exposure..........Inhalation, Eye Contact and Skin Contact

Inhalation Inhalation of vapor or mist can cause the following: -headache –nausea –irritation of nose, throat, and lungs

Eye Contact.......Direct contact with material can cause the following: -slight irritation

Skin Contact......Prolonged or repeated skin contact can cause the following: -slight skin irritation

4. FIRST AID MEASURES

Inhalation..........Move subject to fresh air.

Eye Contact ......Flush eyes with water. Consult a physician if irritation persists.

Skin Contact......Wash affected skin area thoroughly with soap and water. Consult a physician if irritation persists.

Ingestion...........If swallowed, give 2 glasses of water to drink. Consult a physician. Never give anything by mouth to an unconscious person.

5. FIRE FIGHTING MEASURES

Flash Point..............................Noncombustible

Auto-ignition Temperature............Not Applicable

Lower Explosive Limit..................Not Applicable

Upper Explosive Limit..................Not Applicable

Unusual Hazards..........................Material can splatter above 100C/212F. Dried product can burn.

Extinguishing Agents ....Use extinguishing media appropriate for surrounding fire.

Personal Protective Equipment......Wear self-contained berating apparatus (pressure-demand NIOSH approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal Protection.....Appropriate protective equipment must be worn when handling a spill of this material. See SECTION 8, Exposure Controls/Personal Protection, for recommendations. If exposed to material during clean-up operations, see SECTION 4, First Aid Measures, for actions to follow.

Procedures ....Keep spectators away. Floor may be slippery; use care to avoid falling. Contain spills immediately with inert materials (e.q. sand, earth). Transfer liquids and solid diking material to separate suitable containers for recovery or disposal.

CAUTION Keep spills and cleaning runoff our of municipal sewers and open bodies of water.

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Material Safety Data Sheet (page 2/4)

7. HANDLING AND STORAGE

Storage Conditions..........Keep from freezing; material may coagulate. The minimum recommended storage temperature for this material is 1C/34F. The maximum recommended storage temperature for this material is 49C/120F.

Handling Procedures........Monomer vapors can be evolved when material is heated during processing operations. See SECTION 8, Exposure Controls/Personal Protection, for types of ventilation required.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limit Information

No.		CAS REG NO	WEIGHT (%)
1	Acrylic copolymer	Not Hazardous	39-43
2	Individual residual monomers	Not Required	<0.1
3	Aqua ammonia	1336-21-6	<1.0
4	Water	7732-18-5	57-61

Comp.		EP&A, Inc.		OSHA		ACGIH	
No.	Units	TWA	STEL	TWA	STEL	TWA	STEL
1		None	None	None	None	None	None
2		a	a	a	a	a	a
3	ppm	25 b	35 b	None	35 b	25 b	35 b
4		None	None	None	None	None	None

a... Not Required
b... As Ammonia

Respiratory Protection....................A respiratory protection program meeting OSHA 1910.134 and ANSI Z88.2 requirements or equivalent must be followed whenever workplace conditions warrant a respirator's use. None required if airborne concentrations are maintained below the exposure limit listed in 'Exposure Limit Information'. For airborne concentrations up to 10 times the exposure limit, wear a properly fitted NIOSH approved (or equivalent) half-mask, air-purifying respirator. Air purifying respirators should be equipped with NIOSH approved (or equivalent) ammonia/methylamine cartridges and N95 filters. If oil mist is present, use R95 or P95 filters.

Eye Protection..............................Use safety glasses with side shields (ANSI Z87.1 or approved equivalent). Eye protection worn must be compatible with respiratory protection system employed.

Hand Protection............................The glove(s) listed below may provide protection against permeation. Gloves of other chemically resistant materials may not provide adequate protection: - Neoprene

Engineering Controls (Ventilation)...Use Local exhaust ventilation with a minimum capture velocity of 100 ft/min. (0.5 m/sec.) at the point of vapor evolution. Refer to the current edition of Industrial Ventilation: A Manual of Recommended Practice published by the American Conference of Governmental Industrial Hygienists for Information on the design, installation, use, and maintenance of exhaust systems.

Other Protective Equipment:...........Facilities storing or utilizing this material should be equipped with an eyewash facility.

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Material Safety Data Sheet (page 3/4)

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance........................Milky
Color..............................White
State..............................Liquid
Odor Characteristic..............Ammonia odor
PH.................................5.0 to 9.5
Viscosity..........................1500 CPS Maximum
Specific Gravity (Water = 1)....1.0 to 1.2
Vapor Density (Air = 1)..........<1 Water
Vapor Pressure....................17 mm Hg @ 20°C/68°F Water
Melting Point......................0°C/32°F Water
Boiling Point.......................100°C/212°F Water
Solubility in Water...............Dilatable
Percent Volatility.................57to 61% Water
Evaporation Rate (Bac = 1).......<1 Water

The physical and chemical data given in Section 9 are typical values for this product and are not intended to be product specifications.

See Section 5, Fire Fighting Measures

10. STABILITY AND REACTIVITY

Instability..............................This material is considered stable. However, avoid temperatures above 177C/350F, the onset of polymer decomposition. Thermal decomposition is dependent on time and temperature

Hazardous Decomposition Products....Thermal decomposition may yield acrylic monomers.

Hazardous Polymerization...............Product will not undergo polymerization.

Incompatibility..........................There are no known materials which are incompatible with this product.

11. TOXICOLOGICAL INFORMATION

Acute Data No Toxicity data are available for this material.
The information shown in SECTION 3, Hazards Identification, is based on the toxicity profiles for a number of acrylic emulsions that are compositionally similar to this product. Typical data are·

Oral LD50..........rat.......>5000 mg/kg
Dermal LD.........rabbit....>5000 mg/kg
Skin irritation.....rabbit....practically non-irrupting
Eye irritation......rabbit....inconsequential irrational

12. ECOLOGICAL INFORMATION

No Applicable Data

13. DISPOSAL CONSIDERATIONS

Procedure Coagulate the emulsion by the stepwise addition of ferric chloride and lime. Remove the clear supernatant and flush to a chemical sewer.

Landfill or incinerate remaining solids in accordance with local, state and federal regulations.

14. TRANSPORT INFORMATION

US DOT Hazard Class.....NONREGULATED

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Material Safety Data Sheet (page 4/4)

15. REGULATORY INFORMATION

Workplace Classification...This product is considered non-hazardous under the OSHA Hazard Communication Standard (29CFR 1910.1200).

This product is not a 'controlled product' under the Canadian Workplace Hazardous Materials Information System (WHMIS).

SARA TITLE 3: Section 311/312 Categorizations (40CFR 370)..........This product is not a hazardous chemical under 29CFR 1910.1200, and therefore is not covered by Title III of SARA

SARA TITLE 3: Section 313 Information (40CRF 372)..........This product does not contain a chemical which is listed in Section 313 at or above de minimis concentrations.

CERCLA Information (40CFR 302.4)..........Releases of this material to air, land, or water are not reportable to the National Response Center under the Comprehensive Environmental Response, Compensation, Liability Act (CERCLA) or to state and local emergency planning committees under the Superfund Amendments and Reauthorization Act (SARA) Title III Section 304.

Waste Classification..........When a decision is made to discard this material as supplied, it does not meet RCRA's characteristic definition of ignitability, corrosively, or reactivity, and is not listed in 40 CFR 261.33. The toxicity characteristic (TC), however, has not been evaluated by the Toxicity Characteristic Leaching Procedure (TCLP).

United States......All components of this product are in compliance with the inventory listing requirements of the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

Pennsylvania......Any material listed as "Not Hazardous" in the CAS REG NO column of SECTION 2, Composition/Information On Ingredients, of this MSDS is a trade secret under the provisions of the Pennsylvania Worker and Community Right-to-Know Act.

16. OTHER INFORMATION

HMIS Hazard Ratings......HEALTH = 1, FLAMMABILITY = 0, REACTIVITY = 0.
PERSONAL PROTECTION: See Section 8, Exposure Controls/Personal Protection for recommended handling of material as supplied; check with supervisor for your actual use condition.
Scale: 0 = Minimal, 1 = Slight, 2 = Moderate, 3 = Serious, 4 = Severe
* = Chronic Effects (See Section 3, Hazards Identification)
HMIS is a registered trademark of the National Paint and Coatings Association.

ABBREVIATIONS		
	ACGIH	American Conference of Governmental Industrial Hygienists
	OSHA	Occupational Safety and Health Administration
	TLV	Threshold Limit Value
	PEL	Permissible Exposure Limit
	TWA	Time Weighted Average
	STEL	Short-Term Exposure Limit
	BAc	Butyl acetate
	|	Bar denotes a revision from previous MSDS in this area

MSDS Number: **M0156** * * * * * *Effective Date: 11/04/04* * * * * * *Supercedes: 03/28/02*

MSDS *Material Safety Data Sheet*

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

MAGNESIUM CHLORIDE

1. Product Identification

Synonyms: Magnesium chloride, hexahydrate; Magnesium chloride, 6-hydrate, crystal
CAS No.: 7786-30-3 (Anhydrous); 7791-18-6 (Hexahydrate)
Molecular Weight: 203.30
Chemical Formula: $MgCl_2\ 6H_2O$
Product Codes:
J.T. Baker: 2444, 2448, 2449, 2450, 4003, 5183
Mallinckrodt: 12131, 5910, 5933, 5954, 5956, 5958, 5960, 7550, 7791

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Magnesium Chloride	7786-30-3	98 - 100%	Yes

3. Hazards Identification

Emergency Overview

CAUTION! MAY BE HARMFUL IF SWALLOWED.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 1 - Slight
Flammability Rating: 0 - None
Reactivity Rating: 1 - Slight
Contact Rating: 1 - Slight
Lab Protective Equip: GOGGLES; LAB COAT; PROPER GLOVES
Storage Color Code: Green (General Storage)

Potential Health Effects

Inhalation:
Inhalation of dust may cause mild irritation to the mucous membranes.
Ingestion:
Since magnesium salts are slowly absorbed, abdominal pain, vomiting and diarrhea may be the only symptoms. However, if elimination is blocked by bowel blockage or other reasons, CNS depression, lack of reflexes, hypocalcemia (deficiency of calcium in the blood) may occur.
Skin Contact:
No adverse effects expected but may cause minor skin irritation.
Eye Contact:
No adverse effects expected but dust may cause mechanical irritation.
Chronic Exposure:
No information found.
Aggravation of Pre-existing Conditions:
No information found.

---

4. First Aid Measures

Inhalation:
Remove to fresh air. Get medical attention for any breathing difficulty.
Ingestion:
Give several glasses of water to drink to dilute. If large amounts were swallowed, get medical advice.
Skin Contact:
Remove any contaminated clothing. Wash skin with soap and water for at least 15 minutes. Get medical attention if irritation develops or persists.
Eye Contact:
Wash thoroughly with running water. Get medical advice if irritation develops.

Note to Physician:
IV administration of calcium gluconate will partially reverse the effects of acute magnesium toxicity. Ventricular support with calcium chloride infusion and mannitol forced diuresis has also been successful.

5. Fire Fighting Measures

Fire:
Not considered to be a fire hazard.
Explosion:
Not considered to be an explosion hazard. At room temperature the addition of magnesium chloride to furan-2-peroxycarboxylic acid, will cause the acid to explode.
Fire Extinguishing Media:
Use any means suitable for extinguishing surrounding fire.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from incompatible substances. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
None established.
Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
Personal Respirators (NIOSH Approved):
For conditions of use where exposure to dust or mist is apparent and engineering controls are not feasible, a particulate respirator (NIOSH type N95 or better filters) may be worn. If

oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:
Wear protective gloves and clean body-covering clothing.

Eye Protection:
Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

---

9. Physical and Chemical Properties

Appearance:
Colorless flakes or crystals.

Odor:
Odorless.

Solubility:
167g/100ml water @ 20C (68F)

Density:
1.57

pH:
5% in water is neutral to litmus.

% Volatiles by volume @ 21C (70F):
0

Boiling Point:
Not applicable.

Melting Point:
118C (244F)

Vapor Density (Air=1):
No information found.

Vapor Pressure (mm Hg):
No information found.

Evaporation Rate (BuAc=1):
No information found.

---

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage. By strong ignition is converted into oxychloride.

Hazardous Decomposition Products:
When heated to decomposition it emits corrosive hydrochloric acid vapor. When heated to temperatures above 300C (572F) it emits toxic fumes of chlorine gas.

Hazardous Polymerization:
Will not occur.

Incompatibilities:

makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.

****

Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

SOIL STABILIZATION PRODUCTS COMPANY, IN
P.O. Box 2779, Merced, CA 95:
Phone: (209) 383-3296 or (800) 523-9:
Fax: (209) 383-7849 E-mail: info@sspco.c
Environmentally Appropriate Product Technologi
for Pavements, Dust Control, Erosion Control & Soil Stabilizati

SSPCo
A Registered Trademark of Soil Stabilization Products Co., Inc

MATERIAL SAFETY DATA SHEET
SOIL SEAL® CONCENTRATE

I. PRODUCT IDENTIFICATION

PRODUCT OR TRADE NAME:	SOIL SEAL® Concentrate
INFORMATION FURNISHED BY:	Soil Stabilization Products Company, Inc
ADDRESS:	P.O. Box 2779, Merced, CA 95344
DATE PREPARED:	January 9, 2006
EMERGENCY PHONE #:	(800) 523-9992 or (209) 383-3296
Chemical Family	Acrylic Polymer product in water
DOT Shipping Name	Acrylic Polymer product in water
DOT Status	Not regulated

II. OSHA REGULATED INGREDIENTS

Ingredients	CAS#	OSHA PEL	ACGIH TLV	Approx. % by Wt
ACRYLIC POLYMER	Non Haz	NE	NE	46-48%
WATER	Non Haz	NE	NE	54-52%
AMMONIA	7664-41-7	NE	25 ppm	0.2% Max

NOTE: See section XII for other regulatory information

III. PRECAUTIONARY INFORMATION

- Product is not considered hazardous under normal conditions.
- Direct contact of product with eyes can cause irritation.
- Prolonged or repeated contact with skin may cause irritation.

IV. EMERGENCY and FIRST AID PROCEDURES

Eye Contact	Flush eyes immediately with water for at least 15 minutes. Consult a physician if irritati persists.
Skin Contact	Wash affected skin areas with soap and water. Wash contaminated clothing before reuse.
Inhalation	Move subject to fresh air.
Ingestion	If swallowed, dilute by giving 2 glasses of water to drink. See a physician. Never give anythir by mouth to an unconscious person.
Fire	Product is non-flammable in the liquid state. Use water spray, foam, dry chemical of carbo dioxide on dried product.
Spill	Collect and remove using inert absorbent. Contain spill entering sewers. Notify appropriat agencies

V. PHYSICAL CHARACTERISTICS

Physical State	Milky liquid
Boiling Point	>200° F
Weight per gallon	8.85 lbs./gal.
Solubility in Water	Dilutable

VI. PERSONAL PROTECTION EQUIPMENT

Eyes	Wear chemical safety goggles to reduce the potential for eye contact. Eye wash fountain should be availabl
Skin	Use impermeable chemical gloves and wear appropriate protective clothing. Launder contaminated clothi before reuse.
Respiratory	Respiratory protection is not normally required. Use NIOSH/MSHA approved respirator if conditions warrar
Ventilation	Standard industrial ventilation is recommended.

VII. FIRE PROTECTION

Flash Point	Non-flammable
Extinguishing media.	Non-flammable in Liquid state. Use water spray, foam, dry chemical or carbon dioxi on dried product.
Unusual Fire and Explosion Hazard	Personnel exposed to product of combustion should wear self-contained breathi apparatus and full protective equipment. Containers exposed in a fire should be coole with water to prevent vapor pressure buildup leading to a rupture.

VIII. REACTIVITY INFORMATION

Stability	Stable under normal conditions
Incompatibility	Not Established
Hazardous Decomposition	Combustion of the dried product can give off oxides of carbon and nitrogen.
Hazardous Polymerization	Will not occur.

IX. EFFECT OF OVEREXPOSURE

Eyes	Eye contact with liquid may cause irritation.
Skin	Repeated or prolonged skin contact with liquid may cause irritation.
Inhalation	No expected effects.
Chronic	No anticipated effects. This product does not contained regulated levels of NTP, IARC or OSHA liste carcinogens.

Existing Health Conditions Affected by Exposure - No know effects on other illnesses.

X. SPILL and DISPOSAL INFORMATION

Small Spills — Should be contained using absorbent material, such as clay, soil or any commercially available absorbent.

Large Spills — Should be diked to prevent further movement and reclaim into recovery of salvage drums for disposal.

Disposal — This product does not meet the definition of hazardous waste under the U. S. EPA Hazardous Waste Regulations 40 CFR 261. Consult your state or local authorities for proper disposal in the event more restrictive requirements apply.

XI. STORAGE Protect from freezing - product stability may be affected.

XII. REGULATORY INFORMATION

TOSCA — This product meets the compositional requirements of the Toxic Substances Control Act and contains only chemical ingredients that are listed on the TOSCA inventory.

SARA Title III, Sec. 313 — This product does not contain toxic chemical(s) at or above the de minimus concentrations subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986(SARA) and 40 CFR part 372.

SOILWORKS, LLC
681 N Monterey St., #101
Gilbert, Arizona 85233
Phone (800) 545-5420 Fax (480) 545-5456
www Soiltac com Info@Soiltac.com

SOILTAC®
Soil Stabilizer & Dust Control Agent

MATERIAL SAFETY DATA SHEET

SECTION 1 - MATERIAL IDENTIFICATION

PRODUCT NAME	**SOILTAC*** *SOILTAC is a registered trademark of Soilworks, LLC
MANUFACTURER	Soilworks, LLC 681 North Monterey Street, Suite 101 Gilbert, Arizona 85233-8318 USA www soilworks com
TELEPHONE NUMBER	800-545-5420
ONLINE INFORMATION	www Soiltac com
EMERGENCY TELEPHONE NUMBERS	800-545-5420 (National & International)
REVISION DATE	March 2006

EMERGENCY OVERVIEW

PHYSICAL FORM	Mobile liquid
COLOR	White (transparent once cured)
ODOR	Mild
HAZARDS	There are no known health hazards
EXTINGUISHING MEDIA	The product will only burn after the water it contains is driven off
C.A.S. CHEMICAL NAME	Mixture
SYNONYMS	Soil stabilizer, soil stabilization agent, soil solidifier, soil amendment, soil additive, soil crusting agent, dust control agent, dust inhibitor, dust palliative, dust suppressant, dust retardant
CHEMICAL FAMILY	Vinyl Acetate Copolymer Emulsion
EMPIRICAL FORMULA	Mixture
INTENDED USE	Soil stabilization, soil solidification, fugitive dust control, dust suppression, dust abatement, tackifier, dust abatement, PM_{10} and $PM_{2.5}$ air quality control and erosion control
REVISION NOTES	None

SECTION 2 - INGREDIENTS

	%	CAS Number and Chemical Name
1	50-65	Vinyl Acetate Copolymer
2	50-35	7732-18-5 Water
3	< 0 5	108-05-04 Vinyl Acetate Monomer

The composition is a trade secret Contains no other components or impurities which will influence the classification of the product

SECTION 3 - HEALTH HAZARDS

ROUTES OF EXPOSURE

Eye Contact
Skin Contact
Ingestion
Inhalation

EXPOSURE STANDARDS

See Section 2 for exposure standards on ingredients. Maintain air contaminant concentrations in the workplace at the lowest feasible levels Minor components will migrate into the container headspace Levels in excess of the TLV's or PEL's can accumulate in non-vented container headspaces Open drums in a well ventilated space The principal volatile component is water Minor volatile components are identified in Section 2 "Ingredients"

HEALTH HAZARDS

There are no known health hazards

TARGET ORGANS

None known

SIGNS AND SYMPTOMS OF EXPOSURE (Acute effects)

There are no known signs or symptoms of exposure

SIGNS AND SYMPTOMS OF EXPOSURE (Possible Longer Term Effects)

No known effects

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE

None known

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SECTION 4 - FIRST AID

EYE CONTACT

Rinse immediately with plenty of water

SKIN CONTACT

Remove contaminated clothing and shoes Wash affected area with soap and water

INHALATION

Move patient to fresh air. If breathing has stopped or is labored give assisted respiration (e g mouth-to-mouth). Supplemental oxygen may be indicated Seek medical advice Prevent aspiration of vomit Turn victim's head to the side

INGESTION

If swallowed, call a physician immediately Remove stomach contents by gastric suction or induce vomiting only as directed by medical personnel Never give anything by mouth to an unconscious person

SECTION 5 - FIRE AND EXPLOSION DATA

FLASH POINT (closed cup)	No Data
UPPER EXPLOSION LIMIT (UEL)	No Data
LOWER EXPLOSION LIMIT (LEL)	No Data
AUTOIGNITION TEMPERATURE	No Data
FIRE HAZARD CLASSIFICATION (OSHA/NFPA)	Non-Combustible

EXTINGUISHING MEDIA

The product will only burn after the water it contains is driven off For dry polymer use water or carbon dioxide Product does not burn Aqueous solution is not flammable

SPECIAL FIRE FIGHTING PROCEDURES

No special procedures required The product, as distributed, is noncombustible

UNUSUAL FIRE AND EXPLOSION HAZARDS

When dried polymer burns, water (H_2O), carbon dioxide (CO_2), carbon monoxide (CO) and smoke are produced

SECTION 6 - ACCIDENTAL RELEASE MEASURES

CONTAINMENT TECHNIQUES (Removal of ignition sources, diking etc)

Stop the leak, if possible Ventilate the space involved

CLEAN-UP PROCEDURES

Wear suitable protective equipment If recovery is not feasible, admix with dry soil, sand or non-reactive absorbent and place in an appropriate chemical waste container Transfer to containers by suction, preparatory for later disposal Place in metal containers for recovery or disposal Flush area with water spray. Wash contaminated property (e g , automobiles) quickly before the material dries For large spills, recover spilled material with a vacuum truck.

OTHER EMERGENCY ADVICE

Spilled polymer emulsion is very slippery Use care to avoid falls A film will form on drying Remove saturated clothing and wash contacted skin area with soap and water. Product imparts a milky white color to contaminated waters Foaming may result. Sewage treatment plants may not be able to remove the white color imparted to the water

SECTION 7 - HANDLING AND STORAGE

STORAGE

Keep away from oxidizers Avoid freezing temperatures during storage
Minimize contact with atmospheric air to prevent inoculation with microorganisms

HANDLING

Use only in well-ventilated areas Avoid contact with eyes Avoid breathing vapors Avoid contact with skin When using, do not eat, drink or smoke

OTHER PRECAUTIONS

No special precautions required.

SECTION 8 - PERSONAL PROTECTION / EXPOSURE CONTROLS

EYE PROTECTION

Chemical safety glasses

HAND PROTECTION

Rubber Gloves. The breakthrough time of the selected glove(s) must be greater than the intended use period

RESPIRATORY PROTECTION

Not required under normal use

PROTECTIVE CLOTHING

No specific recommendation

ENGINEERING CONTROLS

Maintain air concentrations in work spaces in accord with standards outlined in Sections 2 and 3.

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WORK AND HYGIENIC PRACTICES

Minor components will migrate into the container headspace Levels in excess of the exposure limits can accumulate in non-vented container headspaces Under normal conditions of use in a well-ventilated space, the concentration of minor components in the workplace air will not exceed the exposure limits.

SECTION 9 - TYPICAL PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL FORM	Mobile liquid
COLOR	White (transparent once cured)
ODOR	Mild
pH	4 0-6 0
VAPOR PRESSURE	18 65 (mm Hg at 21°C (70°F))
VAPOR DENSITY (Air = 1)	Of water vapor
BOILING POINT	>100 00°C (>212 00°F)
SOLUBILITY IN WATER	Completely (100%) (until cured)
SPECIFIC GRAVITY (Water = 1)	1.04-1 10
MOLECULAR WEIGHT	Mixture

SECTION 10 - STABILITY AND REACTIVITY

CHEMICAL STABILITY

Stable at ambient temperatures Coagulation may occur following freezing, thawing or boiling

CONDITIONS TO AVOID (if unstable)

Not applicable

INCOMPATIBILITY (Materials to Avoid)

Mineral acids (i e sulfuric, phosphoric, etc) Alkalis (i e Sodium or Potassium Hydroxide etc.)

HAZARDOUS DECOMPOSITION PRODUCTS (from burning, heating, or reaction with other materials).

Depending upon formulation conditions (such as pH>7), the level of acetaldehyde may increase as a result of hydrolysis of residual vinyl acetate monomer Carbon Monoxide in a fire Carbon Dioxide in a fire Aldehydes Acetic Acid

HAZARDOUS POLYMERIZATION

Will not occur

CONDITIONS TO AVOID (if polymerization may occur)

Not applicable

SECTION 11 - TOXICOLOGICAL PROPERTIES

ACUTE ORAL TOXICITY

No Data

ACUTE DERMAL TOXICITY

No Data

ACUTE INHALATION TOXICITY

No Data

Components Vinyl Acetate Monomer LC50 (1 h) 5,656 ppm Species· Rat

OTHER ACUTE EFFECTS

No Data

CHRONIC/SUBCHRONIC DATA

This product contains small amounts of vinyl acetate monomer ACGIH evaluated vinyl acetate (1993) as an A3 Animal Carcinogen Available evidence suggests that the agent is not likely to cause cancer in humans except under uncommon or unlikely routes of exposure The International Agency for Research on Cancer (IARC) published a monograph on vinyl acetate (1995) In this monograph IARC indicates "there is inadequate evidence in humans for carcinogenicity of vinyl acetate. There is limited evidence in experimental animals for carcinogenicity of vinyl acetate " Normally, this lack of conclusive evidence would place a substance in the IARC Category 3 classification (Not classified as a human carcinogen) However, because vinyl acetate is metabolized to acetaldehyde, which has an IARC 2 B (Possibly carcinogenic to humans) classification, it also has been listed under Category 2B

SECTION 12 - ECOLOGICAL INFORMATION

ECOTOXICITY

Common Name	Species	Test	Result	Concentration
Green Algae	Raphidocelus Subcapitata	96-hr chronic LC50	>1,000	Undiluted
Fathead Minnow	Pimephales Promelas	96-hr acute LC50	>1,208	Undiluted
Rainbow Trout	Oncorhynchus Mykiss	96-hr acute LC50	>1,000	Undiluted

ENVIRONMENTAL FATE

No Data

ADDITIONAL INFORMATION

No Data

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SECTION 13 - DISPOSAL CONSIDERATIONS

WASTE DISPOSAL

Comply with all Federal, State and Local Regulations For small quantities (less than 100 gallons) Disposal to municipal or industrial wastewater treatment plants is normally acceptable Obtain approval from these authorities before disposal The product does impart a white, milky color to water, which may not be removed or sufficiently diluted by the treatment facility The product may also cause foaming when agitated The product can be chemically or biologically degraded. For large quantities Disposal through licensed waste disposal facilities is suggested The product can be incinerated, though chemical or biological treatment is sufficient Chemical precipitation/coagulation can be used to facilitate removal of solids (consult manufacturer for detailed procedure) NOTE As supplied or diluted, product material (foam included), when splashed on automobiles or other personal property, is difficult to remove if allowed to dry

SECTION 14 - TRANSPORT INFORMATION

DOT NON-BULK SHIPPING NAME	Refer to Bill of Lading - Not DOT Regulated // Keep From Freezing // Not dangerous goods
DOT BULK SHIPPING NAME	Refer to Bill of Lading
IMO SHIPPING DATA	Refer to Bill of Lading
ICAO/IATA SHIPPING DATA	Refer to Bill of Lading - Not IATA Regulated // Keep From Freezing // Not dangerous goods
CFR	Not Regulated // Keep From Freezing // Not dangerous goods
IMDG	Not Regulated // Keep From Freezing // Not dangerous goods
CTC	Not Regulated // Keep From Freezing // Not dangerous goods

SECTION 15 - REGULATORY INFORMATION

TOXIC SUBSTANCES CONTROL ACT (TSCA)-

All components are included in the EPA Toxic Substances Control Act (TSCA) Chemical Substance Inventory

TOXIC SUBSTANCE CONTROL ACT (TSCA) 12(b) COMPONENT(S)

None

OSHA Hazard Communication Standard (29CFR1910.1200) hazard class(es)

None

EPA SARA Title III Section 312 (40CFR370) hazard class

None

EPA SARA Title III Section 313 (40CFR372) toxic chemicals above "de minimis" level are

Vinyl Acetate Monomer

US. California Safe Drinking Water & Toxic Enforcement Act (Proposition 65)

WARNING! This product contains a chemical known in the State of California to cause cancer Acetaldehyde

WHMIS HAZARD CLASSIFICATION

None

WHMIS INGREDIENT DISCLOSURE LIST

None

WHMIS SYMBOLS

None

EINECS / ELINCS MASTER INVENTORY (EU)

Included on EINECS inventory or polymer substance, monomers included on EINECS inventory or no longer polymer

DSL (Canada)

Included on inventory

AICS (Australia)

Included on inventory

ENCS (Japan)

Included on inventory

ECL (South Korea)

Included on inventory

SEPA (China)

Included on inventory

SECTION 16 – OTHER INFORMATION

HMIS Rating

Health	1
Flammability	0
Physical Hazard	0

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"DRC-2013-003353"

RECEIVED
OCT 24 2013
Division of Radiation Control

October 21, 2013

To: Rusty Lundberg, Utah Division Radiation Control

From: Jim Kuipers P.E., Kuipers & Associates

Re: **Comments regarding Utah Division of Radiation Control's Proposed Licensing Action to Amend State of Utah Radioactive Material License No. UT 1900479 to Authorize the Receipt and Processing of Alternate Feed Material from Dawn Mining Corporation's Midnite Mine.**

The following comments are submitted on behalf of the Grand Canyon Trust ("Trust") based on my review of the Utah Division of Radiation Control's ("Utah DRC") Proposed Licensing Action to Amend State of Utah Radioactive Material License No. UT 1900479 to Authorize the Receipt and Processing of Alternate Feed Material from Dawn Mining Corporation's Midnite Mine. The comments are focused on the issue of the control of fugitive dust resulting from the receipt, storage, and processing of the alternate feed material at the White Mesa Mill ("Mill"). I support the comments filed by Grand Canyon Trust, and submit additional comments as set out below. My qualifications to evaluate the proposed licensing action are documented in my resume submitted as Appendix A.

The following comments are based on over 30 years of professional experience in the mining and mineral processing industry as well as mining environmental practice. In particular I have been involved in the design, implementation, operation and maintenance of fugitive dust control measures at numerous mine/mill and water treatment sites throughout the western U.S. including in Utah. I have been involved in the development of best management practices related to dust control at Superfund sites such as the Anaconda Smelter Superfund Site in Montana and am currently involved on behalf of several governmental organizations in the development of dust control guidance for hardrock mining and mineral processing sites.

These comments take the following approach to analyzing the adequacy of the proposed license amendment: 1) Background on the proposed licensing action; 2) explanation of the public and environmental health threats posed by fugitive dust from the alternate feed material from the Midnite Mine site; 3) examples of best management practices for fugitive dust control; 4) an evaluation and recommendation is made to assist Utah DRC to craft license conditions that are adequately protective of public and environmental health.

I. Background

Based on the *Affidavit of Robert Nelson* dated 13 October, 2010, Dawn Mining Corporation is proposing to ship waste products from a Water Treatment Plant (WTP) located at their Wellpinit, Washington facility. The WTP treats uranium contaminated mine water using a pH adjustment process using hydrated lime which results in a precipitate or waste stream that contains radium-226. Dawn Mining proposes to ship the waste stream to the White Mesa Mill near Blanding, Utah for processing as alternate feed materials.

According to *UTAH DIVISION OF RADIATION CONTROL, RADIOACTIVE MATERIALS LICENSE, SUPPLEMENTARY SHEET, License #UT1900479, Amendment # 056* (License) the White Mesa Mill is required to perform the following actions relative to fugitive dust which might be generated from receiving, storage and processing of the proposed waste materials:

10.20 ... The Licensee is authorized to receive no more than 1,000 tons per year and a total limit of 4,500 tons (dry weight)...

A. (1) Dawn Mining Uranium Material stored (stockpiled) at the Mill Site longer than 14 days shall be covered with a durable geomembrane cover resistant to damage by ultraviolet (UV) radiation and sufficient ballast shall be placed over the cover to prevent wind uplift of the cover during peak wind conditions at the site; and

(2) If at any time, visible dust is observed to be originating from Uranium Material stored on site, the EFRI RSO or his or her authorized representative shall take actions within 30 minutes to stop the generation of visible dust."

License Conditions 10.20 (A)(1) and (A)(2) do not adequately protect public and environmental health from the fugitive dust hazards posed by the alternate feed from the Midnite Mine site. Contrary to the Utah Radiation Control Rules, Utah DRC does not institute fugitive dust controls adequate to meet the "as low as reasonably achievable" occupational dose standard mandated in the Utah Admin. Code. Utah Admin. Code R313-15-101(2). These comments will demonstrate that there are recognized best management practices (BMPs) that Utah DRC should consider as "reasonably achievable" in use at other sites. Utah DRC could and should mandate the use of the technology referenced in these comments to control fugitive dust resulting from the Midnite Mine alternate feed material at the Mill as part of its duty to in order to adequately protect public and environmental health. *See* Utah Admin. Code R313-12-2. (The general purpose of the radiation rules is "to ensure maximum protection of the public health and safety to all persons at, or in the vicinity of, the place of use, storage, or disposal."); Utah Admin. Code R313-22-33 (Director shall approve an amendment to a radioactive material license if "the Director determines that... (b) the applicant's proposed equipment, facilities, and procedures are adequate to minimize danger to public health and safety or the environment. (standards applied to license amendments by Utah Admin. Code R313-22-39)).

II. Hazards Posed by Fugitive Dust From the Midnite Mine Alternate Feed Material

As the Utah Division Radiation Control is well aware, fugitive dust represents a significant impact both to public health and to general public welfare in the following ways:

- Threatens physical injury to the public with chronic lung disease, asthma and other lung related illness;
- Significant detriment, nuisance or annoyance to the public;
- Cause injury or damage to business or property;
- Create hazardous conditions on public right of ways; and
- Cause blight and impairment of property values and development opportunity.

While it is not the focus of our area of expertise, we have a great deal of knowledge with respect to the undesirable nature of fugitive dust from a public health and socio-economic impact standpoint, as well as its mitigation from an engineering and regulatory standpoint.

III. Fugitive Dust Control Plans Currently Utilized at Other Sites

The primary area of concern relates to the nature of the waste stream and the implementation of best management practices (BMPs) related to the proper receiving, storage and disposal of the waste materials. Although no specific information is provided in the License, WTP waste streams from lime precipitation processes are typically highly amorphous (e.g. water containing) and consist of extremely fine grained precipitates and water in varying proportions. Unfiltered or settled WTP waste streams from similar processes typically contain <5% solids, while settled waste streams contain up to 20% solids, and filtered waste streams may contain up to 80% solids.

The licensee should be required to provide additional information as to the nature of the waste materials to be received. Although 1,000 tons per year of dry solids may not appear to be a significant amount of material, if the waste stream were unfiltered and shipped in 55 gallon drums at 5% solids approximately 14,545 barrels would be shipped and stored. With 50% solids more than 1,455 barrels would still require shipment and storage as well as proper disposal. The License, in requiring in 10.20 A. (1) that material stored or stockpiled be covered with a durable geomembrane cover, gives the impression that the material may be received in trucks or containers and dumped at the site. The License should more specifically identify the types of materials to be received (e.g. unfiltered, settled or filtered waste materials), the percentage of dry contents, and the nature of the shipping containers or methods to be utilized or allowed.

The License should require the licensee to take every reasonable precaution not to cause or allow the emissions of fugitive dust from being airborne while in transit to the site. The Draft Utah Division of Air Quality Fugitive Dust Control Plans Instructions, available at: http://www.airquality.utah.gov/Permits/FORMS/2013/March/Draft%20FDCP%20Instructions%2012-12.pdf contain the following requirements:

The Fugitive Dust Rule (R307-309) requires a fugitive dust control plan (R307-309-6) from all sources whose activities or equipment have the potential to produce fugitive dust (airborne dust) in PM10 and PM2.5 non-attainment areas. Fugitive dust control plans include steps your company will take to minimize fugitive dust on-site from pits, yards, storage areas, and areas of operation and to prevent opacities caused by fugitive dust from exceeding 20% on site and 10% at the property boundary. The fugitive dust rule addresses storage and handling of aggregate materials, construction and demolition activities on sites greater than 1/4 acre, road ways and tailings piles and ponds. Sources shall develop\their fugitive dust control plans and submit them to the Director prior to the start of clearing or construction. Fugitive dust control plans, tailored to specific operations and sites of operation, shall be required for:
1. All operations with material storage, handling and/or hauling operations and areas of source operations, construction sites; and all sources or operations which have the potential to produce fugitive dust in nonattainment areas along the Wasatch Front;
2. All temporary relocations under R307-401-17. Sources will be required to develop a site specific fugitive dust control plan for each temporary relocation of permitted equipment;
3. All sources and areas of source operations, pits and yards, statewide, which have been issued a Compliance Advisory for excess fugitive dust. Operations, areas of operation and sources that shall be addressed in fugitive dust control plans are:

- *material storage/handling - drilling, blasting, and pushing operations*
- *material handling/transfer - clearing/leveling/development construction*
- *material processing/transfer - earth moving and excavation*
- *road ways and yard areas - track out/spillage on paved roads*
- *loading/hauling/dumping materials - exposed surfaces*

These requirements are also consistent with the fugitive dust controls that are commonly used by the mining industry as well as that part of the mining industry that deals with WTP waste materials. Those practices are also consistent with regulatory and permitting requirements in Nevada, Wyoming, Montana, Colorado, Idaho and North Dakota according to the National Mining Association
(http://www.nma.org/pdf/pol_briefs/041906_naaqs_snapshot.pdf);
Moreover, these requirements have been implemented at sites near the Mill in Utah. *See* Moab Project Site Fugitive Dust Control Plan (March 2002) (Trust Comments Exhibit 1); Crescent Junction Project Site Fugitive Dust Control Plan (July 2006) (Trust Comments Exhibit 2).

IV. Recommendations

The License should, at a minimum, require similar measures to those documented above to minimize fugitive dust emissions at the White Mesa Mill from the proposed Dawn Mining waste stream materials. These should specifically include the following:

- Identification of the nature of the waste materials in terms of the physical properties of the materials transported to and received at the site.

- Measures to ensure fugitive dust control from material transport from Dawn Mining to the White Mesa Mill;
- Measures to ensure fugitive dust control during material receiving including during discharge of the material from trucks, containers or drums into the receiving area;
- Measures to **immediately** assure that materials are covered to prevent drying and increase susceptibility to blowing wind as well as to prevent flowing of dried materials;
    - This should include a windbreak to prevent offsite migration of radionuclide laden dust around the storage pads.
    - There is no reason why BMPs should not be implemented on an immediate basis at the site. The 14 day window is not consistent with modern practice of control measures to protect worker and public safety.
- Measures to assure that materials are handled for processing in a manner so as to minimize fugitive dust;
- Development as a part of the License of a site-specific fugitive dust control plan including identification of additional measures and assurance that those measures can be implemented in a safe and timely manner.
    - The fugitive dust control plan should include fugitive dust standards, action levels, response actions, and real time meteorological and dust monitoring during periods of high winds, and work practice standards for mitigating wind dispersion of differing waste materials based on density estimates of those materials.

These recommendations are standard practice where similar situations are encountered and are both practical and reasonable. They benefit public health without being overly burdensome as evidenced by their routine use in Utah as well as at many other locations in the United States. The lack of more specific measures in the present License is not consistent with current industry or regulatory practice.

Finally, in the larger context these same requirements and standards should be applied to the White Mesa Mill site as a whole. I have been involved in the mining industry, including working for Energy Fuels as a miner in 1979. The White Mesa Mill has a long and unfortunate history relative to fugitive dust emissions, which I need not elaborate on. However, as a professional engineer involved in similar manners, failure to utilize modern BMPs to control fugitive emissions is evident at the site. This is despite significant advances and acceptance by industry of BMPs that are both effective and economical. I strongly encourage the Utah Division of Radiation Control to similarly recognize this situation as well as the Licensee and take the necessary measures to responsibly rectify this situation.

Appendix A

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SUMMARY OF EXPERIENCE

Over 30 years experience in mining and environmental process engineering design, operations management, regulatory compliance, waste remediation, reclamation and closure, and financial assurance. Over 15 years experience providing technical assistance to public interest groups and tribal, local, state and federal governments on technical aspects of mining and environmental issues.

EDUCATION

Montana College of Mineral Science and Technology, B.S. Mineral Process Engineering, 1983.

PROFESSIONAL REGISTRATION

Professional Engineer (PE Mining/Minerals): Colorado (No. 30262), Montana (No. 7809 & Corp. No. 197)

PROFESSIONAL EXPERIENCE

1996 to Present **Kuipers & Associates/J. Kuipers Engineering, Butte, MT.**

- *ABN AMRO Bank, Netherlands*: Consulting Engineer, confidential mine evaluation.
- *Amigos Bravos, Taos, NM*: Consulting Engineer, Molycorp Questa Mine, technical review committee and working group member in reclamation and closure/closeout permitting and bonding process.
- *Anaconda Deer Lodge County, MT*: Consulting Engineer/Project Manager, Anaconda Superfund Site, provide technical services related to institutional controls, property conveyance and redevelopment, property and facility operation and maintenance, review of regulatory documents, renewable energy development , air and water monitoring and other tasks related to county involvement in Superfund activities.
- *Bannock Technologies, Pocatello, ID*: Consulting Engineer, Shoshone Bannock Tribe mining oversight project studies.
- *Blackfoot Legacy, Lincoln, MT:* Consulting Engineer, McDonald Project, review of project feasibility and environmental issues.
- *Border Ecology Project, Santa Fe, NM:* Consulting Engineer, Cananea Project (Mexico), consulting engineer mine reclamation and closure planning.
- *Cabinet Resource Group, Noxon, MT*: Consulting Engineer, Rock Creek Project, review of proposed tailing impoundment.
- *Clark Fork River Technical Advisory Committee, Missoula, MT*: Technical Advisor, Clark Fork River and Milltown Reservoir Operable Units, Upper Clark Fork Basin Superfund Sites.

- *Center for Science in Public Participation, Bozeman, MT:* See separate description below.

- *Citizens' Technical Environmental Committee, Butte, MT:* Technical Advisor, Butte-Silver Bow Site Operable Units, Upper Clark Fork Basin Superfund Sites.

- *Cottonwood Resource Council, Big Timber, MT:* Consulting Engineer, Lodestar Mine and Mill, review of operating and MPDES permits, financial assurance and operations data.

- *Earthjustice, Bozeman, MT:* Consulting Engineer, Montanore and Rock Creek Projects permitting process.

- *Earthworks, Washington, D.C.:* Project Manager and co-author, Water Quality Predictions and NEPA/EIS Studies.

- *Environmental Defender Law Center, Bozeman, MT:* Expert Witness and Consulting Engineer, Boliden Promel, Chile arsenic waste disposal.

- *Gila Resources Information Project, Silver City, NM:* Consulting Engineer, Phelps Dodge Chino, Cobre and Tyrone Mines, reclamation and closure/closeout permitting and bonding process.

- *Great Basin Mine Watch, Reno, NV:* Expert Witness and Consulting Engineer, various NV projects, permitting and reclamation and closure/closeout permitting and bonding process.

- *ICF International, Stafford, VA:* Consulting Engineer, 108(b) rulemaking technical support contract including financial assurance cost estimation model evaluations.

- *Johnson County, KS:* Consulting Engineer, Sunflower Limestone Mine reclamation plan and financial assurance.

- *Little Salmon Carmacks First Nation, Yukon Territory, Canada:* Expert Witness and Consulting Engineer, Carmacks Copper Project.

- *Montana Attorney Generals Office, Helena, MT:* Consulting Engineer, assist in defense of I-137 Open Pit Cyanide Mine Ban appeals.

- *Montana Department of Environmental Quality, Helena, MT:* General Contractor, Pony Mill Site Reclamation.

- *Montana Environmental Information Center, Helena, MT and National Wildlife Federation, Missoula, MT:* Expert Witness and Consulting Engineer, Golden Sunlight Mine, EIS Review and assist appeal of State operating permit.

- *Montana Environmental Information Center, Helena, MT:* Expert Witness, Bull Mountain Coal Mine appeal.

- *Montana Trout Unlimited, Missoula, MT:* Consulting Engineer, Trout Unlimited's Four Mines Campaign, review and provide technical assistance on McDonald, Crandon, New World and Rock Creek Mines.

- *Natural Resources Defense Council,* New York State: Consulting Engineer, review of Oil & Gas Draft EIS.

- *New Mexico Environmental Law Center, Santa Fe, NM:* Consulting Engineer, Oglebay Norton Mica Mine reclamation and financial assurance; New Mexico Environment Department Copper Rules Stakeholder Process.

- *Northern Plains Resource Council, Cottonwood Resource Council, Stillwater Protective Association, Billings. MT:* Consulting Engineer, Stillwater Mining Company Nye and East Boulder Mines, facilitate and perform technical aspects of Good Neighbor Agreement.

- *Northern Plains Resouce Council, Billings, MT; Wyoming Outdoor Council, Sheridan, WY:* Consulting Engineer, Montana Statewide and Wyoming Powder River Basin Coal Bed Methane EIS.

- *Northern Plains Resouce Council, Billings, MT:* Project Manager and co-author, Coal Bed Methane Produced Water Studies.

- *Northern Alaska Environmental Council, Fairbanks, AK:* Consulting Engineer, Pogo Mine NPDES permit negotiations.

- *Picuris Pueblo, Penasco, NM:* US Hill Mica Mine Reclamation Plan and financial assurance cost estimate and site reclamation project management.

- *Powder River Basin Resource Council, Sheridan, WY/Steven Adami, Buffalo, WY:* Expert Witness, Kennedy Oil IMADA POD appeals.

- *Rock Creek Alliance, Missoula, MT:* Expert Witness and Consulting Engineer, Rock Creek and Montanore Mines permitting.

- *Selkirk First Nation, Yukon Territory, Canada:* Expert Witness and Consulting Engineer, Minto Mine Project reclamation and closure and financial assurance.

- *Sheep Mountain Alliance, Telluride, CO:* Expert Witness and Consulting Engineer, Silver Bell Tailings remediation.

- *Shoshone-Paiute Tribes of the Duck Valley Reservation, NV:* Consulting Engineer, Rio Tinto Mine Reclamation and Closure.

- *Sierra Club and Mineral Policy Center:* Expert Witness, Cripple Creek and Victor Mining Company Clean Water Act case.

- *SKEO, Charlottesville, VA:* Consulting Engineer, 108(b) rulemaking technical support contract and EPA Region NEPA review and financial assurance support.

- *Southern Environmental Law Center, Charleston, SC:* Consulting Engineer, Haile Gold Mine permitting.

- *Systems Research and Applications Corporation, Fairfax, VA:* Consulting Engineer, mine cleanup and financial assurance guidelines subcontract to EPA.

- *Montana Trout Unlimited, Missoula, MT:* Consulting Engineer, I-147 initiative campaign.

- *Tohono O'odham Nation, San Xavier District, AZ:* Consulting Engineer, Mission Mine reclamation plan and financial assurance.

- *Trust for Public Lands, San Francisco, CA:* Consulting Engineer, Viceroy Castle Mountain Mine, evaluated pit backfill and reclamation alternatives for settlement agreement trust fund determination.

- *Walz and Associates, Albuquerque, NM:* Expert Witness and Consulting Engineer, assist in defense of New Mexico Environment Department and Mining and Minerals Division permitting and takings case (Manning v. NM).

- *Western Organization of Resource Councils, Billings, MT:* Oil and gas reclamation and financial assurance guide.

- *Western Resource Advocates, Salt Lake City, UT:* Expert Witness and Consulting Engineer, Red Leaf Resources oil shale project permitting.

1997 to 2005 **Center for Science in Public Participation, Bozeman, MT.**

- *Canadian Earthcare Society, Vancouver, BC:* Consulting Engineer, Brenda Mine, assist appeal of reclamation and closure permit.

- *CEE Bankwatch, Budapest, Hungary:* Consulting Engineer, Rosario Montana Mine (Romania), economic feasibility study of mine proposal.

- *Friends of the Similkameen, Hedley, BC:* Consulting Engineer, Candorado Mine, assist appeal of reclamation and closure permit.

- *Fort Belknap Tribal Council and Environment Department, Fort Belknap,MT:* Consulting Engineer, Zortman and Landusky Mines, Alternative Reclamation and Closure Plan, multiple accounts analysis working group member and technical advisor during supplemental environmental impact statement.

- *Guardians of the Rural Environment, Yarnell, AZ:* Consulting Engineer, Yarnell Project, EIS review and assist appeal of State operating permit.

- *Mineral Policy Center, Washington, D.C.:* Technical Advisor on general mining issues and Author of MPC Issue Paper.

- *National Wildlife Federation, Boulder, CO:* Consulting Engineer authoring report on Hardrock Mining Reclamation and Closure Bonding Practices in the Western United States.

- *Sakoagan Chippewa Tribes, Mole Lake Reservation, Wisconsin:* Consulting Engineer, Crandon Project, permitting process review.

1993 - 1995 **Denver Mineral Engineers, Inc., Littleton, CO.**

- Manager, Process Engineering Department.

- Manager, Mining and Environmental Wastewater Treatment Program

- *Arrowhead Industrial Water Co., San Jose, CA*: Project Manager, evaluation of reverse osmosis for mine wastewater treatment.

- *Barrick Goldstrike, USA, Elko, NV*: Project Engineer, engineering design, construction and installation of 1.5 M oz/year stainless steel electrowinning system.

- *Battle Mountain Gold, Co., Battle Mountain, NV*: Project Manager, evaluation, pilot testing, and preliminary feasibility study of wastewater treatment options for groundwater remediation of Fortitude Mine tailings area.

- *Commerce Group Corporation, Milwaukee, WI*: Project Manager, San Sebastian Gold Project, El Salvador.

- *Independence Mining Corp, Jerritt Canyon, NV*: Project Manager, technical evaluation and feasibility study of column flotation for beneficiation of refractory ores.

- *Kennecott Utah Copper, Bingham Canyon, UT*: Project Manager, design and construct stainless steel solvent extraction mixer settlers for prototype SX/EW plant.

- *Israeli Chemical Corp., Beersheeba, Israel*: Project Manager, evaluation of bromine as an alternative to cyanide gold leaching and prototype design.

- *Marston and Marston, St Louis, MO*: Project Manager, Kommunar Gold Mill Modernization Project, Kommunar, Siberia, Russia (CIS) and Suzak Polymetal Leach Circuit Evaluation and Feasibility Study, Kazakhstan (CIS).

- *Nevada Goldfields Mining Co., Denver, CO*: Project Manager, Nixon Fork Mine Preliminary Engineering Design and Feasibility Study, Concentrate Marketing Study, and environmental permitting studies.

- *Southern Pacific Railroad, Denver, CO*: Project Manager, design, construction and installation of dissolved air flotation wastewater treatment system.

1991 - 1992 **Western States Minerals Corp.**

- Project Manager, Northumberland Gold Mine, Round Mountain, NV.

- Corporate Senior Metallurgist, Wheat Ridge, CO. Engineering design and feasibility evaluations.

1986 - 1991 **Western Gold Exploration and Mining Co. (WESTGOLD)/Minorco**

- Corporate Senior Metallurgist / Project Manager, WESTGOLD, Golden, CO. Acquisitions and engineering design and feasibility evaluations, corporate acquisitions and business development group.

- Project Manager, Shamrock Resources (WESTGOLD Subs.), Reno, NV. Evaluation, engineering design and feasibility study, and prototype plant operation of refractory gold ore bioleaching technology program.

- Project Manager, Balmerton Mine, Ontario: Refractory gold ore bioleaching project and feasibility evaluation.

- Project Engineer, Johannesburg South Africa: Evaluation of Anglo American Corp. Pumpcell Technology.

- Mill Superintendent, Austin Gold Venture (WESTGOLD), Austin, NV.

- Shift Foreman, Inspiration Consolidated Copper Co, Globe, AZ.

1984 - 1985 **Canyonlands 21st Century Corporation**

- Director of Metallurgy, Blanding, UT. Project Manager, Jarbidge, NV.

1983 - 1984 **Cumberland Mining Corporation**

- Mill Superintendent / Head Metallurgist, Basin and Virginia City, MT.

1974 – 1980 **Huckaba Construction**

- Summer employment as Underground and Surface Miner, Millwright, Mill Operator, Fire Assayer, Whitehall and Cooke City, MT. Family owned small mining operation.

PRESENTATIONS and PUBLICATIONS

- *Financial Assurance Regulations and Cost Estimation at US Hardrock Mines,* U.S. Chile Mining Financial Assurance Seminar, US Office of Surface Mining and Environmental Protection agency and Chilean Ministry of Mining, Santiago, Chile, May 2012.

- *Mining Reclamation and Closure Regulations and Best Practices,* 2012 International Conference on Mining in Mindanao, Ateneo de Davao University, Davao City, Philippines, January 26-27, 2012.

- *Beyond the Global Acid Rock Drainage Guide,* Lake Superior Binational Program, Mining in the Lake Superior Basin Webinar Series, Environmental Impacts of Mining in the Lake Superior Basin, October 27, 2009

- *Characterizing, Predicting, and Modeling Water at Mine Sites,* California Environmental Protection Agency, California Water Board Training Academy, May 18 - 21, 2009

- *Mitigating Mining Impacts: Principles and Practices,* Lake Superior Binational Program, Mining in the Lake Superior Basin Webinar Series, Environmental Impacts of Mining in the Lake Superior Basin, March 24, 2009

- *Long-term Requirements & Financial Assurance at Superfund & Other Mine Sites,* Mine Design, Operations and Closure Conference, Fairmont Hot Springs, MT, April 2008.

- *The Effects of Coalbed Methane Production on Surface and Ground Water Resources,* Committee on Earth Resources, Board on Earth Sciences and Resources, National Research Council, Meeting on the Status of Data and Management Regarding the Effects of Coalbed Methane Production on Surface and Ground Water Resources, Denver, Colorado, April 2008.

- *Reclamation Planning and Financial Assurance Practice in the United States,* Kamchatka Mining Conference, Kamchatka Oblast People's Council of Deputies, the Committee on Ecology and Resource Management of Kamchatsky Krai, the Rosprirodnadzor Division of Kamchatka Oblast and Koryaksky Autonomous Okrug, the Division for Minerals Management for Kamchatka Krai, and the Kamchatka Oblast Council of the All-Russia Society for Nature Protection, Petropavlovsk-Kamchatsky, Russia, October 2007.

- *The Good Neighbour Agreement: A Proactive Approach to Water Management through Community Enforcement of Site-Specific Standards,* w Sarah Zuzulock, Greener Management International, Issue 53, Spring 2006, Greenleaf Publishing. 2007.

- *Sustainable Development at the Anaconda Superfund Site,* Mine Design, Operations and Closure Conference, Fairmont Hot Springs, MT, April 2007.

- *Comparison of Predicted and Actual Water Quality at Hardrock Mines: The reliability of predictions in Environmental Impact Statements* with A. Maest, K. MacHardy, G. Lawson. *Predicting Water Quality at Hardrock Mines: Methods and Models, Uncertainties, and State-of-the-Art* with A. Maest, Final Report Release December 2006.

- *Reclamation and Bonding in Copper Mining,* U.S. EPA Hardrock 2006: Sustainable Modern Mining Applications, Tucson, Arizona , November 2006.

- *Sustainable Development at the Anaconda Superfund Site:* U.S. EPA Hardrock 2006: Sustainable Modern Mining Applications, Tucson, Arizona , November 2006.

- *U.S. Perspective on Financial Assurance for Mine Cleanup,* presented at International Bar Association Conference, Chicago, Illinois, September 2006.

- *Comparison of Predicted and Actual Water Quality at Hardrock Mines: The reliability of predictions in Environmental Impact Statements* with A. Maest, K. MacHardy, G. Lawson, presented at Mine Design, Operations and Closure Conference, Fairmont Hot Springs, MT, April 2006.

- *Predicted Versus Actual Water Quality at Hardrock Mine Sites: Effect of Inherent Geochemical and Hydrological Characteristics* with A. Maest, K. MacHardy, and G. Lawson at International Congress on Acid Rock Drainage (ICARD), March 2006, St. Louis, MS.

- *Oil, Gas and Coal Bed Methane Reclamation and Financial Assurance Guide,* with Kimberley MacHardy and Victoria Lynne, November 2005; 12th International Petroleum Environmental Conference, Houston, TX.

- *Approaches to Abandoned Mine Site Assessment and Remedy Selection in the U.S.,* NOAMI Workshop on Assessing Liabilities and Funding Options, November 2, 2005 Ottawa, Canada

- *Filling the Gaps: How to Improve Oil and Gas Reclamation and Reduce Taxpayer Liability,* Kuipers & Associates for Western Organization of Resource Councils, August 2005.

- *The Environmental Legacy of Mining in New Mexico,* Mining in New Mexico: The Environment, Water, Economics and Sustainable Development, New Mexico Bureau of Geology and Mineral Resources, Decision-Makers Field Conference 2005, L. Greer Price et al Editors.

- *Financial Assurance and Bonding,* 2005 Decision-Makers Field Conference, Mining in New Mexico: The Environment, Water, Economics and Sustainable Development, New Mexico Bureau of Geology and Mineral Resources, May 2005.

- *Evaluation of the NEPA Process for Estimating Water Quality Impacts at Hardrock Mine Sites* with A. Maest, K. MacHardy, G. Lawson, for Earthworks, presented at Society of Mining Engineers Annual Conference, Salt Lake City, UT, March 2005 and Mine Design, Operations and Closure Conference, Polson, MT, April 2005.

- *Evaluation of Methods and Models Used to Predict Water Quality at Hardrock Mine Sites: Sources of uncertainty and recommendations for improvement* with A. Maest, C. Travers and D. Atkins, for Earthworks, presented at Society of Mining Engineers Annual Conference, Salt Lake City, UT, March 2005 and Mine Design, Operations and Closure Conference, Polson, MT, April 2005.

- *Coal Bed Methane-Produced Water: Management Options for Sustainable Development,* co-authored with K. MacHardy, W. Merschat and T. Myers, presented at Coal Bed Natural Gas Research, Monitoring and Applications Conference, Laramie, WY, August 2004; 11th International Petroleum Environmental Conference, Albuquerque, NM, October 2004; Northern Plains Resource Council Annual Meeting, November 2004.

- *Technology-Based Effluent Limitations for Coal Bed Methane-Produced Wastewater Discharges in the Powder River Basin of Montana and Wyoming,* Northern Plains Resource Council, Billings, MT, November 2004.

- *Financial Assurance Guidelines for Hardrock Mine Cleanup,* Mine Design, Operations and Closure Conference, Polson, MT, April 2004.

- *Introduction to Mine Water Treatment,* Mine Discharge Water Treatment Short Course, Mine Design, Operations and Closure Conference, Polson, MT, April 2004.

- *Coal Bed Methane: A Design and Process Overview of Production and Produced Water,* presented as short course at Joint Engineers Conference, Helena, MT, November 2003.

- *The Good Neighbor Agreement between Stillwater Mining Company and Northern Plains Resource Councils: An Example of Industry and Citizen Cooperation,* presented as a short course at Joint Engineers Conference, Helena, MT, November 2003.

- *Reclamation and Financial Assurance for Mines on or Impacting Tribal Land,* presented at U.S. EPA Workshop on Mining Impacted Native American Lands, Reno, NV, September 2003.

- *Reclamation and Financial Assurance from a Public Interest Perspective,* presented at U.S. Forest Service National Geofest, Park City, UT, September 2003.

- *U.S. State and Federal Policies on Financial Assurance Forms for Hardrock Mines,* presented at New Mexico Financial Assurance Forum, Santa Fe, NM, May 2003.

- *Public Interest Perspective on Land Application Disposal,* presented at Mine Design, Operations and Closure Conference, Polson, MT, April 2003.

- *Putting a Price on Pollution: Financial Assurance for Mine Reclamation and Closure*, Mineral Policy Center, Washington, D.C., March 2003.

- Testimony to the Subcommittee on Energy and Mineral Resources, Committee on Resources, U.S. House of Representatives, Hearing on "Availability of Bonds to Meet Federal Requirements for Mining, Oil and Gas Projects." Washington, D.C., July 23, 2002.

- *Mine Closure and Financial Assurance: Can the Mining Industry Afford It's Legacy?*, presented at Global Mining Initiative Conference, Toronto, Canada, May 2002.

- *The Role of the Center for Science in Public Participation in Mining Environmental Issues, with Perspective for Regulators and Industry*, presented at Canadian Institute of Mining and Metallurgical Engineers Conference, Vancouver, Canada, May 2002 and U.S. EPA Hardrock Mining Conference, Denver, Colorado, May 2002.

- *The Good Neighbor Agreement between Stillwater Mining Company and the Northern Plains Resource Councils: The Formation and Implementation of a New Approach to Addressing Environmental and Community Relations Issues*, presented at U.S. EPA Hardrock Mining Conference, Denver, Colorado, May 2002.

- *Underground Hard-Rock Mining: Subsidence and Hydrologic Environmental Impacts*, Center for Science in Public Participation, Bozeman, MT, February 2002. Co-authored with S. Blodgett.

- *Review of the Multiple Accounts Analysis Alternatives Evaluation Process Completed for the Reclamation of the Zortman and Landusky Mine Sites*; presented at National Association of Abandoned Mine Lands Annual Conference, Athens, Ohio, August 2001. Co-authored with S.C.Shaw, A.M. Robertson, W.C. Maehl and S. Haight.

- *Full Reclamation and Closure Plan, Phelps Dodge Tyrone Mine, Grant County, NM;* Gila Resources Information Project, Silver City, NM, July 2001. Co-authored with S. Blodgett.

- *Reclamation Bonding for Hardrock Metal Mines Workshop*, presented by CSP2 at Juneau and Fairbanks, AK, July 2001.

- *Full Reclamation and Closure Plan, Phelps Dodge Chino Mine, Grant County, NM;* Gila Resources Information Project, Silver City, NM, June 2001. Co-authored with S. Blodgett.

- *Reclamation Bonding in Montana;* Montana Environmental Information Center, Helena, MT, November 2000. Co-authored with S. Levit.

- *Full Reclamation and Closure Plan, Molycorp Questa Mine, NM;* Amigos Bravos, Taos, NM, May 2000.

- *Hardrock Mining Reclamation and Bonding Practices in the Western United States*: National Wildlife Federation, Boulder, CO, February 2000.

- *An Economic Evaluation of the McDonald Gold Project*; Blackfoot Legacy, Lincoln, MT, February 2000..

- *Restoring the Upper Clark Fork: Guidelines for Action*, Trout Unlimited, Missoula, MT, April 1999. Co-authored with D. Workman, B. Farling and P. Callahan.

- *Alternative Final Reclamation and Closure Plan, Zortman and Landusky Mines, MT:* Indian Law Resource Center, Helena, MT, January 1999.

- *Reclamation Bonding Regulations of Precious Metal Heap Leach Facilities in the Western United States:* Presented at the workshop on Closure, Remediation and Management of Precious Metals Heap Leach Facilities, University of Nevada, Reno, Jan 15, 1999.

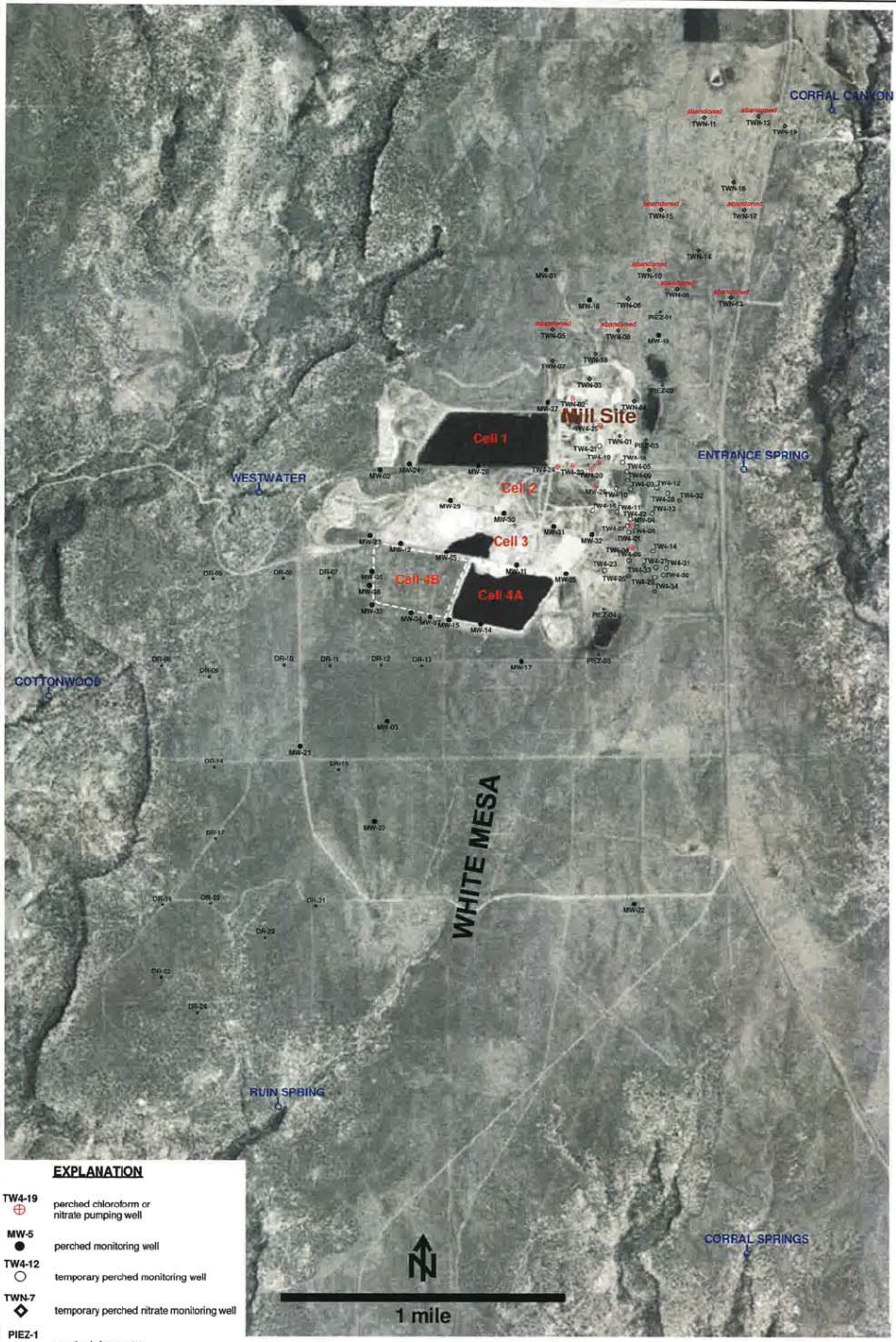
- *Wastewater Treatment Methods for Base and Precious Metal Mines:* Public Education for Water Quality Project, Northern Plains Resource Council, Billings, MT, 1996.

- *Bacterial Leaching Pilot Study – Oxidation of a Refractory Gold Bearing High Arsenic Sulphide Concentrate:* Randol Gold Forum, Squaw Valley, 1990. Co-authored with J. Chapman, B. Marchant, R. Lawrence, R. Knopp.

- *Novel Aspects of Gold Recovery Using Column Flotation at Austin Gold Venture:* Gold and Silver Recovery Innovations, Phase IV Workshop, Randol International Ltd, Sacramento, CA, 1989.

Attachment C:

Energy Fuels Cell and Monitoring Well Locations



EXPLANATION

TW4-19 ⊕	perched chloroform or nitrate pumping well
MW-5 ●	perched monitoring well
TW4-12 ○	temporary perched monitoring well
TWN-7 ◆	temporary perched nitrate monitoring well
PIEZ-1	perched piezometer
TW4-32 ☼	temporary perched monitoring well installed September, 2013
RUIN SPRING	seep or spring

HYDRO GEO CHEM, INC.

SITE PLAN SHOWING PERCHED WELL AND PIEZOMETER LOCATIONS WHITE MESA SITE

APPROVED	DATE	REFERENCE	FIGURE
		H:/718000/nov13/Uwelloc0913.srf	A-1

Attachment D:

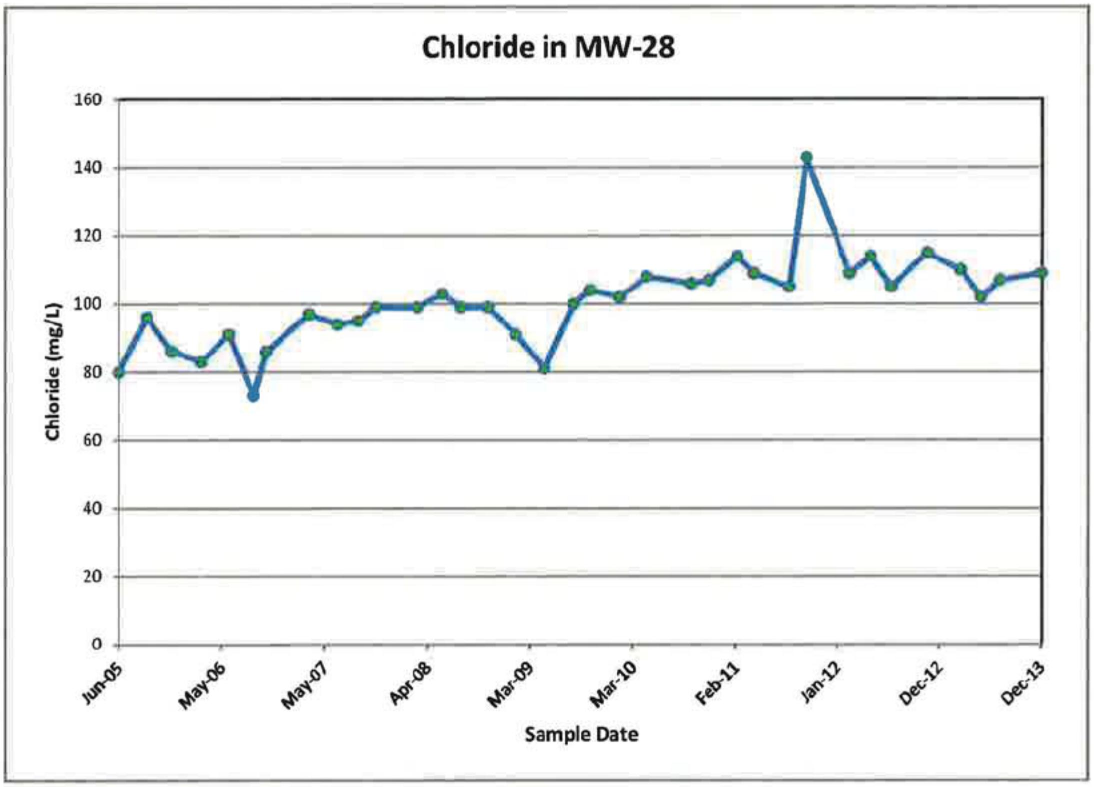
NRC and DRC Oversight of Energy Fuels

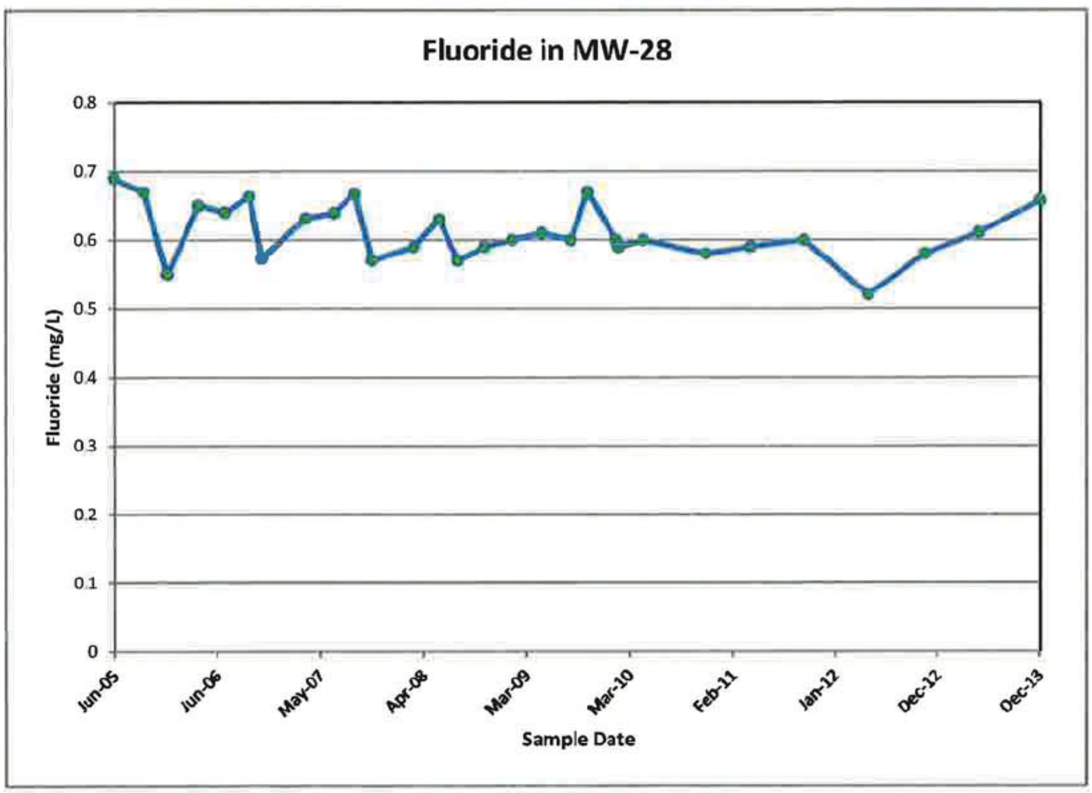
<table>
<tr><th colspan="5">White Mesa Uranium Mill Regulation Comparison</th></tr>
<tr><th></th><th>Nuclear Regulatory Commission</th><th colspan="3">Utah Division of Radiation Control</th></tr>
<tr><td>Time Regulating the White Mesa Mill</td><td>24 Years, 11 Months, 16 Days
(August 31, 1979 – August 15, 2004)</td><td colspan="3">9 Years, 8 Months, 4 Days
(August 16, 2004 – April 18, 2014)</td></tr>
<tr><td>Notice of Violations Issued</td><td>2</td><td colspan="3">38</td></tr>
<tr><td>Total Amount Civil Penalties Issued</td><td>$0</td><td colspan="3">$176,875</td></tr>
<tr><td>Average Penalty Per Year</td><td>$0</td><td colspan="3">$18,141</td></tr>
<tr><td rowspan="3">Wells Sampled</td><td rowspan="3">6</td><td>Tailing Wells</td><td colspan="2">27</td></tr>
<tr><td>Chloroform</td><td colspan="2">33</td></tr>
<tr><td>Nitrate</td><td colspan="2">12</td></tr>
<tr><td rowspan="3">Parameters Sampled</td><td rowspan="3">Chloride, Potassium, Nickel, and Uranium</td><td>Tailings Wells
38</td><td colspan="2">Ammonia (as N), Nitrate + Nitrite (as N), Arsenic, Beryllium, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Mercury, Molybdenum, Nickel, Selenium, Silver, Thallium, Tin, Uranium, Vanadium, Zinc, Gross Alpha, Acetone, Benzene, 2-Butanone (MEK), Carbon Tetrachloride, Chloroform, Chloromethane, Dichloromethane, Naphthalene, Tetrahydrofuran, Toluene, Xylenes (total), Field pH, Fluoride, Chloride, Sulfate, TDS</td></tr>
<tr><td>Chloroform
6</td><td colspan="2">Carbon Tetrachloride, Chloride, Chloroform, Chloromethane, Dichloromethane, Nitrate + Nitrite (as N)</td></tr>
<tr><td>Nitrate
2</td><td colspan="2">Nitrate + Nitrite (as N), Chloride</td></tr>
<tr><td>Surety</td><td>$10,522,914 (Approved 2/2/2004)</td><td colspan="3">$ 21,126,149 (Approved 10/17/2013)</td></tr>
<tr><td rowspan="3">Inspections Performed Per Year</td><td rowspan="3">1 Annual Inspection</td><td colspan="2">Health Physics</td><td>8</td></tr>
<tr><td colspan="2">Groundwater</td><td>4</td></tr>
<tr><td colspan="2">Engineering</td><td>6</td></tr>
</table>

Attachment E:

Time Concentration Plots for Indicator Parameters for Wells MW-24 and MW-28, Adjacent to and Downgradient from Cell 1

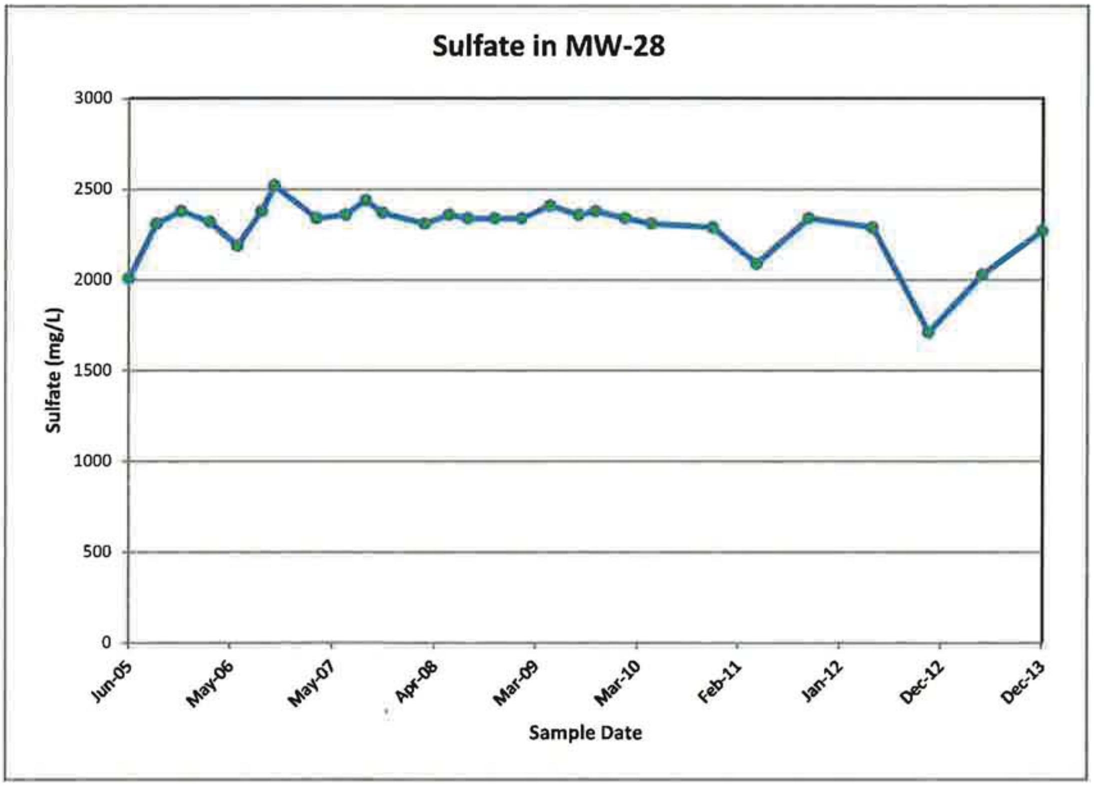
Time concentration plots for MW-28

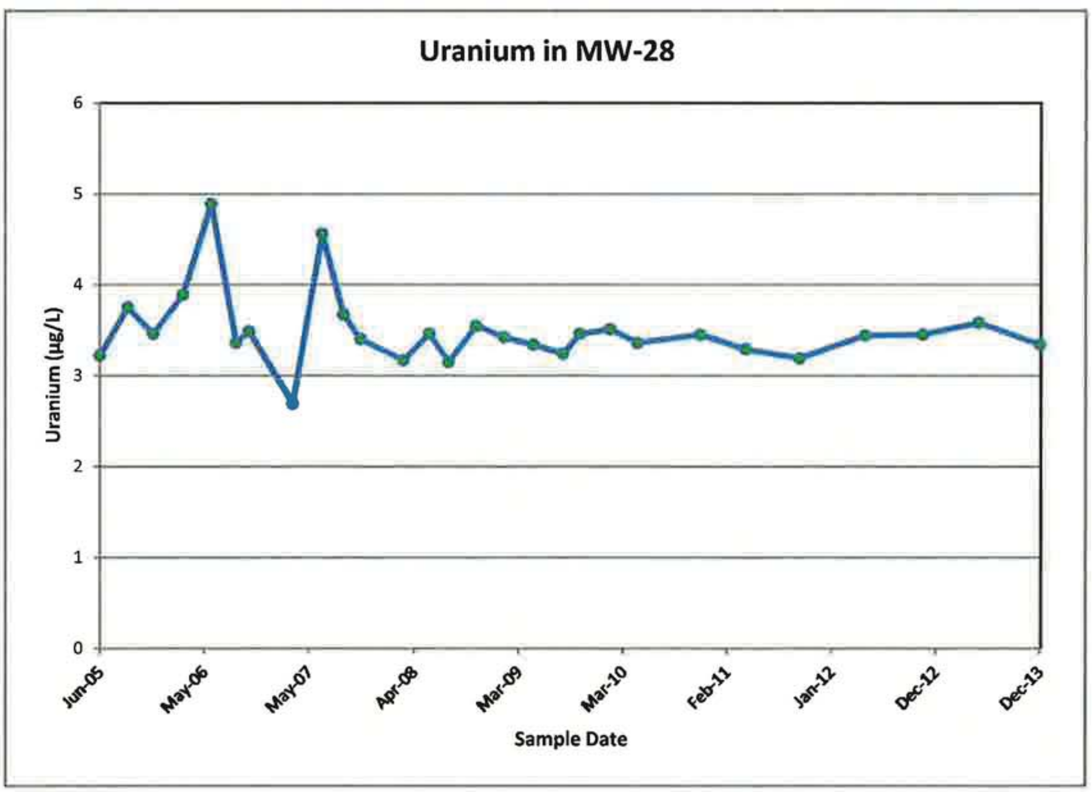




Detected Values
Non-Detected Values

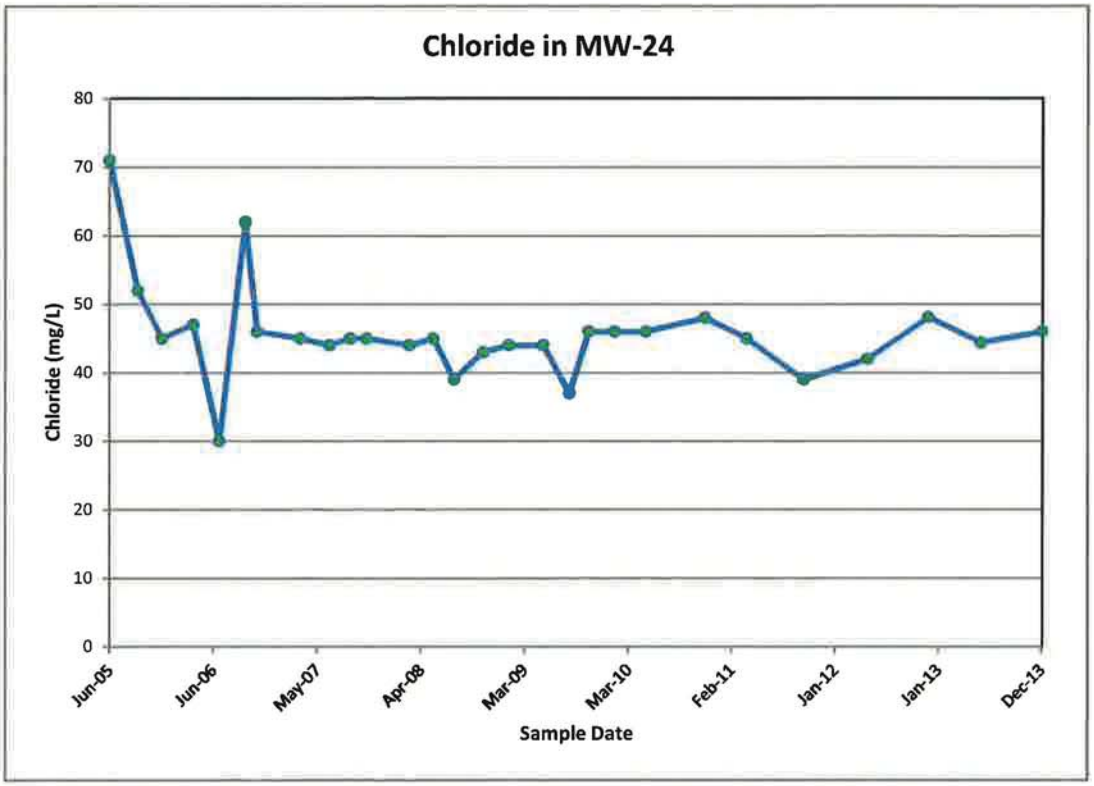
Time concentration plots for MW-28

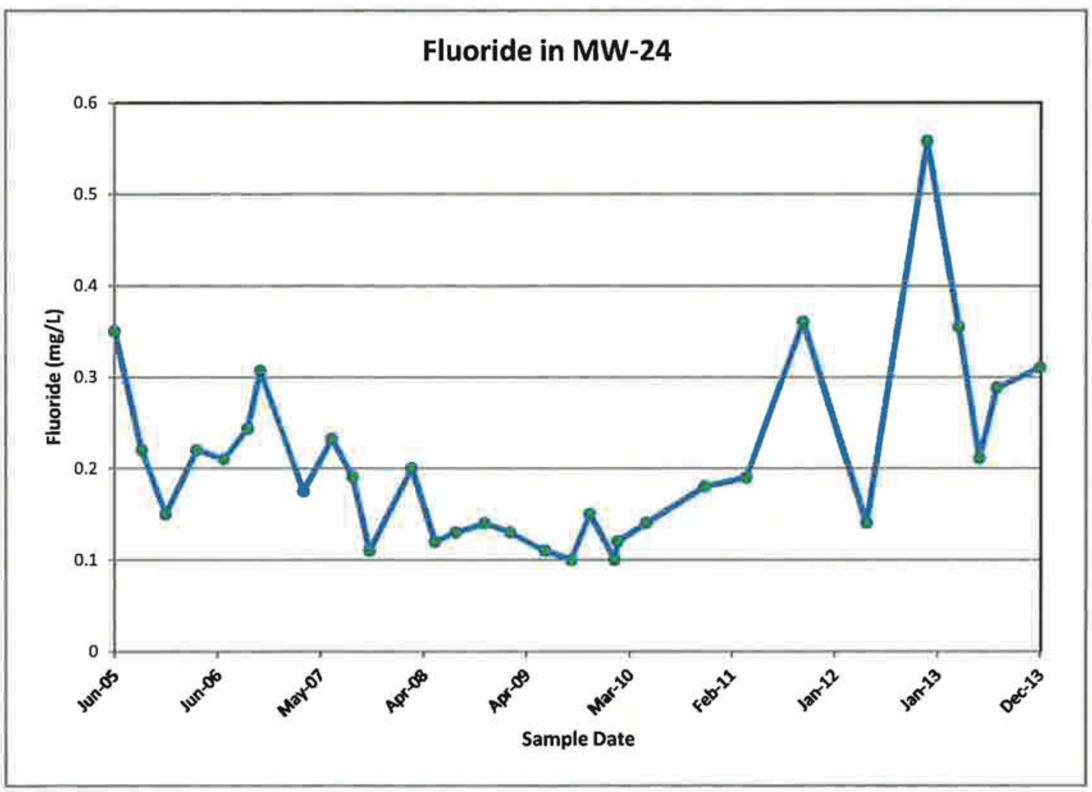




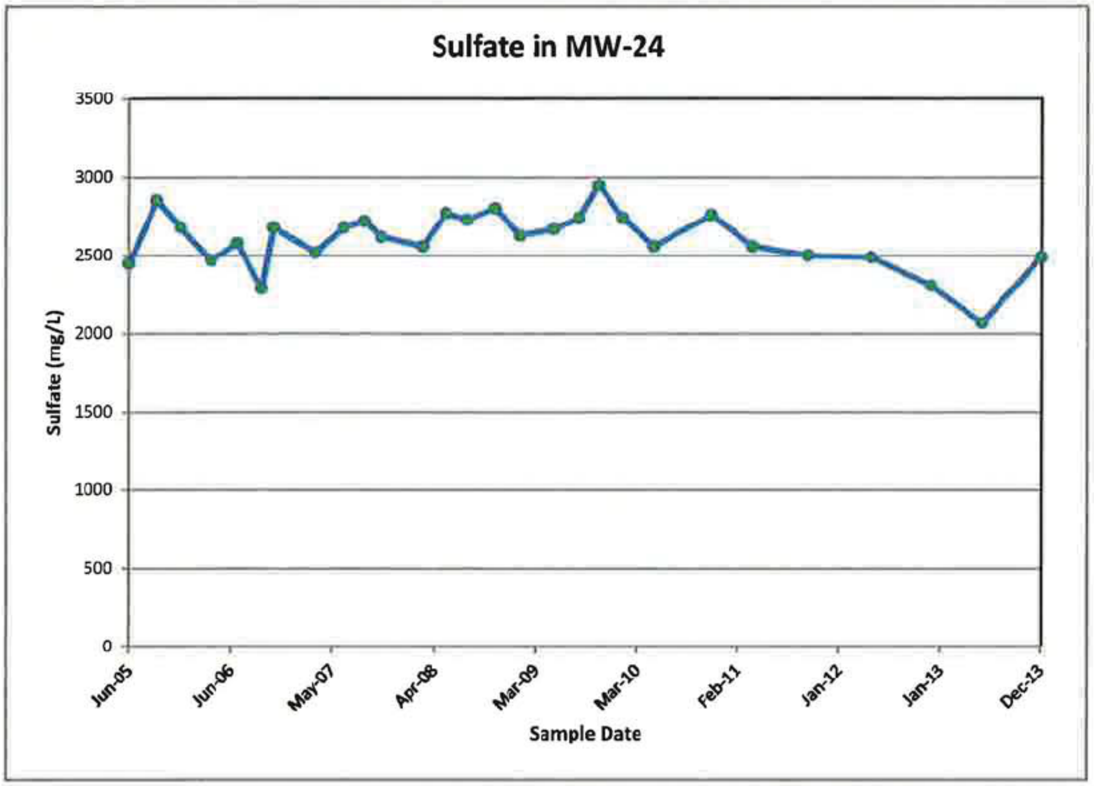
Detected Values
Non-Detected Values

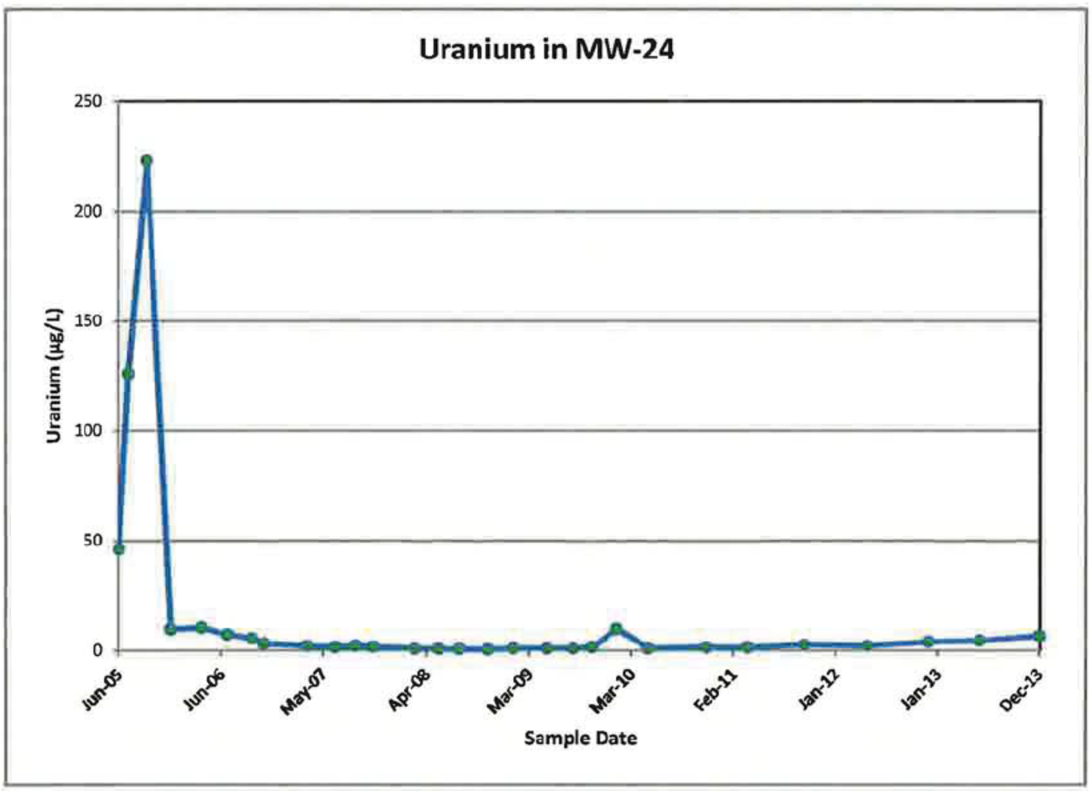
Time concentration plots for MW-24





Time concentration plots for MW-24

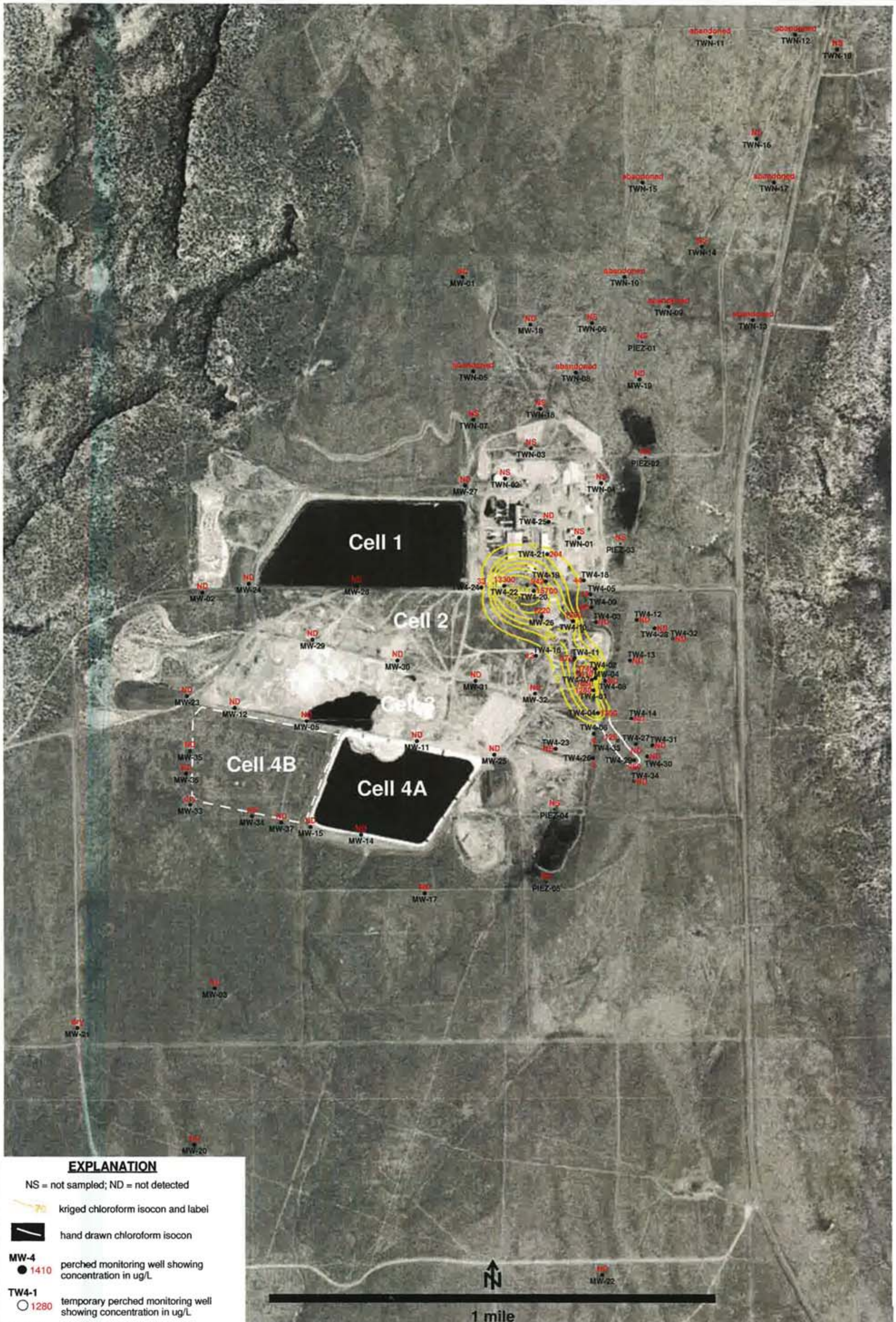




Detected Values
Non-Detected Values

Attachment F:

Chloroform Plume Location



EXPLANATION

NS = not sampled; ND = not detected

70 kriged chloroform isocon and label

hand drawn chloroform isocon

MW-4 ● 1410 perched monitoring well showing concentration in ug/L

TW4-1 ○ 1280 temporary perched monitoring well showing concentration in ug/L

TWN-1 ◇ NS temporary perched nitrate monitoring well (not sampled)

PIEZ-1 NS perched piezometer (not sampled)

TW4-32 ☼ ND temporary perched monitoring well installed September, 2013 showing concentration in ug/L

NOTE: MW-4, MW-26, TW4-4, TW4-19, and TW4-20 are chloroform pumping wells; TW4-22, TW4-24, TW4-25, and TWN-2 are nitrate pumping wells

HYDRO GEO CHEM, INC.

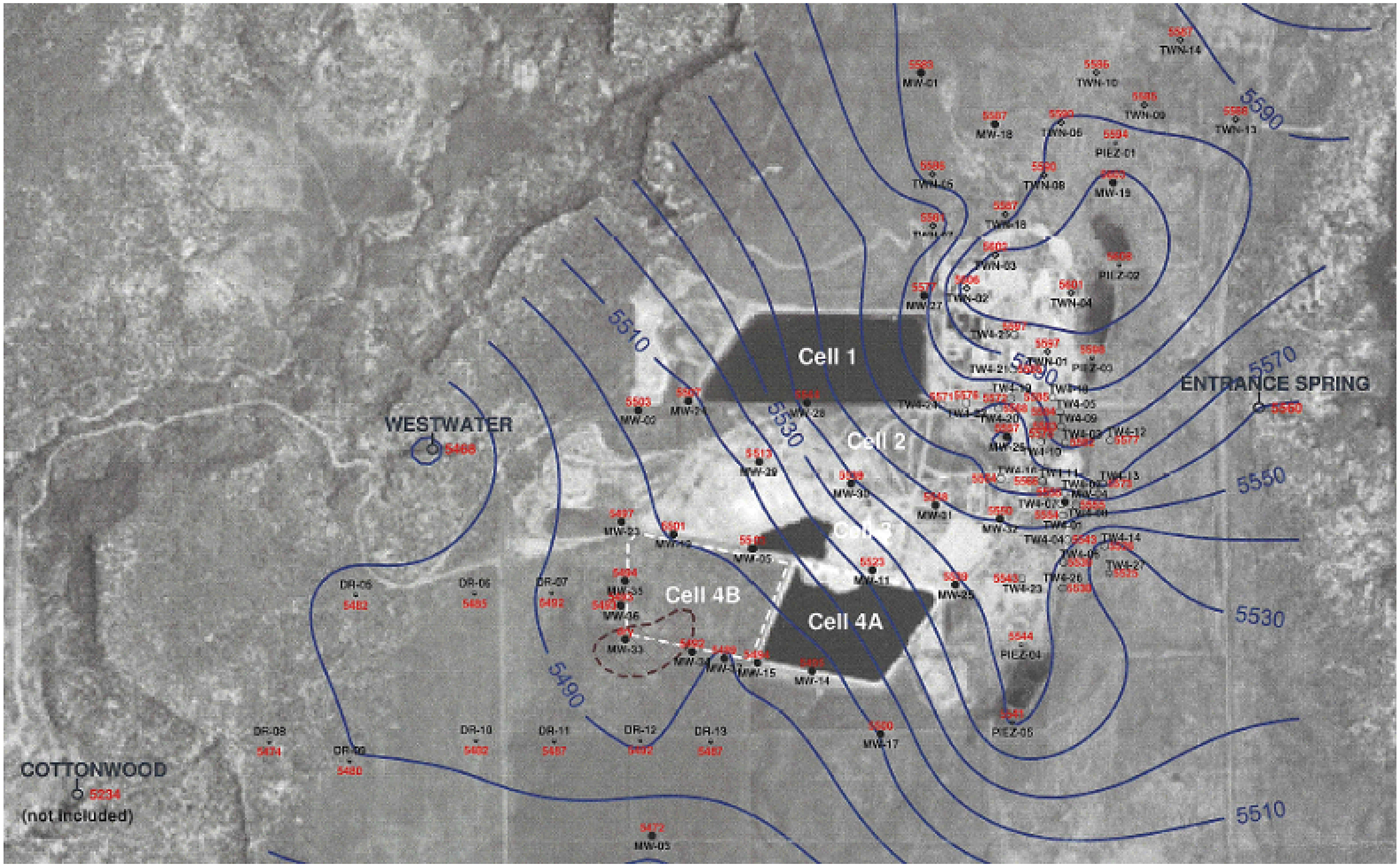
KRIGED 4th QUARTER, 2013 CHLOROFORM (ug/L)
WHITE MESA SITE

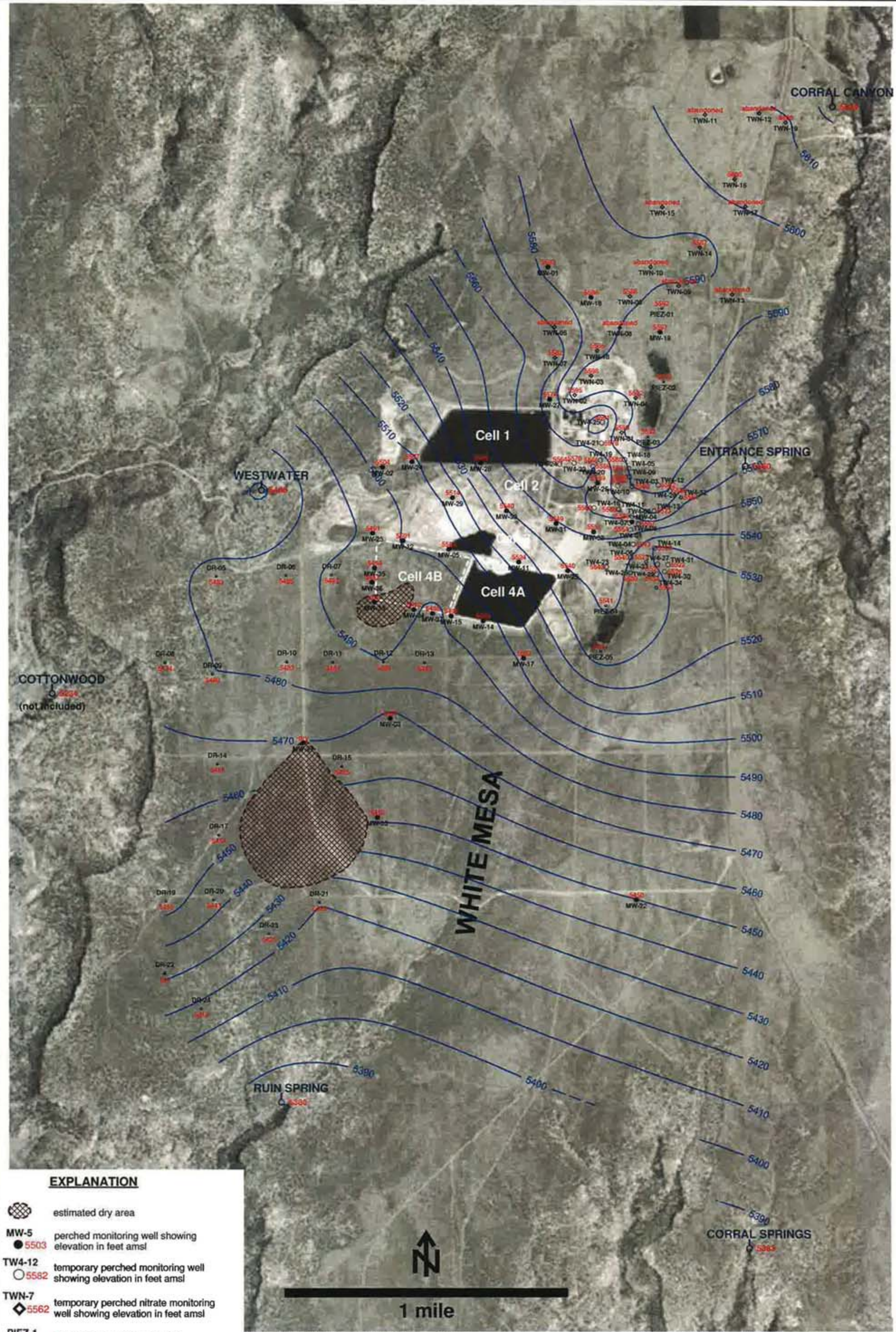
APPROVED	DATE	REFERENCE	FIGURE
		H:/718000/feb14/Uchl1213h.srf	J-1

Attachment G:

Ground Water Elevation and Direction Map

2012 1st Quarter Monitoring Report, Figure H-1





NOTE: MW-4, MW-26, TW4-4, TW4-19, and TW4-20 are chloroform pumping wells; TW4-22, TW4-24, TW4-25, and TWN-2 are nitrate pumping wells

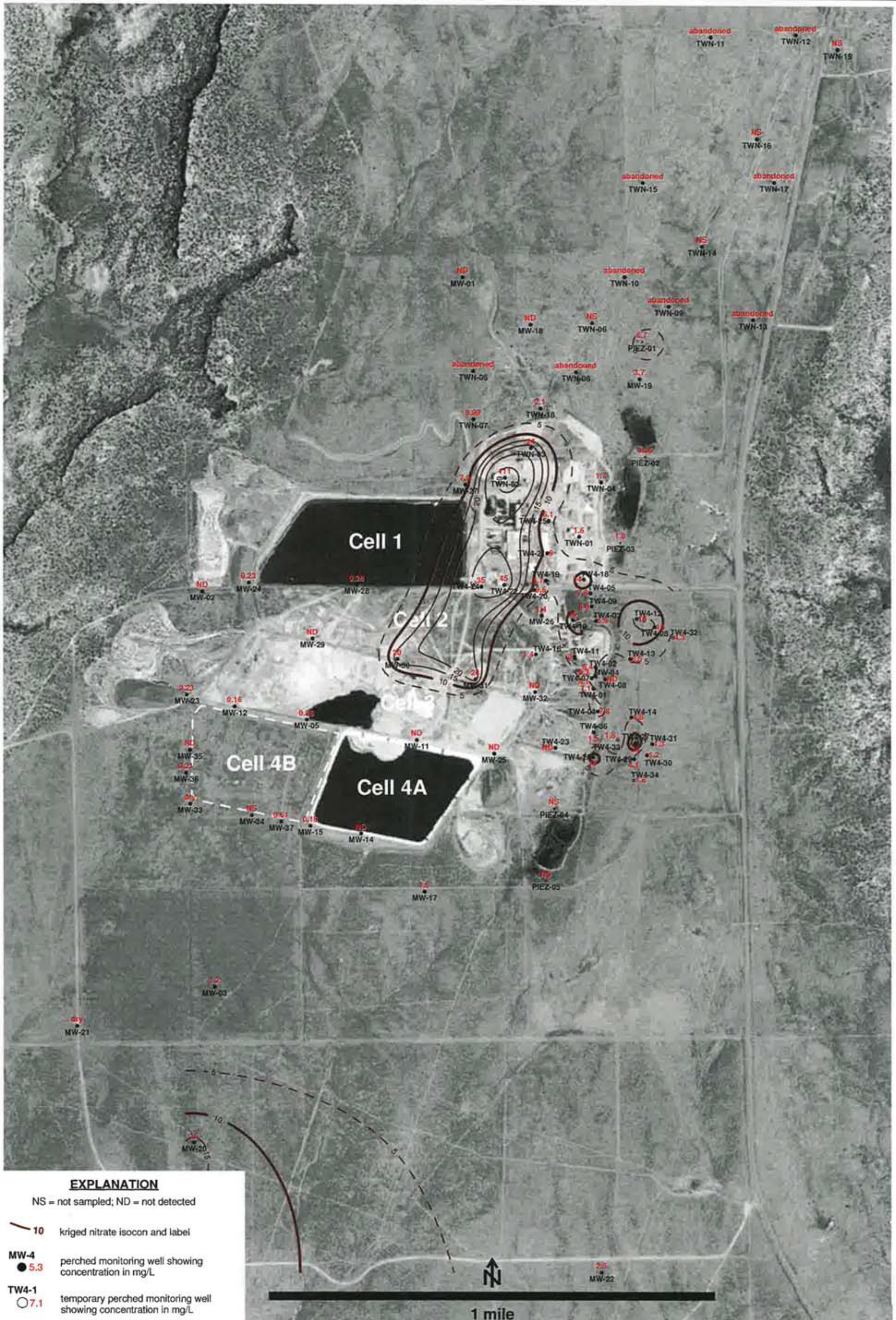
HYDRO GEO CHEM, INC.

KRIGED 4th QUARTER, 2013 WATER LEVELS WHITE MESA SITE

APPROVED	DATE	REFERENCE	FIGURE
		H:/718000/feb14/Uwl1213.srf	D-1

Attachment H:

Nitrate Plume Location



EXPLANATION

NS = not sampled; ND = not detected

10 kriged nitrate isocon and label

MW-4 ● 5.3 perched monitoring well showing concentration in mg/L

TW4-1 ○ 7.1 temporary perched monitoring well showing concentration in mg/L

TWN-1 ◆ 1.6 temporary perched nitrate monitoring well showing concentration in mg/L

PIEZ-1 ◒ 6.7 perched piezometer showing concentration in mg/L

TW4-32 ☼ 4.3 temporary perched monitoring well installed September, 2013 showing concentration in mg/L

NOTE: MW-4, MW-26, TW4-4, TW4-19, and TW4-20 are chloroform pumping wells; TW4-22, TW4-24, TW4-25, and TWN-2 are nitrate pumping wells

HYDRO GEO CHEM, INC.

KRIGED 4th QUARTER, 2013 NITRATE (mg/L) (NITRATE + NITRITE AS N) WHITE MESA SITE

APPROVED	DATE	REFERENCE	FIGURE
		H:/718000/feb14/nitrate/Unt1213.srf	I-1

Attachment I:

2013 EPA Storm Water Report

NPDES Stormwater Industrial Inspection

National Database Information	
Inspection Type	Industrial Stormwater
NPDES ID Number	Unpermitted
Facility Type	Uranium Mill
Inspection Date	3/14/2013
Entry Time	8:50 a.m.
Exit Time	1:10 p.m.

General	
Inspector Name	Natasha Davis
Telephone	303-312-6225
Inspector Type	EPA
Inspector Name	Emilio Llamozas
Telephone	303-312-6407
Inspector Type	EPA

Facility Location Information				
Name	White Mesa Uranium Mill			
Location	6425 South Highway 191, Blanding, Utah			
Mailing Address	225 Union Blvd. Suite 600 Lakewood, Colorado			
GPS Coordinates	Latitude	37.53451 ° N	Longitude	109.5026 ° W
Receiving Water(s)	Ephemeral Drainages and Natural Springs that flow to Recapture Creek			

Contact Information		
	Name	Telephone
Owner/Permittee	Jo Anne Tischler, Director, Compliance and Permitting Energy Fuels Resources (USA) Inc.	303-389-4132
Operator	David Turk, Environmental Health and Safety Manager White Mesa Uranium Mill Energy Fuels Resources (USA) Inc.	435-678-4113

Site Information	
Industrial Activity	Milling of Uranium, Radium, Vanadium Ores
SIC Code(s)	1094

General	
Industrial Activity	The White Mesa Uranium Mill processes conventional uranium ores, uranium/vanadium ores, and alternate feed materials to recover uranium and vanadium. Conventional ore and alternate feed materials are stored on the ore storage pad in bulk form, bags, drums, and liners. The materials stored on the ore storage pad are exposed to precipitation and were the focus of the inspection.

General	
Facility Description	**The facility is located approximately six miles south of Blanding, Utah in San Juan County. The facility began operations in 1980, and currently employs approximately 150 people. The facility manages stormwater by directing all flow into the evaporation pond onsite. The evaporation pond is also known as Cell 1 (photos 436 to 439). Stormwater from the truck weighing station, drum stored alternate feed, bulk conventional ore and bulk alternate feed flow from the storage pad into a tank at the southwest corner of the ore storage pad (photos 420 to 423). The tank conveys stormwater underground, through a culvert along the access road, and into Cell 1. Stormwater from the northeast portion of the site, where bulk conventional ore and some bulk alternate feed are stored, generally flows to the west/northwest, into a sump located to the south of the sulfuric acid bulk storage tank, which pumps contaminated stormwater in aboveground piping into Cell 1 (photo 434 and 435). The alternate feed stored in the northeast portion of the facility is covered with native soil to prevent wind erosion of the alternate feed material (photo 428, 429, 432, and 433). When stormwater puddles onsite pumper trucks are sent out to pump the puddle water and discharge it into Cell 1 (photo 429, 435, and 436). The facility implements a series of berms throughout the site to protect their roads and prevent offsite discharges. There are berms located along the ore storage pad and the access road on the southern area of the ore storage area (photo 423). There are berms located on the eastern boundary of the ore storage pad, north of the loading dock (photo 431). There is a lined trench along east of the decontamination station, which flows to a tank that needs to be periodically pumped out and discharged into a tank located at the decontamination area which is reused in the decontamination process (photo 424 and 425). Clean stormwater run-on is controlled by a series of large diversion ditches along the northern boundary of the property (photo 440).**
Inspection Description	**EPA inspectors, Natasha Davis, Emilio Llamozas, and Terry Brown, arrived at the White Mesa Uranium Mill with Utah Department of Environmental Quality (Utah DEQ) Radiation Program inspectors Tom Rushing and Boyd Imai to conduct a Clean Water Act compliance evaluation inspection. The EPA inspectors presented their credentials to facility representatives David Turk, Environmental Health and Safety Manager, and Garrin Palmer, Environmental Coordinator, prior to conducting the inspection. The EPA inspectors interviewed on-site representatives about their stormwater management responsibilities, the Stormwater Best Management Practices Plan required by the Utah DEQ Groundwater Discharge Permit UGW370004, and the self-inspections conducted to monitor the stormwater practices implemented on site. The EPA inspectors requested and received copies of the Stormwater Best Management Plan and the daily stormwater inspection reports for March 8, 2012 to March 13, 2012. The EPA inspectors proceeded to conduct a site inspection with the Utah DEQ inspectors and on-site representatives. Approximately half way through the site inspection, Energy Fuels corporate representatives requested a conference call with the EPA. The conference call attendants from Energy Fuels included: David Frydenlund, General Council; Harold Roberts, Vice President; Jo Anne Tischler, Compliance and Permitting Director; and**

General	
	Kathy Winehouse, Quality Assurance Manager. Mr. Frydenlund questioned EPA's authority to conduct Clean Water Act inspections at their facility and requested that an EPA attorney contact him to discuss this issue. Ms. Davis contacted Art Palomares, Director of the Water Technical Enforcement Program, at EPA Region 8, who, in turn, had Jim Eppers, Supervisory Enforcement Attorney, contact Mr. Frydenlund to discuss the jurisdictional issue. **The EPA inspectors continued their site inspection of the diversion ditches, Cell 1, Cell 4a (photos 443 and 444), Cell 4b (photos 441 and 442) and the bone yard storage area. Stormwater from the bone yard appeared to flow into the facility rather than off site, due to the slope of the land and the protection of eastern flows from a historic topsoil stockpile (photos 445 to 447). The site inspection concluded, and a second conference call was conducted with Energy Fuels corporate representatives to discuss the status of the jurisdictional question. The facility agreed that the EPA inspectors could take their photos and copies of the Stormwater Best Management Practices Plan back to the office.** **The EPA inspectors along with the facility representatives also visited the Entrance Spring prior to leaving the facility (photo 448).** **A close out conference was conducted by phone on March 20, 2013.** **Attendees included:** **Natasha Davis, EPA Region 8** **Gwen Campbell, EPA Region 8** **Terry Brown, EPA Region 8** **David Turk, Energy Fuels Resources (USA) Inc.** **Garrin Palmer, Energy Fuels Resources (USA) Inc.** **Tanner Holiday, Energy Fuels Resources (USA) Inc.** **Jo Anne Tischler, Energy Fuels Resources (USA) Inc.** **Phil Gobel, Utah DEQ** **Rusty Lundberg, Utah DEQ** **Tom Rushing, Utah DEQ** **Boyd Iami, Utah DEQ** **Mike George, Utah DEQ** **Jay Morris, Utah DEQ** **During the closing conference call, the EPA inspectors noted that there were no significant findings regarding off-site discharges of stormwater and made a couple of recommendations to improve the stormwater management program at the facility. The EPA recommended that a berm be installed and maintained along the eastern central boundary of the ore storage pad to prevent any stormwater runoff from the ore storage pad from flowing toward the ephemeral drainages that flow toward Recapture Creek (photos 426 and 427). The EPA also recommended that the Stormwater Best Management Practices Plan be updated to include the sophisticated stormwater diversion efforts made at the site to control stormwater that has come into contact with ore materials as well as the clean stormwater diversion practices on site.**

General	

Photographs for White Mesa Uranium Mill

Inspection Type: Industrial Stormwater

Photo Number 418
Inspection Date 3/14/2013
Photographer N. Davis
Description Entrance sign for White Mesa Uranium Mill. Photo is facing west.

Photo Number 419
Inspection Date 3/14/2013
Photographer N. Davis
Description Map of White Mesa Uranium Mill.

Photo Number 420

Inspection Date 3/14/2013

Photographer E. Llamozas

Description Photo is facing east, toward the truck weighing station on the right and a portion of the alternate feed stored in drums on the left. Stormwater flows from east to west in this section of the mill.

Photo Number 421

Inspection Date 3/14/2013

Photographer E. Llamozas

Description Uranium ore piles located on the southeast portion of the ore storage pad. Photo is facing southeast. Stormwater flows from east (left) to west (right) in the photo.

Photographs for White Mesa Uranium Mill

Inspection Type: Industrial Stormwater

Photo Number 422
Inspection Date 3/14/2013
Photographer E. Llamozas
Description Alternate feeds storage. Photo is facing northeast.

Photo Number 423
Inspection Date 3/14/2013
Photographer E. Llamozas
Description Stormwater drainage area for Uranium ore piles shown in photos 420 through 422. Note standing water and dirt berm along the fence. Photo is facing east.

Photographs for White Mesa Uranium Mill

Inspection Type: Industrial Stormwater

Photo Number 424
Inspection Date 3/14/2013
Photographer E. Llamozas
Description Vehicle decontamination area. Photo is facing north.

Photo Number 425
Inspection Date 3/14/2013
Photographer E. Llamozas
Description Collection ditch for run-off from vehicle decontamination area. Solution accumulated in ditch is pumped to decontamination area. Collection ditch was installed approximately in 2009. Photo is facing to the north.

Photographs for White Mesa Uranium Mill

Inspection Type: Industrial Stormwater

Photo Number 426
Inspection Date 3/14/2013
Photographer E. Llamozas
Description Uranium ore piles on north east portion of site. Photo is facing north.

Photo Number 427
Inspection Date 3/14/2013
Photographer E. Llamozas
Description Uranium ore piles on north east portion of the site. Photo is facing east. This is a possible location for stormwater to escape the site.

Photo Number 428

Inspection Date 3/14/2013

Photographer E. Llamozas

Description Uranium ore piles on northeast portion of site. At this location the site slopes to the north. Photo is facing north. Note red pile is an alternate feed (FMRI or CABOT) that has been covered with local soil.

Photo Number 429

Inspection Date 3/14/2013

Photographer E. Llamozas

Description Pooled stormwater on the north east portion of the site. The facility uses a truck to pump accumulated water and transport it to the evaporation pond, Cell 1. Photo is facing west.

Photo Number 430
Inspection Date 3/14/2013
Photographer E. Llamozas
Description North East corner of Uranium ore piles. Photo is facing south.

Photo Number 431
Inspection Date 3/14/2013
Photographer E. Llamozas
Description Northeast corner of Uranium ore piles. Photo is facing south. Note this is the same location as photo 430 on the east side of the fence. Note the dirt berm on the eastern section of the site.

Photographs for White Mesa Uranium Mill

Inspection Type: Industrial Stormwater

Photo Number 432
Inspection Date 3/14/2013
Photographer E. Llamozas
Description Northeast corner of Uranium ore piles. Photo is facing west. The site flows to west in this part of the site.

Photo Number 433
Inspection Date 3/14/2013
Photographer E. Llamozas
Description FMRI or CABOT pile covered with local soil. Photo is facing south.

Photo Number 434

Inspection Date 3/14/2013

Photographer E. Llamozas

Description Stormwater from northeast ore piles flows from the top of the photo towards bottom of the photo, or east to west. Photo is facing east.

Photo Number 435

Inspection Date 3/14/2013

Photographer E. Llamozas

Description Sulfuric acid bulk storage tank. A sump is located to the south (left) side of the sulfuric acid tank. Stormwater flows into the sump or accumulated outside of the berm around the sulfuric acid tank. The sump pumps water into Cell 1. Photo is facing west.

Photographs for White Mesa Uranium Mill

Inspection Type: Industrial Stormwater

Photo Number 436

Inspection Date 3/14/2013

Photographer E. Llamozas

Description Stormwater accumulated to the east of Cell 1. The accumulated water is pumped into Cell 1. Photo is facing west. Cell 1 is in photo center.

Photo Number 437

Inspection Date 3/14/2013

Photographer E. Llamozas

Description Overview of Cell 1 facing northeast. Cell 1 is approximately 60 acres. In 2012 the pond liner was inspected and repaired.

Photographs for White Mesa Uranium Mill

Inspection Type: Industrial Stormwater

Photo Number	438
Inspection Date	3/14/2013
Photographer	E. Llamozas
Description	Northeast corner of Cell 1 facing south. The black pipe is the inlet to Cell 1 from the sump next to the sulfuric acid tank shown in photo 435.

Photo Number	439
Inspection Date	3/14/2013
Photographer	E. Llamozas
Description	Northeast corner of Cell 1 facing southeast. The black pipe is the inlet to Cell 1 from the sump next to the sulfuric acid tank shown in photo 435.

Photographs for White Mesa Uranium Mill

Inspection Type: Industrial Stormwater

Photo Number 440
Inspection Date 3/14/2013
Photographer E. Llamozas
Description Diversion ditch 1. Photo is facing north.

Photo Number 441
Inspection Date 3/14/2013
Photographer E. Llamozas
Description Southwest corner of Pond 4B facing west.

Photographs for White Mesa Uranium Mill

Inspection Type: Industrial Stormwater

Photo Number 442
Inspection Date 3/14/2013
Photographer E. Llamozas
Description Southwest corner of Pond 4B facing north.

Photo Number 443
Inspection Date 3/14/2013
Photographer E. Llamozas
Description Southwest corner of Pond 4A facing west.

Photographs for White Mesa Uranium Mill

Inspection Type: Industrial Stormwater

Photo Number 444
Inspection Date 3/14/2013
Photographer E. Llamozas
Description Southwest corner of Pond 4A facing north.

Photo Number 445
Inspection Date 3/14/2013
Photographer E. Llamozas
Description Bone yard storage area. Photo is facing north.

Photographs for White Mesa Uranium Mill

Inspection Type: Industrial Stormwater

Photo Number 446

Inspection Date

Photographer E. Llamozas

Description Bone yard storage area. Photo is facing west.

Photo Number 447

Inspection Date

Photographer E. Llamozas

Description Bone yard storage area. Photo is facing west.

Photo Number 448

Inspection Date

Photographer E. Llamozas

Description Entrance spring.
Photo is facing to the
east.

Attachment J:

Application for (Energy Fuels) and Approval of (DAQ) Construction of Cell 4B

DENISON MINES

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SENT VIA PDF AND FEDERAL EXPRESS

April 13, 2010

M. Cheryl Heying
Executive Secretary
Utah Air Quality Board
State of Utah Department of Environmental Quality
168 North 1950 West
Salt Lake City, UT 84114-4850

Re: Denison Mines White Mesa Mill
Application for Approval of Modification of an Existing Source Under 40 CFR 61.07
State of Utah Division of Air Quality
Approval Order Number DAQE-AN0112050008-08

Dear Ms. Heying:

1. INTRODUCTION

This is an application for approval of modification of an existing source under 40 Code of Federal Regulations ("CFR") 61.07 (the "Application"), with respect to the construction and operation of a new tailings impoundment, Cell 4B, at Denison Mines (USA) Corp's ("Denison's") White Mesa Uranium Mill (the "Mill").

The Mill is located approximately six miles south of Blanding, Utah, and is operated by Denison under State of Utah Radioactive Materials License No. UT 1900479 (the "License"), State of Utah Ground Water Discharge Permit No. UGW 370004 (the "Permit") and State of Utah Air Quality Approval Order DAQE-AN1205005-06 (the "Air Approval Order").

The Mill is licensed to process natural uranium ores and selected alternate feed materials, which are uranium-bearing materials other than conventionally mined uranium or uranium/vanadium ores.

This Application is being made in conjunction with applications that have been made to the Executive Secretary of the Utah Radiation Control Board/Co-Executive Secretary of the Utah Water Quality Board for amendments to the License and Permit to authorize the specific design, construction and operation of Cell 4B.

While Cell 4B has not yet been constructed, it was contemplated, described, and assessed previously and is therefore contemplated by the License, being a critical component of the initial environmental analysis and licensing of the facility. See the *Environmental Report, White Mesa Uranium Project San Juan County, Utah*, January 30, 1978, prepared by Dames & Moore (the "1978 ER") and the *Final Environmental Statement Related to Operation of the White Mesa Uranium Project Energy Fuels Inc.*, May 1979, (the "FES"), prepared by the United States Nuclear Regulatory Commission ("NRC").

The current applications for amendments to the License and Permit therefore relate to the specifics of Cell 4B's design, construction and operation but not to the approval of the cell itself, which is already contemplated by the License.

Enclosed with this Application are the following Figures and Attachments:

Figures:

Figure 1-1	Regional Location Map
Figure 1-2	Mill Layout, Showing Proposed Location of Cell 4B
Figure 1-3	Schematic Drawing of Cell 4B

Attachments:

Attachment A	Consolidated Approval Order and Approval Order for Cells 4A and 4B dated June 26, 1989
Attachment B	EPA Approval Letter Under 40 CFR 61.08 for Cell 4A dated March 16, 1989
Attachment C	Summary of Compliance with the Requirements of 40 CFR 192.32(a)

2. BACKGROUND

The relevant background information is as follows:

a) Construction of the Mill commenced in 1979, and the Mill was originally licensed for operations by NRC under Source Material License No. SUA-1358 in May 1980.

b) The initial environmental analyses and the initial NRC License contemplated six cells in the Mill's tailings management system containing approximately 11 million tons of tailings solids, which would be the tailings resulting from 15 years of Mill operations at full capacity (see Section 3.2.4.7 of the FES and Section 3.4 and Appendices H and I of the 1978 ER). These are evaporation pond Cell 1-I (now referred to as Cell 1), a second evaporation pond (Cell 1-E), which has not been constructed, and a series of

80-acre cells, of which Cells 2 and 3 and half of Cell 4 (Cell 4A) have been constructed to date. 80-acre Cells 4 and 5 have been specifically contemplated and included in the License (see Figure 3.4 of the FES). With Cell 4A in place, Cell 4B will consume the second half (the second 40 acres) of the previously authorized 80-acre Cell 4.

c) Construction of Cell 2 was completed in May of 1980, construction of Cell 1 was completed in June of 1981, and construction of Cell 3 was completed in September of 1982. As a result, all liquids and tailings solids generated prior to June 1981 were deposited into Cell 2. In September 1981, after completion of Tailings Cell 1, solutions were placed in both Cells 1 and 2, but all tailings solids were placed into Cell 2. Cell 3 was put into service after September 1982.

d) Cell 4A was constructed in 1989, and licensed by NRC for operations in 1990. In conjunction with the initial approval of Cell 4A, the State of Utah Department of Health, Division of Environmental Health issued a Consolidated Approval Order and Approval Order for Cells 4A and 4B on June 26, 1989, a copy of which is included as Attachment A to this letter, and the United States Environmental Protection Agency ("EPA") issued an approval under 40 CFR 61.08 for Cell 4A on March 16, 1989, a copy of which is included as Attachment B to this letter.

e) Cell 4A was only used for a short period of time for the evaporation of liquid solutions (raffinates) from the Mill's vanadium circuit, and its initial use ceased in 1990. As a result, damage occurred to the seams in the liner due to thermal stress from years of exposure to direct sunlight. Denison removed the residual crystals from Cell 4A in 2006 and deposited them into Cell 3. Cell 4A was relined with a new flexible membrane liner in 2007 and 2008, and approved by the Executive Secretary of the Utah Radiation Control Board/Co-Executive Secretary of the Utah Water Quality Board, through the issuance of amendments to the License and Permit, and put into service in 2008.

f) The design specifications for Cell 4B were submitted by Denison on December 8, 2007, in a report entitled *Cell 4B Design Report, White Mesa Mill Blanding Utah*, prepared by Geosyntec Consultants (the "Design Report"). The design of Cell 4B is virtually identical to the design for Cell 4A, which design was approved earlier in 2007. The Design Report was followed by an *Environmental Report in Support of Construction of Tailings Cell 4B, White Mesa Uranium Mill, Blanding, Utah*, April, 30, 2008 (the "2008 ER"), and applications for amendment to the License and Permit in June, 2008. The 2008 ER was subsequently revised and resubmitted on September 11, 2009.

g) In conjunction with the 2008 ER, Denison submitted a report entitled *Proposed Development of New Tailings Cell 4B for the White Mesa Uranium Mill*, dated April 2008, (the "2008 MILDOS Report") prepared by SENES Consultants Limited ("SENES"), which updated the *Dose Assessment in Support of the License Renewal*

Application & Environmental Report for the White Mesa Uranium Mill, February 2007, prepared by SENES (the "2007 MILDOS Report") to include the addition of Cell 4B.

h) During its review of Denison's requests to amend the License and Permit to include the specific design and operating conditions applicable to Cell 4B, the State of Utah Division of Radiation Control ("DRC") issued a number of interrogatories, requiring responses from Denison, including a request for Denison to perform a sensitivity analysis to demonstrate that reasonable variations in MILDOS input parameters (related to Cell 4B performance) do not change the conclusions of the 2008 MILDOS Report. As a result of this request, Denison submitted a letter report dated February 12, 2010, prepared by SENES (the "MILDOS Sensitivity Study").

i) On April 7, 2010, DRC published for public comment the proposed revised License and Permit, as well as a Statement of Basis dated April 6, 2010 (the "SOB") in support of the proposed amendments to the Permit, and a Safety Evaluation Report dated April 6, 2010 (the "SER") in support of the proposed amendments to the License. The proposed amended License and Permit as well as the SOB and SER are available on the DRC website at

    http://www.radiationcontrol.utah.gov/Uranium_Mills/IUC/cell4b/permitM
    od_licenseAmend.htm

j) With the approval of the Executive Secretary of the Utah Radiation Control Board/Co-Executive Secretary of the Utah Water Quality Board, Denison commenced pre-construction excavation and site preparation activities for Cell 4B in November 2009. However, construction of Cell 4B will not commence until all required License and Permit amendments and approvals have been obtained.

3. NAME AND ADDRESS OF THE APPLICANT

This Application is being submitted by:

Denison Mines (USA) Corp.
1050 17th Street Suite 950
Denver, Colorado 80265

4. LOCATION OR PROPOSED LOCATION OF THE SOURCE

Per the Air Approval Order, the source has been defined as the entire Mill operating facility.

The Mill is located in central San Juan County, Utah approximately six miles south of Blanding, Utah. The Mill can be reached by taking a private road for approximately 0.5 miles west of Utah State Highway 191 South. The location is depicted in Figures 1-1 and 1-2.

The Mill is located on fee land and mill site claims, covering approximately 5,415 acres, encompassing all or part of Sections 21, 22, 27, 28, 29, 32, and 33 of T37S, R22E, and Sections 4, 5, 6, 8, 9, and 16 of T38S, R22E, Salt Lake Base and Meridian.

5. NATURE, SIZE, DESIGN, OPERATING DESIGN CAPACITY, METHOD OF OPERATION OF THE SOURCE AND EQUIPMENT USED FOR CONTROL OF EMISSIONS

5.1 Nature of the Source

The Mill is an operating conventional uranium mill. It has operated on a campaign basis over the years, depending on the availability of ores and market conditions. The Mill has been fully operational, processing conventionally mined uranium/vanadium ores, during the period from April 2008 to May 2009, and alternate feed materials from June 2009 to the current time. The Mill resumed processing conventional ores in March 2010.

Cell 4B will be an essential element of future operations at the Mill as its construction is necessary in order to continue providing sufficient impoundment surface area for the evaporation of Mill process water. Cell 4B will also provide additional tailings capacity which is necessary to accommodate the tailings volume associated with routine ore processing operations once Cell 3 is full and Cell 4A is partially full.

5.2 Size and Design of the Source

As discussed in Section 2(b), above, the Mill was authorized in its initial NRC license for the construction of six cells in its tailings management system, of which three and a half have been constructed. The Mill's tailings system currently consists of one evaporation pond (Cell 1) and three tailings cells, of which one cell (Cell 2) has been filled and closed, and two cells (Cell 3 and Cell 4A (which is the first half of Cell 4)) are currently in operation. Design information relating to the size (surface area) of the cells that currently comprise the tailings system is provided in Table 1, below.

Table 1 – Cell Specifications

Cell Designation	Surface Area (Acres)	Approximate Capacity Cubic Yds	Estimated Capacity Dry Tons or Gallons
Cell 1	55	661,500*	133,600,000 gal*
Cell 2	67	2,015,000	2,337,400 dry tons
Cell 3	71	2,345,000	2,720,200 dry tons
Cell 4A	40	1,600,000	1,856,000 dry tons

*Measured to the freeboard limit.

The area comprising the Mill's restricted area is approximately 500 acres. Included in this area are the cells described above as well as an ore pad, mill process building (which includes a semi-autogenous grind mill, and leach, countercurrent decantation, yellowcake precipitation, drying and packaging circuits), a solvent extraction building, a maintenance shop, a warehouse, an administration building and various associated facilities.

5.3 Operating Design Capacity of the Source

The Mill has a nominal operating capacity of approximately 2,000 tons of conventional ore per day for a maximum yellowcake production of 4,380 tons of U_3O_8 per year.

Capacity data for each cell in the current tailings system is provided in Table 1.

5.4 Method of Operation

The "method of operations" at the Mill is phased disposal of tailings. Compliance with the NESHAP standards at 40 CFR 61.252(a) is determined annually for existing impoundments (i.e., Cells 2 and 3). The annual radon emissions for existing impoundments are measured using Large Area Activated Charcoal Canisters in conformance with 40 CFR, Part 61, Appendix B, Method 115, Restrictions to Radon Flux Measurements. These canisters are passive gas adsorption sampling devices used to determine the flux rate of radon-222 gas from the surface of the tailings material.

For impoundments licensed for use after December 15, 1989 (i.e., Cell 4A and proposed Cell 4B), Denison employs the work practice standard listed at 40 CFR 61.252(b)(1) in that all tailings impoundments constructed or licensed after that date are lined, are no more than 40 acres in area and no more than two impoundments are operated for tailings disposal at any one time.

The Mill conducts on-going tailings reclamation by the following processes. As each cell is filled with tailings, solutions are separated from tailings solids and pumped to the evaporation pond (Cell 1) or to another tailings cell. Tailings solids are allowed to dry in place. As each tailings cell reaches final capacity, reclamation begins with the placement of interim cover over the tailings. Tailings Cell 2 is full and has been completely covered with interim cover.

At the time of this Application, Cell 3 is nearly full and partially covered with interim cover, such that the uncovered liquid pool has been reduced significantly relative to the cell's total footprint. Cell 3 is currently receiving only tailings solids and slimes drain solutions from Cell 2. The Mill is attempting to complete the filling of Cell 3 and advancement of full interim cover during the 2010 operating year. In any event, disposal of tailings into Cell 3 will cease and the cell will be filled and taken out of service, before tailings solids are disposed of in Cell 4B. Once Cell 3 is filled and taken out of service, Cell 4A will be the only remaining disposal cell in active service, other than proposed Cell 4B.

5.5 Equipment Used for Control of Emissions

The primary method of controlling radon and other air emissions from the tailings system is by limiting the operative surface area. Section 29 of the Air Approval Order requires that the Mill operate in accordance with the requirements of 40 CFR 61, Subpart W. Under the Subpart W work practice standard followed by the Mill, the Mill may only have up to 80 acres of tailings surface (or two 40 acres tailings disposal cells) in operation at any time.

In addition, In order to maintain radon and other emissions As Low As Reasonably Achievable (ALARA), the Mill maintains a practice of concurrent/ongoing reclamation on active cells. The Mill advances cover over solids-filled areas of each cell as operations proceed and the cell fills, thereby further limiting the operative surface area.

Radon gas flux measurements have been made at Cells 2 and 3. Currently Cell 2 is fully covered and Cell 3 is partially covered with three to four feet of random fill. During the period 2005 through 2008, Cell 2 was only partially covered with such random fill. Radon flux measurements, averaged over the covered areas, were as follows for the years 2005-2009:

Table 2
Average Radon Flux From Tailings Cells 2005-2009
($pCi/m^2/sec$)

	2005	2006	2007	2008	2009
Cell 2	7.1	7.9	13.5	3.9	13.7
Cell 3	6.2	10.0	8.9	3.1	7.9

The radon-222 emission standard for existing impoundments (i.e., tailings disposal impoundments that were licensed prior to December 15, 1989), such as Cells 2 and 3, is 20 $pCi/m^2/sec$. These empirical data therefore demonstrate that the random fill cover, alone, is currently providing an effective barrier to radon flux.

Upon final closure of each cell, including Cell 4B, a final cover will be placed over the tailings in accordance with the Mill's NRC-approved Reclamation Plan. The final cover has been designed to maintain long-term radon emissions from the cells within the regulatory limit of 20 $pCi/m^2/sec$ set out in UAC R313-24-4 (incorporating by reference the requirements of 10 CFR Part 40, Appendix A, Criterion 6(2)). See the discussion at pages 44 and 45 of the SER.

6. PRECISE NATURE OF THE PROPOSED CHANGES

Existing Cell 4A is a below-grade synthetically lined evaporation and solids disposal cell of approximately 1.6 million cubic yards capacity at the freeboard limit and encompassing approximately 40 acres inside its dikes.

The nature of the change would consist of the construction and operation of new Cell 4B. Cell 4B will have a similar design and identical function as the existing Cell 4A. Cell 4B will be a synthetically-lined evaporation and solids cell of approximately 1.9 million cubic yards capacity encompassing approximately 40 acres inside its dikes. The increased tailings capacity in Cell 4B compared to Cell 4A is due to the slightly greater average depth of Cell 4B compared to Cell 4A. Cell 4B will initially be used as an evaporation pond for solutions only. It will subsequently be used as a tailings disposal cell for the disposal of tailings solids, as operational needs warrant.

Figure 1-2 shows the location of proposed Cell 4B relative to the existing tailings cells. Figure 1-3 shows the dimensions and surface area of Cell 4B (which indicates that the designed surface area of Cell 4B is 39.84 acres).

A summary of the design features for Cell 4B follows. Each design element listed below is currently being evaluated by the Executive Secretary of the Utah Radiation Control Board/Co-Executive Secretary of the Utah Water Quality Board, and is undergoing extensive analysis, in conjunction with the applications for amendments to the License and Permit associated with the proposed construction and operation of Cell 4B.

The proposed design of Cell 4B consists of:

a) North, South, East, and West dikes of 2H to 1V interior sideslope (except at the slimes drain);

b) A foundation of subgrade soils over bedrock;

c) A surface area inside the dikes of 40 acres, and a capacity of approximately 1.9 million cubic yards below the required 3 foot freeboard;

d) Primary and secondary 60-mil HDPE flexible membrane liners ("FMLs") that extend across the entire cell floor and inside side slopes, and which sandwich a leak detection system;

e) A permeable HDPE geonet leak detection system that extends across the entire area below the primary FML, with gravel-filtered leak detection sump;

f) A manufactured geosynthetic bentonite clay liner beneath the secondary FML;

g) North and East Dike splash pads to protect the primary FML from abrasion and scouring by tailings slurry;

h) A perforated pipe and strip drain slimes drain collection system above the primary FML; and

i) A concrete lined spillway to allow emergency runoff from Cell 4A.

See Part I.D.12 of the proposed amended Permit for a more detailed description of the proposed design of Cell 4B.

As mentioned above, other than a slight change in geometry, the proposed design of Cell 4B is virtually identical to that of Cell 4A. The installation and operation of Cell 4B will result in no change to:

- The design of the tailings system;
- The operation of the tailings system;
- The surface area of exposed tailings solids (other than the fact that the surface area of proposed Cell 4B at 40 acres will be less than the surface area of Cell 3 which is 71 acres, thereby actually reducing the surface area of exposed tailings solids);
- The throughput capacity of the Mill; or
- The proposed reclamation sequence for the Mill site.

7. PRODUCTIVE CAPACITY OF THE SOURCE BEFORE AND AFTER THE CHANGES ARE COMPLETED

As described in Section 5.3 above, the Mill has a nominal operating design capacity of approximately 2,000 tons of conventional ore per day or 4,380 tons of U_3O_8 production per year. The construction and operation of Cell 4B will not change the Mill's productive operating capacity.

As required by 40 CFR 61.252(b)(1), Cell 3 will be filled and closed prior to disposal of tailings solids into Cell 4B. Cell 4B capacity will replace the tailings management capacity lost by closure of Cell 3.

8. ESTIMATES OF EMISSIONS BEFORE AND AFTER THE CHANGES ARE COMPLETED

In accordance with 40 CFR 61.252(b)(i), the Mill cannot have more than two tailings impoundments in operation at any one time for the disposal of tailings. This means that prior to Cell 4B coming into operation for the disposal of tailings, Cell 3 must cease operations. As a result, the total emissions from the addition of Cell 4B will not be significantly different from previously approved operations (which include the operation of Cell 3). The 2008 MILDOS Report takes these factors into account.

In the 2008 MILDOS Report, the calculated total annual effective dose commitments (including radon) calculated using MILDOS-AREA were compared to the Utah Administrative Code ("UAC") R313-15-301(1)(a) requirement that the dose to individual members of the public shall not exceed 100 mrem/yr (radon included). For the processing of Colorado Plateau ore at full Mill capacity, the maximum total annual effective dose commitments were calculated to be a maximum of 1.4 mrem/yr for an infant at the nearest potential residence, which is about 1.4% of the UAC R313-15-301(1)(a) limit of 100 mrem/yr (radon included) to an individual member of the public. There was no significant difference in the dose assuming operation of Cell 4B compared to the current state of operations without Cell 4B. For the processing of higher grade Arizona Strip ore at full Mill capacity, the total annual effective dose commitments were calculated to be a maximum of 3.1 mrem/yr for an infant at the nearest potential residence, which is about 3.1% of the 100 mrem/yr limit (radon included) to an individual member of the public. Again, there was no significant difference in the dose assuming operation of Cell 4B compared to the current state of operations without Cell 4B. Overall, using conservative assumptions, the predicted annual effective dose commitments for operations with or without Cell 4B comply with UAC R313-15.

In addition, the 2008 MILDOS Report calculated 40 CFR 190 annual dose commitments (excluding radon) and compared those results to the 40 CFR 190 criterion, which is 25 mrem/yr to the whole body (excluding the dose due to radon) and 25 mrem/yr to any other organ, to any member of the public. The 40 CFR 190 doses were also used to demonstrate compliance with the ALARA (As Low As Reasonably Achievable) goal set out in UAC R313-15-101(4) (10 CFR 20.1101(d)) (i.e., the ALARA goal is to demonstrate that total effective dose equivalent to the individual member of the public likely to receive the highest total effective dose equivalent will not exceed 10 mrem/yr (absent the radon dose)). For the processing of Colorado Plateau ore at full Mill capacity, the 40 CFR 190 annual dose commitments were calculated to be a maximum of 4.8 mrem/yr for a teenager at the nearest potential residence (dose to the bone), which is about 19% of the 40 CFR 190 dose criterion of 25 mrem/yr. For the processing of higher grade Arizona Strip ore at full Mill capacity, the 40 CFR 190 annual dose commitments were at most 12 mrem/yr for a teenager at the nearest potential residence (dose to the bone), which is about 49% of the 40 CFR 190 dose criterion of 25 mrem/yr. Further, the 40 CFR 190 annual effective dose commitments demonstrate compliance with the UAC R313-15-101(4) (10 CFR 20.1101(d)) ALARA goal of 10 mrem/yr to the individual member of the public likely to receive the highest total effective dose equivalent (the maximum total effective dose equivalent (radon excluded) was 1.39 mrem/yr for an infant at the nearest potential residence). In each of these calculations, there was no significant difference in the dose assuming operation of Cell 4B compared to the current state of operations without Cell 4B. Overall, using conservative assumptions, ore processing with or without the operation of Cell 4B complies with the requirements of 40 CFR 190 and the ALARA goal set out in UAC R313 -15-101(4).

See the discussion on pages 1 through 5 of the SER for DRC's evaluation of the MILDOS modeling related to Cell 4B.

9. COMPLIANCE WITH THE REQUIREMENTS OF 40 CFR 192.32(A)

As mentioned above, the work practice the Mill follows under 40 CFR 61.252(b)(1) is phased disposal in lined tailings impoundments that are no more than 40 acres in area and meet the requirements of 40 CFR 192.32(a) as determined by NRC.

As discussed in Section 6 above, and as indicated on Figure 1-3, Cell 4B will be a lined tailings impoundment that is no more than 40 acres in area. Compliance with the requirements of 40 CFR 192.32(a) is being determined by the Executive Secretary of the Utah Radiation Control Board/ Co-Executive Secretary of the Utah Water Quality Board, in his review of the applications to amend the License and Permit to include the specific design criteria and operating conditions applicable to Cell 4B. These determinations are discussed in the SER and the SOB. See also Attachment C to this Application for a summary of the requirements of 40 CFR 192.32(a) and the manner in which Cell 4B will satisfy those requirements, with references to the relevant pages of the SOB and SER, where applicable.

10. CONCLUSIONS

Based on the foregoing information, it is evident that Cell 4B will be a lined tailings impoundment that is no more than 40 acres in area and that, upon approval of amendments to the License and Permit by the Executive Secretary of the Utah Radiation Control Board/Co-Executive Secretary of the Utah Water Quality Board, will satisfy the standards set out in 40 CFR 192.32(a). It is further evident that, upon approval, Cell 4B will be capable of being operated in compliance with the provisions of 40 CFR Subpart W.

Based on the foregoing, Denison believes that it would be appropriate for the Executive Secretary of the Utah Air Quality Board to determine that the construction or operation of Cell 4B will not cause emissions in violation of a standard if properly operated, and to approve the requested modification pursuant to 40 CFR 61.08 (b).

Please notify us whether you agree that the foregoing requirements of 40 CFR 61.07 have been met, so that construction of Cell 4B can proceed.

If you should have any questions regarding this Application please contact me at 303-389-4132 or David C. Frydenlund, Denison's Vice President, Regulatory Affairs and Counsel, at 303-389-4130.

Yours very truly,

DENISON MINES (USA) CORP.
fm Jo Ann Tischler
Director, Compliance and Permitting

cc: EPA, Region VIII, Attention: Director, Air and Toxics Technical Enforcement Program
Dane L. Finerfrock, Executive Secretary, Utah Radiation Control Board
Ron F. Hochstein
David C. Frydenlund
Harold R. Roberts
David E. Turk.

DENISON MINES

Figure 1-1

Denison Mines (USA) Corp.

DENISON MINES

Project:	WHITE MESA MILL		
County:	San Juan	State:	Utah

FIGURE 1-1

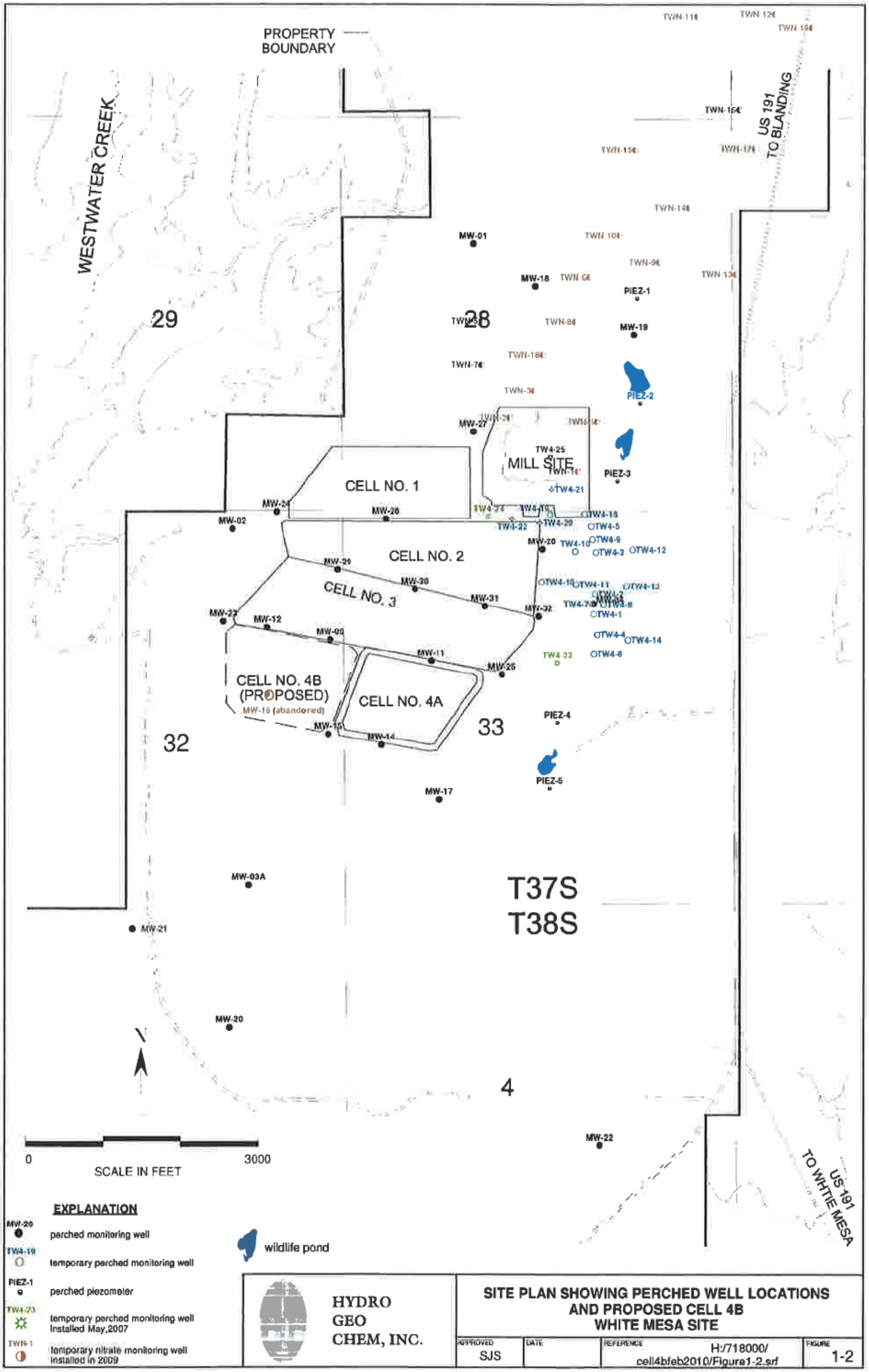
REGIONAL LOCATION MAP

Date: Nov 2009	Design:	Drafted By: D.Sledd

Scale 1"=5 miles A portion of USGS Map No NJ12-9 Cortez, CO-UT

W:\USA\Utah\Mill\dwgs\Reclamation Plans\RecPlan4.0\Figure 1-1_ Regional Location Map.dwg Figure 1 03/11/2009 dsledd

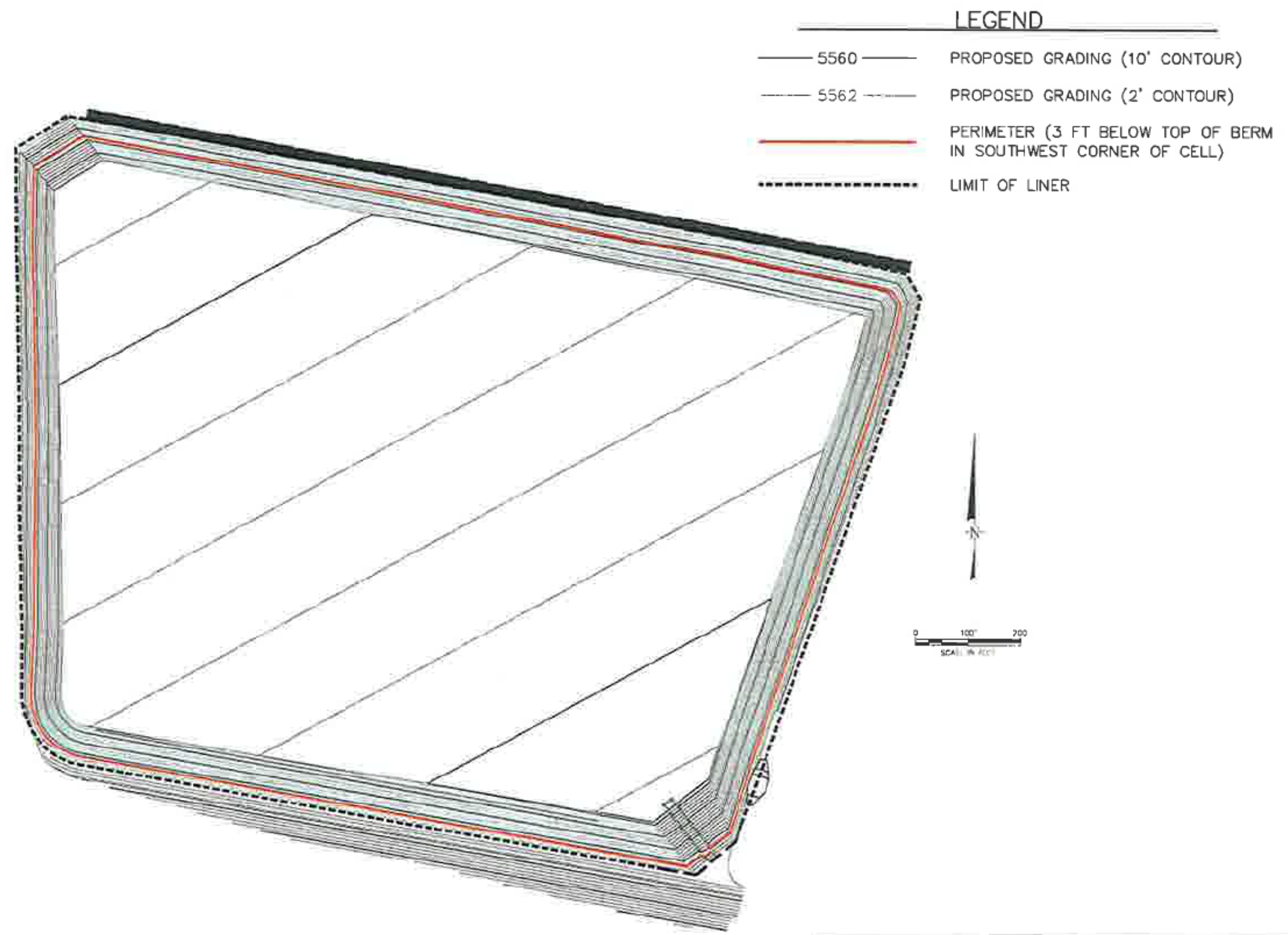
Figure 1-2



SITE PLAN SHOWING PERCHED WELL LOCATIONS AND PROPOSED CELL 4B WHITE MESA SITE

APPROVED	DATE	REFERENCE	FIGURE
SJS		H:/718000/ cell4bfeb2010/Figure1-2.srf	1-2

Figure 1-3



NOTE:

1. PERIMETER AREA = 39.84 ACRES.

CELL 4B WHITE MESA MILL BLANDING UTAH		
Geosyntec consultants	DATE APRIL 2010 PROJECT NO SC0349	FIGURE 1—3

Attachment A

Norman H. Bangerter
Governor
Suzanne Dandoy, M.D., M.P.H.
Executive Director
Kenneth L. Alkema
Director

State of Utah
DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL HEALTH

Bureau of Air Quality
288 North 1460 West
P.O. Box 16690
Salt Lake City, Utah 84116-0690
(801) 538-6108

June 26, 1989

John S. Hammrick
Umetco Minerals
P.O. Box 669
Blanding, Utah 84511

Dear Mr. Hammrick:

Re: Consolidated Approval Order and Approval Order for Cells 4A and 4B
San Juan County, CDS A1

The above-referenced project has been evaluated and found to be consistent with the requirements of the Utah Air Conservation Regulations (UACR) and the Utah Air Conservation Act. A 30-day public comment period was held and all comments received were evaluated. The conditions of this approval order reflect any changes to the proposed conditions which resulted from the evaluation of the comments received. This air quality approval order authorizes the project with the following conditions and failure to comply with any of the conditions may constitute a violation of this order:

1. Umetco Minerals Corporation, located near Blanding, San Juan County, Utah, shall construct and operate according to the following notices of intent:

   A. The notice of intent dated November 15, 1978 to operate the White Mesa Uranium Mill

   B. The notice of intent dated July 22, 1988 to modify the vanadium circuit

   C. The notice of intent dated February 15, 1989 to add Cells 4A and 4B

2. This approval order shall replace and void all previous approval orders.

3. The approved installations shall consist of the following equipment located at the plant:

   A. A rotary ammonium metavanadate dryer

   B. A Ducon dry cyclone installed on the off-gas stream of the rotary dryer

   C. A new propane melting furnace

   D. An existing propane melting furnace

   E. An existing propane-fired multiple hearth dryer

F. A new Kice dry cyclone located between the hearth dryer and the Sly No. 6 wet scrubber

G. A second fusion furnace and casting wheel

H. A new Ducon dryer scrubber

I. An existing Sly No. 6 wet scrubber

J. Yellow cake dryer

K. Yellow cake scrubber

L. Yellow cake packaging scrubber

M. Yellow cake enclosure scrubber

N. Leach demistor

O. Coal fired boiler and scrubber

P. Oil fired boiler

Q. Coal stockpile

R. Soil and overburden stockpiles

S. Ore grizzly and fabric filter dust collector

4. The equipment used to construct Cells 4A and 4B shall consist of the following:

A. Scrapers (3)
B. Cat trucks (3)
C. Cat crawlers (2)
D. Front-end loader (1)
E. Compactor (1)
F. Grader (1)
G. Water truck (1)
H. Personnel vehicles (1)
I. Other equipment which does not produce air contaminants

5. Cell #4 shall consist of two separate cells, known as Cell A and Cell B. Cells 4A and 4B shall be sized to each have a volume not exceeding 1150 acre-feet (1,855,333 cubic yards) with a phased final surface area of no more than 40 acres each. Cell #4 shall be designed as a below-grade repository similar to the previously constructed cells in the Tailings Management System.

6. Visible emissions from any point or fugitive emission source associated with the installation or control facilities of Cell #4 shall not exceed 20% opacity. Opacity observations of emissions from stationary sources shall be conducted in accordance with 40 CFR 60, Appendix A, Method 9. Opacity observations of intermittent sources shall use procedures similar to Method 9, but the requirement for observations to be made at

15-second intervals over a 6-minute period shall not apply. The averaging time shall be the actual time interval over which visible emissions are observed. Any time interval with no visible emissions shall not be included.

7. The total amount of tailings to be deposited into five proposed cells over the life of the plant shall not exceed 10,950,000 tons. Compliance with these limitations shall be determined by an annual examination of company records by the Executive Secretary. Any changes to these limitations shall require an approval order in accordance with Section 3.1, UACR.

8. All unpaved roads and other unpaved operational areas shall be water sprayed and/or chemically treated to the extent necessary to maintain a surface damp condition. Control is required whenever the roads or areas are being used. An operational water truck shall be maintained on site and available during each operating day. If the water truck is out of service and the roads or operational areas become dry they shall not be used until a truck has been obtained and water has been applied. The equipment shall be capable of delivering a minimum application rate of water of 0.5 gallons per square yard. Records of water treatment shall be kept for all periods when the plant is in operation. The records shall include the following items:

   A. Date
   B. Number of treatments made
   C. Rainfall received, if any, and approximate amount
   D. Time of day treatments were made

   Records of treatment shall be made available to the Executive Secretary upon request and shall include a period of time equal to the entire duration of the project. If chemical treatment is to be used, the plan must be approved by the Executive Secretary.

9. Fugitive dusts from the disturbed areas shall be controlled through the use of watering as dry conditions warrant or as determined necessary by the Executive Secretary. The speed of compactors shall not exceed 3 mph at any time.

10. The storage piles shall be watered to minimize generation of fugitive dusts as dry conditions warrant or as determined necessary by the Executive Secretary.

11. For front-end loading operations and truck dumping operations, the drop distances shall be kept as small as practicable. The speed of the scrapers shall not exceed 3 mph while loading and 12 mph while dumping. The moisture content of the materials shall be no less than 4% by weight during these operations. The moisture content shall be tested if directed by the Executive Secretary using a test method approved by the Executive Secretary.

12. The owner/operator shall comply with 40 CFR 61, Subpart W, National Emission Standards for Radon-222 Emissions from Licensed Uranium Mill Tailings. The owner/operator shall comply with Section 4.5.5, UACR during the construction and operation of the cells.

13. The vanadium circuit, the yellow cake dryer, and the coal fired boiler scrubbers shall be stack tested for particulate within 180 days of start-up. The emission rates/concentrations shall not exceed any of the following values:

    A. Vanadium circuit scrubber

        1) 0.02 grain/dscf (68°F, 29.92 in Hg)
        2) 2.50 lb/hr

    B. Yellow cake dryer - 0.40 lb/hr

    C. Coal fired boiler - 5.70 lb/hr

    The test method used shall be 40 CFR 60, Appendix A, Method 5. Notification of the test date shall be provided at least 30 days prior to the test. A pretest conference shall be held if directed by the Executive Secretary. It shall be held at least 30 days prior to the test between the owner/operator, the tester, and the Executive Secretary. The emission points shall be designed to conform to the requirements of 40 CFR 60, Appendix A, Method 1, and OSHA approvable access shall be provided to the test location.

14. Visible emissions from the following points shall not exceed the following values:

    A. Vanadium circuit scrubbers - 15% opacity
    B. All other points - 20% opacity

    Opacity observations of emissions from stationary sources shall be conducted in accordance with 40 CFR 60, Appendix A, Method 9. Opacity observations of intermittent sources shall use procedures similar to Method 9, but the requirement for observations to be made at 15-second intervals over a 6-minute period shall not apply. The averaging time shall be the actual time interval over which visible emissions are observed. Any time interval with no visible emissions shall not be included.

15. The owner/operator shall use only propane as a fuel in the multiple hearth dryer, the two fusion furnaces, and the AMV rotayr dryer. If any other fuel is to be used, an approval order shall be required in accordance with Section 3.1, UACR.

16. The sulfur content of any coal or any mixture of coals burned shall not exceed 1.0 pound of sulfur per million BTU heat input as determined by ASTM Method D-3177-75. The sulfur content shall be tested if directed by the Executive Secretary.

17. The ore and coal loading areas shall be partially enclosed on three sides and have wetting agents applied to the ore grizzly.

18. The coal stock piles shall be sprayed with wetting agents to minimize fugitive dusts.

19. The tailings retention areas shall be sprayed with water or a crusting agent when dry conditions exist.

20. The mill area shall be graveled and, when necessary, sprayed with water as a minimum to minimize fugitive dust.

21. The soil and overburden stockpiles shall be sprayed between stockpiling and vegetation periods as required (records of spraying shall be maintained).

22. Unpaved haul/access roads shall have at least one inch of gravel as roadbase surface.

23. When the cells are filled with tailings, the surfaces shall be reclaimed in a manner such that wind-blown particulate emissions from the site are minimized. A plan for reclaiming the site shall be submitted to the Executive Secretary for approval no less than 180 days before the ponds are filled with tailings.

24. All installations and facilities authorized by this approval order shall be adequately and properly maintained.

25. The Executive Secretary shall be notified in writing upon start-up of the installation, as an initial compliance inspection is required.

Any future modifications to the equipment approved by this order must also be approved in accordance with Section 3.1.1, UACR.

This approval order in no way releases the owner or operator from any liability for compliance with all other applicable federal, state, and local regulations including the Utah Air Conservation Regulations.

"Allowable emissions" as defined in Section 1.12, UACR, for this source (the entire plant) are currently calculated at 214.32 tons/yr for particulate, 62.3 tons/yr for SO_2, 80.7 tons/yr for NO_x, 1.1 tons/yr for VOC, and 4.5 tons/yr for CO. These calculations are for the purposes of determining the applicability of PSD and nonattainment area major source requirements of the UACR. They are not to be used for purposes of determining compliance.

Sincerely,

F. Burnell Cordner

F. Burnell Cordner, Executive Secretary
Utah Air Conservation Committee

FBC:DER:slt

cc: EPA Region VIII, John Dale
Southeastern Utah District Health Department
David R. Ariotti, P. E.

Attachment B

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VIII
999 18th STREET - SUITE 500
DENVER, COLORADO 80202-2405

MAR 16 1989

Ref: 8ATD

Mr. John S. Hamrick
Site Environmental Coordinator
Umetco Minerals Corporation
P.O. Box 669
Blanding, UT 84511

Dear Mr. Hamrick:

This is in response to your letter to the Regional Administrator, James J. Scherer (dated February 8, 1989) resubmitting your construction plan for a new tailings disposal impoundment at the White Mesa Uranium Mill. Our review of this submission is in accordance with the requirements of 40 CFR Part 61 - National Emission Standards for Hazardous Air Pollutants, Standards for Radon-222 Emissions from Licensed Uranium Mill Tailings.

In your original submittal the planned impoundment was greater than 40 Acre in size. In the resubmittal you indicate that the original impoundment which you named Cell 4 will be divided into two cells which you named Cell 4a and Cell 4b. Further your application indicates that for the present only Cell 4a will be constructed.

Accordingly I find that Cell 4a as described in your application will not cause emissions in violation of 40 CFR Part 61 Subpart W if properly operated. In accordance with 40 CFR Part 61.08 I am approving the construction of Cell 4a.

This approval does not relieve you of the responsibility for compliance with any applicable provisions of this part or any other Federal, State, or local requirements. I will be anticipating your notification of startup as required under 40 CFR 61.09.

Sincerely yours,

(for)

Irv Dickstein, Director
Air and Toxics Division

Attachment C

ATTACHMENT C

SUMMARY OF COMPLIANCE WITH THE REQUIREMENTS OF 40 CFR 192.32(a)

Capitalized terms used in this Attachment and not otherwise defined below have the meanings set out in the Application.

As discussed in Section 9 of the Application, compliance with the standards set out in 40 CFR 192.32(a) is being determined by the Executive Secretary of the Utah Radiation Control Board/Co-Executive Secretary of the Utah Water Quality Board in his review of the applications to amend the License and Permit to include the specific design criteria and operating conditions applicable to Cell 4B. This Attachment is intended to summarize briefly the requirements of 40 CFR 192.32(a), and the manner in which the proposed design and operation of Cell 4B will satisfy those requirements. Where applicable, references will be made to the SER and SOB to refer the reader to the DRC's conclusions and analysis relating to these matters.

Congress created Title II of the Uranium Mill Tailings Radiation Control Act of 1978 ("UMTRCA") to regulate the management and disposition of uranium mill tailings and related wastes at active mill tailings sites. UMTRCA amended the Atomic Energy Act of 1954 ("AEA") by adding the definition of 11e.(2) byproduct material[1], by adding Section 83 of the AEA[2], which requires that mill tailings sites must be transferred to the United States Department of Energy (or a willing State) for long-term custody and maintenance, and by adding Sections 84[3] and 275[4] of the AEA, which give NRC broad authority to regulate the radiological and non-radiological aspects of mill tailings sites, *in accordance with general standards promulgated by EPA and specific regulatory requirements established by NRC.*

In 1980, NRC promulgated its 10 CFR Part 40, Appendix A Criteria[5], based upon the findings in its Final Generic Environmental Impact Statement On Uranium Milling set forth in NUREG-0706.[6]

In 1983, EPA issued its general standards for active uranium mill sites at 40 CFR 192.32(a).[7] In 1985, NRC amended its earlier 1980 Criteria to conform them to EPA's generally applicable

[1] *See* 42 U.S.C. 2014.
[2] *See* 42 U.S.C. 2113.
[3] *See* 42 U.S.C. 2114.
[4] *See* 42 U.S.C. 2022.
[5] 45 Fed. Reg. 65,521 (1980).
[6] NUREG-0706, Final Generic Environmental Impact Statement on Uranium Milling, (September, 1980).
[7] 48 Fed. Reg. 45,926 (1983) (codified at 40 CFR 192.30-.43).

standards, [8] although many of the Appendix A Criteria were consistent with the EPA standards and remained unchanged.

NRC determined that the Mill was operating in compliance with the requirements of 10 CFR Part 40, Appendix A, and hence in compliance with the standards established in 40 CFR 192.32(a) (as implemented by NRC), by virtue of renewing the Mill's Source Material License in 1997.

The State of Utah became an Agreement State for the regulation of uranium mills under Section 274 of the AEA in August of 2004. Section 274(d) of the AEA provides that NRC shall only enter into an Agreement with a State under Section 274, if among other things NRC finds that the State program is in accordance with the requirements of subsection 274(o) of the AEA. Subsection 274(o) provides that in licensing uranium mills the State shall require "compliance with standards which shall be adopted by the State for the protection of the public health, safety, and the environment from hazards associated with such material which are equivalent, to the extent practicable, or more stringent than, standards adopted and enforced by the Commission for the same purpose, *including requirements and standards promulgated by the Commission and the Administrator of the Environmental Protection Agency pursuant to sections 83, 84, and 275,*" [emphasis added].

Accordingly, upon granting the State of Utah Agreement State status for uranium mills in August 2004, NRC determined that the State of Utah's regulatory program contained standards equivalent to or more stringent than the standards established by NRC (implementing standards set by EPA under 40 CFR 192.32).

Upon the State of Utah becoming an Agreement State for uranium mills in 2004, the Mill's NRC Source Material License was replaced by the License and Permit.

Ongoing compliance with the standards set by NRC (implementing EPA's standards in 40 CFR 192.32) is therefore determined by the State of Utah Department of Environmental Quality ("UDEQ") through its administration of the License and Permit in accordance with State regulations and through the administration of the NESHAPS Program at the Mill.

However, even though compliance with the standards set out in 40 CFR 192.32(a), as implemented by NRC, are determined by UDEQ in the administration of the License and Permit in accordance with State regulations, the following discussion will address the various standards set out in 40 CFR 192.32(a), which have been incorporated into various State regulations, as they relate to proposed Cell 4B (the relevant paragraphs of 40 CFR 192.32(a) are set out below in italics, followed by Denison's comments in regular font):

[8] 50 Fed. Reg. 41,852 (1985).

(a)(1) Surface impoundments (except for an existing portion) subject to this subpart must be designed, constructed, and installed in such manner as to conform to the requirements of §264.221 of this chapter, except that at sites where the annual precipitation falling on the impoundment and any drainage area contributing surface runoff to the impoundment is less than the annual evaporation from the impoundment, the requirements of §264.228(a)(2)(iii)(E) referenced in §264.221 do not apply.

The major design elements for Cell 4B are described in Section 6 of the Application and Part I.D.12 of the proposed amended Permit, and demonstrate that:

- Cell 4B has two or more liners and a leachate collection and removal system between such liners, in accordance with the standard set out in 40 CFR 264.221(c). See the discussion on page 4 of the SOB;
- The top liner is 60 ml HDPE and has been designed and constructed of materials to prevent the migration of hazardous constituents into such liner during the active life and post-closure care period, in accordance with the standards set out in 40 CFR 264.221(c)(1)(i)(A). See the discussion on page 4 of the SOB;
- Cell 4B has a composite bottom liner, consisting of at least two components. The upper component is 60 ml HDPE and is designed and constructed of materials to prevent the migration of hazardous constituents into this component during the active life and post-closure care period. The lower component is a geoclay liner that is designed and constructed of materials to minimize the migration of hazardous constituents if a breach in the upper component were to occur, in accordance with the standards set out in 40 CFR 264.221(c)(1)(i)(B). See the discussions on page 4 of the SOB and page 36 of the SER;
- The Cell 4B liner system is designed, and will be constructed, and installed to prevent any migration of wastes out of the impoundment or pond to the adjacent subsurface soil or ground water or surface water at any time during the active life (including the closure period) of the impoundment or pond, in accordance with the standards set out in 40 CFR 264.221(c)(1)(ii) and 40 CFR 264.221(a). See the discussion on pages 36 and 37 of the SER;
- The HDPE liner will be constructed of materials that have appropriate chemical properties and sufficient strength and thickness to prevent failure due to pressure gradients (including static head and external hydrogeologic forces), physical contact with the waste or leachate to which they are exposed, climatic conditions, the stress of installation, and the stress of daily operation, in accordance with the standards set out in 40 CFR 264.221(c)(1)(ii) and 40 CFR 264.221(b). See the discussion on pages 36 and 37 of the SER;
- Cell 4B will have a liner that will be placed upon a foundation or base capable of providing support to the liner and resistance to pressure gradients above and below

the liner to prevent failure of the liner due to settlement, compression, or uplift, in accordance with the standards set out in 40 CFR 264.221(c)(1)(ii) and 40 CFR 264.221(a)(2). See the discussion on pages 36 and 37 of the SER;

- The Cell 4B liner system will be installed to cover all surrounding earth likely to be in contact with the waste or leachate, in accordance with the standards set out in 40 CFR 264.221(c)(1)(ii) and 40 CFR 264.221(a)(3). See the discussion on pages 36 and 37 of the SER.
- The leachate collection and removal system between the liners and immediately above the bottom composite liner is also a leak detection system. This leak detection system is capable of detecting, collecting, and removing leaks of hazardous constituents at the earliest practical time through all areas of the top liner likely to be exposed to waste or leachate during the active life and post-closure period, in accordance with the standard set out in 40 CFR 264.221(c)(2). See the discussion on pages 4 and 5 of the SOB;
- The Permit requires that the operator shall collect and remove pumpable liquids in the sumps to minimize the head on the bottom liner (see Part I.D.13 of the draft Permit), in accordance with the standards set out in 40 CFR 264.221(c)(3). See the discussion on pages 9 and 10 of the SOB;
- The leak detection system is located completely above the seasonal high water table (which is located at least 40 feet below the bottom of the cells), as contemplated by 40 CFR 264.221(c)(4); and
- The design and construction of the new liner system will be approved by the Executive Secretary of the Utah Radiation Control Board/Co-Executive Secretary of the Utah Water Quality Board, as contemplated by 40 CFR 264.221(d).

Cell 4B has been designed, and will be constructed, maintained, and operated to prevent overtopping resulting from normal or abnormal operations; overfilling; wind and wave action; rainfall; run-on; malfunctions of level controllers, alarms, and other equipment and human error, in accordance with the standards set out in 40 CFR 264.221(g). Part I.D.3(c) of the Permit prohibits placement of tailings into Cell 4B above the flexible membrane liner in the cell. The Permit and the License also set freeboard limits for solutions in all cells that take into account wind and wave action and rainfall storm events (see Part I.D.12(a)4 of the Permit and condition 10.3 of the License). See also the discussion on page 39 of the SER.

The dikes of Cell 4B are designed, and will be constructed, and maintained with sufficient structural integrity to prevent massive failure of the dikes, even without presuming that the liner system will function without leakage during the active life of the unit, in accordance with the standard set out in 40 CFR 264.221(h). See the discussion on page 41 of the SER. In addition to the initial approval of the dikes by the NRC or Executive Secretary of the Utah Radiation Control Board/Co-Executive Secretary of the Utah Water Quality Board, the dikes are inspected every five years by the State Engineer.

The Permit and License specify all design and operating practices that are necessary to ensure that the foregoing requirements are satisfied, in accordance with the standards set out in 40 CFR 264.221(i).

(a)(2) Uranium byproduct materials shall be managed so as to conform to the ground water protection standard in §264.92 of this chapter, except that for the purposes of this subpart:

(i) To the list of hazardous constituents referenced in §264.93 of this chapter are added the elements molybdenum and uranium;

(ii) To the concentration limits provided in Table 1 of §264.94 of this chapter are added the radioactivity limits in Table A of this subpart;

(iii) Detection monitoring programs required under §264.98 to establish the standards required under §264.92 shall be completed within one (1) year of promulgation;

(iv) The regulatory agency may establish alternate concentration limits (to be satisfied at the point of compliance specified under §264.95) under the criteria of §264.94(b), provided that, after considering practical corrective actions, these limits are as low as reasonably achievable, and that, in any case, the standards of §264.94(a) are satisfied at all points at a greater distance than 500 meters from the edge of the disposal area and/or outside the site boundary, and

(v) The functions and responsibilities designated in Part 264 of this chapter as those of the "Regional Administrator" with respect to "facility permits" shall be carried out by the regulatory agency, except that exemptions of hazardous constituents under §264.93(b) and (c) of this chapter and alternate concentration limits established under §264.94(b) and (c) of this chapter (except as otherwise provided in §192.32(a)(2)(iv)) shall not be effective until EPA has concurred therein.

NRC determined compliance with the foregoing requirements by issuing the Mill's original Source Material License, as amended from time to time. Upon the State of Utah becoming an Agreement State, NRC determined that the State's groundwater protection regulations are equivalent or stricter than the standards set by 40 CFR 264.92, as implemented by NRC. The State enforces compliance with its groundwater protection regulations through the Mill's Permit. The Mill has not applied for any alternate concentration limits at its points of compliance. See the discussion on pages 66 through 83 of the SER.

(a)(3)(i) Uranium mill tailings piles or impoundments that are nonoperational and subject to a license by the Nuclear Regulatory Commission or an Agreement State shall limit releases of radon-222 by emplacing a permanent radon barrier. This permanent radon barrier shall be constructed as expeditiously as practicable considering technological feasibility (including factors beyond the control of the licensee) after the pile or impoundment ceases to be operational. Such control shall be carried out in accordance with a written tailings closure plan (radon) to be incorporated by the Nuclear Regulatory Commission or Agreement State into individual site licenses.

(ii) The Nuclear Regulatory Commission or Agreement State may approve a licensee's request to extend the time for performance of milestones if, after providing an opportunity for public participation, the Nuclear Regulatory Commission or Agreement State finds that compliance with the 20 pCi/m^2-s flux standard has been demonstrated using a method approved by the NRC, in the manner required in 192.32(a)(4)(i). Only under these circumstances and during the period of the extension must compliance with the 20 pCi/m^2-s flux standard be demonstrated each year.

(iii) The Nuclear Regulatory Commission or Agreement State may extend the final compliance date for emplacement of the permanent radon barrier, or relevant milestone, based upon cost if the new date is established after a finding by the Nuclear Regulatory Commission or Agreement State, after providing an opportunity for public participation, that the licensee is making good faith efforts to emplace a permanent radon barrier; the delay is consistent with the definition of "available technology" in 192.31(m); and the delay will not result in radon releases that are determined to result in significant incremental risk to the public health.

(iv) The Nuclear Regulatory Commission or Agreement State may, in response to a request from a licensee, authorize by license or license amendment a portion of the site to remain accessible during the closure process to accept uranium byproduct material as defined in section 11(e)(2) of the Atomic Energy Act, 42 U.S.C. 2014(e)(2), or to accept materials similar to the physical, chemical and radiological characteristics of the in situ uranium mill tailings and associated wastes, from other sources. No such authorization may be used as a means for delaying or otherwise impeding emplacement of the permanent radon barrier over the remainder of the pile or impoundment in a manner that will achieve compliance with the 20 pCi/m^2-s flux standard, averaged over the entire pile or impoundment.

(v) the Nuclear Regulatory Commission or Agreement State may, in response to a request from a licensee, authorize by license or license amendment a portion of a pile or impoundment to remain accessible after emplacement of a permanent radon barrier to accept uranium byproduct material as defined in section 11(e)(2) of the Atomic Energy Act,

42 U.S.C. 2014(e)(2), if compliance with the 20 pCi/m^2-s flux standard of 192.32(b)(1)(ii) is demonstrated by the licensee's monitoring conducted in a manner consistent with 192.32(a)(4)(i). Such authorization may be provided only if the Nuclear Regulatory Commission or Agreement State makes a finding, constituting final agency action and after providing an opportunity for public participation, that the site will continue to achieve the 20 pCi/m^2-s flux standard when averaged over the entire impoundment.

The Mill has an NRC-approved Reclamation Plan that is designed to limit releases of radon-222 by emplacing a permanent radon barrier. The Reclamation Plan will be amended to include Cell 4B prior to commencement of use of Cell 4B. See the discussion on page 56 of the SER.

(a)(4)(i) Upon emplacement of the permanent radon barrier pursuant to 40 CFR 192.32(a)(3), the licensee shall conduct appropriate monitoring and analysis of the radon-222 releases to demonstrate that the design of the permanent radon barrier is effective in limiting releases of radon-222 to a level not exceeding 20 pCi/m^2-s as required by 40 CFR 192.32(b)(1)(ii). this monitoring shall be conducted using the procedures described in 40 CFR part 61, Appendix B, Method 115, or any other measurement method proposed by a licensee that the Nuclear Regulatory Commission or Agreement State approves as being at least as effective as EPA Method 115 in demonstrating the effectiveness of the permanent radon barrier in achieving compliance with the 20 pCi/m^2-s flux standard.

The 20 pCi/m^2-s radon-222 standard is being satisfied with the interim cover alone. There is no question that the final cover, which will include the addition of several additional feet of cover, will also comply with that standard. All testing has been and will continue to be performed by the 40 CFR Part 61, Appendix B, Method 115. See Section 5.5 of the Application and the discussion on page 44 of the SER.

(a)(4)(ii)When phased emplacement of the permanent radon barrier is included in the applicable tailings closure plan (radon), then radon flux monitoring required under §192.32(a)(4)(i) shall be conducted, however the licensee shall be allowed to conduct such monitoring for each portion of the pile or impoundment on which the radon barrier has been emplaced by conducting flux monitoring on the closed portion.

Radon flux monitoring is performed on Cells 2 and 3 annually in accordance with 40 CFR Part 61, Appendix B, Method 115 and 192.32(a)(4)(ii).

(a)(5) Uranium byproduct materials shall be managed so as to conform to the provisions of:

(i) Part 190 of this chapter, "Environmental Radiation Protection Standards for Nuclear Power Operations"

40 CFR 190.10(a) provides that operations from facilities such as the Mill shall be conducted in such a manner as to provide reasonable assurance that: "The annual dose equivalent does not exceed 25 millirems to the whole body, 75 millirems to the thyroid, and 25 millirems to any other organ of any member of the public as the result of planned discharges of radioactive materials, radon and its daughters excepted, to the general environment from uranium fuel cycle operations and to radiation from these operations."

As discussed in Section 8 of the Application, the Mill has demonstrated compliance with this requirement using NRC's MILDOS-AREA code for estimating environmental radiation doses for uranium recovery operations (Argonne 1998).

The analysis performed in the 2008 MILDOS Report assumed the Mill to be processing high grade Arizona Strip ores at full capacity (which has yet to be achieved in practice over an entire year), and calculated the concentrations of radioactive effluents at individual receptor locations around the Mill, including at the location of the member of the public most likely to receive the highest dose from Mill operations, with and without the operation of Cell 4B. The modeling indicated that even with these very conservative assumptions the dose to any member of the public did not come close to exceeding the standards set out in 40 CFR 190.10(a), nor was there any significant difference in the doses with the addition of Cell 4B. See Section 8 of the Application and the discussion on pages 1 through 5 of the SER.

(ii) Part 440 of this chapter, "Ore Mining and Dressing Point Source Category: Effluent Limitations Guidelines and New Source Performance Standards, Subpart C, Uranium, Radium, and Vanadium Ores Subcategory."

The Mill is designed not to discharge any pollutants to ground water. The Permit is intended to protect against any potential discharges to ground water. The Mill is also designed not to discharge any process wastewater to navigable waters. There are no navigable waters in the vicinity of the Mill that could be impacted by Mill operations.

(a)(6) The regulatory agency, in conformity with Federal Radiation protection Guidance (FR, May 18, 1960, pgs. 4402-4403), shall make every effort to maintain radiation doses from radon emissions from surface impoundments of uranium byproduct materials as far below the Federal Radiation Protection Guides as is practicable at each licensed site.

The Mill is required by NRC Regulatory Guide 8.31 and UAC R313-15-101(2) to employ the As Low As is Reasonably Achievable (ALARA) concept to all Mill operations in order to maintain doses from radiation to Mill workers and members of the public as low as reasonably achievable. This includes maintaining radiation doses from radon emissions from surface impoundments of uranium byproduct materials as far below the Federal Radiation Protection Guides as is practicable.

The Mill's success in its efforts to keep radon emissions from its tailings impoundments as low as reasonably achievable is evidenced by its NESHAPs results for 2005-2009, which indicate that the radon-222 fluxes for Cells 2 and 3 were well below the 20 $pCi/m^2/sec$ standard, based on current tailings management practices at the Mill. See Section 5.5 of the Application.

State of Utah
GARY R. HERBERT
Governor
GREG BELL
Lieutenant Governor

Department of
Environmental Quality
Amanda Smith
Executive Director
DIVISION OF AIR QUALITY
Cheryl Heying
Director

DAQ-2010-002452
Document Date: 05/03/2010

May 3, 2010

DAQC-444-10
Site ID 11205 (B1)

David Frydenlund
Denison Mines (USA) Corporation
1050 17th Street, Suite 950
Denver, Colorado 80265

Dear Mr. Frydenlund:

Re: White Mesa Uranium Mill Construction Notification

On April 13, 2010, the Utah Division of Air Quality (DAQ) received a constmction notification for Cell 4B from the White Mesa Uranium Mill Site, Denison Mines. The notification appears to be in accordance with 40 CFR Part 61 Subpart A Section 61.07: Application for approval of construction or modification.

The information Denison Mines submitted has been reviewed and appears to satisfy all requirements of 40 CFR 61.07. Approval is granted by the DAQ as our review determined that these facilities will not cause emissions in violation of the standard found in 40 CFR 61.252, if properly operated. Furthermore, Denison Mines has been issued and is required to comply with the White Mesa Mill Approval Order DAQE-AN0112050008-08 dated March 28, 2008.

Thank you for your response. Direct any questions to Jay Morris at (801) 536-4079 or jpmorris@utah.gov.

Sincerely,

M. Cheryl Heying, Executive Secretary
Utah Air Quality Board

MCH:SLM:lgt

Attachment K:

EPA Letter Regarding Tailings Size

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VIII
999 18th STREET - SUITE 500
DENVER, COLORADO 80202-2405

MAR 16 1989

Ref: 8ATD

Mr. John S. Hamrick
Site Environmental Coordinator
Umetco Minerals Corporation
P.O. Box 669
Blanding, UT 84511

Dear Mr. Hamrick:

This is in response to your letter to the Regional Administrator, James J. Scherer (dated February 8, 1989) resubmitting your construction plan for a new tailings disposal impoundment at the White Mesa Uranium Mill. Our review of this submission is in accordance with the requirements of 40 CFR Part 61 - National Emission Standards for Hazardous Air Pollutants, Standards for Radon-222 Emissions from Licensed Uranium Mill Tailings.

In your original submittal the planned impoundment was greater than 40 Acre in size. In the resubmittal you indicate that the original impoundment which you named Cell 4 will be divided into two cells which you named Cell 4a and Cell 4b. Further your application indicates that for the present only Cell 4a will be constructed.

Accordingly I find that Cell 4a as described in your application will not cause emissions in violation of 40 CFR Part 61 Subpart W if properly operated. In accordance with 40 CFR Part 61.08 I am approving the construction of Cell 4a.

This approval does not relieve you of the responsibility for compliance with any applicable provisions of this part or any other Federal, State, or local requirements. I will be anticipating your notification of startup as required under 40 CFR 61.09.

Sincerely yours,

John W. Hedinger (for)

Irv Dickstein, Director
Air and Toxics Division

Attachment L:

March 5, 2007 Radiation Control Board Decision in Fansteel Alternative Feed case

BEFORE THE
UTAH RADIATION CONTROL BOARD

In the Matter of:	*	
International Uranium (USA) Corp.	*	Findings of Fact, Conclusions of Law And Order
Revised lle.(2) Materials License No. UT1900479 Amendment #2 (June 13, 2006)	* *	
Revised Ground Water Quality Discharge Permit WBW370004 (June 13, 2006)	* *	

Glen Canyon Group of the Utah Chapter of the Sierra Club ("Sierra Club") filed a "Request for Agency Action/Petition to Intervene" dated July 13, 2006, challenging the Revised 11e.(2) Materials License Number UT1900479 Amendment #2 and the Revised Ground Water Quality Discharge Permit UGW370004 issued to International Uranium (USA) Corporation ("IUC") by the Executive Secretary of the Board on June 13, 2006.

The Utah Radiation Control Board granted Sierra Club intervention. Thereafter, Sierra Club's Request for Agency Action was considered at a hearing of the Board on January 26, 2007, in Blanding, Utah and continued on February 2, 2007, in Salt Lake City, Utah. Board members present were Kent J. Bradford, Stephen T. Nelson, Dianne R. Nielson, Gregory G. Oman, Patrick D. Cone, Frank D. DeRosso, Joette E. Langianese, Joseph K. Miner, John W. Thomson, Elizabeth Goryunova, Peter A. Jenkins, and Robert S. Pattison. Sierra Club was represented by Travis Stills and Brad Bartlett. IUC was represented by Michael Zody and Robert Hughes.

Laura Lockhart represented the Executive Secretary. Fred Nelson acted as legal counsel to the Board.

After review of pre-filed briefs, pre-filed testimony, the administrative record, and testimony and arguments presented to the Board by the parties at hearing, the Board, by motion of Gregory G. Omen, seconded by Joseph K. Miner, upheld the issuance of Amendment #2 of the license by a vote of seven in favor (John W. Thomson, Joseph K. Miner, Robert S. Pattison, Frank D. DeRosso, Dianne R. Nielson, Gregory G. Oman, and Elizabeth Goryunova), and three opposed (Patrick D. Cone, Joette E. Langianese, and Peter A. Jenkins), with Kent J. Bradford and Stephen T. Nelson abstaining. The Board decision is based on the following findings and conclusions.

Findings of Fact

1. The White Mesa Mill was originally licensed by the U.S. Nuclear Regulatory Commission ("NRC") and operated under federal license, starting in the early 1980's, processing conventional uranium ore. Beginning in 1993, the mill began processing "alternate feed materials" pursuant to license amendments granted by NRC.

2. In 2003, the State of Utah applied to NRC to become an Agreement State for 11e.2 byproduct material (to assume responsibility for licensing of facilities such as the White Mesa Mill) and as part of its application included a statement in Attachment 3:

> It is also the intent of the State to follow the guidance affirmed by the Commission for review and decision of receipt of alternate feed materials by uranium mills. Each alternate feed amendment will be considered a major amendment for the purposes of licensing and will follow procedures as described in this final application. The alternate feed guidance as described in NRC Regulatory Issues Summary 2000-23 is included in Appendix L of the application.

3. Utah became an Agreement State in August of 2004 assuming responsibility for the

regulation of uranium mills and issued to IUC an 11(e)(2) Materials License Number UT1900479 ("IUC Materials License").

4. IUC Materials License condition 10.1(B) states that "(t)he licensee may not dispose of any material on site that is not 'byproduct material', as that term is defined in 42 U.S.C. Section 2014(e)(2)(Atomic Energy Act of 1953, Section 11(e)(2))."

5. Section 11(e)(2) defines byproduct material as "the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content."

6. NRC defines ore as "a natural or native matter that may be mined and treated for the extraction of any of its constituents or any other matter from which source material is extracted in a licensed uranium or thorium mill." NRC Regulatory Issues Summary 2000-23, Attachment 2.

7. The IUC Materials License includes a Condition 10.1(C) which states:

> The licensee may not receive or process any alternate feed material without first applying for and obtaining approval of a license amendment. For any such proposal, the licensee shall demonstrate that it will comply with Condition 10.1(B). Any such demonstration shall include:
> (1) Demonstration of compliance with the NRC Regulatory Summary 2000-23 Recent Changes to Uranium Recovery Policy, November 30, 2000, and
> (2) Demonstration of compliance with the November 22, 1999 Protocol for Determining Whether Alternate Feed Materials are Listed Hazardous Wastes, as approved by the Utah Division of Solid and Hazardous Waste on December 7, 1999.

8. IUC has a Utah Groundwater Discharge Permit, UGW370004 ("Groundwater Discharge Permit"), and compliance and enforcement of that permit are under the authority of the Utah Water Quality Board.

9. IUC is currently authorized pursuant to its IUC Materials License and the Groundwater Discharge Permit to process ores and place the tailings in the impoundments.

10. In March 2005, IUC applied for a license to mill, as "alternate feed material", materials from Ponds 2 and 3 of the FMRI's Muskogee Facility located in Muskogee, Oklahoma, known as the "Fansteel materials".

11. The Executive Secretary, in November, 2005, issued a public notice requesting comment on the proposed approval of the IUC request to mill the Fansteel materials which included a draft Safety Evaluation Report ("SER") and other information and references to historical information concerning the White Mesa Mill. Public hearing was conducted and comments both oral and written were received. A Public Participation Summary was issued on June 12, 2006 (DRC IUC 1048-1188).

12. On June 13, 2006, the Executive Secretary issued license Amendment #2 to the IUC Materials License authorizing IUC's White Mesa Mill to mill the Fansteel materials.

13. The Executive Secretary, in review of the IUC application to mill the Fansteel materials, concluded the Fansteel materials constituted "alternate feed material" meeting the criteria in the NRC Regulatory Issues Summary 2000-23, in part because the Fansteel materials contained a uranium content, the materials could be milled by the White Mesa Mill, the materials did not contain listed hazardous waste, and the resulting tailings were 11e.2 byproduct material that could be placed in the licensed White Mesa Mill tailings ponds.

14. The Fansteel material has concentrations of uranium that are substantial, on par with natural, unprocessed uranium ore (greater than .05%), and IUC is capable of processing the material for recovery of uranium. See SER, DRC IUC 799C through 799I and pre-filed and rebuttal direct testimony of Harold Roberts.

15. The Executive Secretary determined the Fansteel material would be "processed

primarily for its source content" based on IUC's representations. See DRC IUC 0472-73 and pre-filed testimony of Dane Finefrock, paragraph III.B.3.

16. The Fansteel material does not contain listed hazardous wastes, pp 5-7 of IUC's license application (DRC IUC 0235 through 00237 and DRC IUC 0304) and pre-filed and direct rebuttal testimony of Jo Ann Tischler.

17. The tails resulting from milling the Fansteel materials will be byproduct, NRC Regulatory Issues Summary 2000-23, Attachment 2.

18. The Executive Secretary determined the characterization information of the Fansteel material provided by IUC was sufficient. Pre-filed testimony of Loren Morton, Attachment 5, Answer to Questions 8, 9 and 13, and pre-filed Testimony of Dean Henderson, Attachment 4, Answers to Questions 3 through 6 (to include review of characterization work performed for NRC).

19. The volume of the Fansteel materials and the resulting tailings is small when compared to the volume of tailings already in the impoundment and the tailings will be placed on the existing impounded tailings. Pre-filed testimony of Harold Roberts, paragraph 12.

20. The IUC Materials License and Groundwater Discharge Permit require monitoring of ambient air, surface water and groundwater, vegetation, and soils as described in the Executive Secretary's pre-filed testimony, paragraph III.C. See also, pre-filed testimony of Dean Henderson, Attachment 4, Answers to Questions 7 through 9 and pre-filed testimony of Loren Morton, Answer to Questions 11 and 12. The Executive Secretary conducted a review of constituents in the Fansteel materials and modified monitoring requirements for constituents based on the review. Testimony of Loren Morton, p 73-76 of January 26, 2007 Transcript.

21. The IUC Materials License and Groundwater Discharge Permit contain closure requirements, one purpose of which is to minimize discharge from the facility. Pre-filed testimony Executive Secretary III.C (p.11) and pre-filed testimony of Loren Morton, Attachment 5, Answer to Question 11.

22. The Executive Secretary determined that the applicable requirements of UAC R313-22-33 and R313-24-3 had been met and that approval of the License Amendment is protective of human health and the environment based on the monitoring requirements of the DRC license and the Groundwater Discharge Permit (with corrective action authority), the closure requirements for the tailings cells (subject to performance modeling), evaluation of potential contaminants in the Fansteel material (SER at DRC IUC 0799I through 0799P), and other bases as stated in the Safety Evaluation Report (DRC IUC 0799A) and the Public Participation Summary (DRC IUC 1048). See also Executive Secretary's Responsive Testimony of Loren Morton concerning authority under Groundwater Discharge Permit.

23. The Executive Secretary testified that, in his opinion, the placement of the Fansteel material versus the equivalent amount of tailings from milling Colorado plateau ore would not make a substantial difference in what may leak out of the impoundment. Testimony of Dane Finerfrock, pp. 257-258 of January 26, 2007 Transcript.

Conclusions of Law

1. The Executive Secretary complied with the procedural and substantive requirements of the Board's rules in issuing the license Amendment #2. Changes to the license or supporting documentations as a result of public comment do not require further public review. The analysis and review of the Executive Secretary consists of both generated and referenced documents.

2. The Fansteel material meets the definition of alternate feed material and the definition of "ore" under NRC Regulatory Summary 2000-23 as "other matter." The Executive Secretary properly interpreted the NRC Regulatory Summary 2000-23 by not considering economics and profit to be factors in determining whether a material is ore. The Executive Secretary correctly applied the Ashland 2 decision (In the Matter of International Uranium (USA) Corporation, CLI-00-1, February 10, 2000).

3. The Executive Secretary properly determined that the tailings resulting from the milling of the Fansteel materials constitute byproduct material and may be disposed of in the tailings impoundments because the alternate feed material constitutes "ore" that will be "processed primarily for its source content" under the criteria stated in the Ashland 2 decision and NRC Regulatory Issues Summary 2000-23, Attachment 2.

4. The Executive Secretary's determination that the characterization of the Fansteel materials is adequate is supportable and reasonable based on the evidence as listed in the findings above.

5. Sierra Club did not present evidence that the Fansteel materials contain listed hazardous wastes. The determination by the Executive Secretary that it does not contain listed wastes is supported by the evidence.

6. The determination of "alternate feed materials" under NRC Regulatory Issues Summary 2000-23 is the applicable process in evaluating the license amendment, not the definition of "alternate feed materials" used in the tax code, UCA Section 59-24-102, or the reference to the tax code definition in UCA Section 19-3-105 concerning legislative and gubernatorial approval.

7. While the SER did consider groundwater issues, the existence of measured levels of different materials that exceed groundwater compliance limits (DRC IUC DISC 0107 and testimony of Loren Morton, pp. 58-65 of January 26, 2007 Transcript) presents issues of unresolved concern to this Board. IUC submitted a Background Groundwater Quality Report (Mill Exhibit #2) in response to the issues raised by Sierra Club. Sierra Club filed a formal objection to admission of the report but agreed with IUC to defer the Board ruling on the objection. The Board reviewed the report and heard testimony and discussion concerning the report. The Board did not rule on the objection. The Board specifically notes that it does not rely in any way on the Background Groundwater Quality Report in issuing this decision. Mr. Morton testified he had not reviewed the report, nor was it part of the decision of the Executive Secretary to grant the license amendment. The Executive Secretary will be reviewing that report and making a determination on matters regarding the discharge or potential discharge from the tailings impoundments, as they relate to impacts on groundwater. He will be doing so in his capacity as Executive Secretary of the Water Quality Board. These matters will be addressed through the Groundwater Discharge Permit, and if violations are found they should be addressed through the issuance of notices of violation and corrective action orders under water quality authorities of the State for the purpose of protection of the public health and the environment.

8. With respect to the Fansteel materials, the evidence does not support the conclusion that milling of the Fansteel materials and deposition of the tailings in the impoundments will create a threat to the public health or the environment, or exacerbate an existing groundwater discharge, if there is one. The Executive Secretary's determination that the applicable requirements of UAC R313-22-33 and R313-24-3 have been met and that the public health and

environment are protected is upheld based on the relative volume and effect of the addition of the Fansteel materials to the existing tailings impoundments, the monitoring requirements of the DRC license and the Groundwater Discharge Permit, the closure requirements for the tailings cells, the evaluation of potential contaminants in the Fansteel material by the Executive Secretary, other bases as stated in the Safety Evaluation Report and the Public Participation Summary, and the Board's understanding of the requirements of the rules of the Utah Water Quality Board and the Groundwater Discharge Permit.

9. Sierra Club did not present evidence that the processing of the Fansteel material and the placement of the resulting tailings would pose a threat to the public health or the environment sufficient to support overturning the decision of the Executive Secretary.

10. The Sierra Club presented the testimony of Mr. Ivan Weber, over objection of IUC. By agreement of the parties, the Board did not rule on the objection and the Board heard Mr. Weber's testimony. Mr. Weber's testimony focused, in part, on design requirements for new disposal cells. New design requirements and the land disposal requirements in UAC R313-25 are not applicable to license Amendment #2 which is a request for approval of milling of materials for disposal in an already constructed and licensed tailings impoundment currently authorized to receive tailings.

11. Any challenge by Sierra Club to the Groundwater Discharge Permit must, as a matter of jurisdiction, be presented to the Utah Water Quality Board.

Order

The issuance of the Revised 11e.(2) Materials License Number UT1900479 Amendment #2 by the Executive Secretary is upheld.

DATED this 5th day of March, 2007.

Kent J Bell
Chair
Utah Radiation Control Board

NOTICE

Under Utah Code Ann. § 63-46b-13, any participant may request that the Board reconsider this Order. Any such request must be in writing, must be filed with the Board (with a copy to each participant) within twenty days after the date shown on the attached mailing certificate, and must state specific grounds upon which relief is requested.

Judicial review of this Order may be sought in the Utah Court of Appeals under applicable statutes and court rules, including Utah Code Ann. §§ 63-46b-14 and –16, and Utah Code Ann. § 78-2a-3, and Rule 14 of the Utah Rules of Appellate Procedure by the filing of a proper petition within thirty days of the date shown on the attached mailing certificate for this Order (or, if applicable, within thirty days after a request for reconsideration is denied).

CERTIFICATE OF SERVICE

I hereby certify that on this 5th day of March 2007, I caused a copy of the forgoing Findings of Fact, Conclusions of Law, and Order to be mailed by United States Mail, postage prepaid, to the following:

Dane Finerfrock
Executive Secretary, Utah Radiation Control Board
168 North 1950 West
PO Box 14850
Salt Lake City, Utah 84114-4850

Joel Ban
Attorney at Law
1024 S. 800 E.
Salt Lake City, Utah 84105

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Fred G Nelson
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160 East 300 South 5th Floor
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Attachment M:

Executive Secretary's Brief on the Merits in Fansteel Alternate Feed Case

LAURA LOCKHART (U.S.B. No. 4493)
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160 East 300 South, 5th Floor
P.O. Box 140873
Salt Lake City, Utah 84114-0873
(801) 366-0290

Counsel for the Executive Secretary

STATE OF UTAH
BEFORE THE UTAH RADIATION CONTROL BOARD

In the Matter of: International Uranium (USA) Corp. Revised lle.(2) Materials License No. UT1900479 Amendment #2 (June 13, 2006)	The Executive Secretary's Pre-hearing Brief

The Executive Secretary submits to the Utah Radiation Control Board (Board) the following Pre-hearing Brief and Prefiled Testimony of Witnesses.

I. BACKGROUND

This proceeding

The Executive Secretary issued a License Amendment to the White Mesa Mill ("White Mesa Mill") operated by the International Uranium (USA) Corp. ("IUSA") on June 13, 2006. The License Amendment authorizes the White Mesa Mill to mill, as alternate feed material[1],

[1] The meaning of the term "alternate feed material" is described below.

materials from Ponds 2 and 3 of the FMRI's Muskogee Facility located in Muskogee, Oklahoma, also known as "Fansteel materials,"

The Glen Canyon Group of the Utah Chapter of the Sierra Club (the "Petitioner") challenged that License Amendment approval with a Request for Agency Action (the "RFAA") filed on July 13, 2006.

White Mesa Mill History

The White Mesa Mill was initially licensed by the U.S. Nuclear Regulatory Commission ("NRC") in 1979.[2] It was regulated by the NRC for the first 24 years of its existence. The White Mesa Mill processed natural, unprocessed uranium ores for many years, but beginning in 1993, the NRC issued the first of many license amendments authorizing the White Mesa Mill to process alternate feed material, materials that were not natural, unprocessed uranium ore. *See* paragraphs 10.6 through 10.18 of White Mesa Mill's license, DRC IUC 1041 through 1044. (These paragraphs, from White Mesa Mill's NRC license, transferred to White Mesa Mill's DRC license after Utah became an Agreement State.)

The State of Utah challenged two of those approvals by the NRC, making arguments very similar to some of those being made by the Petitioner in this proceeding. Utah finally lost one of those challenges in a decision by the Commission in a case known as the "Ashland-2" case.[3] The Commission relied largely upon legislative history of the Uranium Mill Tailings Radiation Control Act of 1978 ("UMTRCA") to conclude that NRC was not required, as Utah

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[2] *See* In the Matter of International Uranium (USA) Corporation, LBP-98-21, September 1, 1998 at n. 10 and accompanying text.

[3] *See* In the Matter of International Uranium (USA) Corporation, CLI-00-1, February 10, 2000 ("Ashland-2," included as Attachment 1).

had urged, to perform an economic analysis to ensure that alternate feed material was being milled primarily for the extraction of its source material content.

Accepting the Commission's decision, the State of Utah did not appeal that decision, and subsequently withdrew its other challenge.[4]

NRC Staff, as instructed by the Commission in Ashland-2, wrote new guidance implementing the Ashland-2 decision to govern NRC's future consideration of alternate feed proposals.[5] That guidance, NRC Regulatory Summary 2000-23 (included as Attachment 2), outlines the criteria that must be met in order for the proposal to be accepted, using the criteria the Commission.

Utah Agreement State Status

Following its proceedings before the NRC, the State of Utah applied to the NRC to become an Agreement State for 11.e(2) byproduct material. In July, 2003, the State of Utah submitted its "Final Revised Application" for Agreement State status for 11.e(2) byproduct materials. Part of that Application (included as Attachment 3) stated:

> It is also the intent of the State to follow the guidance affirmed by the Commission for review and decision of receipt of alternate feed materials by uranium mills. Each alternate feed amendment will be considered a major amendment for the purposes of licensing and will follow procedures as described in this final application. The alternate feed guidance as described in NRC Regulatory Issues Summary 2000-23 is included in Appendix L of the application.

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[4] *See* In the Matter of International Uranium (USA) Corporation, Docket No. 40-8681-MLA-5, CLI-00-11, April 27, 2000.

[5] NRC Regulatory Summary 2000-23, Recent Changes to Uranium Recovery Policy, November 30, 2000 (included as Attachment 2).

See Attachment 3 at DRC IUC DISC 0922. The Chair of the NRC and Utah's Governor Olene S. Walker signed a State Agreement approving the State of Utah's Application in August, 2004. The Utah Board of Radiation Control therefore became the regulator for the White Mesa Mill and other uranium mills in the state.

The importance of the "Intent" language quoted above should be neither understated nor overstated. It is not by itself an enforceable provision of law, but is instead a statement of intent to recognize as governing precedent reasonable interpretations of its own governing law made by the NRC.

II. STANDARD OF REVIEW AND ROLE OF THE EXECUTIVE SECRETARY

This matter is to be considered by the Board de novo.[6] The Board will therefore be considering the issues raised by the Petitioner as if it were the first decisionmaker. The Utah Supreme Court has found, in the parallel situation of trial court de novo review of informal agency action, that de novo review "means a new trial with no deference to the administrative proceedings below." *Archer v. Board of State Lands & Forestry*, 907 P.2d 1142, 1145 (Utah 1995). The Board may take additional evidence, even if that evidence was not before the Executive Secretary, and it may make a decision different from the Executive Secretary's. However, if after the Board reviews the evidence presented it determines that it agrees with Executive Secretary's findings and analyses, it may simply affirm those findings.

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[6] Although this standard is not explicit, it is a reasonable inference of the requirement of Utah Code Ann. § 63-46b-1(2)(k) that the Utah Administrative Procedures Act "governs any agency action commenced by any person authorized by law to contest the validity or correctness of [an initial] notice [of violation] or order."

A corollary of this non-deferential standard is that, if additional evidence on a matter is presented, the Petitioner may not simply rely on perceived flaws in the findings made by the Executive Secretary, or the bases for those findings as the basis for requesting invalidation of a license amendment.

III. BASIS FOR EXECUTIVE SECRETARY'S DECISION

The Executive Secretary made the initial decision in this matter and appears before the Board to describe his basis for making that decision.

A. Alternate Feed Materials May Legally Be Processed in Uranium Mills

The Executive Secretary rejected the Petitioner's assertions that alternate feed materials may never be accepted and processed by licensed Uranium Mills and that mills may only process natural, unprocessed uranium ore. The Executive Secretary did so because the Petitioner did not identify any pertinent provision in federal or state law that prohibits that activity.

Petitioner's assertion that <u>all</u> processing of materials other than natural, unprocessed uranium ore is illegal appears to be related to the definition of "byproduct" in the Atomic Energy Act. A little background is required to understand this argument and the Executive Secretary's reason for rejecting it.

1. <u>The "byproduct" limitation</u>

There is no statute or regulation that requires a uranium mill to use its tailings ponds only for the disposal of "byproduct material," as that term is defined in the Atomic Energy Act. It has always been an implied limitation, however, and a very important one. The U.S. Department of Energy ("DOE") is legally obligated to provide perpetual care for byproduct material once a uranium mill closes. Both the State of Utah and the licensee are relying on the DOE to take possession of the White Mesa Mill after closure; neither has made any other plans for perpetual care.

Because of the importance of this limitation, the Executive Secretary chose to make the limitation explicit in this License Amendment. New license condition 10.1.B states:

> The licensee may not dispose of any material on site that is not "byproduct material," as that term is defined in 42 U.S.C. Section 2014(e)(2) (Atomic Energy Act of 1953, Section 11 (e)(2)).

Section 11(e)(2) byproduct is defined as "the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content."

2. <u>Petitioner's argument</u>

Petitioner's argument for a general prohibition on the use of alternate feeds appears to be derived from its reading of the term "ore" to mean only natural, unprocessed uranium ore. The Executive Secretary rejected that argument for two reasons.

First, Petitioner's narrow definition of ore has been rejected by NRC in a number of proceedings that have allowed the processing of ores that are not natural, unprocessed uranium ore. *See, e.g.,* <u>Ashland-2</u>, included as Attachment 1, and Conditions paragraphs 10.6 through 10.18 of White Mesa Mill's license, DRC IUC 1041 through 1044. (These paragraphs, from White Mesa Mill's NRC license, transferred to White Mesa Mill's DRC license after Utah became an Agreement State.)

Second, the only explicit prohibition against disposal at White Mesa Mill of matter that does not qualify as byproduct material is found in White Mesa Mill's License Amendment, as described above. That License Amendment also specifies how that limitation will be interpreted. Condition 10.1.C states:

The licensee may not receive or process any alternate feed material without first applying for and obtaining approval of a license amendment. For any such proposal, the licensee shall demonstrate that it will comply with Condition 10.1(B). Any such demonstration shall include:

1) Demonstration of compliance with the NRC Regulatory Summary 2000-23 Recent Changes to Uranium Recovery Policy, November 30, 2000; and
2) Demonstration of compliance with the November 22, 1999 Protocol for Determining Whether Alternate Feed Materials are Listed Hazardous Wastes, as approved by the Utah Division of Solid and Hazardous Waste on December 7, 1999.

These documents specify criteria for determining whether proposed feeds may be accepted as alternative feeds for uranium mills. Neither document prohibits, in any way, the use of feed other than natural, unprocessed uranium ores. The NRC Regulatory Summary 2000-23, defines ore much more broadly as "a natural or native matter that may be mined and treated for the extraction of any of its constituents *or any other matter from which source material is extracted in a licensed uranium or thorium mill.*"[7] (Emphasis added.)

B. The Executive Secretary determined that the tails that result from milling these materials will be byproduct

The Executive Secretary used NRC Regulatory Summary 2000-23 (included as Attachment 2) to determine that the tails resulting from milling the Fansteel materials will be byproduct. That Regulatory Summary provides three tests that were each considered by the Executive Secretary. See Attachment 2 at p. 7.

1. Is the proposed alternate feed an ore? The NRC defines an ore as "a natural or native matter that may be mined and treated for the extraction of any of its constituents or any

[7] Petitioner has also made statements that suggest the Fansteel material must be byproduct before it is milled at the White Mesa Mill, but has provided no law or argument in support of those suggestions.

other matter from which source material is extracted in a licensed uranium or thorium mill." Attachment 2 at 7.

IUSA's License Amendment Application (DRC IUC 0422) and the DRC's Safety Evaluation Report ("SER," at DRC IUC 0799A) demonstrate that the concentrations of uranium in the Fansteel Material are substantial, on par with natural, unprocessed uranium ore. *See* SER, DRC IUC 799C, at 799E and 799I.[8] There is no doubt, then, that the Fansteel material is an "other matter" from which source material – uranium – can be extracted. This part of NRC's test is easily met.

2. Does the proposed alternate material contain hazardous waste? The NRC explains that ores containing listed hazardous wastes[9] may not be ordinarily be milled as alternate feed.[10] Attachment 2 at 7. Ores that are or contain characteristic waste[11] are not prohibited under this test.

The Executive Secretary determined first that the feed material could not contain hazardous waste because it is source material, both by NRC license of the FMRI facility in

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[8] *See also* the Public Participation Summary (DRC IUC 1048), Executive Secretary's Responses to Comments A.7 (DRC IUC 1052-53), A.8 (DRC IUC 1053), and B.43 (DRC IUC 1077-79).

[9] Listed wastes are wastes from specified industrial processes listed in rules made under the Recource Conservation and Recovery Act. A waste may have exactly the same chemical composition as a listed waste, but it is still not a listed waste if it did not come from an industrial process listed in the rule.

[10] A mill may still use ore with listed wastes if it gets approval from EPA or the state hazardous waste regulating agency, and if it gets a commitment from DOE or the State that it will still take title to the site after closure.

[11] Characteristic wastes are hazardous wastes no matter what process they arose from simply because they have specified characteristics such as reactivity.

Oklahoma and because uranium and thorium concentrations are greater than 0.05% (10 CFR 40.4). Source material is exempted from the definition of solid waste under 40 CFR 261.4(a)(4). Because a material that is not a solid waste is not, by definition, a hazardous waste, the Fansteel materials are not hazardous wastes. Resource Conservation and Recovery Act, Section 1004(5); 42 U.S.C. § 6903(5).

The Executive Secretary also determined that the Fansteel material did not contain listed hazardous waste based on the information provided at pp. 5-7 of IUSA's license application (DRC IUC 0235 through 0237), and Joann Tischler's analysis cited in that application and included at Attachment 4 to IUSA's License Amendment Application (beginning at DRC IUC 0304). Although Petitioner has stated generally that the Fansteel materials included listed hazardous wastes, it has provided no information to support that statement.

3. Is the ore is being processed primarily for its source material content?

NRC's guidance states:

> For the tailings and waste from the proposed processing to qualify as 11e.(2) byproduct material, the ore must be processed primarily for its source-material content. If the only product produced in the processing of the alternate feed is uranium product, this determination is satisfied. If, in addition to uranium product, another material is also produced in the processing of the ore, the licensee must provide documentation showing that the uranium product is the primary product produced.

Attachment 2 at 7.

IUSA stated in its application that it would be processing the materials primarily for uranium. *See* DRC IUC 0238. This was also affirmed in a letter from IUSA. *See* DRC IUC 0472-73. This test is therefore also met.

The Executive Secretary rejected Petitioner's argument that the Agency must consider all of IUSA's economic motivations and determine which is the primary motivation for processing the Fansteel material. The NRC faced this issue squarely in Ashland-2 and, relying largely on an extensive analysis of legislative history, rejected the identical argument being made at that time by the State of Utah. See Attachment 1. Petitioner has, to date, provided no legal arguments that demonstrate NRC has misinterpreted its governing statute.

C. The Executive Secretary determined that approval of the License Amendment will be protective of human health and the environment, and that the requirements of R.313-24 and R.313-24-3 have been met[12]

To understand the Executive Secretary's determination that approval of the License Amendment will be protective of human health and the environment, it is helpful first to understand the extensive nature of monitoring being conducted at the White Mesa Mill under its DRC License and under its Groundwater Discharge Permit:

- 21 groundwater monitoring wells are sampled for 37 potential contaminants, 12 quarterly and the remainder every six months.
- Surface water is sampled at Cottonwood Creek quarterly, and results are reported semi-annually.
- Emissions from gas stacks venting from the yellowcake drying equipment is monitored for 12 parameters whenever the gas control systems are operating. Results are reported every six months.

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[12] It should be noted that, on its face, R.313-24-3 is a procedural requirement – it requires only an evaluation of impacts. However, the Executive Secretary has interpreted this provision to require him to ensure that human health and the environment will be protected.

- Surface water is sampled at Cottonwood Creek quarterly, and results are reported semi-annually.
- Emissions from gas stacks venting from the yellowcake drying equipment is monitored for 12 parameters whenever the gas control systems are operating. Results are reported every six months.
- Radon levels on the tailings are measured annually and reported to the Utah Division of Air Quality under its National Emissions for Hazardous Air Pollutants program.
- Monitoring for direct radiation and air monitoring for four radioactive isotopes is conducted at five sites quarterly, with results reported semi-annually.
- Samples of vegetation from three sites are taken and analyzed for two parameters quarterly, with results reported semi-annually.
- Soil samples are taken from six sites and analyzed for four parameters quarterly, with results reported semi-annually.

See Prefiled Testimony of Dean Henderson, Attachment 4, Answers to Questions 7 through 9.

If any of this monitoring results in detection of contaminants, the Executive Secretary will order IUSA to investigate and conduct corrective action, as appropriate.

In addition, IUSA is required to demonstrate before closure that the cover system of the tailings cells will minimize discharge from the facility. This requirement will, in turn, mean that IUSA's proposed plans for capping the facility will be subject to extensive performance modeling to ensure design rigor and long-term protection of groundwater resources. *See* Prefiled Testimony of Loren Morton, Attachment 5, Answer to Question 11.

White Mesa Mill's Groundwater Discharge Permit also provides other protection that is described in the Prefiled testimony of Loren Morton, Attachment 5, Answer to Question 11.

materials proposed for feed in a license amendment application are similar to materials previously evaluated and approved by NRC.

As described extensively in the SER, the Executive Secretary's staff carefully considered each potential contaminant from the Fansteel material. *See* SER at DRC IUC 0799I through 0799P. Each potential contaminant was eliminated as a key monitoring parameter except one: tin. As a result of that analysis, tin was added to the list of contaminants IUSA is required to analyze for in its groundwater monitoring program.[13]

Other bases for the Executive Secretary's determination may be found in the Safety Evaluation Report (DRC IUC 0799A) and the Public Participation Summary (DRC IUC 1048).

Neither the licensee nor the Executive Secretary conducted a risk assessment. No risk assessment is required by statute or rule and, for the reasons described above, the Executive Secretary does not require a risk assessment to conclude that human health and the environment are being protected.

D. The Executive Secretary determined that the characterization information about the Fansteel Material provided by the Applicant was sufficient.

Staff reviewed and relied upon the information submitted by IUSA in approving this License Amendment. See Prefiled Testimony of Loren Morton, Attachment 5, Answer to

[13] *See* Prefiled testimony of Loren Morton, Attachment 5, Answers to Questions 3 through 5.

Question 9. In addition, at the suggestion of the Petitioner, Division staff reviewed a summary of characterization work performed for NRC. This summary helped confirm and further supported the characterization information submitted by IUSA. See Prefiled Testimony of Dean Henderson, Attachment 4, Answers to Questions 3 through 6.

Petitioner has made general allegations about the inadequacy of characterization, but has not provided details that would allow the Executive Secretary to evaluate their concerns. For that reason, and for the reasons stated above, the Executive Secretary determined that the characterization information about the Fansteel Material provided by the Applicant was sufficient.

E. The Radiation Control Board does not have jurisdiction over IUSA's Groundwater Discharge Permit

The Petitioner brought its Request for Agency Action only before the Utah Radiation Control Board. *See* RFAA, ¶ 2. A groundwater discharge permit is permit required under Utah Admin. Code § R317-6, rules of the Utah Water Quality Board. Permits issued under those rules must be challenged before that Board. Utah Admin. Code § R317-9-3. Therefore, Petitioner's allegations about and request for relief from the Utah Radiation Control Board regarding IUSA's Groundwater Discharge Permit must be dismissed.

IV. CONCLUSION

Petitioner's primary concerns in this matter seems to be with the implementation of NRC's decision in <u>Ashland-2</u>. Petitioner has provided no legal basis for concluding that decision was wrong, however.

If, instead, Petitioner is requesting that this Board adopt a more stringent policy than the NRC's, the Executive Secretary respectfully suggests that an adjudication is not the most appropriate way to implement new policy, and to allow consideration of all of the ramifications of a proposed new policy. In most situations, that is a role much better suited to lawmaking or rulemaking.

DATED this 16th day of January, 2007.

Laura Lockhart
Assistant Attorney General
Attorney for Executive Secretary

CERTIFICATE OF SERVICE

I hereby certify that I caused a true and correct copy of the foregoing "Executive Secretary's Opening Brief to be delivered to the following, as indicated:

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Laura Lockhart

Laura Lockhart

**1 IN THE MATTER OF
INTERNATIONAL URANIUM (USA) CORPORATION
Nuclear Regulatory Commission

CLI-00-1
Docket No. 40-8681-MLA-4 (Request for Materials License Amendment)

February 10, 2000

*9 COMMISSIONERS: Richard A. Meserve, Chairman, Greta Joy Dicus, Nils J. Diaz, Edward McGaffigan, Jr., Jeffrey S. Merrifield

MEMORANDUM AND ORDER

I. INTRODUCTION

In this decision we review a Presiding Officer's Initial Decision, LBP-99-5, 49 NRC 107 (1999), which upheld a license amendment issued to the International Uranium (USA) Corporation ("IUSA"). The license amendment authorized IUSA to receive, process, and dispose of particular alternate feed material from Tonawanda, New York. The state of Utah challenges the license amendment and now on appeal seeks reversal of the Presiding Officer's decision. Envirocare of Utah, Inc., has filed an amicus curiae brief supporting Utah's challenge of the Presiding Officer's decision. The NRC Staff and IUSA support the Presiding Officer's decision. We affirm the decision for the reasons we give below.

II. BACKGROUND

**2 IUSA owns and operates a uranium mill located at White Mesa, near Blanding, Utah. On May 8, 1998, IUSA submitted a request for a license amendment to allow it to receive and process approximately 25,000 dry tons of uranium-bearing material from the Ashland-2 Formerly Utilized Sites Remedial Action Program (FUSRAP) site, currently managed by the Army Corps of Engineers *11 and located near Tonawanda, New York. [FN1] The NRC granted the IUSA license amendment on June 23, 1998. Utah timely petitioned for leave to intervene in the license amendment proceeding. On September 1, 1998, the Presiding Officer admitted Utah as a party to the proceeding. See International Uranium (USA) Corp. (Receipt of Material from Tonawanda, New York), LBP-98-21, 48 NRC 137 (1998).

At issue in this proceeding is the Atomic Energy Act's definition of 11e(2) material, defined by the statute as "the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content." 42 U.S.C. § 2014e (emphasis added). Utah interprets this to mean that the primary purpose for acquiring the ore must be an interest in processing the material to recover the uranium. Emphasizing that IUSA is being paid over 4 million dollars to receive the Ashland-2 material from the FUSRAP site, Utah argues that IUSA's interest in obtaining the material is "primarily for payment of a disposal fee" and not for recovering any uranium the material might contain. Utah's Appeal Brief (May 24, 1999) at 11.

Utah explains that the fee IUSA will receive for this transaction far exceeds the monetary value of the uranium that might be extracted from the material. Utah accordingly suggests that the "primary" reason IUSA is processing the material is so that it can be reclassified as 11e(2) material and then disposed of at the IUSA mill site. See id. at 10.

In short, Utah argues that the NRC Staff improperly granted this license amendment because IUSA is not processing the Ashland-2 material "primarily" to recover its relatively minimal uranium content, but rather to obtain the generous handling and disposal fee. Utah emphasizes that IUSA's license amendment application failed to adequately substantiate that the material was to be "processed primarily" for its uranium content. Utah insists upon "some objective documentation" to show that recovery of the uranium, not payment for disposal, was IUSA's primary interest behind the license amendment. See Utah's Reply to NRC Staff's and IUSA's Briefs (June 28, 1999) ("Utah's Reply Brief") at 10. Given the "wide disparity" between the fee IUSA will receive for taking and processing the material and the probable market value of the uranium that can be recovered, Utah claims that the "only reasonable conclusion" to be drawn is that the "primary purpose of applying for the license amendment was to receive a four million dollar disposal fee." Id. at 9-11.

**3 In interpreting what is meant by section 11e(2)'s requirement that ore be "processed primarily for its source material content," Utah relies heavily upon language in the NRC's "*12Final Revised Guidance on the Use of Uranium Mill Feed Material Other Than Natural Ores," 60 Fed. Reg. 49,296 (Sept. 22, 1995) ("Alternate Feed Guidance"). The Alternate Feed Guidance asks licensees to "certify" that the feed material will be "processed primarily for the recovery of uranium and for no other purpose." Id. at 49,297. The Guidance goes on to enumerate three possible ways a licensee can "justify" this certification that feed material is to be processed for source material. The three possible factors a licensee can cite are "financial considerations, high uranium feed content of the feed material, or other grounds." Id. Throughout this proceeding, the parties sharply have disputed the meaning of these and other statements in the Alternate Feed Guidance.

Utah, for instance, argues that the Guidance included a "Certification and Justification" test expressly to prohibit licensees from "using a uranium mill to process material for the primary purpose of ... [reclassifying] the material to allow it to be disposed of in the mill tailings impoundment." See Utah's Appeal Brief at 10, 12. Utah claims that processing material merely for the sake of reclassifying it as 11e(2) material is "sham processing," and that the wastes or mill tailings generated from such "sham processing" do not meet the definition of 11e(2) byproduct material. See id. at 10-11. Utah concludes that IUSA "failed to justify and document under the Alternate Feed Guidance any satisfactory or plausible grounds to show that [IUSA] was not engaged in sham processing." Id. at 11.

In LBP-99-5, the Presiding Officer rejected Utah's arguments. "[O]re is processed primarily for its source material content," stated the Presiding Officer, "when the extraction of source material is the principal reason for processing the ore," regardless of any other reason behind the Licensee's interest in acquiring the material or seeking the overall transaction. See 49 NRC at 109.

On the other hand, the Presiding Officer went on to explain,

> [i]f ... the material were processed primarily to remove some other substances (vanadium, titanium, coal, etc.) and the extraction of uranium was incidental, then the processing would not fall within the statutory test and it would not be byproduct material within the meaning of the Atomic Energy

Act. That is, the adverb "primarily," applies to what is removed from the material by the process and not to the motivation for undertaking the process.

Id. (emphasis added). In the Presiding Officer's view, "the only 'sham' that stops material from being byproduct material is if it is not actually milled. If it is milled, then it is not a sham." Id. at 111 n.6.

**4 The Presiding Officer found this interpretation of section 11e(2) consistent with the language and legislative history of the Uranium Mill Tailings Radiation Control Act of 1978, as amended (UMTRCA). He went on to conclude that the Staff appropriately granted the license amendment because IUSA "is milling ore" to extract uranium and therefore is "not involved in a sham." See id. at 113. The Presiding Officer also found that Utah had misunderstood the NRC Alternate Feed *13 Guidance. He rejected Utah's claim that the Guidance was intended to prevent material from being categorized as 11e(2) byproduct material if the Licensee's primary economic motive was to receive a fee for waste disposal instead of to recover the uranium. Id. at 112. "The Alternate Feed Guidance," the Presiding Officer stated, "is not supportive of the position, taken by the State of Utah, that material is to be considered byproduct only if the primary economic motivation is to remove uranium rather than to dispose of waste." Id. Under LBP-99-5, then, the Licensee's underlying motive or purpose for acquiring the material in the first place is irrelevant. What matters is that the material actually is processed through the mill to recover source material.

Both the NRC Staff and IUSA endorse the Presiding Officer's conclusions. The Staff explains that "the Presiding Officer properly applied the [alternate feed] guidance by focusing on whether the processing was primarily to extract uranium," regardless of any economic motivations involved. See NRC Staff Opposition to Utah Appeal of LBP-99-5 ("Staff Brief") (June 14, 1999) at 13 (emphasis added). The Staff also stresses that "[n]either a high uranium content nor economic profitability is 'required' under the guidance," which provides three separate and alternative reasons a licensee can describe to support a proposed license amendment, including any number of reasons that might fall within the category of "other grounds." See id. Indeed, the Staff argues, the definition of section 11e(2) byproduct material should be broad enough to encompass those fuel cycle activities involving the processing of even low grade -- with relatively low concentration of uranium -- feedstock. Id. at 15. "Utah's attempt to require an economic motive test and to require detailed financial review should be rejected," the Staff urges. Id.

Focusing upon UMTRCA's legislative history, IUSA similarly concludes that at issue is simply whether the tailings and wastes were "produced as part of the nuclear fuel cycle." See IUSA's Reply to Utah's Appeal Brief and Envirocare's Amicus Curiae Brief ("IUSA Brief") (June 14, 1999) at 9-10. According to IUSA, those tailings and waste from feeds processed to recover uranium outside of the nuclear fuel cycle, as in a secondary or side-stream process at a phosphate recovery operation, would not be 11e(2) material because the actual processing was not [intended] primarily for the source material content. Id. But where there is a licensed uranium mill involved, "the only question to be answered," argues IUSA, "is whether it is reasonable to expect that the ore will, in fact, be processed for the extraction of uranium." Id. at 15.

**5 While not adopting the Presiding Officer's reasoning in its entirety, the Commission affirms LBP-99-5, for the reasons given below.

***14** III. ANALYSIS

To clear away a threshold matter, we must briefly consider the NRC Staff's claim that the Ashland-2 material already was section 11e(2) byproduct material, even before it was sent to IUSA and even before it was processed. See Staff Brief at 8 n.11, 14 n.18, 15 n.19. The Staff's theory derives from the Department of Energy's certification that the Ashland-2 material was the residue of a Manhattan Project uranium extraction project, and therefore constituted "tailings or waste produced by the extraction ... of uranium ... from ... ore processed primarily for its source material content" within the meaning of section 11e(2). We find it unnecessary to reach the Staff argument. Historically, the NRC has maintained that it lacks regulatory authority over uranium-bearing material, like the Ashland-2 material, generated at facilities not licensed on or after 1978 (when UMTRCA was passed). See United States Army Corps of Engineers, DD-99-7, 49 NRC 299, 307-08 (1999). Nothing in this opinion addresses the pre-1978 question or should be understood to do so. Instead, our opinion rests solely on section 11e(2)'s "processed primarily for its source material content" clause.

On appeal, Utah finds the Presiding Officer's "first error" to have been that of having "resort[ed] to interpretation of the AEA and the legislative history of UMTRCA in searching for the meaning of 'primarily processed for."DD' See Utah Appeal Brief at 11-12. Instead, Utah argues, the Presiding Officer should have focused only upon the NRC's Alternate Feed Guidance to discern how the section 11e(2) definition is to be applied and met. Id. at 12. The Commission, however, agrees with the Presiding Officer that the section 11e(2) definition, with its requirement that material be "primarily processed for its source material content," can only be properly understood within the context of UMTRCA and its legislative history.

Based on an in-depth review of UMTRCA and its legislative history, and of the Alternate Feed Guidance and its background documents, the Commission reaches several conclusions. To begin with, the Guidance does appear to contemplate an NRC Staff inquiry into a licensee's motives for a license amendment, just as Utah suggests. The Guidance, for instance, expresses a "concern that wastes that would have to be disposed of as radioactive or mixed waste would be proposed for processing at a uranium mill primarily to be able to dispose of it in the tailings pile as 11e.(2) byproduct material." 60 Fed. Reg. 49,296, 49,297 (Sept. 22, 1995). The Guidance thus outlines possible "justifications" that a licensee may describe in support of the license application, and these are intended to assist the Staff "[i]n determining whether the proposed processing is primarily for the source material content or for the disposal of waste." Id. Indeed, the requirement of a licensee "justification" apparently stemmed from a 1993 Presiding Officer decision that questioned, in another proceeding, whether a simple licensee "certification, without ***15** more, would adequately protect against ulterior motives to dispose of waste." See UMETCO Minerals Corp., LBP-93-7, 37 NRC 267, 283 (1993) (emphasis added).

****6** Such statements do not support the NRC Staff's current view that under the Guidance all that matters is that processing for uranium was intended, regardless of underlying motive. On the contrary, the statements in both the proposed and final Guidance take as a given that processing for uranium content will take place, but also indicate that such processing should not be employed simply as a device to reclassify material to enable it to be disposed of -- as 11e(2) byproduct material -- at a uranium mill site. [FN2] As Utah has maintained, therefore, the Alternate Feed Guidance certainly can be understood -- and is perhaps best understood -- as reflecting an intent to prevent material from being categorized as 11e(2) byproduct material when the licensee's overriding economic motive is to receive a fee for waste disposal.

Yet, although the drafters of the Guidance apparently intended to distinguish between those license amendment requests where the licensee's overriding interest is obtaining uranium and those where payment for disposal is driving the transaction, the NRC Staff apparently has not consistently utilized the Guidance in this way. While the language of the Guidance may suggest that a licensee's motivations are to be scrutinized, parsed, and weighed, the NRC Staff typically has not relied upon such probing reviews of licensee motives. It has not been the Staff's practice, for example, to require licensees essentially to "prove" quantitatively or otherwise that the value of the uranium to be recovered from a particular licensing action will outweigh other economic reasons for the transaction. See, e.g., UMETCO, 37 NRC at 274, 281-82; Staff Brief at 15-16. Since the Guidance was first issued, it seems, there has been little connection between what the Guidance seemingly proposes and what the Staff in reality has required.

This fact has prompted the Commission on this appeal to take an in-depth look at the Guidance and its policy ramifications. We find that the apparent intent in the Guidance to have the Staff scrutinize the motives behind the license amendment transaction is neither compelled by the statutory language or history of UMTRCA nor reflects sound policy. Our review of UMTRCA and its legislative history confirms the Presiding Officer's conclusion that the requirement that material be "processed primarily for its source material content" most logically refers to the actual act of processing for uranium or thorium within the course of the nuclear ***16** fuel cycle, and does not bear upon any other underlying or "hidden" issues that might be driving the overall transaction.

As we describe in further detail below, the purposes behind the wording of section 11e(2)'s definition served: (1) to expand the types of materials that properly could be classified as byproduct material; (2) to make clear that even feedstock containing less than 0.05% source material could qualify as byproduct material; and (3) to ensure that the NRC's jurisdiction did not cross over into activities unrelated to the nuclear fuel cycle. The IUSA license amendment is consistent with these statutory intentions, regardless of whether IUSA's bigger interest was payment for taking the material or payment for the recovered uranium. Indeed, even accepting Utah's claim that the 4 million dollar payment IUSA contracted to receive for processing and disposing of the Ashland-2 FUSRAP site material was the primary motivator for this transaction, the tailings generated from the processing can still properly be classified as section 11e(2) byproduct material.

A. UMTRCA's Purposes and History

****7** It may be helpful to outline a little of UMTRCA's legislative history and, in particular, how the section 11e(2) definition came about. UMTRCA had two general goals: (1) providing a remedial-action program to stabilize and control mill tailings at various identified inactive mill sites; and (2) ensuring the adequate regulation of mill tailings at active mill sites, both during processing and after operations ceased. As then Chairman Hendrie of the NRC explained to Congress, the agency at the time did not have direct regulatory control over uranium mill tailings. The tailings themselves were not source material and did not fall into any other category of NRC-licensable material. The NRC exercised some control over tailings, but only indirectly as part of the Commission's licensing of ongoing milling operations. Once operations ceased, however, the NRC had no further jurisdiction over tailings. This resulted in dozens of abandoned or "orphaned" mill tailings piles.

To prevent future abandoned and unregulated tailings piles, Congress enacted the 11e(2) definition, which expressly declared mill tailings to be a form of byproduct material. As Chairman Hendrie explained, tailings are "fairly regarded as waste materials from the milling operation," but the proposed definition would classify them as byproduct material and thus make them licensable under the AEA. Under the new section 11e(2) definition, Chairman Hendrie emphasized, tailings generated during uranium milling operations would """formally be byproducts rather than waste." Uranium Mill Tailings Radiation Control Act of 1978: Hearings on H.R. 11698, H.R. 12229, H.R. 12938, H.R. 12535, H.R. 13049, and H.R. 13650 (hereinafter "UMTRCA Hearings I") Before the Subcomm. on Energy and Power of the House Comm. on Interstate and Foreign Commerce, 95th Cong. 400 (1978) (statement of Joseph M. Hendrie, Chairman, NRC).

***17** At the time Congress drafted UMTRCA, the Environmental Protection Agency had some authority over uranium mill tailings under the Resource Conservation and Recovery Act of 1976 (RCRA), but EPA had no authority over the milling process that generated the tailings. By defining mill tailings as a byproduct material, the new 11e(2) definition removed mill tailings from RCRA's coverage since RCRA excludes all source, byproduct, and special nuclear material. This exclusion from RCRA was intended to minimize any "dual regulation" of tailings by both EPA and the NRC. Chairman Hendrie suggested that since the NRC already regulated the site-specific details of uranium milling, it seemed logical for the NRC to regulate the treatment and disposal of tailings "which we permitted to be generated in the first place." Id. at 342-43.

From the legislative history, we can glean a few conclusions about the actual wording of the 11e(2) definition. As originally proposed, the definition of 11e(2) byproduct material was directly linked to the Commission's definition of source material. The original definition referred to "the naturally occurring daughters of uranium and thorium found in the tailings or wastes produced by the extraction or concentration of uranium or thorium from source material as defined in [then] Section 11e(2)." But Chairman Hendrie was concerned that a definition of byproduct material that was linked to that of source material would exclude ores containing 0.05% or less of uranium or thorium. [FN3] He proposed that the language be revised to "from any ore processed primarily for its source material content." His discussion with Congressman Dingell went as follows:

****8** Mr. Hendrie: The Commission is informed that there are a few mills currently using feedstock of less than 0.05 percent uranium. As high grade ores become scarcer, there may be a greater incentive in the future to turn to such low grade materials.

Since such operations should be covered by any regulatory regime over mill tailings, the Commission would suggest that the definition of byproduct material in H.R. 13382 be revised to include tailings produced by extraction of uranium or thorium from any ore processed primarily for its source material content.

Mr. Dingell: I am curious why you include in that the word "processed" primanly for source material content. There are other ores that are being processed that do contain thorium and uranium in amounts and I assume equal in value to those you are discussing here. Is there any reason why we ought not to give you the same authority with regard to those ores?

Mr. Hendrie: The intent of the language is to keep NRC's regulatory authority primarily in the field of the nuclear fuel cycle. Not to extend this out into such things as phosphate mining and perhaps even limestone mining which are operations that do disturb the radium-bearing ***18** crust of the Earth and produce some exposures but those other activities are not connected with the nuclear fuel cycle.

UMTRCA Hearings I at 343-44.

There were, therefore, two principal intentions behind Chairman Hendrie's proposed language, which Congress accepted. First, the 11e(2) definition was intended to reach even "low grade" feedstock with less than a 0.05% concentration of uranium. Second, the definition was intended to make sure that the NRC's jurisdiction did not expand into areas not traditionally part of the NRC's control over the "nuclear fuel cycle." The definition therefore "focuses upon uranium milling wastes" and not, for example, upon the wastes from phosphate ore processing which are also contaminated with small quantities of radioactive elements. Id. at 354 ("Section by Section Analysis of H.R. 13382 as Revised by NRC Recommended Language Changes"). Similarly, 11e(2) material was not to encompass uranium mining wastes because, as Chairman Hendrie explained, """[w]e don't regulate mines The mining is regulated by the Department of Labor under other regulations so our definition was drawn to maintain that and to keep us out of the mine-regulating business." Id. at 401.

We find, then, that the section 11e(2) definition focused upon whether the process generating the wastes was uranium milling within the course of the nuclear fuel cycle. As Chairman Hendrie made clear, the concentration of the uranium or thorium in the feedstock was not a determinative factor in whether the resulting tailings should be considered 11e(2) material. The focus was not on the value of the extracted uranium but on the activity involved.

In short, the section 11e(2) definition focuses upon the process that generated the radioactive wastes -- the removal of uranium or thorium as part of the nuclear fuel cycle. See Kerr-McGee Chemical Corp. v. NRC, 903 F.2d 1, 7 (D.C. Cir. 1990). But UMTRCA does not require that the market value of the uranium recovered be the licensee's predominant interest, and thus UMTRCA does not require the NRC to ensure that no other incentives lie behind the licensee's interest in processing material for uranium. There simply is no reason under UMTRCA why licensees cannot have several motives for a transaction. [FN4] That IUSA's primary goal here may have been the 4 million dollar payment for disposal, ***19** instead of potential profit from any recoverable uranium, does not in and of itself prevent the tailings generated from the milling process from falling within the section 11e(2) definition. Moreover, as we touch upon further below, making such purely economic considerations a determinative part of the Staff's review would unnecessarily divert agency resources to issues unrelated to public health and safety.

B. The Need for Revising the Guidance

****9** In this litigation, Utah and the other parties focused not upon UMTRCA and its legislative history, but upon the NRC's Alternative Feed Guidance. The Commission, however, is not bound by the Guidance. Like NRC NUREGs and Regulatory Guides, NRC Guidance documents are routine agency policy pronouncements that do not carry the binding effect of regulations. See, e.g., Curators of the University of Missouri, CLI-95-1, 41 NRC 71, 149 (1995); International Uranium (USA) Corp. (White Mesa Uranium Mill), LBP-97-12, 46 NRC 1, 2 (1997) (referring specifically to final Alternate Feed Guidance as "non-binding Staff guidance"). Such guidance documents merely constitute NRC Staff advice on one or more possible methods licensees may use to meet particular regulatory requirements. See, e.g., Curators, 41 NRC at 150 & n.121; Petition for Emergency and Remedial Action, CLI-78-6, 7 NRC 400, 406-07 (1978); Consumers Power Co. (Big Rock Point Nuclear Plant), ALAB-725, 17 NRC 562, 568 n.10 (1983); Vermont Yankee Nuclear Power Corp. (Vermont Yankee Nuclear Power Station), CLI-74-40, 8 AEC 809, 811 (1974). These guides, however, do not themselves have the force of regulations for they do not impose any additional legal requirements upon licensees. Licensees remain free to use other means to accomplish the same regulatory objectives. See Curators, 41 NRC at 150 & n.121; Petition for Emergency and Remedial Action, 7 NRC at 406-07; Big Rock Point, 17 NRC at 568 n.10; Vermont Yankee, 8 AEC at 811. "[A]gency interpretations and policies are not 'carved in stone' but rather must be subject to re-evaluations of their wisdom on a continuing basis." Kansas Gas and Electric Co. (Wolf Creek Generating Station, Unit 1), CLI-99-19, 49 NRC 441, 460 (1999) (referencing Chevron U.S.A., Inc. v. Natural Resources Defense Council, Inc., 467 U.S. 837, 863-64 (1984)).

Accordingly, it has long been an established principle of administrative law that an agency is free to choose among permissible interpretations of its governing statute, and that at times new interpretations may represent a sharp shift from prior agency views or pronouncements. Chevron, 467 U.S. at 842- 43, 862. This is permissible so long as the agency gives "adequate reasons for changing course." Envirocare of Utah v. NRC, 194 F.3d 72, 78 (D.C. Cir. 1999). Given that: (1) the disputed portions of the Alternate Feed Guidance are not derived directly from UMTRCA or its history; (2) the Guidance apparently has not been consistently ***20** applied in the manner proposed by Utah; (3) the precise terms of the Guidance are not entirely clear (cf., e.g., "other grounds"); and (4) the Commission believes that literal adherence to the apparent intent of the Guidance would lead to unsound policy results, the Commission declines to follow it here and will require the NRC Staff to revise it as soon as practicable. [FN5]

****10** Several policy reasons support departing from the Guidance. First, the NRC's statutory mission is public health and safety. Our regulations establish comprehensive criteria for the possession and disposal of 11e(2) byproduct material under NRC or agreement state jurisdiction. See 10 C.F.R. Part 40, Appendix A. The criteria were designed to ensure the safe disposal of bulk material whose primary radiological contamination is uranium, thorium, and radium in low concentrations. But whether the concentration of uranium in the feedstock material is 0.058% or 0.008% -- the initial high and low estimates, respectively, of the Ashland-2 material based upon samples taken -- has no impact upon the general applicability and adequacy of the agency's health and safety standards for disposal of section 11e(2) material. Yet, in Utah's view, whether the actual uranium concentration proved to be 0.058% or 0.008% could well dictate whether the resulting tailings appropriately could be classified as section 11e(2) material and regulated by the NRC.

Utah's interpretation thus divides byproduct material into two different regulatory camps based solely upon market-oriented factors, i.e., the expected profit from selling recovered uranium versus any other economically advantageous aspects of the license amendment. Utah emphasizes, for example, that it "has not objected to several [IUSA] alternate feed license amendment requests where the waste material contained [greater amounts] of uranium." See Utah's Petition for Review of LBP-99-5 (Feb. 26, 1999) at 9 n.10. From a health and safety perspective, though, there is no reason to prohibit IUSA from disposing of tailings material in its disposal cells solely on account of the feedstock having a lower uranium concentration or lower market value. Cf. Kerr-McGee, 903 F.2d at 7-8.

Second, the Guidance if applied as originally intended, would cast the NRC Staff into an inappropriate role, conducting potentially multifaceted inquiries into the financial attractiveness of transactions. The Staff essentially would need to look behind and verify every assertion about the economic factors motivating a proposed processing of material -- an unnecessary and wasteful use of limited agency resources, at a time when the Commission increasingly has moved away ***21** from performing economics-oriented reviews that have no direct bearing on safety and are not specifically required by Congress. [FN6]

In addition, the NRC seeks to regulate efficiently, imposing the least amount of burdens necessary to carry out our public health and safety mission. Yet, as this proceeding itself demonstrates, the Alternate Feed Guidance's unwieldy """Certification and Justification" test lends itself easily to protracted disputes among the NRC Staff, intervenors, and the licensee over such issues as how much the licensee will "really" profit from selling recovered uranium, what the licensee's "bigger" motives may be, etc. All this effort and attention imposes burdens on the parties while detracting from our central mission -- radiological safety, i.e., ensuring that there are no constituents in the alternate feed material that would prevent the mill from complying with all applicable NRC health and safety regulations.

****11** Nor is it inconceivable that eventual potential changes in the marketplace could impact whether particular material might fall within the section 11e(2) definition one year but not the next, merely on account of some new market factor. Purely economic factors, in short, should not determine how radioactive material is defined. Whether IUSA was paid a "substantial sum," as Utah emphasizes, a nominal sum, or had to pay a sum to acquire the Ashland-2 material has no bearing on health and safety issues. Therefore, this is not appropriately the Commission's concern and also should have no bearing on whether the resulting tailings meet the statutory definition of byproduct material under section 11e(2).

While it may be true, as Utah states, that when Congress enacted UMTRCA there was no "thought of using offsite active uranium mills to process and dispose of industrial cleanup waste from FUSRAP sites," Utah's Reply Brief at 5, several congressmen did express an interest in having private corporations take and reprocess materials as a means to offset the federal government's ultimate disposal costs for cleaning up UMTRCA's designated Title I sites. See, e.g., UMTRCA Hearings on H.R. 13382, H.R. 12938, H.R. 12535, and H.R. 13049 ("UMTRCA Hearings II") Before the Subcomm. on Energy and the Environment of the House Comm. on Interior and Insular Affairs, 95th Cong. 82 (1978) (statement of Rep. Weaver) (some "companies might be interested in sharing the cost of stabilization of tailings in return for access to minerals remaining in the piles"). [FN7] Then Chairman Hendrie voiced no objection, stating that "[i]f they want to reprocess the piling to make a complete recovery of the resource there, I think that is fine from a ***22** conservation standpoint. It also puts them back in the active business of milling." See UMTRCA Hearings II at 82.

Here, the Ashland-2 material has been approved for processing and disposal, and the resulting byproduct material will be disposed of pursuant to the same health and safety standards that apply to any other 11e(2) material in an NRC-licensed mill: 10 C.F.R. Part 40, Appendix A. Though Utah may be dissatisfied with those standards, an adjudicatory proceeding is not the appropriate forum to contest generic NRC requirements or regulations. See, e.g., Duke Energy Corp. (Oconee Nuclear Station, Units 1, 2, and 3), CLI-99-11, 49 NRC 328, 334 (1999).

We note, additionally, that early in the proceeding Utah expressed concern that the Ashland-2 material, contrary to the NRC Staff's findings, possibly contained listed hazardous waste. But while the accuracy of the license application can appropriately be the subject of an adjudication, notwithstanding Staff findings, here subsequent events have rendered Utah's hazardous waste concern moot. Following negotiations with IUSA and, after analyzing investigations and data from the Ashland-2 site, Utah formally withdrew its allegation that the Ashland-2 material may contain listed hazardous waste. See Utah's Appeal Brief at 3 n.2. Although Utah is upset that the Staff's allegedly "scanty" review took only "about six weeks," its own review failed to uncover any errors in the Staff's conclusion that the material contains no listed hazardous waste. Utah's remaining generalized complaint about how the Staff reached its conclusion is not a litigable issue, given that Utah now concurs with the Staff's conclusion and no longer alleges the presence of any listed hazardous waste.

****12** Nevertheless, such disputes about the presence of hazardous waste are likely to recur, and the issue is a significant one, implicating three concerns: (1) possible health and safety issues; (2) the potential for an undesirable, complex NRC-EPA "dual regulation" of the same tailings impoundment; and (3) the potential for jeopardizing the ultimate transfer of the tailings pile to the U.S. government, for perpetual custody and maintenance. See generally UMTRCA, Title II, § 202 (section 83 of the AEA). In view of our decision that the Alternate Feed Guidance requires revision to reflect our decision on the 11e(2) definition, we will direct the Staff to consider whether the Guidance also should be revised to include more definitive and objective requirements or tests to ensure that listed hazardous or toxic waste is not present in the proposed feed material. We note, for example, that in a recent license amendment proceeding, the Presiding Officer declared it simply "impossible" for him to "ascertain the basis for the Staff determination that this material is not hazardous." International Uranium (USA) Corp. (White Mesa Uranium Mill), LBP-97-12, 46 NRC 1, 5 (1997). Similarly, in another earlier proceeding, the Presiding Officer found that the "Staff's new guidance for determining whether feed material is a mixed [or hazardous] waste appears confusing," and accordingly suggested there be more "specific protocols ... to determine if alternate feed materials contain hazardous components." ***23**UMETCO, 37 NRC at 280-81. The Commission concludes that this issue warrants further Staff refinement and standardization.

In conclusion, applying the Commission's statutory interpretation of section 11e(2) byproduct material, the Commission finds that the IUSA license amendment properly was issued and that the mill tailings at issue do constitute section 11e(2) byproduct material. From the information in the record, we believe that it was reasonable for the NRC Staff to have concluded that: (1) processing would take place, and (2) uranium would be recovered from the ore. Utah itself has acknowledged that "[i]n three different estimates, taken from DOE documents, the average uranium content of the material ranged from a high of 0.058% to a low of 0.008%." See Utah's Appeal Brief at 4; see also Utah's Brief in Opposition to IUSA's License Amendment (Dec. 7, 1998) ("Utah's Brief in Opposition") at 8, and Attachment at 7-8. Utah's own expert estimated that up to $617,000 worth of uranium might be recovered from the Ashland-2 material. See Utah's Brief in Opposition at 8, and Attachment at 9. Utah's primary argument all along has been that the monetary value of the recovered uranium would be much lower than the 4-million-dollar payment IUSA would receive, not that no source material would be recovered through processing. See, e.g., id., Attachment at 9 (where Utah's expert stressed that the value of the uranium-238 that could be extracted from the Ashland-2 material "represents a fraction (1.6 to 15 percent) of the $4,050,000 that [IUSA] will receive from Material Handling & Disposal Services fees"); Utah's Reply Brief at 11 (the "disposal fee received by [IUSA] ... is almost 60 times the value of the uranium recovery").

****13** Not only was it reasonable to conclude that uranium could be recovered from the Ashland-2 material, but it was also reasonable to conclude that the processing would indeed take place. IUSA had a contractual commitment to do so; its contract with the Army Corps of Engineers required IUSA to process the material prior to disposal. See IUSA Brief at 18, 25. In addition, as the Presiding Officer noted, "IUSA has a history of successfully extracting uranium from alternate feed material and has developed credibility with the NRC ... for fulfilling its proposals to recover uranium from alternate feeds." 49 NRC at 112. This was not an instance, then, where there was no reasonable expectation that the mill operator would in fact process material through the mill to extract recoverable uranium. Moreover, it is also the Commission's understanding that the Ashland-2 material has in fact been processed in the IUSA mill and that approximately 8,000 pounds of uranium were extracted. While that quantity of uranium was on the low end of IUSA's estimates, it nevertheless represents more than a minute or negligible recovery of uranium. [FN8]

***24** The Commission concludes, therefore, that the Presiding Officer's interpretation of the section 11e(2) definition reflects a sensible reading of the UMTRCA statute and legislative history -- one we hereby embrace -- and that the record overall supports the issuance of the license amendment.

III. CONCLUSION

For the foregoing reasons, LBP-99-5 is affirmed.

IT IS SO ORDERED.

For the Commission,

Annette L. Vietti-Cook

Secretary of the Commission

FN1. IUSA made a similar request to receive, process, and dispose of uranium-bearing material from the nearby Ashland-1 and Seaway Area D FUSRAP sites. That license amendment is the subject of a separate NRC adjudicatory proceeding (Docket No. 40-8681-MLA-5) currently held in abeyance pending the outcome of this appeal.

FN2. In fact, when the Guidance was first proposed, there was a description of how owners of low-level or mixed waste, facing the high costs of disposal, might find it "very attractive" to "pay a mill operator substantially less to process [the material] for its uranium content and dispose of the resulting 11e.(2) material," rather than to pay for disposal at a low-level or mixed waste facility. See "Uranium Mill Facilities, Request for Public Comments on Guidance on the Use of Uranium Mill Feed Materials Other Than Natural Ores," 57 Fed. Reg. 20,525, 20,533 (May 13, 1992) ("Proposed Guidance"). The Proposed Guidance labeled such transactions "sham disposals," and implied they "would not meet the definition of 11e.(2) byproduct material" Id. at 20,533.

FN3. "Source material" has been defined by the Commission to exclude ores containing less than 0.05% of uranium or thorium, 10 C.F.R. § 40.4.

FN4. See also, e.g. Kerr-McGee, 903 F.2d at 7 (where the court suggested that the word "primarily" in the section 11e(2) definition could be read to mean """substantially," and thus the tailings from the coproduction of source material and rare earths could still be deemed 11e(2) byproduct material so long as one of the reasons for processing the ore was for extracting source material). The court's reasoning in Kerr-McGee is consistent with the UMTRCA history, which reflects that it has long been the case, for instance, that both vanadium and uranium might be extracted during a processing of material, and indeed that the amount of recoverable vanadium may very likely be much greater than that of the recoverable uranium. See, e.g., UMTRCA Hearings I at 155 (where private company reprocessing material was extracting 2 1/2 pounds of vanadium for every 1/2 pound of uranium extracted); see also UMTRCA Hearings III at 136 ("We recover ... about 1,000 pounds a day of uranium, about 4,000 pounds of vanadium"). There was never any suggestion in the legislative history that if the amount or value of the vanadium proved higher than that of the uranium, the tailings could not be categorized as 11e(2) byproduct material.

FN5. The Commission has promulgated no regulation implementing the Guidance. Thus, the Commission's rejection of the Guidance does not present a situation where the Commission has altered "suddenly and sub silentio settled interpretations of its own regulations." Natural Resources Defense Council, Inc. v. NRC, 695 F.2d 623, 625 (D.C. Cir. 1982). See generally Syncor International Corp. v. Shalala, 127 F.3d 90 (D.C. Cir. 1997); Paralyzed Veterans of America v. D.C. Arena L.P., 117 F.3d 579 (1997), cert. denied, 523 U.S. 1003 (1998); United Technologies Corp. v. EPA, 821 F.2d 714 (D.C. Cir. 1987).

FN6. See, e.g., Final Rule, Environmental Review for Renewal of Nuclear Power Plant Operating Licenses, 61 Fed. Reg. 28,467, 28,484 (June 5, 1996); Wolf Creek, 49 NRC 441 (1999).

FN7. See also, e.g., UMTRCA Hearings I at 89-90 (written statement of Rep. Johnson); Hearings on S.3008, S.3078, and S.3253 ("UMTRCA Hearings III") Before the Subcomm. on Energy Production and Supply of the Senate Comm. on Energy and Natural Resources, 95th Cong. 59 (1978) (statement of Sen. Haskell) (if private companies reprocessed some of the tailings, that would be regulated under the NRC's regulations).

FN8. Moreover, even if we had adhered to and sought to apply the Guidance's tests for licensee "motives," the record does not show that IUSA processed the Ashland-2 material as a means to change non-11e(2) material into section 11e(2) material. IUSA was aware that the NRC Staff had accepted a DOE certification declaring that the Ashland-2 FUSRAP material met the 11e(2) byproduct material definition. Based upon the DOE certification, the Staff had concluded that "the material could be disposed of directly in the White Mesa tailings impoundments," without any need of processing at the mill. See Technical Evaluation Report at 6, attached to Amendment 6 to Source Material License SUA-1358 (June 23, 1998). The Staff thus claims that "sham disposal" was not a concern "since it did not appear that the material was being processed to change its legal definition, and as such was truly being processed for its uranium content." See Staff Aff. of Joseph Holonich at 7. Whether the Ashland-2 material actually already was section 11e(2) byproduct material under UMTRCA remains unclear. See supra at p. 14. Nevertheless, IUSA was aware that DOE, the Army Corps of Engineers, and the NRC Staff all had categorized the material as such, and that the Staff indeed had stated that this was material that could have been disposed of without any further processing. This suggests that IUSA had a genuine interest in processing the material for the uranium and not simply an interest in "reclassifying" the material by processing it. The subtle and complex nature of this inquiry, however, reinforces our view that discerning a licensee's motives for a license amendment transaction is a difficult, virtually impossible, and, in any event, unnecessary exercise. Accordingly, our approach in this decision rejects ultimate business motivations as irrelevant to the section 11e(2) definition.

Recent Changes to Uranium Recovery Policy

November 30, 2000

- ADDRESSEES
- INTENT
- BACKGROUND
- PART 41 RULEMAKING (SECY-99-011)
- DISPOSAL OF NON-11e.(2) BYPRODUCT MATERIAL IN TAILINGS IMPOUNDMENTS (SECY-99-012)
- PROCESSING OF MATERIAL OTHER THAN NATURAL URANIUM ORES (SECY-99-012)
- CLASSIFICATION OF LIQUID WASTES AT ISL FACILITIES (SECY-99-013)
- GROUND-WATER ISSUES AT ISL FACILITIES (SECY-99-013)
- CONCURRENT JURISDICTION OF NON-RADIOLOGICAL HAZARDS OF URANIUM MILL TAILINGS (SECY-99-277)
- SUMMARY OF ISSUES

ADDRESSEES

All holders of materials licenses for uranium and thorium recovery facilities.

TOP

INTENT

The U.S. Nuclear Regulatory Commission (NRC) is issuing this regulatory issue summary (RIS) to inform materials licensees of the Commission's decisions on four Commission Papers prepared by the Uranium Recovery staff and the Office of the General Counsel (OGC). All the policy decisions will be codified in the 10 CFR Part 41 rulemaking that has been initiated. No specific action nor written response is required.

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BACKGROUND

NRC staff prepared four Commission Papers in 1999 to address various uranium recovery issues. One Commission Paper (SECY-99-011, "Draft Rulemaking Plan; Domestic Licensing of Uranium and Thorium Recovery facilities - Proposed New 10 CFR Part 41") addressed the need to revise and update uranium recovery regulations, particularly with respect to in situ leach (ISL) facilities and recommended the initiation of rulemaking to create a new Part 41 specific to uranium recovery. The other three Commission Papers addressed issues raised by the National Mining Association EXIT (NMA) in its April 1998 paper, "Recommendations for a Coordinated Approach to Regulating the Uranium Recovery Industry." The first of those papers (SECY-99-012, "Use of Uranium Mill Tailings Impoundments for the Disposal of Other Than 11e(2) Byproduct Materials, and Reviews of Applications to Process Material Other Than Natural Ore") discussed the disposal of radioactive waste, other than byproduct material, defined in section 11e.(2) of the Atomic Energy Act (AEA) of 1954, as amended, in mill tailings impoundments, and the processing of material, other than natural ore, for source material at licensed uranium mills. The second of those papers (SECY-99-013, "Recommendations on ways to Improve the Efficiency of NRC Regulation at In Situ Leach Uranium Recovery Facilities") discussed the regulation of ground water at ISL sites and the issue of which waste streams at ISL facilities come under NRC regulatory jurisdiction as 11e.(2) byproduct material. The last paper (SECY-99-277, "Concurrent Jurisdiction of Non-Radiological Hazards of Uranium Mill Tailings") addressed the issue of concurrent jurisdiction (with States that do not have Agreement State regulatory authority for 11e.(2) material under section 274 of the AEA) over the non-radiological hazards of uranium mill tailings.

On July 13, 2000, the Commission issued a Staff Requirements Memorandum (SRM) on SECY-99-011. On July 26, 2000, the Commission issued SRMs on SECY-99-012 and SECY-99-013, and on August 11, 2000, the "SRM on SECY-99-277 was issued.

The decisions and directions in these SRMs and the staff actions in response are discussed in sections that follow.

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PART 41 RULEMAKING (SECY-99-011)

SECY-99-011 approved the staff's recommendation to provide a draft Rulemaking Plan (RP) for comment to the Agreement States, with the preferred option being the creation of a new Part 41 dedicated to uranium recovery regulation. The Commission directed the staff to revise the draft RP to reflect the Commission's guidance in the other uranium recovery SRMs.

On September 11, 2000, the staff transmitted the draft RP to all States for comment. The staff sent the draft RP to all States rather than just Agreement States because the issue of concurrent jurisdiction regarding non-radiological hazards primarily affects non-Agreement States, and the staff wanted to give those States an opportunity to comment on the draft RP. Comments have been received from several States. In addition, the NMA and two licensees provided comments on the draft RP. The staff will consider all the comments received in preparing its final RP, which it expects to issue in early 2001.

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DISPOSAL OF NON-11e.(2) BYPRODUCT MATERIAL IN TAILINGS IMPOUNDMENTS (SECY-99-012)

In 1995, the staff published guidance, in the *Federal Register* EXIT (60 FR 49296), for the disposal, in uranium mill tailings impoundments, of radioactive material that is not byproduct material, as defined in section 11e.(2) of the AEA. The guidance consisted of 10 criteria to determine whether to approve a proposed disposal of non-11e.(2) byproduct material in a uranium mill tailings impoundment. In its 1998 white paper, the NMA emphasized that the criteria were too restrictive, pointing out that no requests for such disposals have been made since the guidance was issued. The Commission, in the SRM for SECY-99-012, approved an option that would allow more flexibility in permitting non-11e.(2) material to be disposed of in tailings impoundments. The NRC intends to incorporate the criteria into the new Part 41. In the interim, the Commission directed the staff to implement the SRM.

To comply with the direction in the SRM, the staff is revising the 1995 guidance in the following manner:

- The staff will remove the prohibitions, found in items 2, 4, and 5, regarding non-AEA radioactive material and material subject to regulation under other legislative authorities, such as the Toxic Substance Control Act (TSCA) or the Resource Conservation and Recovery Act (RCRA).
- The staff will add a criterion regarding approval from the appropriate regulators of TSCA, RCRA, and non-AEA radioactive material for disposal of such material in the tailings impoundment.
- The staff will revise the criterion, in item 8, regarding approval by Low-Level Waste Compacts, to allow for the situation in which material proposed for disposal does not fall under the jurisdiction of Low-Level Waste Compacts (e.g., radioactive material not regulated under the AEA).
- The Commission directed the staff to pursue a generic exemption to NRC's disposal requirements for low-level radioactive waste in 10 CFR Part 61, rather than having to grant an exemption, under 10 CFR 61.6, as identified in item 10. A generic exemption to regulations must be issued through a rulemaking process. Therefore, the staff will pursue incorporating the generic exemption in the new Part 41. In the interim, the requirement for a specific exemption will remain in the guidance, with addition of a caveat for material not regulated under Part 61.

The staff therefore is revising its 1995 guidance. The complete revised guidance, is in Attachment 1.

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PROCESSING OF MATERIAL OTHER THAN NATURAL URANIUM ORES (SECY-99-012)

In 1995, the staff published its position and guidance, in the *Federal Register* EXIT (60 FR 49296), on the use of uranium feed material other than natural ores (alternate feed material), in uranium mills. The guidance identified three determinations that the staff had to make in order to approve an alternate feed request. The third determination -- whether the ore is being processed primarily for its source material content -- generated considerable controversy. This determination was required to address the concern that wastes that would otherwise have to be disposed of as radioactive or mixed waste would be proposed for processing at a uranium mill primarily to be able to dispose of them in the tailings pile as 11e.(2) byproduct material. This determination was essentially a determination of the motives of the mill operator in requesting approval of a specific stream of alternate feed material. In many cases it involved questioning the financial aspects of acquiring and processing the alternate feed material, and selling the resultant uranium product.

In its 1998 white paper, the NMA emphasized that NRC should not be looking to a licensee's motives in processing alternate feed material. After careful consideration of stakeholder comments and the staff's analysis, the Commission, in the SRM for SECY-99-012, directed the staff to allow processing of alternate feed material without inquiry into a licencee's economic motives, and referred to a Commission decision (CLI-00-01 51 NRC 9) on a specific instance of proposed processing of alternate feed, that was brought before the Atomic Safety Licensing Board and then appealed to the Commission. The Commission also addressed the second determination in the 1995 guidance (i.e., whether the feed material contains hazardous waste). It directed the staff to allow more flexibility with regard to this issue consistent with its direction to the staff on the disposal of non-11e.(2) byproduct material in tailings piles.

The Commission directed the staff to revise, issue, and implement final guidance on the processing of alternate feed as soon as possible and to codify the guidance in the new Part 41.

To comply with the SRM, the staff is revising the 1995 position and guidance in the following manner:

The staff will modify the prohibition in item 2 on feed material containing hazardous waste, to allow such feed material provided that the licensee obtains approval of the U.S. Environmental Protection Agency EXIT (EPA) or the State, and a commitment from the long-term custodian to accept the tailings after site closure.

The staff will revise the manner in which it determines whether the ore is being processed primarily for its source material content, to focus on the product of the processing, and eliminate any inquiry into the licensee's economic motives for the processing.

The staff therefore is revising its 1995 guidance. The complete revised guidance, is in Attachment 2.

TOP

CLASSIFICATION OF LIQUID WASTES AT ISL FACILITIES (SECY-99-013)

Before 1995, the staff practice for addressing the disposal of evaporation pond sludges at ISL facilities relied on a broad reading of the definition of 11e.(2) byproduct material. This broad reading only addressed discrete surface wastes capable of controlled disposal and did not distinguish between wastes generated at various phases of an ISL operation. All waste materials generated during ISL operations and ground-water restoration activities were designated 11e.(2) byproduct material and disposed of at licensed uranium mill tailings impoundments, in accordance with 10 CFR Part 40, Appendix A, Criterion 2.

The staff issued two guidance documents in 1995 to address issues raised by the industry in the uranium recovery program. The first, "Staff Technical Position on Effluent Disposal at Licensed Uranium Recovery Facilities" (hereinafter, the effluent guidance), was intended to ensure protection of the environment and public, while providing uranium recovery licensees with flexibility regarding the disposal of various types of liquid effluents generated during the operation of their facilities. In issuing this guidance, the staff took a more narrow view of the definition of 11e.(2) byproduct material. It differentiated between the various waste waters generated during ISL operations on the basis of their origin and whether uranium was extracted for its source material content during that phase of the operation. Waste waters and the associated solids produced during the uranium extraction phase of site operations, called "production bleed," were classified as AEA Section 11e.(2) byproduct material and therefore subject to regulation by NRC. Conversely, waste waters and the resulting solids produced after uranium extraction (i.e., during ground-water restoration activities) were classified as "mine waste waters," and therefore were subject to regulation by individual States under their applicable mining programs. These wastes were considered naturally occurring radioactive material (NORM). However, because licensees often dispose of waste waters from uranium extraction and post-extraction activities in the same evaporation ponds, the resulting solids are a commingled waste consisting of 11e.(2) byproduct material and sludges derived from mine waste water.

In the second guidance document, "Final Revised Guidance on Disposal of Non-Atomic Energy Act of 1954, Section 11e.(2) Byproduct Material in Tailings Impoundments" (hereinafter, the disposal guidance), the staff identified 10 criteria that licensees should meet before NRC could authorize the disposal of AEA material other than 11e.(2) byproduct material in tailings impoundments. One of these criteria prohibited the disposal of radioactive material not covered by the AEA, including NORM (see earlier discussion for policy revisions). This criterion was intended to avoid the possibility of dual regulation of the radioactive constituents in the impoundments, since individual States are responsible for radioactive materials not covered by the AEA.

The industry expressed concerns, in NMA's white paper, that, taken together, these two guidance documents leave no option for the disposal of radioactively contaminated sludges from ISL evaporation ponds. The reason for this concern is that the 11e.(2) byproduct material was commingled with a NORM waste, which the disposal guidance prohibits from disposal in a tailings impoundment. The industry emphasized that the staff's waste classification, based on the origin of the waste water (i.e., from the extraction or restoration phase) at an ISL facility, makes the disposal of such sludges in a mill tailings impoundment, as required under Criterion 2 of 10 CFR Part 40, Appendix A, impossible -- even though the sludges derived from waste waters produced throughout a facility's life cycle are physically, chemically, and radiologically identical.

The staff analyzed several options in SECY-99-013 for addressing the industry's concerns. In the SRM for SECY-99-013, the Commission determined that all liquid effluents at ISL uranium recovery facilities are 11e.(2) byproduct material. NRC takes the position that any waste water generated during or after the uranium extraction phase of site operations, and all evaporation pond sludges derived from such waste waters, are classified as 11e.(2) byproduct material. The staff will make no legal distinction among the waste waters produced at different stages in a facility's life cycle.

This revised policy is effective immediately. The staff intends to codify this policy in the new rulemaking for Part 41 and associated regulatory guidance.

TOP

GROUND-WATER ISSUES AT ISL FACILITIES (SECY-99-013)

Over the past several years, the industry has expressed concern that NRC's regulation of ground water at ISLs is duplicative of the ground-water protection programs required by the Safe Drinking Water Act (SDWA), as administered by EPA or EPA-authorized States. EPA and the States protect ground-water quality through the Underground Injection Control (UIC) program, under the SDWA. The States often require additional measures in the UIC program that are more stringent than the Federal program. As presented in NMA's white paper, the industry contended that NRC's review and licensing activities are a duplicative form of regulation covering the same issues. Additionally, NMA also expressed the view that NRC did not have authority to regulate ground water at ISLs.

Historically, NRC has imposed conditions on ISL operations to ensure that ground-water quality is maintained during licensed activities and that actions are taken to ensure the restoration of ground-water quality before the license is terminated. The specific conditions imposed in an ISL license have typically been the result of NRC's independent review, as documented in safety evaluation reports and appropriate environmental evaluations.

In addition to NRC's review, licensees must also obtain a UIC permit from EPA or the EPA-authorized State before uranium recovery operations can begin. EPA or the authorized State conducts many of the same types of reviews as NRC. This is evidenced by NRC incorporating ground-water protection limits from a State's permitting program into specific license requirements, after conducting its own review of the licensee's groundwater protection program, including the use of State-imposed standards -- and staff routinely accepting specific methodologies and guidance developed by EPA or States for ground-water monitoring programs and well construction.

In the SRM for SECY-99-013, the Commission approved the staff continuing discussions with EPA and appropriate States to determine the extent to which NRC can rely on the EPA UIC program for ground-water protection issues, thereby potentially minimizing duplicative review of ground-water protection at ISL facilities. Part of the discussions with EPA and appropriate States should include appropriate methods to implement any agreements, including Memoranda of Understanding (if necessary) and potential requirements that could be incorporated in the new Part 41. In the interim, it is recognized that some NRC/EPA dual regulation of the ground-water at ISL facilities will continue until such time that NRC can defer to EPA's UIC program.

NRC has initiated a new round of discussions with the EPA since the Commission decision in July 2000, and discussions with the appropriate States should begin in early to mid 2001.

In February 1998, staff documented its review process for ISLs, including a detailed evaluation of ground-water activities, in a draft Standard Review Plan (draft SRP) for ISL facility license applications (NUREG-1569), that was published for public comment. Following the comment period, staff held a public workshop on the SRP to discuss the issues raised. The staff intends to use the draft SRP in licensing reviews until the rulemaking for new Part 41 (SECY 99-011) has been completed and NUREG-1569 is finalized.

TOP

CONCURRENT JURISDICTION OF NON-RADIOLOGICAL HAZARDS OF URANIUM MILL TAILINGS (SECY-99-277)

In 1980, the staff considered the issue of whether the Uranium Mill Tailings Radiation Control Act (UMTRCA) preempts a non-Agreement State's authority to regulate the non-radiological hazards associated with 11e.(2) byproduct material and concluded that it did not. The NRC concluded that NRC and the State both exercised this authority. As a result, the staff has followed the practice of sharing jurisdiction of the non-radiological hazards with States. In its 1998 white paper, the NMA questioned the 1980 staff interpretation of UMTRCA. The Commission, in the SRM for SECY-99-0277 determined that NRC has exclusive jurisdiction over both the radiological and non-radiological hazards of 11e.(2) byproduct material.

As a result of this decision, the staff will implement its exclusive authority over the non-radiological hazards of 11e.(2) byproduct material and not recognize State authority in this area.

TOP

SUMMARY OF ISSUES

The Commission has evaluated a range of uranium recovery issues and the staff evaluation and has directed, through SRMs, the staff to take various actions that will ultimately be incorporated into the new Part 41 rulemaking and existing uranium recovery SRPs.

In the interim, this RIS informs the licensees of the Commission's decisions. These are: 1) to allow more flexibility in the disposal of non-11e.(2) material in tailings impoundments, subject to certain considerations; 2) to allow alternate feed material to be processed for uranium (or thorium) without any inquiry into a licensee's economic motives; 3) to classify all waste water and sludges generated during or after the uranium (or thorium) extraction phase of in situ leach operations as 11e.(2) byproduct material; 4) to continue discussions with EPA and appropriate States to determine the extent that NRC can rely on the EPA UIC program for ground-water protection at ISL facilities; and 5) to note that NRC has exclusive jurisdiction over both the radiological and non-radiological hazards of 11e.(2) byproduct material.

This regulatory issue summary requires no specific action nor written response. If you have any questions about this summary, please contact the technical contact listed below.

TOP

/RA/

Michael F. Weber, Director
Division of Fuel Cycle Safety & Safeguards
Office of Nuclear Material Safety and Safeguards

Technical Contact: Kenneth R. Hooks, NMSS
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E-mail: krh1@nrc.gov

Attachments:
1. Interim Guidance Non-11e.(2)
2. Interim Position Alternate Feed
3. List of Recently Issued NRC Regulatory Issue Summaries

(ADAMS Accession Number ML003773008)

ATTACHMENT 1

Interim Guidance on Disposal of Non-Atomic Energy Act of 1954, Section 11e.(2) Byproduct Material in Tailings Impoundments

1. In reviewing licensee requests for the disposal of wastes that have radiological characteristics comparable to those of Atomic Energy Act of 1954, Section 11e.(2) byproduct material [hereafter designated as "11e.(2) byproduct material"] in tailings impoundments, the Nuclear Regulatory Commission staff will follow the guidance set forth below. Since mill tailings impoundments are already regulated under 10 CFR Part 40, licensing of the receipt and disposal of such material [hereafter designated as "non-11e.(2) byproduct material"] should also be done under 10 CFR Part 40.

2. Special nuclear material and Section 11e.(1) byproduct material waste should not be considered as candidates for disposal in a tailings impoundment, without compelling reasons to the contrary. If staff believes that such material should be disposed of in a tailings impoundment in a specific instance, a request for Commission approval should be prepared.

3. The 11e.(2) licensee must provide documentation showing necessary approvals of other affected regulators (e.g., the U.S. Environmental Protection Agency or State) for material containing listed hazardous wastes or any other material regulated by another Federal agency or State because of environmental or safety considerations.

4. The 11e.(2) licensee must demonstrate that there will be no significant environmental impact from disposing of this material.

5. The 11e.(2) licensee must demonstrate that the proposed disposal will not compromise the reclamation of the tailings impoundment by demonstrating compliance with the reclamation and closure criteria of Appendix A of 10 CFR Part 40.

6. The 11e.(2) licensee must provide documentation showing approval by the Regional Low-Level Waste Compact in whose jurisdiction the waste originates as well as approval by the Compact in whose jurisdiction the disposal site is located, for material which otherwise would fall under Compact jurisdiction.

7. The U.S. Department of Energy (DOE) and the State in which the tailings impoundment is located, should be informed of the U.S. Nuclear Regulatory Commission findings and proposed action, with a request to concur within 120 days. A concurrence and commitment from either DOE or the State to take title to the tailings impoundment after closure must be received before granting the license amendment to the 11e.(2) licensee.

8. The mechanism to authorize the disposal of non-11e.(2) byproduct material in a tailings impoundment is an

amendment to the mill license under 10 CFR Part 40, authorizing the receipt of the material and its disposal. Additionally, an exemption to the requirements of 10 CFR Part 61, under the authority of 10 CFR 61.6, must be granted, if the material would otherwise be regulated under Part 61. (If the tailings impoundment is located in an Agreement State with low-level waste licensing authority, the State must take appropriate action to exempt the non-11e.(2) byproduct material from regulation as low-level waste.) The license amendment and the 10 CFR 61.6 exemption should be supported with a staff analysis addressing the issues discussed in this guidance.

ATTACHMENT 2

Interim Position and Guidance on the Use of Uranium Mill Feed Material Other Than Natural Ores

In reviewing licensee requests to process alternate feed material (material other than natural ore) in uranium mills, the Nuclear Reguatory Commission staff will follow the guidance presented below. Besides reviewing to determine compliance with appropriate aspects of Appendix A of 10 CFR Part 40, the staff should also address the following issues:

1. Determination of whether the feed material is ore.

For the tailings and wastes from the proposed processing to qualify as 11e.(2) byproduct material, the feed material must qualify as "ore." In determining whether the feed material is ore, the following definition of ore will be used:

Ore is a natural or native matter that may be mined and treated for the extraction of any of its constituents or any other matter from which source material is extracted in a licensed uranium or thorium mill.

2. Determination of whether the feed material contains hazardous waste.

If the proposed feed material contains hazardous waste, listed under subpart D Sections 261.30-33 of 40 CFR (or comparable Resource Conservation and Recovery Act (RCRA) authorized State regulations), it would be subject to the U.S. Environmental Protection Agency (EPA) or State regulation under RCRA. If the licensee can show that the proposed feed material does not contain a listed hazardous waste, this issue is resolved.

Feed material exhibiting only a characteristic of hazardous waste (ignitable, corrosive, reactive, toxic) would not be regulated as hazardous waste and could therefore be approved for recycling and extraction of source material. However, this does not apply to residues from water treatment, so determination that such residues are not subject to regulation under RCRA will depend on their not containing any characteristic hazardous waste. Staff may consult with EPA (or the State) before making a determination of whether the feed material contains hazardous waste.

If the feed material contains hazardous waste, the licensee can process it only if it obtains EPA (or State) approval and provides the necessary documentation to that effect. Additionally, for feed material containing hazardous waste, the staff will review documentation from the licensee that provides a commitment from the U.S. Department of Energy or the State to take title to the tailings impoundment after closure.

3. Determination of whether the ore is being processed primarily for its source-material content.

For the tailings and waste from the proposed processing to qualify as 11e.(2) byproduct material, the ore must be processed primarily for its source-material content. If the only product produced in the processing of the alternate feed is uranium product, this determination is satisfied. If, in addition to uranium product, another material is also produced in the processing of the ore, the licensee must provide documentation showing that the uranium product is the primary product produced.

If it can be determined, using the aforementioned guidance, that the proposed feed material meets the definition of ore, that it will not introduce a hazardous waste not otherwise exempted, or if it has been approved by the EPA (or State) and the long-term custodian, and that the primary purpose of its processing is for its source-material content, the request can be approved.

FINAL REVISED APPLICATION

AMENDED AGREEMENT FOR URANIUM RECOVERY REGULATION

STATE OF UTAH

DIVISION OF RADIATION CONTROL
UTAH DEPARTMENT OF ENVIRONMENTAL QUALITY

JULY 2003

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UTAH FINAL APPLICATION
FOR
URANIUM MILLS AND MILL TAILINGS

Introduction (Criterion 29*).

Section 274 of the Atomic Energy Act of 1954, as amended, authorizes the U.S. Nuclear Regulatory Commission (NRC) to enter into agreements, whereby states assume certain regulatory functions that would otherwise be the responsibility of the NRC. Utah Code Annotated (UCA) 19-3-113 authorizes the Governor of Utah to enter into such an agreement. On April 1, 1984, Utah became an Agreement State with regulatory authority over 11e.(1) byproduct material, source material, and special nuclear material in quantities not sufficient to form a critical mass. On May 9, 1990, the agreement was amended to include the regulatory authority for land disposal within the State of source, byproduct, and special nuclear material received from other persons. At this time, the State of Utah wishes to amend its agreement to assume regulatory authority over byproduct material as defined in Section 11.e.(2) of the Atomic Energy Act for uranium mills and mill tailings.

The Utah Department of Environmental Quality (DEQ), Division of Radiation Control (DRC), will be the designated agency for carrying out these responsibilities. William J. Sinclair, Director of the Division of Radiation Control, will be the contact.

*1981/1983 Policy Statement: "Criteria for Guidance of States and NRC in Discontinuance of NRC Regulatory Authority and Assumption Thereof by States Through Agreement"

Policy Statement (Criteria 29 and 35)

The following policy statement for assuming regulatory authority over byproduct material as defined in Section 11.e.(2) of the Atomic Energy Act for uranium mills and mill tailings has evolved through a discussion process involving scoping and task force meetings. During October and November 1999, the Division of Radiation Control conducted a series of stakeholder meetings with potential licensees and a series of public scoping meetings that were held in Salt Lake City, Tooele, Ticaboo, Blanding, and Moab, Utah. At the public scoping meetings, the Division requested comments on the following proposal: "The State of Utah will amend its current agreement with the Nuclear Regulatory Commission to regulate uranium mills and tailings." Thirty-nine persons offered oral comments during the public scoping meetings and approximately 150 persons attended the five scoping meetings. In addition, 8 written comments were received during a public comment period that ran from October 28, 1999 through December 6, 1999.

During the 2000 Utah legislative session, it was determined that it would be beneficial to form an Agreement State/Groundwater Authority task force to examine several issues relating to Agreement State status. The task force was initiated by the Utah Department of Environmental Quality in April 2000. Interested stakeholders that were invited to participate on the task force included licensee representatives, local community representatives, representatives of the Utah Radiation and Water Quality Boards, and a representative of the Utah Mining Association. The task force was jointly sponsored by the Department of Environmental Quality, Divisions of Water Quality and Radiation Control. After several meetings, the task force formulated a paper entitled: "Elements of a Utah Agreement State Program for Uranium Mill Regulation." In July

2000, the task force unanimously supported the Division of Radiation Control in pursuing Agreement State status as established in the "Elements" paper. The "Elements" paper described several aspects of a Utah Agreement State program including the following policy statement:

"The State of Utah recognizes the importance of and supports the uranium mining and milling industry. The State recognizes that to remain viable at this time, uranium mills must be able to engage in activities other than milling conventional mined uranium ores such as processing alternate feed materials for the recovery of uranium alone or together with other minerals. The State also recognizes its responsibility to ensure that all such activities are accomplished in a manner that is protective of human health and the environment. It has been a long-standing policy for the State to seek primacy for environmental programs. In this regard, the State believes that a cooperative uranium mills and tailings regulatory program will be of benefit to both the regulated community and Utah citizens. The advantages that the State can offer over the current Nuclear Regulatory Commission program include better communication with and participation of the public in uranium recovery issues, elimination of duplicative regulatory responsibilities, providing a more cost effective program for the regulated community, and establishing control of materials not currently being regulated (e.g. pre-1978 uranium mill tailings) while maintaining a regulatory program that is adequate and compatible with existing and future NRC regulations and policy. The elements within this application provide the framework for how the State of Utah would regulate uranium mills and tailings as an Agreement State."

Information on the task force, including minutes of each meeting can be found on the Division of Radiation Control website at http://www.deq.state.ut.us/EQRAD/MILLS/ATLAS/Deq_task.htm. Announcement of formation of the task force as well as periodic updates of the task force work were provided to the Utah Radiation Control Board.

Following the formulation of the policy in conjunction with discussions with the NRC, it was realized that the current Commission policy related to pre-1978 uranium mill tailings would have to be followed. This does not prevent the State from exercising regulatory authority under its existing rules of such material as naturally occurring radioactive material. It is also the intent of the State to follow the guidance affirmed by the Commission for review and decision of receipt of alternate feed materials by uranium mills. Each alternate feed amendment will be considered a major amendment for the purposes of licensing and will follow procedures as described in this final application. The alternate feed guidance as described in NRC Regulatory Issues Summary 2000-23 is included in Appendix L of the application.

The State of Utah also wishes to emphasize that this application does not include the former Atlas site in Moab, Utah, now known as the Moab Millsite. In accordance with the Defense Reauthorization Act, this property was transferred to the Department of Energy. The Moab Millsite has converted back to a Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I site with cleanup responsibility delegated to the Department of Energy.

Description of Organization (Criteria: 29, 33, and 35)

[See Appendix A for Organizational Charts]

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STATE OF UTAH
BEFORE THE UTAH RADIATION CONTROL BOARD

In the Matter of: International Uranium (USA) Corp. Revised lle.(2) Materials License No. UT1900479 Amendment #2 (June 13, 2006)	The Executive Secretary's Prefiled Testimony of Dean Henderson, Hydrogeologist, Geotechnical Services Section, Division of Radiation Control

I, Dean Henderson, being first duly sworn, submit the following testimony:

Q.1: Please state your name, affiliation, and qualifications.

A.1: My name is Dean Henderson. I am a hydrogeologist in the Geotechnical Services Section in the Division of Radiation Control. I hold a Bachelor's Degree in Geology from Utah State University. I worked for two environmental consulting companies from 1990 through 2004. I joined the Division of Radiation Control in March, 2004.

Q.2: Are you familiar with the licensing proceeding that is the subject of this proceeding?

A.2: Yes. My supervisor Loren Morton assigned me to help prepare responses to public comments. In doing that work, I became familiar with many documents in the administrative record, including the license application, the Safety Evaluation Report ("SER") (found at DRC IUC 0799a-079dd in the Administrative Record), the ICF Consulting Report entitled "Review and Evaluation of Characterization Data Provided For Fansteel Corporation, Muskogee, Oklahoma" (found at DRC IUC 0018-47 in the Administrative Record), the public comments, and the Public Participation Summary (found at DRC IUC 1048-1188 in the Administrative Record).

Q. 3: Why did you review the ICF Consulting Report?

A.3: A comment from the public suggested that we did not have enough information about the Fansteel materials that were proposed as alternate feed in the License Amendment application. The commenter suggested that we review the ICF Consulting Report.

Q. 4: Please describe your review.

A. 4: I read the report and compared the information to the information provided by the applicant in the License Amendment Application.

Q. 5: What did you conclude?

A. 5: I concluded that it reported analytical results that were similar to those provided by the applicant. I also concluded that the number of samples that were being used to characterize the materials was adequate.

Q. 6: Would you please explain your statement about the number of samples?

A.6: I found the sampling results reported in the ICF Report and the License Amendment Application (both of which refer to the same data) to be adequate based on my experience and professional judgment. I also noted the information found at DRC IUC 0110-12 of the ICF Report supported my conclusion in that the number of samples reported for Ponds 2 and 3 exceeded the number of samples recommended in EPA guidance (as described in the ICF Report).

Q.7: Are you familiar with the environmental monitoring program for White Mesa Mill?

A.7: I am very familiar with the groundwater monitoring program for the Mill. I recently reviewed the requirements of that program by reviewing IUSA's environmental monitoring reports and speaking with other employees in the Division of Radiation Control.

Q.8: Are you familiar with the description of the environmental monitoring program described at Part IV.D in the Executive Secretary's Pre-Hearing Brief?

A.8: Yes, I have reviewed that description.

Q.9: Is the description of IUSA's Monitoring Program for the White Mesa Mill in Part IV.D of the Executive Secretary's Pre-Hearing Brief accurate?

A.9: Yes it is.

DATED this 16th day of January, 2007.

Dean Henderson
Hydrogeologist, Geotechnical Services Section
Division of Radiation Control
Utah Department of Environmental Quality

SUBSCRIBED AND SWORN to before me this 16th day of January, 2007.

Mary Charlene Lamph
NOTARY PUBLIC

Notary Public
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STATE OF UTAH
BEFORE THE UTAH RADIATION CONTROL BOARD

In the Matter of: International Uranium (USA) Corp. Revised lle.(2) Materials License No. UT1900479 Amendment #2 (June 13, 2006)	The Executive Secretary's Prefiled Testimony of Loren Morton, Section Manager, Geotechnical Services Section, Division of Radiation Control

I, Loren Morton, being first duly sworn, submit the following testimony:

Q.1: Please state your name, affiliation, and qualifications.

A.1: My name is Loren Morton. I am the Section Manager for the Geotechnical Services Section in the Division of Radiation Control. I hold a Bachelor's Degree and a Master's Degree in Geology. I was an environmental scientist with the Division of Water Quality from 1984 through 1994, with five years in the underground injection control program and five years in the ground water protection program. I joined the Division of Radiation Control in 1994 and became a section manager in January, 2004.

Q.2: What was your role in the licensing proceeding that is the subject of this proceeding?

A.2: I supervised the preliminary review of the License Amendment Application, preparation of the Safety Evaluation Report ("SER") (DRC IUC 0799A), preparation of draft License Amendment, and review of the public comments. Based on that work, and on the documents that resulted from that work -- particularly the SER and the Public Participation Summary (DRC IUC 1048) – I made a recommendation to the Executive Secretary that he issue the proposed License Amendment.

Q. 3: Did you participate in the preparation of the SER?

A.3: Yes.

Q. 4: Please describe your participation in that document.

A. 4: I reviewed portions of the Application and edited the text of the SER. During preparation of the SER, I held extensive discussions with those on my staff who did the majority of the SER writing and analysis.

Q. 5: Is the technical information provided in the SER accurate?

A. 5: To the best of my knowledge, the technical information provided in the SER is accurate, except where corrections have been noted in the Public Participation Summary.

Q. 6: Did you participate in the preparation of the Public Participation Summary?

A.6: Yes.

Q. 7: Please describe your participation in that document.

A. 7: For portions of the Public Participation Summary, I did the analysis and wrote the text myself. Those technical portions of the Public Participation Summary that I did not prepare, I have discussed extensively with those on my staff who did the writing and analysis.

Q. 8: Is the technical information provided in the Public Participation Summary accurate?

A. 8: To the best of my knowledge, the technical information provided in the Public Participation Summary is accurate. As I described above, the SER and the Public Participation Summary responses must be read together since there were some corrections to the SER that were made in the Public Participation Summary.

Q. 9: Do those documents provide the technical basis for your recommendation to the Executive Secretary to approve the License Amendment?

A. 9: Those documents and the information provided by the Applicant provide part of the technical basis for my recommendation. My recommendation is also based on my knowledge of IUSA's groundwater discharge permit and its requirements, including my knowledge of what will be required at site closure; the ongoing environmental monitoring program at the site; and additional information gathered by my staff about the characterization of the Fansteel materials.

Q.10: Are you familiar with IUSA's groundwater discharge permit?

A.10: I prepared IUSA's groundwater discharge permit and the Statement of Basis that accompanied the Permit. I am very familiar with both documents.

Q. 11: Would you please briefly describe the groundwater monitoring program at the Site?

A. 11: Before Utah became an agreement state, NRC required IUSA to sample six wells for four parameters, with sampling reported semi-annually. In 2005, shortly after Utah became an Agreement State, the Utah Water Quality Control Board (through its co-Executive Secretary

Dane Finerfrock) issued a groundwater discharge permit to IUSA. That permit required IUSA to install eight additional monitoring wells which were designed to detect discharges from each tailings cell independently. IUSA was also required under the Permit to monitor seven other existing monitoring wells, for a total monitoring network of 21 wells at the facility. Twelve of those wells are sampled quarterly, and the rest are sampled semi-annually. This sampling frequency was determined based on the local groundwater velocity at each well.

The new groundwater discharge permit also increased the number of groundwater monitoring parameters from four to more than 37.

IUSA's groundwater discharge permit also requires the facility to investigate any exceedence of groundwater protection levels, and to conduct corrective action as appropriate. IUSA has recently installed an additional 14 wells to investigate an exceedence of chloroform in the shallow aquifer.

Additionally, IUSA's Groundwater Discharge Permit imposes new requirements associated with Site reclamation. IUSA's current Reclamation Plan, which was approved by NRC, does not require performance assessment modeling for the tailings ponds. The Groundwater Discharge Permit now requires a performance assessment model to assess cover system design and construction, with the purpose of assuring long-term groundwater protection.

The groundwater discharge permit also requires a discharge mininimization technology plan to outline improvements in tailings cell operations. One purpose of this plan is to consider technologies to minimize the standing wastewater inside the tailings in Cells 2 and 3 and thereby reduce potential releases to the environment.

Q. 12: Are you familiar with the environmental monitoring program at the Mill?

A. 12: I am very familiar with the groundwater monitoring program at the site. I am less familiar with other aspects of the environmental monitoring program, but I know generally that there is air sampling (including radon monitoring), surface water sampling, soil sampling, and vegetation sampling performed at the facility.

Q. 13: You said that you were also relying on additional information gathered by your staff about the characterization of the Fansteel materials. Would you please explain that statement?

A. 13: Some of the public comments said that the Fansteel materials have been inadequately characterized. In order to respond to that, I asked Dean Henderson of my staff to find and review other sources of information mentioned by public commenters. Dean found and reviewed the ICF Consulting Report entitled "Review and Evaluation of Characterization Data Provided For Fansteel Corporation, Muskogee, Oklahoma" (found at DRC IUC 0018 - 0047 in the Administrative Record), a report prepared for NRC. He found, and I agreed, that the information in that report helped confirm the characterization information provided by the Applicant. I was also comfortable with this information because no contrary information was provided by public commenters.

DATED this 16th day of January, 2007.

Loren B. Morton

Loren Morton
Section Manager, Geotechnical Services Section
Division of Radiation Control
Utah Department of Environmental Quality

SUBSCRIBED AND SWORN to before me this 16th day of January, 2007.

Mary Charlene Lamph

NOTARY PUBLIC

Notary Public
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STATE OF UTAH
BEFORE THE UTAH RADIATION CONTROL BOARD

In the Matter of: International Uranium (USA) Corp. Revised lle.(2) Materials License No. UT1900479 Amendment #2 (June 13, 2006)	The Executive Secretary's Prefiled Testimony of Dane Finerfrock, Executive Secretary, Utah Radiation Control Board

I, Dane Finerfrock, being first duly sworn, submit the following testimony:

Q. 1: Please state your name, affiliation, and qualifications.

A. 1: My name Dane Finerfrock. Since 2003, I have been Executive Secretary for the Utah Radiation Control Board. From 1988 until 2003, I was the Environmental Health Manager of the Low Level Radioactive Waste and Uranium Mill Tailings Section of the Division of Radiation Control, Department of Environmental Quality. Previous to this position, I was in other capacities in the Bureau of Radiation Control and in private consulting.

I have two Bachelor's Degrees from the University of Utah. I have also attended numerous radiation safety and health physics training programs, including one ten week health physics course sponsored by the Nuclear Regulatory Commission at Oak Ridge, Tennessee.

Q.2: Are you familiar with the Safety Evaluation Report (DRC IUC 0799A) in this matter?

A.2: Yes.

Q.2: Are you familiar with the Public Participation Summary (DRC IUC 1048) in this matter?

A.2: Yes.

Q.2: Did you review the Safety Evaluation Report and the Public Participation Summary before approving IUSA's License Amendment Application?

A.2: Yes.

Q.2: Have you reviewed the Executive Secretary's Pre-Hearing Brief in this matter?

A.2: Yes.

Q.3: Does that Brief accurately state your reasons for approving IUSA's License Amendment #2?

A.3: Yes.

DATED this 16th day of January, 2007.

Dane Finerfrock

Dane Finerfrock
Executive Secretary
Utah Radiation Control Board
Utah Department of Environmental Quality

SUBSCRIBED AND SWORN to before me this 16th day of January, 2007.

Mary Charlene Lamph

NOTARY PUBLIC

Notary Public
MARY CHARLENE LAMPH
168 North 1950 West; P.O. Box 144810
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My Commission Expires
December 15, 2007
State of Utah

Attachment N:

Residuals Management Plan for the Midnite Mine Water Treatment Plant, Revision 10

Residuals Management Plan
for the Midnite Mine Water Treatment Plant
Revision 10

Midnite Mine
Superfund Site
November 1, 2013

Prepared For:
Newmont USA Ltd.
6363 South Fiddler's Green Circle
Greenwood Village, Colorado 80111

and

Dawn Mining Company
P.O. Box 250
Ford, Washington 99013

Prepared By:
Worthington Miller Environmental, LLC
201 Linden Street, Suite 301
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1.2 US Ecology Low-Level Radioactive Waste Generator Registration

1.3 Washington State Site Use Permit

1.4 US Ecology Radioactive Materials License

1.5 US Ecology Waste Acceptance Criteria

1.6 WDOH concurrence regarding WTP residuals status as source material, 12/20/10 e-mail from Mike Elsen and 12/31/08 letter from WDOH

1.7 NRC Director's Decision, dated March 26, 1999

ATTACHMENT 2 **RESIDUALS TRANSPORTATION PLAN FOR THE MIDNITE MINE WATER TREATMENT PLANT**

LIST OF ACRONYMS

CD ....Consent Decree

CERCLA ....Comprehensive Environmental Response Compensation and Liability Act

DMC ....Dawn Mining Company

DOT ....United States Department of Transportation

EPA ....United States Environmental Protection Agency

ESD ....Explanation of Significant Difference

NRC.................United States Nuclear Regulatory Agency

NWIC...............Northwest Interstate Compact

RML ....Radioactive Material License

RMP ....Residuals Management Plan

ROD ....Record of Decision

RTP ....Residuals Transportation Plan

SDs..................Settling Defendants

SOW ....Statement of Work

UAO ....Unilateral Administrative Order

WTP ....Water Treatment Plant

WDOH.............Washington Department of Health

1.0 INTRODUCTION

On November 7, 2008, Region 10 of the United States Environmental Protection Agency (EPA) issued to Newmont USA Limited (Newmont) and Dawn Mining Company (DMC) a Unilateral Administrative Order (UAO) for Phase I Remedial Design and Remedial Action, EPA Docket No. Comprehensive Environmental Response Compensation and Liability Act (CERCLA) -10-2009-0026 (UAO; EPA, 2009) with an attached Statement of Work (SOW) (EPA, 2008). The subsequent Consent Decree (CD) with its associated Statement of Work (CD-SOW) which became effective on January 17, 2012 incorporates the requirements of the UAO into the CD.

As part of the prescribed Phase I Remedial Design and Remedial Action, the SOW requires the submission of a draft Residuals Management Plan (RMP) to address disposal of residual materials (sludge) from the water treatment plant (WTP) at the Midnite Mine, near Wellpinit, Washington. Specifically, SOW requirements for the RMP are as follows:

Manage Residuals (Record of Decision (ROD) Section 12.2.3)

In compliance with the ROD (including Section 12.2.3) and applicable regulations, Respondents shall manage all residuals generated by water treatment. Continued disposal of WTP residuals at the Dawn Mill would require amendment of the Mill License, which may not be possible in time for the start of water treatment in spring 2009. Respondents shall implement necessary modifications to the WTP necessary to dispose of WTP residuals (sludge) at a commercial low-level radioactive waste facility (LLRW facility), and dispose of WTP residuals in this manner unless and until arrangements for alternative disposal in accordance with the ROD, the UAO, and this SOW are approved by EPA.

In accordance with the Schedule of Deliverables, Respondents shall submit a draft Residuals Management Plan (RMP) for WTP residuals (sludge) disposal at a commercial low-level radioactive waste facility (LLRW facility). The RMP shall identify applicable regulations for transport and disposal, disposal facility requirements and WTP changes which will be needed to comply with facility disposal requirements.

For WTP changes necessary to meet disposal facility requirements (e.g. the addition of a filter press, containerizing or solidification of residuals) the RMP shall include for EPA review and approval a plan and schedule for pilot testing, submittal of design changes to EPA (see Section 3.4), and for implementation of changes in water treatment and waste management practices necessary for residuals disposal at a LLRW facility to commence when WTP operations resume no later than May 1, 2009. The RMP shall describe how the resulting WTP residuals will comply with facility requirements and include cost estimates for system modifications and unit costs for transport and disposal. Required treatment system changes shall comply with the ROD and shall not adversely affect the flow and pit drawdown rates, discharge water quality, or worker health and safety.

The RMP shall also clearly indicate whether Respondents intend to evaluate other changes to the water treatment process, such as the addition of an ion-exchange step, as provided in the ROD for purposes of reducing overall costs. If so, the plan shall include for EPA review and approval a description of and proposed schedule for the evaluation in accordance with Section 2.1.5 of this SOW, including a schedule for submitting a draft treatability testing plan, reports, and design recommendations. Optional treatment system changes shall comply with the ROD and shall not adversely affect the flow and pit drawdown rates, discharge water quality, or worker health and safety.

In accordance with the ROD and SOW for the UAO, DMC submitted an initial draft RMP to EPA on December 30, 2008. After receiving comments from EPA and the Spokane Tribe of Indians, DMC submitted a revised draft RMP on April 10, 2009 (Miller Geotechnical Consultants, 2009). DMC submitted another iteration of the draft RMP on March 11, 2011. EPA requested an update to the RMP during a meeting in June 2011. A revised draft RMP submitted on August 8, 2011 responded to this request. Additional information has been obtained after the August 2011 submittal which necessitated a subsequent revision submitted on January 15, 2013. EPA provided comments on the January 2013 revision and a subsequent revision incorporating changes was submitted on March 22, 2013. In the March 4, 2013 comment letter from EPA, it was required that the RMP be updated on an annual bases by November 1 of each year. This RMP revision has been developed to meet that requirement and presents the disposal options that will be used in 2014 and the alternatives that could be employed in subsequent years.

With this revised RMP, DMC and Newmont USA Limited, the Settling Defendants (SDs), propose a staged approach to manage WTP sludge, utilizing two short-term alternatives and two additional alternatives that could be used in the future. The SDs request that EPA approve this RMP as consistent with the ROD and authorize the SDs to proceed with residuals management in accordance with this plan. The proposed four alternatives are as follows:

Primary Alternative – Current WTP Process and Processing of Sludge at Energy Fuels (formerly Denison): The primary alternative is to have Energy Fuels process the WTP sludge for its source material content at the White Mesa Mill near Blanding, Utah. Energy Fuels has applied to the State of Utah for an amendment to its Radioactive Material License (RML) to specifically permit receipt and processing of the Midnite Mine WTP sludge. The State of Utah provided preliminary approval of the amendment pending public comments, and final approval is anticipated by the end of 2013.

Management of WTP sludge by processing at Energy Fuels is a preferred alternative and it is potentially an option for as long as the White Mesa Mill remains in operation, which could be many years. This alternative requires minimal change to the existing WTP facility operation, minimizes additional worker exposure, and has the lowest cost. While final approval to allow Energy Fuels to accept the material has not been granted by the State of Utah, it is anticipated that the license amendment will be finalized before the 2014 water treatment season and will allow for the material to be taken to the White Mesa Mill. Although processing by Energy Fuels is likely a viable alternative, the SDs are prepared for the contingent action of taking the residuals to the US Ecology facility near Richland, Washington, if necessary as discussed below and propose that other alternatives be considered in the future as needed.

Contingency Alternative – Disposal at the US Ecology facility at Richland, Washington: The contingency alternative is disposal of WTP sludge at US Ecology's Richland facility. This is the disposal method that was utilized from May 2011 through July 2011, and the Richland facility is expected to be available for disposal over the long-term. The facility does have a limit on the amount of uranium that can be received; however, communications with WDOH and site personnel indicate increasing this limit could be accomplished. As recognized in the ROD and the subsequent UAO, other treatment alternatives should be and are being investigated and proposed for EPA approval in this revised RMP. Nevertheless, the Richland facility would remain available on an emergency basis if, for unforeseen reasons, none of the other alternatives were available.

Post-2014 Alternative One – Modification of Current WTP Process to Remove Uranium Using Ion-Exchange with Off-Site Ion-Exchange Resin Processing: The first longer term alternative which could be used after 2014 is to modify the existing WTP system by adding an ion-exchange component to the WTP process and would require construction of new facilities. This component would selectively remove uranium from the mine water before the chemical precipitation step which produces sludge needing disposal. By removing uranium from the mine water before the sludge is produced, the sludge would not have uranium concentrations in excess of 0.05 percent (%) and therefore would meet the requirements for disposal at the US Ecology facility in Grand View, Idaho. Disposal costs at the Grand View facility are more cost-effective than at the US Ecology Richland facility.

Under this alternative, the ion-exchange resin loaded with uranium would be transported to the Cameco Resources (Cameco) Smith Ranch ISL Central Processing Plant in Wyoming for processing. The process would remove the uranium from the resin and the resin would be transported back to the Midnite Mine for subsequent use. Cameco has authority to accept ion-exchange resin from water treatment facilities. Cameco completed a technical evaluation of the resin from the pilot scale testing program and has concluded that they can process the resin. The SDs are in negotiations with Cameco for this alternative. However, those negotiations have not progressed to the point where it is reasonable to proceed with the construction of the facilities on site to implement this alternative. The design of the mobile ion-exchange system has been finalized. The CDs will continue to work with Cameco to obtain an agreement and will construct the necessary infrastructure to implement this alternative when the agreement has been reached and when it is determined prudent given the viability of the option to deliver the residuals to the White Mesa Mill.

Post-2014 Alternative Two – Modification of WTP Process to Remove Uranium Using Ion-Exchange with On-Site Ion-Exchange Resin Processing: The second long-term alternative that could be implemented after 2014 is to modify the WTP process to remove uranium using ion-exchange with on-site resin regeneration. This process, which has long been used in the uranium industry and has been pilot tested at the WTP, would produce two waste streams—a low volume, source material waste with uranium concentrations above 0.05%, and a high volume effluent sludge waste (resulting from chemical precipitation treatment of water from which uranium has been removed) with uranium concentrations below 0.05%. It is assumed that the low volume source material waste would be disposed of at the US Ecology Richland facility.

The high volume effluent sludge waste resulting from chemical precipitation treatment of water from which uranium has been removed would be disposed of at the US Ecology facility in Grand View, Idaho. Disposal costs at the Grand View facility are more cost-effective than at the Richland facility and a cost savings can therefore be realized, as compared to long-term disposal of all WTP sludge at the Richland facility.

This alternative is not as attractive as the other alternatives as it requires the most change to the existing WTP process, has the potential greatest exposure to workers, presents the most technical and regulatory challenges, and is not as cost-effective as processing by Energy Fuels, or utilizing Cameco for off-site resin regeneration. However, this alternative can be constructed and implemented on-site and would be largely within the SDs' operational control, with minimal reliance on third-party contractors. A preliminary design of this facility has been completed. This added level of operational control would assure EPA and the SDs of a viable, long-term option for management of WTP residuals.

It is recognized that this alternative would require an explanation of significant difference (ESD) before it could be implemented. The SDs have provided EPA with information to support the ESD and will continue to support that effort to optimize sludge management alternatives.

In summary, it is believed that a decision from a the State of Utah to amend Energy Fuels' license allowing for processing of the sludge will be made in the near future and well before the beginning of the 2014 water treatment season. Therefore, the primary option for the near term is to take the residual material to the White Mesa Mill for processing. If for some reason that option is not available, the sludge would be taken to the US Ecology facility in Richland in 2014. Two additional option were identified that could be implemented after 2014. These options include the use of an ion-exchange system to selectively remove uranium from the mine water prior to chemical precipitation. The mobile ion-exchange system would involve processing the loaded resin at the Cameco facility in Wyoming while the fixed system would process the resin on-site. These options would be implemented in the future if it is determined they are necessary and if the required regulatory and contractual agreements could be obtained. Figures 1 and 2 show the key items that are planned for 2014 and the decision process flow diagram for sludge management in the near future. The four alternatives are described in more detail in the following sections.

2.0 PRIMARY ALTERNATIVE: CURRENT WTP PROCESS AND PROCESSING OF SLUDGE AT ENERGY FUELS

The primary alternative the SDs propose is to continue the current WTP process and have the WTP sludge processed for its source material content by Energy Fuels (formerly Denison) at its White Mesa Mill near Blanding, Utah. Energy Fuels has applied to the State of Utah for an amendment to its Radioactive Material License (RML) to specifically permit receipt and processing of the Midnite Mine WTP sludge. The State of Utah has provided preliminary approval of the amendment pending public comments and final approval is anticipated by the end of 2013.

The contractual agreement between the SDs and Energy Fuels will not result in payments from Energy Fuels to the SDs for the uranium produced from processing the WTP sludge. Costs for transportation, processing, and storage are provided in Section 2.6.

2.1 Facility Description

Energy Fuels' White Mesa Mill was constructed in 1979 and first processed conventionally-mined uranium\vanadium ores in May 1980. The mill is licensed to receive uranium ores in bulk, therefore, WTP residuals shipments may be transported in bulk without other packaging. The mill uses sulfuric acid leaching and a solvent extraction process to extract and recover uranium. The White Mesa Mill operates under RML No. UT 1900479, which is administrated by the Utah Department of Environmental Quality (DEQ), Division of Radiation Control (DRC) through the US Nuclear Regulatory Commission (NRC) Agreement State Program. The mill is licensed to process an average of 2,000 tons per day of ore and produce 8.0 million pounds of triuranium octoxide (U_3O_8) per year. The White Mesa Mill is also licensed to process alternate feed materials – uranium-bearing materials derived from other facilities or material from US government cleanup projects. The WTP residuals will be processed as an alternate feed ore stock in the mill with all resulting process tailings reporting to the licensed tailings disposal cells. The resultant tailings are classified as Byproduct Material as defined under Section 11e.(2) of the Atomic Energy Act, as amended.

Based on currently available information, Energy Fuels may be able to receive and process WTP sludge for a period of at least 20 years and possibly longer.

2.2 Residuals Handling

The WTP will use the same process and will be operated in the same manner as in the past. A filter press is currently being constructed and will be in place to dewater the sludge before it is shipped to Energy Fuels. A certified radioactive materials transport carrier (Carrier) will be contracted to maintain multi-axle dump trailers on site for loading of the WTP sludge. The Carrier's trailers will be backed into the WTP building and the filter pressed solids will be conveyed directly into the trailer bed.

The Carrier will be notified when the trailer will meet its capacity and will pick up the trailer for transportation to the White Mesa Mill. The Carrier will maintain an empty second trailer on site to allow for continued loading of the WTP residuals. If practicable, an additional trailer, also referred to as a "pup" trailer, which would be of lesser capacity than the primary trailer, may be used in addition to the primary trailer for each trip to the White Mesa Mill to increase transportation efficiency.

Once the trailer, and pup if used, are filled to capacity, tarps will be tightly secured to completely cover the trailer openings.. The trailers are then scanned by a trained radiation technician for radiation exposure rates and removable contamination as per 49 Part 173.441. The Carrier drives the trailer(s) to the White Mesa Mill, where offloading and trailer decontamination are performed as per Energy Fuels' RML and SOPs. The trailers then return empty directly to the Midnite Mine for the next trip cycle. Details regarding the material transportation and the certified Carrier are addressed in the Residuals Transportation Plan (RTP), included as Attachment 2 to this RMP.

2.3 Containers

The SDs will transport the WTP residuals from the WTP to the White Mesa Mill in bulk via tightly tarped end-dump or side-dump trailers using a certified contract carrier (Carrier) and in accordance with the RTP, included as Attachment 2 to this RMP.

2.4 Transportation

The material is to be transported as a uranium ore with natural uranium, which is US Department of Transportation (DOT) non-fissile Class 7 radioactive LSA-1 material in exclusive use shipments. All transportation will be in accordance with the CD and all applicable state and federal transportation laws, rules, and regulations and the RTP (Attachment 2). The WTP residuals are processed for their source material content and are a uranium ore. In addition, the White Mesa Mill is in Utah, a member of the Northwest Interstate Compact (NWIC) on Low-Level Radioactive Waste Management. Therefore, transportation of the WTP residuals for processing and disposal of the process tailings does not require NWIC approval (per a telephone conversation October 12, 2010 with Mr. Mike Garner, executive director of NWIC).

2.5 Off-Site Rule Verification

The acceptability of the White Mesa Mill to receive the WTP residuals will be confirmed with EPA Region 8 prior to shipping. Recent discussions with Energy Fuels indicated that they have had off-site rule verification by EPA earlier this year and it is not anticipated that there will be any issues with this determination.

2.6 Cost Estimate

Costs associated with processing and disposal of the WTP residuals at the White Mesa Mill are primarily related to transportation and a processing fee. A processing fee of $50/ton has been suggested by Energy Fuels. In addition, transportation costs of the WTP residuals is estimated to be $150/ton, based on the transport of ores from the Dawn Mill to the White Mesa Mill in 2009. Assuming approximately 750 tons/year, transportation and disposal of the WTP residuals at the White Mesa Mill will cost approximately $150,000 per year.

3.0 CONTINGENCY ALTERNATIVE: DISPOSAL AT THE RICHLAND FACILITY

The SDs disposed of WTP residuals at the US Ecology Richland facility in 2011. Disposal at the Richland facility is available as a contingency disposal option if disposal at Energy Fuels is not available. The WTP residuals contain greater than 0.05% natural uranium and are considered uranium ores and Source Material as per 10 CFR Part 810.3. Therefore, these materials are specifically exempted from the Resource Conservation and Recovery Act (RCRA) under 40 CFR Part 261.4 and are not listed as hazardous waste as defined by RCRA 40 CFR Part 261.3. In addition, based on analytical test results, these materials do not exhibit the characteristics of hazardous waste, including toxicity, ignitability, corrosivity, or reactivity. As a result, these materials are not classified as mixed waste. Concurrence from Washington Department of Health that the WTP residuals are Source Material (e-mail dated December 20, 2010 from Mike Elsen) is included in Attachment 1. Source Material is explicitly permitted material included as item 6B of the US Ecology Richland facility RML (WN-I019-2). Attachment 1 also provides the US Ecology Richland facility "Waste Acceptance Criteria."

The SDs do not anticipate utilizing the Richland facility, as occurred in 2011, for disposal of all the residuals from the WTP. The SDs recognize, however, that the Richland facility will be used in 2014 if disposal at Energy Fuels is not available.

3.1 Facility Description

The US Ecology Richland facility site is located 23 miles northwest of Richland, Washington on approximately 100 acres in the federal Hanford Nuclear Reservation, which is leased to the State of Washington. This facility has been in operation since 1965 and accepts Class A, B, and C LLRW from the NWIC and Rocky Mountain Compact states.

Shipping requirements and containers to transport the WTP residuals from the WTP to the Richland facility are discussed in the RTP (Attachment 2). DMC has submitted a "Waste Profile" and a "Radioactive Waste Generator Registration" form to US Ecology (Attachment 1). A Site Use Permit (G1166) has been granted by the Washington Department of Ecology (WDOE) (Attachment 1). This Site Use Permit and Radioactive Waste Generator Registration constitute the required approvals to allow US Ecology to accept the WTP residuals, apart from EPA concurrence. Each shipment will be accompanied by a Radioactive Waste Shipment Certification and a Waste Manifest. Copies of these forms are included in the RTP (Attachment 2).

3.2 Residuals Handling

Because the Richland facility is not licensed as a bulk facility, the WTP residuals must be packaged and cannot be delivered in bulk via covered dump trailers. WTP residuals will be packaged in woven polypropylene flexible intermediate bulk containers or similar packaging as described in Section 3.3.

Recent discussion with WDOH and US Ecology personnel indicate that sludge dewater with a filter press can be disposed of at the Richland facility without the addition of stabilizers such as Petroset, which was required for the sludge that was dewatered with the centrifuge in 2011.

A certified radioactive materials transport carrier (Carrier) will be contracted to maintain a multi-axel flat bed or enclosed trailer on site for loading of the WTP residuals. The Carrier's trailer will be loaded with the containers as they are produced. The Carrier will be notified when the trailer will meet its capacity and will pick up the trailer for transportation to the Richland facility. The Carrier will deliver an empty trailer to the site when arriving at the site to transport the full trailer. If practicable, a second trailer of equal or lesser capacity, also referred to as a "pup" trailer, may be added to the primary trailer for each trip to the Richland facility to increase transportation efficiency.

Once the trailer, and pup, if used, are filled to capacity, the trailers will be scanned by trained radiation technician for radiation exposure rates and removable contamination as per 49 CFR Part 173.441. The Carrier will drive the trailer(s) to the Richland facility, where offloading will be performed as per US Ecology's RML (Attachment 1) and SOPs. The trailers then return empty directly to the Midnite Mine for the next trip cycle.

3.3 Containers

The SDs will transport the WTP solid from the WTP to the US Ecology Richland facility in PacTek LiftPac™ Lift Bags or similar containers. The containers are woven polypropylene flexible intermediate bulk containers for the shipping, handling, and storing products and are IP-1 certified. The containers have an open duffel top with a zipper or web tie closure, flat bottom design, with a polyethylene or similar liner and webbing lift loops. If a different container is used, the characteristics will be comparable to those described above and will meet all necessary DOT requirements and requirements of the US Ecology Richland facility RML. US Ecology has received approval from WDOH to receive the WTP residual solids soft sided packaging (Attachment 1).

3.4 Transportation

The WTP residuals are to be transported as US Department of Transportation (DOT) non-fissile Class 7 radioactive LSA-1 material in exclusive use shipments. All transportation will be in accordance with the ROD, the CD, all applicable state and federal transportation laws, rules, and regulations and the RTP (Attachment 2). Because the WTP residuals are being managed within Washington, a member of the Northwest Interstate Compact on Low-Level Radioactive Waste Management (NWIC), no prior approval from the NWIC is required.

Transportation of the WTP residuals to the US Ecology Richland facility would be governed by DOT regulations and the Richland facility RML (Attachment 1). The license requirements for shipping are included in license conditions 29, 30, 31, and 32 of the Richland facility RML. Details of the transportation plan to ship the WTP residuals to the Richland facility are documented in the RTP (Attachment 2).

The filled containers, also referred to as packages, will each be stenciled with the words identified below in letters greater than 3 inches in height as per 49 CFR Part 183.427(6)(vi):

RADIOACTIVE-LSA, RQ
WAC CLASS AU
DMC-MM
MM-YYYY-#

The unique identification number (mm-yyyy-#) corresponds to the month and year in which the package was filled and a sequential number denoting the n^{th} package filled that operating year (e.g., the 23^{rd} bag filled in 2011, which was filled in May would be labeled 5-2011-23). This labeling meets the requirements of the US Ecology Richland facility RML Conditions 26 and 27 and the Washington Administrative Code (WAC) 246-249-060.

Each package will be scanned by a trained radiation technician for radiation exposure rates and removable contamination as per 49 CFR Part 173.441 to verify that the applicable DOT exclusive use requirements for transportation are met. Once scanned, the Carrier is given the completed shipping papers, as well as specific instructions regarding the shipment controls during transport. The Carrier then applies the appropriate placarding and drives the trailer(s) using a single-axel or multi-axel tractor truck to the Richland facility.

3.5 Off-Site Rule Verification

40 CFR Part 300.440(a)(4) requires determination of:

> *...the acceptability under this section of any facility selected for the treatment, storage, or disposal of CERCLA waste. EPA will determine if there are relevant releases or relevant violations at a facility prior to the facility's initial receipt of CERCLA waste. A facility which has previously been evaluated and found acceptable under this rule (or the preceding policy) is acceptable until the EPA Regional Office notifies the facility otherwise pursuant to 300.440(d).*

The acceptability of the US Ecology Richland facility under the requirements of 40 CFR Part 300.440(a)(4) has been confirmed with Kevin Schanilec, the Off Site Rule Coordinator for EPA Region 10 via e-mail on March 20, 2013. The continued acceptability of the US Ecology Richland facility to receive the WTP residuals will be confirmed with EPA Region 10 less than 60 days prior to shipping.

3.6 Cost Estimate

Costs associated with direct disposal of the WTP residuals at the Richland facility are primarily related to transportation and the disposal fee. The disposal fees for LLRW vary based primarily on the size and therefore number of containers in which the waste is packaged and the overall cap on fees that the facility can charge on an annual basis. The disposal costs, including packaging and containers, are estimated at approximately $200 per cubic foot. The average annual sludge production is estimated to be average approximately 750 tons per year depending on the total amount of water to be treated. The calculated bulk density of the sludge dewatered with the filter press is approximately 69 pounds per cubic foot (lbs/ft^3). The total volume to be disposed would average approximately 22,000ft^3 with an associated disposal cost of approximately $4.4 million. Transportation costs would be approximately $34.00 per ton and would add approximately $25,500 per year. Therefore, transportation and disposal of the WTP residuals at the Richland facility would cost roughly $4.4 million per year, if all WTP residuals were disposed of there. The allowable annual income for the US Ecology Richland facility is approximately $6 million. Therefore, it is possible that the total cost could be less if there are other parties disposing of significant volumes of material at the site.

4.0 POST-2014 ALTERNATIVE ONE: MODIFICATION OF WTP PROCESS TO REMOVE URANIUM THROUGH ION-EXCHANGE WITH OFF-SITE ION-EXCHANGE RESIN PROCESSING

The ROD recognized that sludge disposal would be expensive and that it would therefore, be appropriate to consider ion-exchange and other uranium removal steps to produce a lower volume of source material wastes with higher concentrations of uranium. The ROD states:

> *Because disposal of the sludge at a low-level radioactive waste disposal facility is costly and the availability of such facilities may change over time, treatability testing may be performed to assess the addition of an ion-exchange or other uranium removal step to the water treatment process. If the addition of ion-exchange or alternative step would change the waste designation of sludge to allow less costly disposal without significantly increasing overall costs, the water treatment process may be altered to incorporate such technology.*

Accordingly, the first long-term alternative that could be implemented after 2014 is to modify the WTP process to remove uranium using ion-exchange. The ion-exchange process induces the removal of dissolved uranium in the mine water via adsorption on ion-exchange resin prior to the chemical precipitation step in the water treatment process. After the resin has become loaded with uranium, the resin is processed to remove the uranium and is regenerated to allow the resin to be placed back into the system as the process is repeated. This alternative would involve removal of uranium from the mine water on site with the uranium-loaded resin transported off-site for uranium removal and resin regeneration. The alternative to regenerate the resin on-site to produce two primary waste streams is discussed below. It is noted that spent resin (resin that can no longer be used in the process) will also be a waste stream.

Under this alternative, the ion-exchange resin loaded with uranium would be transported to the Cameco Resources uranium processing facility in Wyoming for processing. The facility would remove the uranium from the resin and then the resin would be transported back to the Midnite mine for subsequent use. Cameco has authority under their current license with the Nuclear Regulatory Agency (NRC) to accept ion-exchange resin from water treatment facilities. Cameco has concluded that processing loaded resin from the mine is compatible with their process based on testing the loaded resin from the pilot scale test program to determine if there are any constituents that might be on the resin that could adversely impact their process. The SDs are in negotiations with Cameco for an agreement to support this alternative. It is unknown when or if the contractual agreement will be completed. This alternative could be implemented in the future when shipment to Energy Fuels is no longer available. This option would require the construction of the mobile ion-exchange facility. The design of the facility has been completed and approved.

While details of any agreement with Cameco have not been defined, preliminary discussion indicates that Cameco charges fees for processing and storage of the uranium. There will also be a cost for transportation; however this amount is unknown at this time.

4.1 Option Description

Ion exchange vessels would be loaded with resin designed to selectively remove uranium from the influent water at the up-stream side of the WTP. The ion-exchange columns would be mounted in trailers and processed as shown on the mobile system ion-exchange system design. Water would be pumped through the columns and uranium removed from the water. The water that has passed through the ion-exchange columns would then be treated to remove other constituents using the same water treatment technology as is currently being used at the existing WTP. Once the resin in the ion-exchange columns becomes saturated with uranium, the resin in the trailer tanks would be removed from the site and transported to the Cameco facility in Wyoming for processing and resin regeneration. The regenerated resin in the trailer mounted system would then be returned to the site for continued use. The design of the mobile ion-exchange system has been completed and approved by the EPA. Construction of the facility would be necessary and would take approximately 6 months for completion.

The uranium removed from the resin would be incorporated into Cameco's uranium recovery process to produce a product that Cameco will sell.

Water that has been stripped of uranium as a result of the ion-exchange process would be treated to remove other constituents using the same technology as is currently being used in the WTP. This would occur in either the existing WTP or in the new facility after it is designed, permitted and constructed. The waste from the post ion-exchange portion of the WTP would result in an effluent sludge with a uranium concentration of less than 0.05% as determined in the Pilot Scale Evaluation (Tetra Tech, 2009). This effluent sludge resulting from chemical precipitation of waste from which uranium has been removed would be acceptable for disposal at the Grand View facility after it is dewatered with a filter press.

Pursuant to 42 U.S.C. Section 9621(e), the SDs will comply with the substance of applicable NRC and WDOH regulations. Separate permitting by the NRC and/or WDOH should not be required. (See

NRC Director's Decision, dated March 26, 1999, attachment 1.7, and December 31, 2008 letter from M. Elsen to E. Hale, included as Attachment 1.6). The regulations applicable to ion-exchange with off-site resin regeneration are the same as the regulations applicable to the current WTP process and disposal. Thus, this option will not impose any additional regulatory burden on EPA or the SDs. As with any change to the WTP process, specific updated health and safety plans will be required.

4.2 Materials Handling and Transport

The loaded resin material will be classified as a loaded ion-exchange resin with residual uranium (natural), which is classified by the US Department of Transportation (DOT) as non-fissile Class 7 radioactive LSA-1 material in exclusive use shipments. All transportation will be in accordance with the ROD, the CD, all applicable state and federal transportation laws, rules, and regulations, and the RTP (Attachment 2).

The remaining effluent sludge from the chemical precipitation portion of the WTP would be shipped to the US Ecology Grand View, Idaho facility in bulk via tightly tarped end-dump or side-dump trailers using a certified contract carrier (Carrier) and in accordance with the RTP (Attachment 2).

4.3 Cost Estimate

Costs associated with this alternative include costs for the ion-exchange system, costs associated with handling and transportation of the loaded resin and return of the regenerated resin, processing costs charged by Cameco, and disposal of the remaining effluent sludge resulting from chemical precipitation of waste from which uranium has been removed. The SDs currently estimate the cost to construct the mobile ion-exchange system including the trailers is approximately $1.5 million.

Costs to transport the resin to and from the Cameco facility and the costs for processing have yet to be finalized, however, based on initial discussion with Cameco, the total cost to the SDs is anticipated to be about $150,000 to $200,000 per year for transportation and processing the resin. Costs to operate the ion-exchange system are estimated to be approximately $170,000 per year for replacement resin as discussed in Tetra Tech, 2010 although the frequency at which resin would need to be replaced will not be known until the system is in operation. The cost for disposal and transportation of the effluent sludge is estimated to be $200,000 per year. Waste disposal costs were estimated based on conversations with US Ecology. Disposal costs for spent resin, assuming it can be disposed of at the Grand View facility, would be included in the costs associated with effluent sludge disposal as the disposal volume for resin would be insignificant compared to the effluent sludge volumes. The total costs for this alternative would be approximately $1.5 million for capital costs and approximately $520,000 to $570,000 annually for operation and disposal costs.

4.4 Off-Site Rule Verification

40 CFR Part 300.440(a)(4) requires determination of:

> *...the acceptability under this section of any facility selected for the treatment, storage, or disposal of CERCLA waste. EPA will determine if there are relevant releases or relevant violations at a facility prior to the facility's initial receipt of CERCLA waste. A facility which has previously been evaluated and found acceptable under this rule (or the preceding policy) is acceptable until the EPA Regional Office notifies the facility otherwise pursuant to 300.440(d).*

Based on communications with US Ecology, their Grand View, Idaho facility will be able to accept the effluent sludge that has been dewatered with a filter press. Once an agreement has been reached to take loaded resin to the Cameco facility for processing, SDs will initiate the offsite rule verification process for the Grand View facility.

5.0 POST-2014 ALTERNATIVE TWO: MODIFICATION OF WTP PROCESS TO REMOVE URANIUM THROUGH ION-EXCHANGE WITH ON-SITE ION-EXCHANGE RESIN PROCESSING

As with the other long-term option, this option would use ion-exchange technology to selectively remove uranium from the mine water prior to the chemical precipitation portion of the WTP process to produce a lower volume of source material waste to reduce the costs associated with sludge disposal. As modified to use ion-exchange, the WTP would produce two primary waste streams—a low volume of source material wastes with high concentrations of uranium and a high volume of effluent sludge resulting from chemical precipitation of waste from which uranium has been removed containing less than 0.05% uranium. Spent resin would also require disposal. The low volume source material waste and spent resin with uranium concentrations greater than 0.05% would be disposed of at the US Ecology Richland facility near Richland, Washington. The effluent sludge and spent resin with uranium concentrations less than 0.05% would be disposed of at the US Ecology facility in Grand View, Idaho.

Ion-exchange technology has been used in the uranium industry for decades to produce source material with high uranium concentrations. Pilot scale testing in 2009 (Tetra Tech, 2009) confirmed that uranium can be selectively removed from the waste water stream in the Midnite Mine WTP using ion-exchange prior to addition of lime and precipitation of the other metals. Technology for stripping and precipitation is proven and used extensively, and DMC has experience from its own milling operations with the relevant technologies to do this. Additional pilot testing work was conducted in 2012 to support finalizing a design of these components (MWH, 2012). This proven method would be used in a multi-step process which would consist of: concentrating uranium on to the resin, stripping the uranium from the resin, precipitating uranium from the stripped solution and dewatering the high uranium concentration source material waste. The 60% design of this system has been submitted to EPA (MWH, 2013). However, the design has not been finalized or approved and the facility would need to be built; therefore implementation of this alternative would take 6 months to a year.

This option is considered as a long-term option for residuals management for two reasons. First, this option minimizes long-terms costs as compared to long-term disposal of all residuals at the Richland facility as the cost for disposal at the Grand View facility for the bulk of the sludge is an order of magnitude less expensive if off-site sludge processing as proposed at Energy Fuels or offsite resin regeneration as proposed at Cameco becomes unavailable. Second, this option maximizes the SDs and EPA's operational control of all aspects of the residuals management process, with minimal reliance on third-parties beyond the SDs or EPA's control.

5.1 Option Description

Ion exchange vessels would be constructed and loaded with resin to selectively remove uranium from the influent water at the up-stream side of the WTP. Water would be pumped through the columns and uranium removed from the water. The water that has passed through the ion-exchange columns would then be treated to remove other constituents using the same water treatment technology as is currently being used. The 60% design of this process facility has been submitted to EPA (MWH, 2013).

Once the resin in the ion-exchange columns becomes saturated with uranium, the resin would be flushed and the uranium stripped from the resin. The solute would be treated to precipitate the uranium and subsequently treated to obtain a source material waste suitable for disposal at the Richland facility. A dedicated filter press would be installed to process the source material sludge for acceptance at the Richland facility. Pilot testing work was conducted in 2012 to support finalizing a design of these components (MWH, 2012). This information was used for scale up and plant design.

The waste from the post ion-exchange portion of the WTP (chemical precipitation step) would be a sludge with a uranium concentration of less than 0.05% (Tetra Tech, 2009, MWH, 2012). This effluent sludge would be acceptable for disposal at the Grand View facility after it is dewatered with a filter press.

It is estimated that only a small volume of high uranium concentration source material waste (10,000 pounds or about 100 cubic feet) would be produced annually, as presented in the Pilot Scale Evaluation Report (Tetra Tech 2010). The amount of effluent sludge is estimated to be approximately the same as the amount of sludge currently produced without an ion-exchange circuit or approximately 750 tons per year with solids content of approximately 30% after the residuals have been processed through the filter press. Pursuant to 42 U.S.C. Section 9621(e), the SDs will comply with the substance of applicable NRC and WDOH regulations. Separate permitting by the NRC and/or WDOH should not be required. (See NRC Director's Decision, dated March 26, 1999, attachment 1.7, and December 31, 2008 letter from M. Elsen to E. Hale, included as Attachment 1.6). The regulations applicable to ion-exchange, stripping of the resin, and producing a high concentration uranium source material waste are the same as the regulations applicable to the current WTP process. Thus, this option will not impose any additional regulatory burden on EPA or the SDs. As with any change to the WTP process, specific updated health and safety plans will be required. EPA has indicated that an explanation of significant difference (ESD) process would be required for this alternative.

5.2 Materials Handling and Transport

The source material waste would be packaged in 55-gallon drums or other suitable containers and shipped to the US Ecology Richland facility. Transportation would be accomplished using the procedures as discussed in the RTP for shipment of residuals to the Richland facility. It is estimated that approximately ten to twelve 55-gallon drums of source material waste would be produced on an annual basis.

The remaining effluent sludge would be shipped to the US Ecology Grand View facility in bulk via tightly tarped end-dump or side-dump trailers using a certified contract carrier (Carrier) and in accordance with the RTP (Attachment 2).

5.3 Cost Estimate

Costs associated with this alternative include costs for the ion-exchange system, costs associated with stripping and processing the source material waste, disposal of the source material waste, and disposal of the remaining effluent sludge. The SDs currently estimates that the ion-exchange system including the holding ponds as detailed in the 60% design would cost approximately $6 million.

Costs to operate the ion-exchange system are estimated to be approximately $170,000 per year for replacement resin as discussed in Tetra Tech, 2010 although the frequency at which resin would need to be replaced will not be known until the system is in operation. Disposal costs for this resin, assuming it can be disposed of at the Grand View facility, would be included in the costs associated with effluent sludge disposal as the disposal volume for resin would be insignificant compared to the effluent sludge volumes. Costs for disposal of the source material waste is estimated to be approximately $75,000 per year based on costs for disposal at the Richland facility experienced in 2011, and the cost for disposal and transportation of the effluent sludge at the Grand View facility is estimated to be $220,000 per year. Waste disposal costs were estimated based on conversations with US Ecology. The total costs for this alternative would be approximately $6 million for capital costs and approximately $465,000 per year for operation and disposal costs.

5.4 Off-Site Rule Verification

40 CFR Part 300.440(a)(4) requires determination of:

> *...the acceptability under this section of any facility selected for the treatment, storage, or disposal of CERCLA waste. EPA will determine if there are relevant releases or relevant violations at a facility prior to the facility's initial receipt of CERCLA waste. A facility which has previously been evaluated and found acceptable under this rule (or the preceding policy) is acceptable until the EPA Regional Office notifies the facility otherwise pursuant to 300.440(d).*

The acceptability of the US Ecology Richland facility under the requirements of 40 CFR Part 300.440(a)(4) has been confirmed with Kevin Schanilec, the Off Site Rule Coordinator for EPA Region 10 via e-mail on March 20, 2013. The continued acceptability of the US Ecology Richland facility to receive the WTP residuals will be confirmed with EPA Region 10 less than 60 days prior to shipping.

The acceptability of the US Ecology facility to accept the effluent sludge will be pursued when this alternative becomes viable, but the waste stream appears to meet all requirements for disposal at US Ecology's Grand View facility in Idaho.

6.0 SUMMARY

This revised RMP sets forth a comprehensive plan for managing WTP residuals based on current information. The SDs propose four alternatives for short- and long-term management of WTP residuals.

The primary option that will be used for residuals management in both the short-term and the long-term is to take the residual material to the Energy Fuels White Mesa Mill for processing. This alternative should be available beginning in 2014 and may remain available for many years thereafter, depending on the operational life of Energy Fuels' White Mesa Mill.

Two additional alternatives exist that could be used after 2014. These alternatives include ion-exchange with off-site ion-exchange resin processing at Cameco, and ion-exchange with on-site resin processing and production of high concentration source material wastes and a remaining effluent sludge. Both of these alternatives could be implemented after 2014 if necessary. Both of these alternatives would require the construction of additional facilities on site. The design of the mobile ion-exchange system for the off-site regeneration alternative has been approved. The fixed ion-exchange system design is at the preliminary level. The off-site regeneration alternative would require the completion of an agreement with Cameco and the on-site regeneration alternative would require an ESD. It is anticipated that it would take 6 months to a year to have either of these option operational.

The Contingency Alternative (disposal at the Richland facility) is available as both a short- and long-term option. However, disposal of all WTP residuals at the Richland facility is far less cost-effective than the other proposed alternatives. Nevertheless, this option will remain available for use on an emergency basis. A summary of the costs and a brief description of the major advantages and disadvantages for each alternative are included in Table 1.

The SDs request that EPA approve this RMP as consistent with the ROD and authorize the SDs to proceed with residuals management in accordance with this plan.

7.0 REFERENCES

Advanced Environmental Sciences, Inc. (AES), 2013. Mobile Ion-Exchange 60 Percent System Design. March 18.

Miller Geotechnical Consultants, 2009. Residuals Management Plan. April 10.

MWH, 2012. Pilot Scale Test Results for Uranium Removal Using Anionic Exchange Resins and Chemical Precipitation. December 31.

MWH, 2013. Intermediate (60 Percent) Design Report, Ion Exchange Treatment System, March 15.

Tetra Tech, Inc. (Tetra Tech), 2010. Midnite Mine Ion-Exchange Treatability Testing Data Report. Revision 2. Prepared for Dawn Mining Company and Newmont USA Limited. June 28.

Tetra Tech, Inc. (Tetra Tech), 2009. Treatability Testing Plan: Pilot Scale Testing of Uranium Removal Using Anionic Exchange with Conventional Strong-Base Resins Revision 3. Prepared for Dawn Mining Company and Newmont USA Limited. August 5.

United States Environmental Protection Agency (EPA), 2008. *Statement of Work (SOW) for Interim Water Management.* Office of Environmental Cleanup EPA Region 10.

United States Environmental Protection Agency (EPA), 2009. *Unilateral Administrative Order (AO) for Remedial Design and Remedial Action.* EPA Docket No. CERCLA-10-2009-0026.

United States Environmental Protection Agency (EPA), 2011. Statement of Work for the Remedial Design and Remedial Action for the Midnite Mine Superfund Site, Appendix B to the RD/RA Consent Decree. April.

Table 1
Options Summary

Table 1. Options Summary

Option	Estimated Costs	Advantages	Disadvantages
Sludge Processing at Energy Fuels	\$150,000 / Year processing fee (\$50 per ton processing + \$150 per ton transportation)	Minimal additional equipment (only Filter Press). Less potential worker risk or water treatment plant effluent risks.	Uncertain in long-term. Approval from Utah pending public comments.
Offsite IX Processing, Effluent Sludge Disposal at Grand View	\$1,500,000 capital costs Estimate \$150,00 to \$200,000/yr for processing and transporting resin \$170,000 / Year, resin replacement \$200,000 / Year, transport and effluent sludge disposal at Grand View	Less equipment and less potential worker and water treatment plant effluent risks than on-site regeneration.	Potentially viable in long-term since comercial business model with Cameco has been identified. Agreement with Cameco is not final, but expected. Additional equipment required on site.
On-Site IX Regeneration, Effluent Sludge Disposal at Grand View	\$6,000,000 capital costs \$170,000 / Year, resin replacement \$75,000 / Year, source material disposal \$200,000 / Year, effluent sludge disposal at Grand View	More long-term certainty.	Most new equipment and greatest potential worker risk. ESD necessary.
Whole Sludge Disposal Richland	\$25,000 / Year, transport \$4,400,000 / Year, disposal costs	No additional equipment, low water risk, approved and available long-term.	Exorbitantly expensive.

Notes:

Assumes treatment volume of 60,000,000 gal/yr, Approx. 750 tons of chemical precipitant sludge (whole or effluent sludge) produced per year

Approximately 1150 cubic feet or 38 ton of resin will need to be replaced each year for IX options

10,000 pounds or 90 cubic-feet of source material waste per year for on-site regeneration option

Figures

Figure 1. 2014 Residuals Management Decision Chart

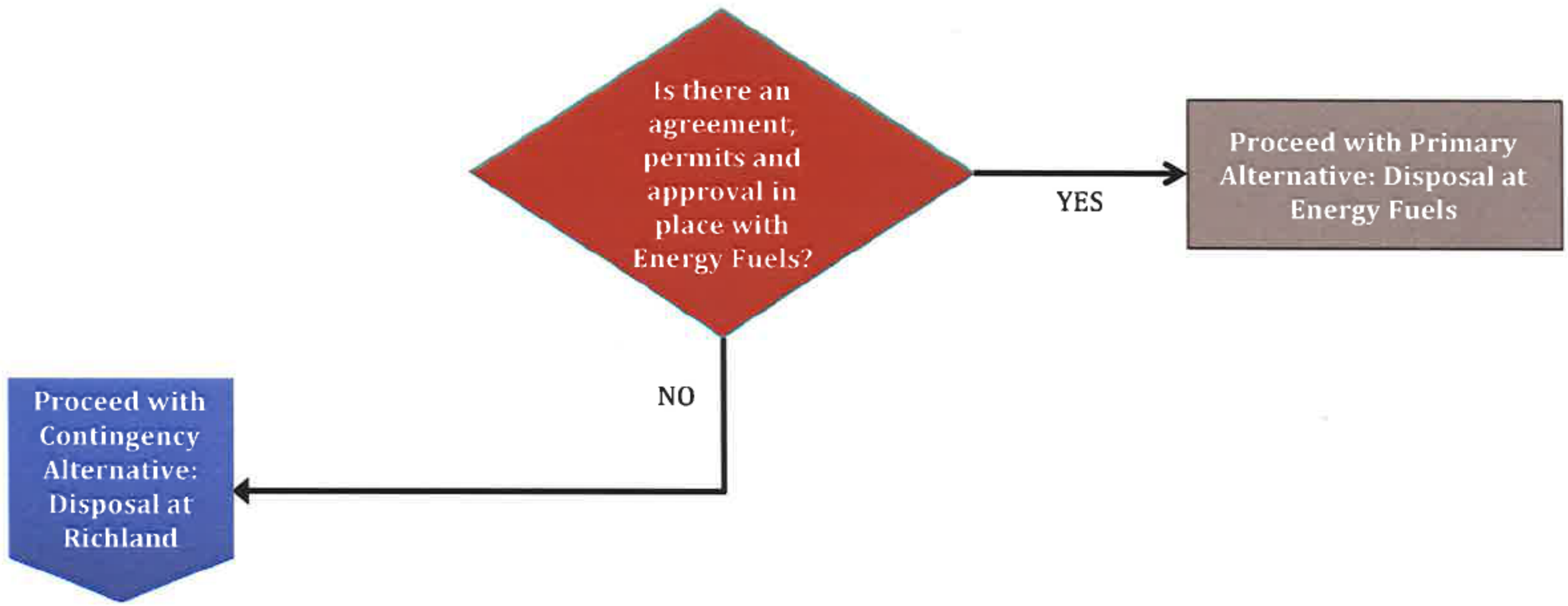
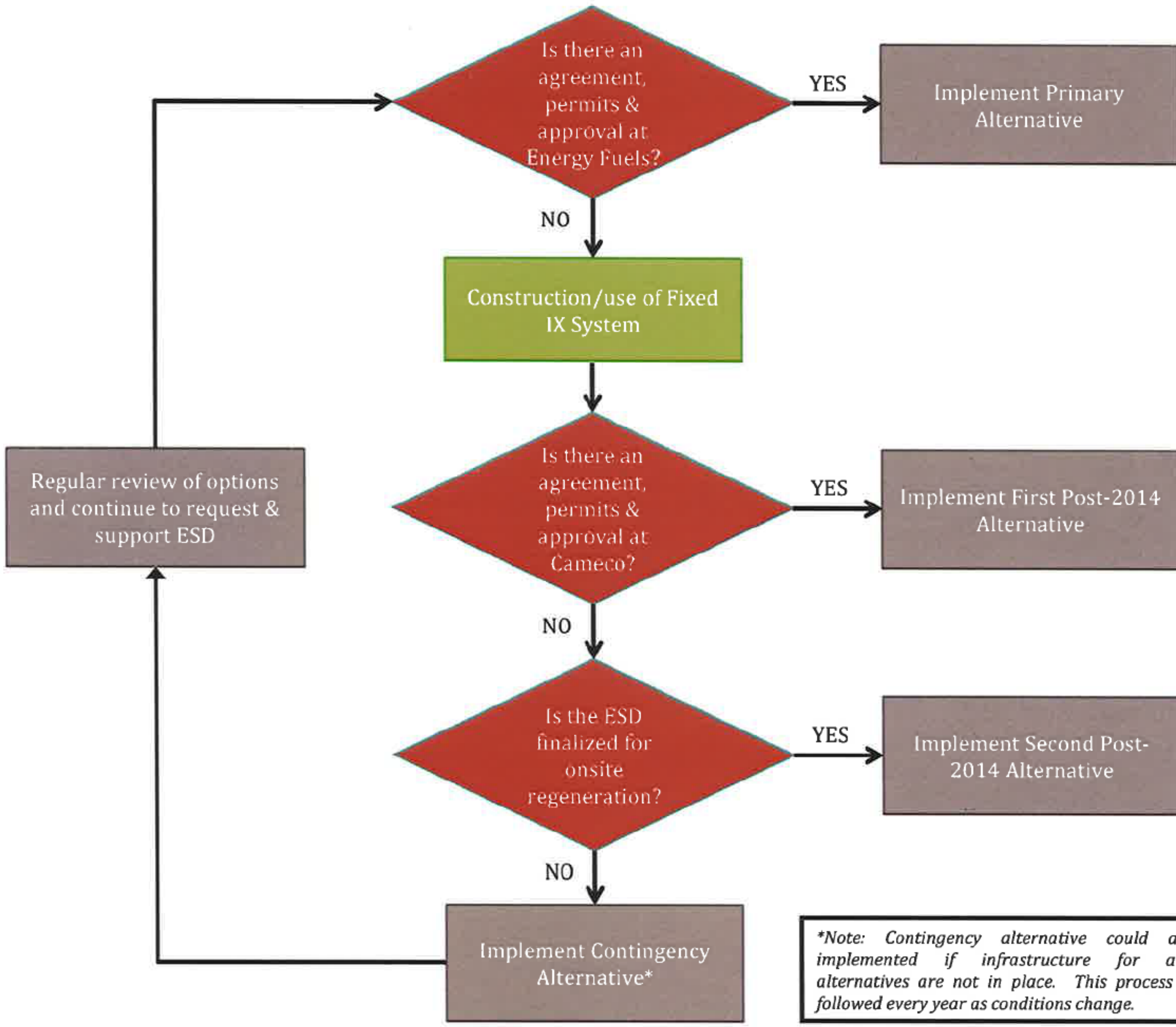


Figure 2. RMP Decision Chart Post-2014



**Note: Contingency alternative could also be implemented if infrastructure for available alternatives are not in place. This process will be followed every year as conditions change.*

Attachment 1
US Ecology Richland Materials

Attachment 1
US Ecology Richland Materials

1.1 Water Treatment Plant Residuals "Waste Profile"

1.2 US Ecology Low-Level Radioactive Waste Generator Registration

1.3 Washington State Site Use Permit

1.4 US Ecology Radioactive Materials License

1.5 US Ecology Waste Acceptance Criteria

1.6 WDOH concurrence regarding WTP residuals status as source material, 12/20/10 e-mail from Mike Elsen and 12/31/08 letter from WDOH

1.7 NRC Director's Decision, dated March 26, 1999

Attachment 1
US Ecology Richland Materials

1.1 Water Treatment Plant Residuals "Waste Profile"

RADIOACTIVE MATERIAL PROFILE RECORD

Generator Name: Dawn Mining Company, LLC Generator #: MMWTP; Volume of Feed Material 250 tons/year

Contractor Name: ______ Feed Stream Name: ______, Delivery Date: ~ April 1, 2011

Check appropriate boxes: Licensed Y ___ No: XX NORM/NARM ___; LLRW ___; MW ___; MW Treated ___; MW Needing Trtmt ___; DOE ___; 11e.(2) ___;

Original Submission: Y XX N ____; Revision # ____; Date of Revision: ______

Name and Title of Person Completing Form: Robert Nelson – Midnite Mine Site Manager Phone: (509) 258-4511

A. CUSTOMER INFORMATION:

GENERAL: Please read carefully and complete this form for one feed stream. This information will be used to determine how to properly manage the material. Should there be any questions while completing this form, contact Denison Mines (USA) Corp. ("Denison") Environmental Management at 303.628.7798. MATERIALS CANNOT BE ACCEPTED AT DENISON'S WHITE MESA MILL UNLESS THIS FORM IS COMPLETED. If a category does not apply, please indicate. This form must be updated annually.

1. GENERATOR INFORMATION

EPA ID# WAD980978753 EPA Hazardous Waste Number(s) (if applicable) ______

Mailing Address: P.O. Box 250, Ford, WA 99013

Phone: (509) 258-4511 Fax: (509)-258-4512

Location of Material (City, ST): ~8 miles west of Wellpinit, WA

Generator Contact: Robert Nelson Title: Site Manager

Mailing Address (if different from above): Same as above

Phone: Same as above Fax: Same as above

B. MATERIAL PHYSICAL PROPERTIES (Should you have any questions while completing this section, contact Denison Environmental Management at 303.628.7798.

1. PHYSICAL DATA (Indicate percentage of material that will pass through the following grid sizes, e.g. 12" 100%, 4" 96%, 1" 74%, 1/4" 50%, 1/40" 30%, 1/200" .5%) See Attached

GRADATION OF MATERIAL:

12"	100%
4"	95%
1"	90%
1/4"	84%
1/40"	65%
1/200"	57%

2. DESCRIPTION: Color ___ Brown/Multi X Odor ___ Odorless X

Liquid ___ Solid XX Sludge ___ Powder/Dust ___

3. DENSITY RANGE: (Indicate dimensions) 56.2 - 74.9 S.G. lb./ft³ lb./yd³

4. GENERAL CHARACTERISTICS (% OF EACH)

Soil ___ Building Debris ___ Rubble ___ Pipe Scale ___ Tailings ___ Process Residue X Concrete ___ Plastic/Resin ___

Other constituents and approximate % contribution of each: WTP Solids 100%

5. MOISTURE CONTENT: (For soil or soil-like materials).

(Use Std Proctor Method ASTM D-698) See Attached

Optimum Moisture Content: ______ %

Average Moisture Content: ______ %

Moisture Content Range: ______ %

6. DESCRIPTION OF MATERIAL (Please attach a description of the material with respect to its physical composition and characteristics. This description can be attached separately or included with the attachment for Item D.1.) See Attached

Generator or Contractor Initials: REN

Radioactive Material Profile Record

C. RADIOLOGICAL EVALUATION

1. MATERIAL INFORMATION. For each radioactive isotope associated with the material, please list the following information. Denison's license assumes daughter products to be present in equilibrium, these are not required to be listed below and do not require manifesting. (Use additional copies of this form if necessary). See Attached

	Isotopes	Concentration Range (pCi/g)	Weighted Average (pCi/g)		Isotopes	Concentration Range (pCi/g)	Weighted Average (pCi/g)
a.	Th-228	2.04 to 3.67	1.22	b.	Th-230	34.6 to 62.2	20.7
c.	Pb-210	55.4 to 99.8	33.3	d.	Th-232	1.39 to 2.51	0.84
e.	Ra-Total	65.2 to 117.3	39.1	f.	Ra-226	40.2 to 72.3	24.1

ND – Analyte not detected.

2. Y N Is the radioactivity contained in the feed material Low-Level Radioactive Waste as defined in the Low-Level Radioactive Waste Policy Amendments Act of 1985 or in DOE Order 5820.2A. Chapter III? (Please Circle) If yes, check "LLRW" block on line 3 of page 1.

3. Y N LICENSED MATERIAL: Is the feed material listed or included on an active Nuclear Regulatory Commission or Agreement State license? (Please Circle)

(If Yes) TYPE OF LICENSE: Source ____; Special Nuclear Material ____; By-Product ____; Norm ____; NARM ____;

LICENSING AGENCY: ________________

D. CHEMICAL AND HAZARDOUS CHARACTERISTICS

1. DESCRIPTION AND HISTORY OF MATERIAL See attached

Please attach a description of the material to this profile. Include the following as applicable: The process by which the material was generated. Available process knowledge of the material. The basis of hazardous material or waste determinations. A list of the chemicals and materials used in or commingled with the material; a list of any and all applicable EPA Hazardous Waste Numbers, current or former; and a list of any and all applicable land-disposal prohibition or hazardous-waste exclusions, extensions, exemptions, effective dates, variances or delistings. Attach the most recent or applicable analytical results of the material's hazardous-waste characteristics or constituents. Attach any applicable analytical results involving the composition of the material. Attach any product information or Material Safety Data Sheets associated with the material. If a category on this Material Profile Record does not apply, describe why it does not.

Please describe the history, and include the following:

Y N Was this material mixed, treated, neutralized, solidified, commingled, dried, or otherwise processed at any time after generation?
Y N Has this material been transported or otherwise removed from the location or site where it was originally generated?
Y N Was this material derived from (or is the material a residue of) the treatment, storage, and/or disposal of hazardous waste defined by 40 CFR 261?
Y N Has this material been treated at any time to meet any applicable treatment standards?

2. LIST ALL KNOWN AND POSSIBLE CHEMICAL COMPONENTS OR HAZARDOUS WASTE CHARACTERISTICS

		(Y)	(N)			(Y)	(N)			(Y)	(N)
a.	Listed HW		X	b.	"Derived-From" HW		X	c.	Toxic		X
d.	Cyanides		X	e.	Sulfides		X	f.	Dioxins		X*
g.	Pesticides		X	h.	Herbicides		X	i.	PCBs		X*
j.	Explosives		X*	k.	Pyrophorics		X*	l.	Solvents		X*
m.	Organics		X	n.	Phenolics		X*	o.	Infectious		X*
p.	Ignitable		X	q.	Corrosive		X	r.	Reactive		X
s.	Antimony		X*	t.	Beryllium	X		u.	Copper	X	
v.	Nickel	X		w.	Thallium		X*	x.	Vanadium		X*
y.	Alcohols		X*	z.	Arsenic		X	aa.	Barium	X	
bb.	Cadmium	X		cc.	Chromium	X		dd.	Lead	X	
ee.	Mercury		X	ff.	Selenium	X		gg.	Silver	X	
hh.	Benzene		X	ii.	Nitrate	X		jj.	Nitrite	X	
kk.	Fluoride	X		ll.	Oil		X	mm.	Fuel		X
nn.	Chelating Agents		X*	oo.	Residue from water treatment	X					

pp. Other Known or Possible Materials of Chemicals ________________

The chemical component identified above with an X indicates that the WTP solids were not tested for this component but process knowledge indicates that these components would not be present in the WTP solids.*

Generator or Contractor Initials: REN

Radioactive Material Profile Record

3. ANALYTICAL RESULTS FOR TOXICITY CHARACTERISTICS (Please transcribe results on the blank spaces provided. Attach additional sheets if needed, indicate range or worst-case results). See attached

Metals (circle one): Total (mg/kg) or TCLP (mg/l)

Organics (circle one): Total (mg/kg) or TCLP (mg/l)

4. Lead ND
Barium ND
Mercury ND
Cadmium ND
Zinc ND
Chromium ND
Copper ND

See attached

ND – Analyte not detected

5. ANALYTICAL RESULTS FOR REQUIRED PARAMETERS: (Please transcribe results on the blank spaces provided. Attached additional sheets if needed).

Soil pH 9.09 -9.26 SU Paint Filter No Free Liquid P Liquids Test (Pass/Fail) Cyanide NQ Released Not detected ND mg/kg Sulfide NQ Released Not detected ND mg/kg

6. IGNITABILITY (40 CFR 261.21[a][2].[4].)

Flash Point >95 °F C Is the material a RCRA oxidizer? Y N

7. CHEMICAL COMPOSITION (List all known chemical components and circle the applicable concentration dimensions. Use attachments to complete, if necessary.) See attached

Chemical Component	Concentration	Chemical Component	Concentration
	% mg/kg		% mg/kg
	% mg/kg		% mg/kg
	% mg/kg		% mg/kg

Halogenated Organic Compounds (HOC) (Sum of the list of HOCs) mg/kg

E. REQUIRED CHEMICAL LABORATORY ANALYSIS. Generator must submit results of analyses of samples of the material. Results are required from a qualified laboratory for the following analytical parameters unless nonapplicability of the analysis for the material can be stated and justified in attached statements. Attach all analytical results and QA/QC documentation available. (CAUTION: PRIOR TO ARRANGING FOR LABORATORY ANALYSIS, CHECK WITH DENISON AND LABORATORY REGARDING UTAH LABORATORY CERTIFICATIONS.)

FOR ALL MATERIAL TYPES: CHEMICAL ANALYSIS: Soil pH (9045), Paint Filter Liquids Test (9095): Reactivity (cyanide and sulfide).

1. MINIMUM ADDITIONAL ANALYTICAL REQUIRED FOR:

   a. Non-RCRA Waste (Non Mixed Waste e.g., LLRW, NORM): TCLP including the 32 organics, 8 metals, and copper (Cu) and zinc (Zn).

2. REQUIRED RADIOLOGICAL ANALYSES. Please obtain sufficient samples to adequately determine a range and weighted average of activity in the material. Have a sufficient number of samples analyzed by gamma spectral analysis for all natural isotopes such that they support the range and weighted average information for the material that will be recorded in item D.1. If Uranium, Thorium, or other non-gamma emitting nuclides are present in the material, have at least (1) sample evaluated by radiochemistry to determine the concentration of these additional contaminants in the material.

Generator or Contractor Initials: REN

3. PRE-SHIPMENT SAMPLES OF MATERIAL TO DENISON

Once permission has been obtained from Denison, and unless amenability samples have previously been sent to Denison, please send 5 representative samples of the material to Denison. A completed chain of custody form must be included with the sampling containers. These samples will be used to establish the material's incoming shipment acceptance parameter tolerances and may be analyzed for additional parameters. Send about two pounds (one liter) for each sample in an air-tight clean glass container via United Parcel Post (UPS) or Federal Express to:

Denison Mines (USA) Corp., Attn: Sample Control, 6425 S. Highway 191, P.O. Box 809, Blanding, UT 84511
Phone: (435) 678-2221

4. LABORATORY CERTIFICATION INFORMATION. Please indicate below which of the following categories applies to your laboratory data.

a. All radiologic data used to support the data in item C.1. must be from a certified laboratory.

_X_ UTAH CERTIFIED. The laboratory holds a current certification for the applicable chemical or radiological parameters from the Utah Department of Health insofar as such official certifications are given.

____GENERATOR'S STATE CERTIFICATION. The laboratory holds a current certification for the applicable chemical parameters from the generator's State insofar as such official certifications are given, or

____GENERATOR'S STATE LABORATORY REQUIREMENTS. The laboratory meets the requirements of the generator's State or cognizant agency for chemical laboratories, or:

If using a non-Utah certified laboratory, briefly describe the generator state's requirements for chemical analytical laboratories to defend the determination that the laboratory used meets those requirements, especially in terms of whether the requirements are parameter specific, method specific, or involve CLP or other QA data packages. Note: When process or project knowledge of this feed material is applied, additional analytical results may not be necessary to complete Section B. D.2. D.5. or D.6. of this form.

b. For analytical work done by Utah-certified laboratories, please provide a copy of the laboratory's current certification letter for each parameter analyzed and each method used for analyses required by this form.

c. For analytical work done by laboratories which are not Utah-Certified, please provide the following information:

State or Other Agency Contact Person	Generator's State	Telephone Number
Lab Contact Person	Laboratory's State	Telephone Number

F. CERTIFICATION

GENERATOR'S CERTIFICATION: I also certify that where necessary those representative samples were or shall be provided to Denison and to qualified laboratories for the analytical results reported herein. I also certify that the information provided on this form is complete, true and correct and is accurately supported and documented by any laboratory testing as required by Denison. I certify that the results of any said testing have been submitted to Denison. I certify that the material described in this profile has been fully characterized and that hazardous constituents listed in 10 CFR 40 Appendix A Criterion 13 which are applicable to this material have been indicated on this form. I further certify and warrant to Denison that the material represented on this form is not a hazardous waste as defined by 40 CFR 261 and/or that this material is exempt from RCRA regulation under 40 CFR 261.4(a)(4).

The Generator's responsibilities with respect to the material described in this form are for policy, programmatic, funding and scheduling decisions, as well as general oversight. The Contractor's responsibilities with respect to this material are for the day-to-day operations (in accordance with general directions given by the Generator as part of its general oversight responsibility), including but not limited to the following responsibilities: material characterization, analysis and handling; sampling; monitoring; record keeping; reporting and contingency planning. Accordingly, the Contractor has the requisite knowledge and authority to sign this certification on behalf of itself, and as agent for the Generator, on behalf of the Generator. By signing this certification, the Contractor is signing on its own behalf and on behalf of the Generator.

Generator's or Contractor's Signature [signature] Title: Vice Pres. & Gen Mgr Date Nov. 16, 2010
(Sign for the above certifications).
Print Name of Individual Signing above: Robert B. Nelson

RADIOACTIVE MATERIAL PROFILE RECORD ATTACHMENTS

B.1. PHYSICAL DATA: Soluble salts will not have solids characteristics in the mill process or in the tailings. As shipped, these materials will be dry, coarse, granular solids (see attached photos). No grain size data is available.

B.5. MOISTURE CONTENT: 25% to 45% solids by weight, will pass paint filter test (ASTM 9095, Paint Filter Test, found in EPA document EPA SW-846, Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods; Third Edition, September, 1986, as revised, December, 1987.) Solids are soluble under acidic conditions and will not have solid density\moisture content characteristic properties as a component of the tailings.

B.6. DESCRIPTION OF MATERIAL: The Uranium Material is light grey to light brown in color and odorless. The material is consolidated chemical precipitates, no grain sized distribution data are available. The material is a relatively dense pressed filter cake and does not exhibit free moisture or drainage of retained liquid. Photo 1 at the bottom of these attachments depicts a sample of the Uranium Material develop from pilot filter press tests on the WTP solids.

C.1 RADIOLOGICAL EVALUATION

Uranium is present in the thousands of pCi/g and Thorium is present in the range of 10's of pCi/g, based on eight years of historical anlyses (2002-2009) of the WTP solids for uranium and the testing of three samples collected in 2010 (WTPS-1, -2, -3) for the other radionuclides (Gross Alpha, Gross Beta, Pb-210, Ra-226, Th-228, Th-230, Th-232). The measured radionuclide activity concentrations for the uranium material at 15% solids have been used to describe the range of concentrations expected for the uranium materials at 25% to 45% solids developed the new filter press to be installed for the 2011 operating season. Uranium values present representative values from the last 8 years of testing. See analytical data presented in response to Item D.1, below.

D. CHEMICAL AND HAZARDOUS CHARACTERISTICS

D.1 DESCRIPTION AND HISTORY OF MATERIAL

The plant feed is a combination of water pumped from two uranium mine pit lakes from the inactive Midnite Mine. Water from the pit lakes, which contain primarily metals, sulfate, and uranium, are pumped into the WTP at a rate of approximately 450 gallons per minute. The WTP is a conventional lime treatment high-density sludge process in which the metals and uranium are precipitated out in the lime treatment process. Historically, the final WTP solids has contained on average 0.18 wet weight percent uranium (0.21 wet weight percent U_30_8) at an average historical solids content of 15 percent when produced using centrifuges for dewatering. However, the centrifuges are to be replaced with a hydraulic filter press in 2011, increasing the percent solids of the final Uranium Material to between 25% and 45% resulting in a proportional increase in weight percent uranium estimated to be between 0.3 and 0.55 wet weight percent uranium (0.35 and 0.65 wet weight percent U_30_8).

The plant is typically operational from early May through the end of October and operates 24 hours per day, four days per week. Barium chloride is added to the influent water upstream of the neutralization tanks for removal of radium. The lime slurry is added to the second of three neutralization tanks for metals precipitation. At the discharge of the third neutralization tank, an anionic water soluble polymer (Neo Solutions NS-6852) is added as a coagulant during clarification. The stream is sent to one of two clarifiers and the sludge drawn from the bottom and currently sent to a centrifuge for dewatering. As mentioned above, the centrifuge will be replaced in 2011 with a plate filter press, and solids content is expected to increase to 25 to 45 percent. The WTP solids decant is sent to the clarifier overflow tank, where it is pH adjusted to between 6.5 and 9.0 using sulfuric acid, and a polyacrylic scale inhibitor are added prior to discharge. Neither the sulfuric acid nor anti-scalant are introduced to the sludge generation process and therefore are not considered in the determination of tailings compatibility or worker safety and environmental hazards analyses.

Once dewatered, the pressed WTP solids will fall directly from the filter press into the bed of the transport vehicle when the dewatering is complete. The transport truck is housed within the WTP building and remains on site until it is covered with a dedicated tight tarp and the material hauled to the off site for disposal or processing. From 1992 through 2007, the WTP produced between 1.05M lbs and 9.3M lbs per year of treatment solids (average 4.8M lbs or 69,760 cubic feet at 15% solids).

The WTP solids, also referred to as the Uranium Material, has been tested for natural uranium for the past eight years (2002-2009). In addition, three samples were collected in 2010 from this year's production of WTP solids (WTPS-1, -2, -3). The 2010 samples were analyzed for the following RCRA characteristic and listed hazardous waste properties: total uranium, total mercury, total metals, TCLP metals and mercury, Lead-210, isotopic thorium, total alpha emitting radium, volatile organic compounds ("VOCs"), semi-volatile organic compounds ("SVOCs"), diesel range organics ("DRO"), gas range organics ("GRO"), pesticides, herbicides, inorganics (reactive cyanides and reactive sulfides), and ignitibility. These data are summarized in the tables below.

The Uranium Material, which contains more than 0.05% uranium, is definitional source material as per 40 CFR Part 261.4 and is explicitly exempt from regulation under RCRA. However, for the sake of completeness, the "Protocol for Determining Whether Alternate Feed Materials are Listed Hazardous Wastes" (November 22, 1999), developed by Denson Mines in conjunction with, and accepted by, the State of Utah Department of Environmental Quality ("UDEQ") (Letter of December 7, 1999) was applied to these data. Based on this evaluation, the uranium materials does not contain any listed or characteristic hazardous wastes. See *Review of Chemical Contaminants in Dawn Mining Company (DMC) Midnite Mine Uranium Material to Determine the Potential Presence of RCRA Characteristic or RCRA Listed Hazardous Waste*, Tetra Tech. November 2010.

D.3 & D.4 ANALYTICAL RESULTS FOR TOXICITY CHARACTERISTICS

See Summary Tables Below.

D.7 CHEMICAL COMPOSITION

See Summary Tables Below.

Uranium Material Organics and Pesticides Analyses, RCRA Toxicity Characteristics (TCLP)

Target Analyte	Units	Results WTPS-1	WTPS-2	WTPS-3
Organochlorine Pesticides - Method SW8081A - TCLP Leachate				
Gamma-BHC (Lindane)	mg/L	<0.0001	<0.0001	<0.0001
Heptachlor	mg/L	<0.00015	<0.00015	<0.00015
Heptachlor Epoxide	mg/L	<0.000079	<0.000079	<0.000079
Gamma-Chlordane	mg/L	<0.000078	<0.000078	<0.000078
Alpha-Chlordane	mg/L	<0.00009	<0.00009	<0.00009
Endrin	mg/L	<0.000096	<0.000096	<0.000096
Methoxychlor	mg/L	<0.00039	<0.00039	<0.00039
Toxaphene	mg/L	<0.0051	<0.0051	<0.0051
Chlordane	mg/L	<0.0011	<0.0011	<0.0011
Chlorinated Herbicides - Method SW8151A - TCLP Leachate				
2,4-D	µg/L	<1.6	<1.6	<1.6
Silvex	µg/L	<0.12	<0.12	<0.12
GC/MS Semivolatiles - Method SW8270D - TCLP Leachate				
Pyridine	mg/L	<0.02	<0.02	<0.02
1,4-Dichlorobenzene	mg/L	<0.02	<0.02	<0.02
2-Methylphenol (o Cresol)	mg/L	<0.02	<0.02	<0.02
3+4-Methylphenol (m+p Cresol)	mg/L	<0.02	<0.02	<0.02
Hexachloroethane	mg/L	<0.02	<0.02	<0.02
Nitrobenzene	mg/L	<0.02	<0.02	<0.02
Hexachlorobutadiene	mg/L	<0.02	<0.02	<0.02
2,4,6-Trichlorophenol	mg/L	<0.02	<0.02	<0.02
2,4,5-Trichlorophenol	mg/L	<0.02	<0.02	<0.02
2,4-Dinitrotoluene	mg/L	<0.02	<0.02	<0.02
Hexachlorobenzene	mg/L	<0.02	<0.02	<0.02
Pentachlorophenol	mg/L	<0.043	<0.043	<0.043
GC/MS Volatiles - Method SW8260_25B - Leachate				
Vinyl Chloride	µg/L	<0.83	<0.83	<0.83
1,1-Dichloroethene*	µg/L	<0.83	<0.83	<0.83
2-Butanone (Methyl Ethyl Keytone)	µg/L	<8.3	<8.3	<8.3
Chloroform	µg/L	<0.83	<0.83	<0.83
Carbon Tetrachloride	µg/L	<0.83	<0.83	<0.83
1,2-Dichloroethane	µg/L	<0.83	<0.83	<0.83
Benzene	µg/L	<0.83	<0.83	<0.83
Trichloroethene*	µg/L	2.7 B,J	1.5 B,J	<0.83
Tetrachloroethene*	µg/L	<0.83	<0.83	<0.83
Chlorobenzene	µg/L	<0.83	<0.83	<0.83
Inorganics - Method SW 846_7.3.1 (Cyanide) & _7.3.2 (Sulfide), SW9045C (pH)				
Reactive Cyanide	mg/kg	<0.1	<0.1	<0.1
Reactive Sulfide	mg/kg	<50	<50	<50
Solid pH in Water @ 25°C	pH	9.09	9.19	9.26
Ignitability - Method SW1010A				
Ignitability - 95°C	°C	U	U	U

B=This flag is used when the analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user. This flag shall be used for a tentatively identified compound (TIC) as well as for a positively identified target compound.

J=This flag indicates an estimated value. This flag is used as follows: (1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; (2) when the mass spectral and retention time data indicate the presence of a compound that meets the volatile and semi-colatile GC/MS identification criteria, and the result is less than the reporting limit (RL) but greater than the method detection limit (MDL); (3) when the data indicate the presence of a compound that meets the identification criteria, and the result is less than the RL but greater than the MDL; and (4) the reported value is estimated.

*IUPAC compounds ending in "ethene" are equivalent to "ethylene".

TETRA TECH

Historic Total WTP Uranium Material Testing Data

Date	Initial Composite Sample U-nat (mg/kg)	Initial Composite Sample Ra-226 (pCi/g)	Annual Composite Sample U-nat (mg/kg)	Annual Composite Sample Ra-226 (pCi/g)
4/1/2003	11,100	5.7	9,700	5.3
4/1/2004	9,060	7.6	8,600	2.4
4/1/2005	12,900	14	19,000	11
4/1/2006	5,200	4.3	11,200	9.1
4/2/2007	2,700	4.7	12,000	24.2
4/9/2008	19,000	5.1	13,500	10.8
5/20/2009		8.7		
Count	6	7	6	6
Max	**19,000**	**8.7**	**19,000**	**24**
Min	**2,700**	**4.3**	**8,600**	**2**
Avg	**9,993**	**7.2**	**12,154**	**10**
Data from Dawn Mining Annual Environmental Reports unless noted				
All results are presented on a ***dry weight basis***				

TETRA TECH

Uranium Material Metals Analysis for RCRA Characteristics

Sample ID	Sample Date	Arsenic mg/L	Barium mg/L	Cadmium mg/L	Chromium mg/L	Lead mg/L	Mercury mg/L	Selenium mg/L	Silver mg/L
	2002	<0.05	<10	<0.1	<0.5	<0.5	<0.02	<0.1	<0.5
	2003	<0.5	<10	0.2	<0.5	<0.5	<0.02	<0.1	<0.5
	2004	<0.5	<10	<0.1	<0.5	<0.5	<0.02	<0.1	<0.5
	2005	<0.5	<10	<0.1	<0.5	<0.5	<0.02	<0.1	<0.5
	2006	<0.5	<10	0.25	<0.5	<0.5	<0.02	<0.1	<0.5
	2007	<0.5	<10	<0.1	<0.5	<0.5	<0.02	<0.1	<0.5
	2008	<0.5	<10	<0.1	<0.5	<0.5	<0.02	<0.1	<0.5
	5/20/2009	<0.5	<10	<0.1	<0.5	<0.5	<0.02	<0.1	<0.5
	9/17/2009	<0.06	0.083	<0.005	<0.01	<0.04	<0.0002	<0.06	<0.01
	9/19/2009	<0.04	0.16	0.019	<0.01	<0.04	<0.0002	<0.04	<0.01
	9/23/2009	<0.04	0.12	0.011	<0.01	<0.04	<0.0002	<0.04	<0.01
	10/6/2009	<0.1	0.066	0.03	0.03	<0.08	<0.0002	0.2	<0.02
WTPS-1	4/13/2010	<0.1	<1	<0.05	<0.1	<0.03	<0.002	0.051	<0.1
WTPS-2	4/13/2010	<0.1	<1	<0.05	<0.1	<0.03	<0.002	0.054	<0.1
WTPS-3	4/13/2010	<0.1	<1	<0.05	<0.1	<0.03	<0.002	0.054	<0.1
Count		15	15	15	15	15	15	15	15
Min		<0.04	0.066	<0.005	<0.01	<0.03	<0.0002	<0.04	<0.01
Max		<0.1	<10	<0.05	<0.5	<0.5	<0.02	0.2	<0.5
40 CFR Part 261.24		5	100	1	5	5	0.2	1	5
PASS?		Yes	Yes	Yes	Yes	Yes	Yes	Yrs	Yes

TETRA TECH

Uranium Material Analyses

Target Analyte	Units[1]	Results WTPS-1	WTPS-2	WTPS-3	Average
Total Uranium - Method SW6020A					
Total Uranium	mg/kg	15,000	16,000	15,000	15,333
	mg/L	2,475	2,640	2,475	2,530
Total ICP Metals - Method SW6010B					
Arsenic	mg/kg	<5.9	<5.9	<5.7	<5.8
	mg/L	<0.97	<0.97	<0.94	<0.96
Barium	mg/kg	8,100	7,900	7,200	7,733
	mg/L	1,337	1,304	1,188	1,276
Beryllium	mg/kg	33	36	36	35
	mg/L	5.4	5.9	5.9	5.8
Cadmium	mg/kg	40	44	43	42
	mg/L	6.6	7.3	7.1	7.0
Calcium	mg/kg	15,000	16,000	16,000	15,667
	mg/L	2,475	2,640	2,640	2,585
Chromium	mg/kg	19	20	19	19
	mg/L	3.1	3.3	3.1	3.2
Cobalt	mg/kg	1,200	1,200	1,100	1,167
	mg/L	198	198	182	193
Copper	mg/kg	160	180	170	170
	mg/L	26	30	28	28
Iron	mg/kg	690	740	740	723
	mg/L	114	122	122	119
Lead	mg/kg	18	19	17	18
	mg/L	3.0	3.1	2.8	3.0
Manganese	mg/kg	110,000	110,000	96,000	105,333
	mg/L	18,150	18,150	15,840	17,380
Molybdenum	mg/kg	<5.8	<6.0	<5.7	<5.8
	mg/L	<0.96	<0.99	<0.94	<0.96
Nickel	mg/kg	1,700	1,800	1,800	1,767
	mg/L	281	297	297	292
Selenium	mg/kg	25	26	26	26
	mg/L	4.1	4.3	4.3	4.2
Silver	mg/kg	11	12	11	11
	mg/L	1.8	2.0	1.8	1.9
Thallium	mg/kg	<580	<600	<570	<583
	mg/L	<96	<99	<94	<96
Tin	mg/kg	<29	<30	<29	<29
	mg/L	<4.8	<5.0	<4.8	<4.8
Vanadium	mg/kg	<5.8	<6.0	<5.7	<5.8
	mg/L	<0.96	<0.99	<0.94	<0.96
Zinc	mg/kg	3,400	3,600	3,600	3,533
	mg/L	561	594	594	583
Total Mercury - Method SW7471A					
Total Mercury	mg/kg	<0.19	<0.2	<0.19	<0.19
Total Mercury	mg/L	<0.031	<0.033	<0.031	<0.031

Uranium Material Analyses

Target Analyte	Units	Results WTPS-1	WTPS-2	WTPS-3	Average
GC/MS Total Volatile Organics - Method SW8260					
Chloromethane	µg/kg	<1.1	<1.2	<1.1	<1.1
	mg/L	<0.182	<0.198	<0.182	<0.182
Acetone	µg/kg	22 B	29 B	33 B	28
	mg/L	3.6	4.8	5.4	4.6
Methylene Chloride	µg/kg	3.8 J,B	3.7 J,B	5.8 J,B	4.4
	mg/L	0.6	0.6	1.0	0.7
2-Butanone	µg/kg	<5.7	<5.9	<5.7	<5.8
	mg/L	<0.94	<0.97	<0.94	<0.96
Tetrahydrofuran	µg/kg	<7.2	<7.4	<7.2	<7.3
	mg/L	<1.19	<1.22	<1.19	<1.20
Chloroform	µg/kg	1.7 J	2 J	1.2 J	1.6
	mg/L	0.28	0.33	0.20	0.27
Carbon Tetrachloride	µg/kg	<1.3	<1.4	<1.3	<1.3
	mg/L	<0.21	<0.23	<0.21	<0.21
Benzene	µg/kg	<0.94	<0.96	<0.93	<0.94
	mg/L	<0.155	<0.158	<0.153	<0.155
Toluene	µg/kg	2.2 J,B	1.9 J,B	1.3 J,B	1.8
	mg/L	0.36	0.31	0.21	0.30
m,p-Xylene	µg/kg	<1.9	<1.9	<1.9	<1.9
	mg/L	<0.31	<0.31	<0.31	<0.31
o-Xylene	µg/kg	<0.95	<0.97	<0.94	<0.95
	mg/L	<0.157	<0.160	<0.155	<0.157
Naphthalene	µg/kg	<1.4	<1.4	<1.4	<1.4
	mg/L	<0.23	<0.23	<0.23	<0.23
GC/MS Total Semi-Volatile Organics - Method SW8270D					
Pyridine	µg/kg	<310	<320	<320	<317
	mg/L	<51.2	<52.8	<52.8	<52.3
1,4-dichlorobenzene	µg/kg	<310	<320	<320	<317
	mg/L	<51.2	<52.8	<52.8	<52.3
2-methylphenol	µg/kg	<310	<320	<320	<317
	mg/L	<51.2	<52.8	<52.8	<52.3
3+4-methylphenol	µg/kg	<310	<320	<320	<317
	mg/L	<51.2	<52.8	<52.8	<52.3
Hexachloroethane	µg/kg	<310	<320	<320	<317
	mg/L	<51.2	<52.8	<52.8	<52.3
Nitrobenzene	µg/kg	<310	<320	<320	<317
	mg/L	<51.2	<52.8	<52.8	<52.3
Hexachlorobutadiene	µg/kg	<310	<320	<320	<317
	mg/L	<51.2	<52.8	<52.8	<52.3
2,4,6-trichlorophenol	µg/kg	<310	<320	<320	<317
	mg/L	<51.2	<52.8	<52.8	<52.3
2,4,5-trichlorophenol	µg/kg	<310	<320	<320	<317
	mg/L	<51.2	<52.8	<52.8	<52.3
2,4-dinitrotoluene	µg/kg	<310	<320	<320	<317
	mg/L	<51.2	<52.8	<52.8	<52.3
Hexachlorobenzene	µg/kg	<310	<320	<320	<317
	mg/L	<51.2	<52.8	<52.8	<52.3
Pentachlorophenol	µg/kg	<490	<500	<500	<497
	mg/L	<81	<83	<83	<82

Uranium Material Analyses

Target Analyte	Units[1]	Results WTPS-1	WTPS-2	WTPS-3	Average
Gasoline Range Organics - Method SW8015B					
Gasoline Range Organics	mg/kg	<0.38	<0.35	<0.39	<0.37
	mg/L	<0.063	<0.058	<0.064	<0.061
Diesel Range Organics - Method SW8015MB					
Diesel Range Organics	mg/kg	<6.5	<6.6	<6.8	<6.6
	mg/L	<1.07	<1.09	<1.12	<1.09
Oil & Grease					
Oil & Grease	mg/kg	<120	<120	<120	<120
	mg/L	<20	<20	<20	<20
Inorganics					
Ammonia as N - Method EPA350.1	mg/kg	7.9	7.9	8.3	8.0
	mg/L	1.30	1.30	1.37	1.33
Nitrate/Nitrite as N - Method EPA353.2 Revision 2	mg/kg	3.1	3.2	3.1	3.1
	mg/L	0.51	0.53	0.51	0.52
Total Dissolved Solids - EPA160.1	mg/kg	26,000	26,000	27,000	26333.3
	mg/L	4,290	4,290	4,455	4345.0
Fluoride - Method EPA300.0 Revision 2.1	mg/kg	38	38	40	38.7
	mg/L	6.3	6.3	6.6	6.4
Chloride - Method EPA300.0 Revision 2.1	mg/kg	40	39	41	40
	mg/L	6.6	6.4	6.8	6.6
Sulfate - Method EPA300.0 Revision 2.1	mg/kg	17,000	17,000	17,000	17,000
	mg/L	2,805	2,805	2,805	2,805
Gross Alpha/Beta - GFPC					
Gross Alpha	pCi/g	4,310±690	4,830±770	5,440±870	4,860
Gross Beta	pCi/g	4,870±780	4,780±760	4,860±780	4,867
Lead-210 - Liquid Scintillation					
Lead-210	pCi/g	33.1±8.0	34.7±8.4	32.0±7.8	33.3
Radium-226 - GFPC					
Radium-226	pCi/g	22.8±5.8	25.7±6.6	23.8±6.1	24.1
Total Alpha Emitting Radium - GFPC					
Total Radium	pCi/g	39.7±10	41±11	36.6±9.4	39.1
Total Radium (duplicate sample)	pCi/g	35.8±9.2			
Isotopic Thorium - Alpha Spectroscopy					
Th-228	pCi/g	1.24±0.99	1.50±0.74	0.93±0.67	1.22
Th-230	pCi/g	20.4±3.8	21.4±3.9	20.4±3.7	20.7
Th-232	pCi/g	1.14±0.48	0.66±0.34	0.71±0.32	0.84

Attachment 1
US Ecology Richland Materials

1.2 US Ecology Low-Level Radioactive Waste Generator Registration

US Ecology

Radioactive Waste Generator Registration

Please Print or Type

(1) Generator Name: Dawn Mining Company

(2) Corporate Billing Address: PO Box 250

City: Ford State: Washington

Zip Code: 99013 - 0250

(3) Generating Facility Address: Midnite Mine Water Treatment Plant

6834 Ford Wellpinit Road

City: Wellpinit County: Stevens

State: Washington Zip Code: 99040 - 6834

(4) Generator Administrative Contact: Robert Nelson

Generator Administrative Title: Site Manager

Generator Telephone: After Hours Telephone:

Working Hours (509) - 258 - 4511 (509) - 936 - 0688

Fax No. ( ) - - E-Mail dmcbob@wildblue.net

(5) Site Use Permit number(s) G 1166

(6) Description of Business: Uranium Mine - water treatment

(7) Please indicate your 4 digit Standard Industry Code (SIC) here: 1094

(8) Will you be using the services of a broker in shipping wastes to US Ecology for disposal:

☒ No ☐ Yes

Name of Broker: Broker Permit #

(9) How much waste do you expect to ship during a typical 12 Month Period: to be determined

Signature [signature]

Print Name ROBERT E. NELSON

Title VP + GEN. MGR

Date 2/10/09

RETURN COMPLETED FORM TO:

US ECOLOGY, INC
Laura Lee Barry
1777 Terminal Drive
Richland, WA 99354
Fax (509) 377-2244

FOR OFFICIAL USE ONLY

WAR-00-990-6854 K Wilson 5.5.09

Generator Number Assigned By Date

Attachment 1
US Ecology Richland Materials

1.3 Washington State Site Use Permit

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

SITE USE PERMIT

for the Commercial Low-Level Radioactive Waste Disposal Site

PERMIT NUMBER: G1166

EXPIRATION DATE: 2/29/2012

Registrant: DAWN MINING COMPANY
PO BOX 250
FORD, WA 99013-0250

For Waste Generated in the State of: WA

The person or organization to whom this certificate is issued must comply with applicable federal and state regulations related to the safe management of low-level radioactive waste.

Permit Does Not Imply Approval

ECY 010-2-78-G (2/93)

Attachment 1
US Ecology Richland Materials

1.4 US Ecology Radioactive Materials License

STATE OF WASHINGTON
DEPARTMENT OF HEALTH
OFFICE OF RADIATION PROTECTION
111 Israel Road SE • PO Box 47827 • Olympia, Washington 98504-7827
TDD Relay Services: 1-800-833-6388

January 24, 2011

Michael R. Ault
Facility Manager
US Ecology, Inc.
1777 Terminal Drive
Richland, Washington 99354

Subject: Radioactive Materials License WN-I019-2 Timely Renewal

Dear Mr. Ault:

Enclosed is your notice of timely renewal. This notice allows your facility to continue operating under your current expired radioactive materials license WN-I019-2, until the department has completed the renewal process of this license.

If you have any questions or concerns regarding this notice, please feel free to contact me or Kristen Schwab.

Sincerely,

Mikel Elsen, Supervisor
Waste Management Section

cc: Kristen Schwab, DOH

State of Washington

Radioactive Materials License

License Number: WN-I019-2
Amendment No. 39

US ECOLOGY WASHINGTON, INC.
1777 Terminal Drive
Richland, Washington 99354

Attention: Mike Ault
Facility Manager

NOTICE OF TIMELY RENEWAL

In accordance with WAC 246-235-050 your application received in proper form on December 28, 2010, and additional clarifying information received January 14, 20, and 21, 2011, are considered adequate as a timely request for renewal. Therefore, your existing license number, as shown above, will not expire until the department has made a final determination regarding the application.

The reviewer assigned to your license is Kristen Schwab, who can be reached by phone at 360-236.3244, or by email at kristen.schwab@doh.wa.gov. If you have any questions regarding this renewal, please contact either myself at 360-236-3241, or Kristen Schwab.

FOR THE STATE OF WASHINGTON DEPARTMENT OF HEALTH

Date: January 24, 2011

By: ______________________
Mikel J. Elsen, Supervisor
Waste Management Section

State of Washington
Radioactive Materials License

License Number: WN-I019-2
Amendment No. 37

US ECOLOGY WASHINGTON, INC.
1777 Terminal Drive
Richland, Washington 99354

Attention: Mike Ault
Facility Manager

Radioactive Materials License Number WN- I019-2 is administratively amended as follows:

License Condition 84 is added:

84. The licensee must comply with the initial inventory reporting requirement in 10 CFR 20.2207(h) for nationally tracked sources by the dates imposed in that paragraph. The licensee must also comply with the reporting requirements for transactions involving nationally tracked sources in 10 CFR § 20.2207. This section includes the requirement to report any manufacture, transfer, receipt, disassembly, or disposal of a nationally tracked source, otherwise allowed by this license, by the close of the next business day after the transaction. A nationally tracked source, as defined in 10 CFR § 20.1003, refers to a sealed source containing a quantity equal to or greater than Category 1 or Category 2 levels of any radioactive material listed in Appendix E to 10 CFR Part 20 - "Nationally Tracked Source Thresholds."

FOR THE STATE OF WASHINGTON DEPARTMENT OF HEALTH

Date: January 26, 2009

By Mikel J. Elsen, Supervisor
Waste Management Section

State of Washington

Radioactive Materials License

License Number: WN- I019-2

Pursuant to the Nuclear Energy and Radiation Control Act, RCW 70.98, and the Radiation Control Regulations, chapters 246-220 through 246-255 WAC, and in reliance on statements and representations heretofore made by the licensee designated below, a license is hereby issued authorizing such licensee to transfer, receive, possess and use the radioactive material(s) designated below; and to use such radioactive materials for the purpose(s) and at the place(s) designated below. **This license is subject to all applicable rules and regulations** promulgated by the State of Washington Department of Health.

1. Licensee Name: US ECOLOGY WASHINGTON, INC.	**3. License Number:** WN-I019-2 **Amendment in Entirety** Amendment 36
2. Address: 1777 TERMINAL DRIVE RICHLAND, WASHINGTON 99354 Attn: Mike Ault, Facility Manager	**4. Expiration Date:** 31 January 2011 **5. Reference Number(s):**

6. Radioactive Material (element and mass number).	7. Chemical and/or Physical Form.	8. Maximum quantity licensee may possess at any one time.
6.A. Any radioactive material, excluding source material and special nuclear material.	7.A. Dry packaged radioactive waste except as authorized by this license.	8.A. 60,000 curies (2.22×10^{15} Bequerels).
6.B. Source material.	7.B. Dry packaged radioactive waste except as authorized by this license.	8.B. 36,000 kilograms.
6.C. Special Nuclear Material.	7.C. Dry packaged radioactive waste except as authorized by this license.	8.C. 350 grams of U^{235} or 200 grams of U^{233} or 200 grams of plutonium or any combination of these, provided the sum of the ratios of the quantities does not exceed unity.
6.D. Any radioactive material.	7.D. Check and calibration sources in any form.	8.D. 0.1 Curie (3.7×10^{9} Bequerels).

CONDITIONS

9. Authorized use.

A-C Radioactive waste may be received, transferred, stored, repackaged, and disposed at a low-level radioactive waste disposal facility. The maximum radioactivity and/or quantity of radioactive material indicated in items 8.A, 8.B, and 8.C apply only to above-ground activity.

D. For use as check and calibration sources.

10. A. The licensee shall not receive for disposal any waste containing Ra-226, H-3, I-129, Tc-99, U-238, C-14, U-234, and Pu-239 once the following source term limits have been reached:

Radionuclide	Total Site Limit (Curies)
Ra-226	464.60
I-129	5.98
Tc-99	55.10
U-238	1,547.7
C-14	5,090.00
U-234	335.4
Pu-239	4,510.00

B. Commencing January 1, 2006, the licensee shall not receive for disposal, any waste containing H-3 in an unstable waste form once the following yearly source term limit has been reached:

Radionuclide	Yearly Limit (Curies)
H-3 (unstable waste form)	100.0 Curies

11. The authorized place of use is a low-level waste burial facility located in the southeast corner of Section 9, Township 12 North, Range 26E W.M., Benton County, Washington, Route 4 - U.S. DOE Hanford Reservation, Richland, Washington 99352, within the boundary of the land area described in Sublease Agreement with the state of Washington, dated July 29, 1965, as amended. For the purposes of this license, the authorized place of use shall be referred to as the "facility."

12. Reference to the "department" in this license shall mean the Department of Health or successor agency.

13. A. The licensee shall notify the department in writing within 30 days of the appointment of a new Facility Manager, Assistant Facility Manager, Radiation Protection Manager, or Assistant Radiation Protection Manager, describing how the appointee meets or exceeds the minimum qualifications specified in the Facility Standards Manual.

    B. The licensee shall notify the department in writing 30 days prior to any change in the licensee's corporate structure.

14. Upon receipt of a shipment, the licensee shall furnish to the department copies of all shipment manifests received. The licensee shall furnish to the department, within 30 days of a specific written request, special reports consisting of selected information contained on shipment manifests. By the tenth day of each month, the licensee shall submit a report totaling the volume and activity of the waste received during the previous month. In addition, a monthly facility receipt and burial activities report shall be submitted by the licensee, no later than the fifteenth day of the following month to the Department of Health, Supervisor, Waste Management Section. The report shall include the following information for each shipment:

    A. Name and address of the generator(s), broker (if any), and shipper.

    B. Radionuclides and activity of each radionuclide in millicuries (total and by generator).

    C. Grams of special nuclear material (total and by generator).

    D. Mass (in kilograms) of source material received (total and by generator).

    E. Class totals of volume and activity of Class A, B, and C waste entrenched (total and by generator).

    F. Volume of packages disposed with radiation readings at the surface of the disposal container of:

≤50 mr/hr	>1 R/hr ≤10 R/hr
>50 mR/hr ≤200 mR/hr	>10 R/hr ≤100 R/hr
>200 mR/hr ≤1 R/hr	>100 R/hr

and to the extent practicable:

G. Type and physical form of the waste.

H. Chemical form of the waste and solidification/stabilization/sorption agent used.

I. If an Engineered Concrete Barrier (ECB), or High Integrity Container (HIC) was used (total and by generator).

J. Quantity and type of chelates in concentrations greater than 0.1 percent by weight (total and by generator).

K. Type of secondary containment used (if any).

L. Volume of diffuse Naturally Occurring or accelerator produced radioactive material received (total and by generator).

15. In addition to the record keeping requirements contained in WAC 246-250-600, the licensee shall maintain a record for each shipment of waste disposed at the facility. As a minimum, the record shall include:

A. The date of disposal of the waste.

B. The location of the waste in the disposal site.

C. The condition of the waste packages as received.

D. Any discrepancies between materials listed on the manifest and those received.

E. Any evidence of leaking or damaged packages or radiation or contamination levels in excess of limits specified in United States Department of Transportation and state of Washington regulations.

F. A description of any repackaging operations of any of the waste packages in the shipment.

G. Type of secondary containment used (if any).

GENERAL PACKAGING CONDITIONS

16. All radioactive waste shall be packaged, loaded, received, and transported in accordance with all applicable U.S. Department of Transportation regulations, U.S. Nuclear Regulatory Commission regulations, state regulations, and the requirements of this license. Nothing in this license shall in any way relieve the licensee from full compliance with all applicable state and federal laws and regulations, including but not limited to the Resource Conservation and Recovery Act of 1976, as amended, and the State Hazardous Waste Management Statutes of 1976, as amended, and subsequently enacted regulations.

17. Unless otherwise authorized, the licensee shall not receive for disposal any mixed low-level radioactive waste. Mixed waste is defined as any radioactive material which is no longer of use or value, and contains waste that either (A) is listed as dangerous waste in the state's Dangerous Waste Regulations, (B) causes the waste to exhibit any of the dangerous waste characteristics identified in the state's Dangerous Waste Regulations, (C) fulfills any of the "dangerous waste criteria" identified in the state's Dangerous Waste Regulations, (D) listed as hazardous waste in Subpart D, 40 CFR Part 261, or (E) causes the waste to exhibit any of the hazardous waste characteristics identified in Subpart C, 40 CFR Part 261.

18. Unless specifically authorized by the department, all radioactive waste shall be received and buried in closed containers. Cardboard, corrugated paper, wood, and fiberboard are prohibited burial containers.

19. All metal containers shall be secured by an intact heavy-duty closure device when presented for disposal. Closure devices of open-head metal drums having 55-gallons or greater capacity shall be secured by bolts having 5/8 inch or larger diameters. The shipper of any DOT 7A Type A container must maintain on file complete documentation of tests and an engineering evaluation or comparative data showing that the construction methods, packaging design, and materials of construction comply with that specification.

20. Radioactive waste shall be packaged in such a manner that waste containers received at the facility do not show:

    A. Significant deformation.

    B. Loss or dispersal of contents.

    C. An increase in the external radiation levels as recorded on the manifest, within instrument tolerances.

D. Degradation due to rust or other chemical action which results in a loss of container integrity.

21. Void spaces within the radioactive waste and between the waste and its package shall be reduced to the maximum extent practicable. Unless specifically approved by the department, void spaces within all waste packages shall be less than 15 percent of the total volume of the disposal package, provided the disposal package is not a high integrity container nor contains activated metals that are too large to put into high integrity containers. For Class B and Class C waste packages containing activated metals, voids shall be reduced to the extent practicable and shall be demonstrated to be structurally stable by any of the methods discussed in WAC 246-249-050(2)(a). This documentation shall be submitted to the department prior to disposal, and shall be kept on file by the licensee.

22. Waste shall not contain, or be capable of generating, toxic gases, vapors, or fumes during transportation, handling, or disposal.

23. No pyrophoric, hazardous, dangerous, or chemically explosive materials or materials which could react violently with water or moisture or when subject to agitation shall be accepted for disposal.

24. Waste or packaging shall not contain any liquid except as authorized by this license.

25. In order to keep doses as low as reasonably achievable (ALARA), the licensee shall not receive shipments of radioactive material unless appropriate lifting devices of sufficient length have been provided and securely attached to containers and palletized shipments within a cask.

26. The licensee shall not accept radioactive waste unless each waste package has been:

A. Classified in accordance with Appendix A of this license and the most recent version of the "Low-Level Waste Licensing Branch Technical Position on Radioactive Waste Classification," issued May 1983 by the U.S. Nuclear Regulatory Commission.

B. Marked as either Class A stable, Class A unstable, Class B, or Class C, as defined in Appendix A of this license and the most recent version of the "Low-Level Waste Licensing Branch Technical Position on Radioactive Waste Classification," Issued May 1983 by the U.S. Nuclear Regulatory Commission.

C. Marked with a unique package identification number, clearly visible on the package, that can be correlated with the manifest for that particular shipment.

D. Stabilized, when required by this license, in accordance with criteria contained in the most recent version of the "Technical Position on Waste Forms," issued May 1983 by the U.S. Nuclear Regulatory Commission, and procedures that are described in approved vendor topical reports. Only those stabilization media approved by the department and listed in Appendix C to this license, or High Integrity Containers approved by the department and listed in Appendix D to this license may be used. Stability may also be achieved using engineered barriers in the disposal unit. Specific approval by the department is required prior to construction of any newly designed or redesigned engineered barrier. Only those engineered barriers listed in Appendix E of this license are approved for use at the facility.

27. The classification and package identification marking required by Condition 26 is in addition to any marking or labeling required by U.S. NRC or U.S. DOT, and shall consist of lettering 1/2 inch high or greater in a durable contrasting color to the background surrounding the lettering. The classification marking shall be visible on the same side as the radioactive marking or label and in close proximity (within six inches). Waste packages marked "Radioactive," "Limited Quantity," or "Radioactive LSA" need only one classification marking, whereas waste packages labeled White I, Yellow II, or Yellow III shall have classification markings in close proximity (within six inches) to each label. Waste materials shipped in casks shall have the classification markings visible on the outside of the cask.

28. The licensee may possess SNM that has not been disposed of at the facility, subject to the following restrictions and all other conditions of this license:

A. No single package shall contain more than 100 grams of U-235, or 60 grams of U-233, or 60 grams of Pu, or any combination thereof, such that the sum of the ratios of the quantity of each SNM radionuclide to the quantities specified herein exceeds unity. Compliance with this requirement shall be determined by the following formula:

$$\frac{\text{grams containing U-235}}{100} + \frac{\text{grams containing U-233}}{60} + \frac{\text{grams containing Pu}}{60} = <1$$

B. No single package shall contain more than 15 grams of any combination of U-235, U-233, and Pu, per cubic foot of the total volume. To the extent practicable, the SNM will essentially be uniformly distributed throughout the waste package.

SPECIFIC WASTE FORM REQUIREMENTS

29. Except as allowed under this license, untreated liquids and wet sludges are not allowed for disposal. Liquids shall be rendered non-corrosive (4≤ pH ≤11) prior to treatment. Acceptable treatments are stabilization or solidification, depending on waste class. Wet sludges and slurries, such as evaporator bottoms, shall be non-corrosive and shall be treated by stabilization or solidification. Ion exchange media shall not be treated by sorption.

30. Liquids, ion exchange resins, or filter media treated by stabilization shall be processed in accordance with a process control program using an approved stabilization medium (see Appendix C). The resulting waste form shall contain no detectable free-standing liquid and shall meet the stability requirements of Condition 26. "No detectable free-standing liquid" is defined to be as little free-standing and noncorrosive liquid as is reasonably achievable, but in no case shall the liquid exceed 1.0% of the volume of the waste when the waste is in a disposal container designed to ensure stability, or 0.5% of the volume of waste processed to a stable form.

31. Liquids treated by solidification shall be processed in accordance with a process control program using an approved solidification medium (see Appendix B). The resulting waste form shall contain no detectable free-standing liquid. "No detectable free-standing liquid" is defined to be as little liquid as is reasonably achievable, but in no case shall it exceed more than 0.5 percent (by volume) of liquid per container.

32. Except as specifically provided in this license, the licensee shall not accept for disposal, any liquid radioactive waste packaged in sorbent material.

33. Incidental and unintentional liquids entrained in solid material may be received, provided that:

    A. (1) The dry material contains less than 0.1 volume percent of liquid within the package, or

       (2) If a process control program (PCP) is used to verify the amount of liquids, the dry material must contain less than 0.5 volume percent of liquids within the package and;

    B. Sufficient approved sorbent material (see Appendix F) is used and layered to absorb the incidental and unintentional liquids.

34. Waste containing biological (excluding animal carcasses, which are considered in Condition 35), pathogenic, or infectious material or equipment (e.g., syringes, test tubes, capillary tubes) used to handle such material, shall be treated to reduce, to the maximum extent practicable, the potential hazard from the non-radiological materials. The inner waste container shall be a metal container meeting DOT 7A performance specifications (see Condition 19) and shall be lined with a minimum 4 mil plastic liner which shall be sealed. The inner waste container shall be placed in an outer metal container meeting DOT 7A performance specifications with a heavy duty closure device (see Condition 19) and shall have a capacity at least 40 percent greater than the inner container. The void between inner container and outer container shall be completely filled by approved sorbent material and the outer container must be sealed. Only sorbents approved by the department shall be allowed (see Appendix F).

35. Animal carcasses containing, or contained in, radioactive materials shall be packaged in accordance with the following requirements: the biological material shall be layered with absorbent and lime and placed in a metal container meeting DOT 7A performance specification, having a heavy duty closure device (see Condition 19). The inner container shall be closed and placed in a metal container meeting DOT 7A performance specification with a heavy duty closure device, having a capacity at least 40 percent greater than the inner container. The void between the inner container and the outer container shall be completely filled by approved sorbent material and the outer container must be sealed. Only sorbents approved by the department (except Perlites) shall be used (see Appendix F).

36. Waste in gaseous form must be packaged at a pressure that does not exceed 1.5 atmospheres at 20^0C. Total activity shall not exceed 100 curies (3.7×10^{12} Bqs) per container. Class A gaseous waste shall be contained within U.S. DOT specification cylinders. Class A gaseous waste contained in hermetically sealed glass ampules, tubes, or sealed sources are exempt from the requirement for the specification cylinder provided that they are packaged in containers meeting DOT 7A specifications, having a heavy duty closure device (see Condition 19) and with sufficient sorbent material to prevent breakage and rupture of its contents. Specific approval of the department is required if the gaseous waste is Class B or C. Only sorbents approved by the department shall be used (see Appendix F).

37. Class A ion exchange and filter media containing radionuclides with half-lives greater than five years, the total package concentration of which is one microcurie (3.7×10^4 Bqs) per cubic centimeter or greater, except Cobalt 60 having a concentration of 50 microcuries per cubic centimeter or greater, shall:

A. Meet the stability requirements of Condition 26 and shall contain no detectable free-standing liquid. "No detectable free-standing liquid" is defined to mean as little liquid as reasonably achievable, but in no case shall the liquid exceed 1.0% of the volume of the waste when the waste is in a disposal container designed to ensure stability, or 0.5% of the volume of waste processed to a stable form. Other Class A ion exchange and filter media which are classified as unstable shall contain no more liquid than 0.5% by volume of the waste.

B. The calculations of concentrations of isotope activity will adhere to the "sum of fractions being equal to or less than unity rule" for ion exchange resins and filter media containing isotopes with half-lives greater than five years, with the exception of Cobalt 60.

38. Radioactive waste containing radium and/or transuranic radionuclides, as described in Appendix A, is acceptable, provided that the radium and transuranic radionuclides are essentially evenly distributed within an homogenous waste form. The receipt and disposal of waste in which the radium or transuranic radionuclides are not evenly distributed (components, or equipment primarily contaminated with radium or transuranic radionuclides), or radium or transuranic radionuclides in excess of Class A limits, requires the specific approval of the department. Radioactive waste packaged in accordance with License Condition 39 is exempt from this condition.

39. Radioactive consumer products, the use and disposal of which is exempt from licensing control (see WAC 246-232), may be received for disposal without regard to concentration limits of Appendix A, provided the entire unit is received and is packaged with sufficient sorbent material so as to preclude breakage and rupture of its contents. Only sorbents approved by the department shall be used (see Appendix F).

This condition allows the disposal of such consumer products as intact household or industrial smoke detector units containing Americium-241 foils, and radium or other radioactive materials incorporated into self-luminous devices and electron tubes. Documentation that the consumer product was manufactured under a U.S. Nuclear Regulatory Commission exempt license shall accompany each shipment made under this condition. Waste packaged in accordance with this license condition shall be Class A unstable, and the words "Condition 39" shall be noted on the manifest or other documentation accompanying the waste package.

40. Incinerator ash which is classified as Class A waste according to Condition 26 shall be solidified, granular, or treated in such a manner as to be rendered nondispersible in air, exclusive of packaging.

41. Wastes containing a concentration of oil in excess of ten percent by weight are not authorized for burial. Dilution by solidification or stabilization media shall not be allowed in determining the waste composition. "Oil" means an organic liquid which is immiscible in water, the disposal of which is not regulated under RCRA or the state hazardous waste regulations.

42. Until alternative waste management techniques such as incineration or recycling become generally available, waste liquids which have a pretreatment concentration of chelating agents in excess of 0.1 percent by weight shall be treated by either solidification or stabilization, and placed into an Engineering Concrete Barrier (ECB). Prior to receipt of any chelate waste in excess of 1.0 percent by weight, the generator must notify the licensee of the intent to ship such material for disposal. The notification shall consist of telephone and written notification to the Facility Manager prior to shipment. Dilution by solidification or stabilization media shall not be allowed in determining waste composition. "Chelating agent" means amine polycarboxylic acids (e.g., EDTA, DTPA), hydroxy-carboxylic acids and polycarboxylic acids (e.g., citric acid, carbolic acid, and gluconic acid), the disposal of which is not regulated under RCRA or the state hazardous waste laws. Additionally, the licensee shall record the three-dimensional location of the ECBs containing these wastes

43. The licensee shall not accept for disposal any neutron source (e.g., polonium 210, americium 241, radium 226 in combination with beryllium or other target) unless the generator has notified the licensee of the intent to ship such source to the licensees disposal facility. The notification shall consist of telephone and written notification to the Facility Manager prior to shipment. The notification shall indicate the isotope, activity, form of the source, a description of the packaging utilized, radiological data, and anticipated date of arrival. Additionally, a copy of the written notification must accompany the shipment made under this license condition.

RECEIPT, ACCEPTANCE, AND INSPECTION CONDITIONS

44. The licensee is exempt from the timely inspection requirements of WAC 246-221-160(2)(a) and (3)(a), provided the requirements of the Facility Standards Manual and Conditions 45 through 48 of this license are met.

45. Waste shipments shall not be accepted at the facility unless accompanied by the following (a single shipment shall consist of not more than one vehicle or one tractor with legal trailer(s) attached):

    A. Shipment manifest approved by the department.

B. Washington State Patrol or Washington State Utilities and Transportation Commission vehicle inspection certificate, or a current visible Washington State 90-day vehicle inspection seal.

C. Current certification Form RHF-31, properly executed by a representative of the shipper/generator of the waste, in accordance with requirements of Washington State Rules and Regulations for Radiation Protection, WAC 246-249-030.

D. Copies of any specific approval or variance granted by the department for disposal.

E. Upon departmental request, other permits or documentation required under this license, or state or federal law or regulation.

46. Waste shipments shall not be accepted by the facility unless the accompanying Form RHF-31 is stamped as received, and initialed by an authorized representative of the department. (This individual may be the licensee, when designated by telephone notification and confirming letter from the department.)

47. Upon acceptance for disposal of each waste shipment, the licensee shall:

A. Acknowledge receipt of the waste as soon as practicable, but no later than seven days following its acceptance for disposal, by returning a signed copy or equivalent documentation of the shipment manifest to the shipper. The shipper to be notified by the licensee is the one last possessing the waste and transferring it to the licensee.

B. Indicate on the returned copy of the shipment manifest, shipping papers, or equivalent documentation any discrepancy between noted waste descriptions listed on the manifest or papers and the waste materials received in the shipment.

C. Notify the shipper and the department when any shipment or part of a shipment has not arrived 60 days after the separate copy of the shipment manifest or shipping papers was received by the licensee.

D. Maintain copies of completed shipment manifests, including annotations of discrepancies found in accordance with Condition 47.B.

E. Maintain records in accordance with in WAC 246-250-600.

48. Any shipment in which there is evidence that any radioactive material is missing, or that the waste packages have been tampered with or damaged in transit, shall be received by the licensee and safely stored pending notification to the department. The licensee shall not dispose of such packages unless authorized by the department.

49. The manifest for each package of waste received for disposal shall list all radionuclides greater than 3,700 kBq (100 microcuries).

BURIAL OPERATIONS CONDITIONS

50. Packages containing radioactive material shall not be stored above ground for a period greater than ninety days from the date of the department's release of the packages. Packages shall be stored in such a manner as to maintain radiation exposures as low as reasonably achievable. Retention of packaged waste above ground for not more than three working days does not constitute storage.

51. Unless otherwise specifically authorized by the department, the licensee is not authorized to open any package containing radioactive material at the facility, except for the following:

    A. For purposes of repairing, repackaging, or overpacking leaking containers or containers damaged in transport in the event the material is to be disposed, or returned to the generator if required for the protection of the health and safety of the employees or the environment.

    B. For purposes of inspection and waste confirmation in the presence of a department inspector for compliance with Title 246 WAC, other applicable federal and state regulations, and conditions of this license.

    C. For purposes of returning outer shipping containers.

    The licensee shall use and maintain a facility, in accordance with the Facility Standards Manual, where the above operations can be safely conducted.

52. By June 1, 2006 the licensee shall dispose of all Class B, and C waste in a secondary containment system which has been reviewed and approved by the department. In addition, waste packages containing any of the following radionuclides, H-3, I-129, C-14, Tc-99, U-238, U-234, and Pu-239, shall be disposed in accordance with procedures approved by the department. Secondary containment shall be used for all packages that exceed the predetermined levels contained in these procedures, and the Facility

Standards Manual. Levels shall be established such that at least 90% of the allowable future source term activity for each listed isotope is placed in secondary containment. The effectiveness of these procedures shall be evaluated annually and reported in the Facility Utilization Report required by License Condition 71:

53. Class B and C waste packages stabilized with bitumen shall be backfilled immediately after waste placement. Sufficient backfill material shall be placed around each container to cover all sides around the packages.

54. Accumulations of waste packages, with an SNM Mass ratio (SNM Mass/ Package Mass) that exceeds 0.0002 (1/5000), in quantities specified in this license, shall be disposed so that there is a minimum of eight inches of soil or a minimum of four feet of non-SNM-bearing waste in all directions from any other accumulation of packages containing SNM in quantities specified in this license, with an SNM Mass ratio that exceeds 0.0002.

55. Class B, and C waste packages must be disposed at a minimum depth of five meters (16.5 feet) below the natural grade of the trench, as defined in the Comprehensive Facility Utilization Plan.

56. All discrete radium 226 must be disposed in an engineered concrete barrier (ECB) at a minimum depth of 23 feet below the natural grade of the trench, as defined in the Comprehensive Facility Utilization Plan.

SITE DESIGN AND CONSTRUCTION CONDITIONS

57. All burial trenches or disposal units shall be in a controlled area surrounded by a chain link fence, eight feet high, and topped with barbed wire.

58. Thirty days prior to commencement of construction of any new disposal unit, the licensee shall submit to the department a detailed engineering plan for the trench in accordance with the provisions of the Facility Standards Manual, or a statement that the proposed trench will be designed and constructed in accordance with Condition 60 of this license.

59. By June 30, 2006, the licensee shall submit, for approval by the department an updated Comprehensive Facility Utilization and Engineering Plan which encompasses the proposed site conditions for the expected lifetime of the facility. The Plan shall discuss, at a minimum, the reasoning for the choice of design, and shall include detailed drawings and calculations sufficient to support the conclusions reached. Changes to the Plan must be submitted to the department for review and approval. The plan shall be updated and submitted for approval by the department every five years.

60. Until an the updated Comprehensive Facility Utilization and Engineering Plan required by Condition 59 is approved by the department, the licensee shall construct new disposal units in accordance with the March 6, 1991 department-approved Comprehensive Facility Utilization Plan, Document 200-DOC-001, Rev. 3.

61. A. Upon completion of the construction of any new trench, submit to the department two copies of the trench construction report. The report shall include, at a minimum, as-built drawings, daily and final inspection reports, laboratory and field soil test results, and a description of any problems encountered during construction, in order to demonstrate that the construction of the disposal unit is in compliance with applicable plans and specifications contained in the approved Facility Utilization Plan.

    B. 30 days prior to use of any new trench, notify the department in writing of the intent to physically place waste in the trench.

62. The dimensions of burial trenches shall not exceed a width of 150 feet (46 meters), a depth of 50 feet (15.24 meters), or a length of 1000 feet (305 meters) without specific documented approval from the department. Measurements shall be referenced to natural grade as established in the March 6, 1991 department-approved Comprehensive Facility Utilization Plan.

63. Until an agreement is secured with agencies controlling adjacent lands, which meets the requirements of Condition 74 (K) of this license, disposal units constructed after the effective date of this license shall be placed at least 100 feet away from the North, South, and West subleasehold boundaries. The set-back distance for the East boundary shall be no less than 50 feet.

ENVIRONMENTAL MONITORING AND SURVEY CONDITIONS

64. The licensee shall perform an exposure pathway analysis of the site closure plan within 180 days of a department-approved closure plan. The licensee shall verify that the proposed closure actions remain within the acceptable parameters developed and established by the Environmental Impact Statement's (EIS) "Comprehensive Exposure Pathway Analysis". The verification shall include air, soil, ground water, vegetation, fauna, burrowing animals, and human impacts. Additionally, the analyses shall be reviewed and updated as necessary every four years subsequent to the approval of the pathway analyses. Upon completion of the review, the licensee shall submit a copy of the review to the department. This requirement is in addition to the requirements found in WAC 246-250-060(1). Within 120 days of completion of the pathway analysis report, the licensee

shall submit to the department the licensee's evaluation and analysis of the report with respect to the environmental monitoring programs. The analyses shall clearly identify and differentiate between the roles performed by the natural disposal site characteristics and design features in isolating and segregating the wastes. The analyses shall clearly demonstrate that there is reasonable assurance that the exposure to humans from the release of radioactivity will not exceed the limits set forth in WAC 246-250-170.

65. The licensee shall conduct an environmental monitoring program capable of detecting the potential contribution of radioactive material from the site to the environment. The program shall include collection of samples and analyses at frequencies specified in the Facility Standards Manual (FSM). The licensee shall coordinate sampling schedules with the department to provide, when possible, duplicate samples on a prearranged frequency. A comprehensive annual report of all sample analyses, with statistical trend analyses and discussions of all anomalous results and actions taken, specification of the quantity of each of the principal contaminants released to unrestricted areas in liquid and in airborne effluents during the preceding year, wind rose for the facility, depth to water, and depth to bottom, Ph, as well as non-radiological contaminants specified in the FSM, for all groundwater wells, ventilation exhaust samples taken from the inspection facility, and comparisons of onsite groundwater wells and U.S. DOE groundwater wells in the vicinity of the facility shall be forwarded to the department by June 1 of each year. The report shall be submitted in general accordance with the department's document entitled "Recommended Content and Format for Annual Environmental Reports." Deviations in the reporting format must be approved by the department. In addition, the licensee shall report immediately any environmental monitoring results in excess of reporting levels specified in the Facility Standards Manual.

66. The licensee shall conduct an experimental monitoring program designed to determine the extent and modes of migration of disposed waste into the unsaturated zone, in accordance with procedures specifically approved by the department. Annual reports shall be made to the department by June 1 of each year. The results of the program shall be discussed in the annual Environmental Monitoring Report required by license Condition 65.

TRENCH AND SITE CLOSURE CONDITIONS

67. The licensee shall, within 90 days of filling each disposal unit, closed after the effective date of this license, erect interim disposal unit monuments upon which the following information shall be displayed in a legible manner:

A. Total activity of radioactive material, in curies, excluding source and special nuclear materials, total amount of source materials in kilograms, and total amount of special nuclear material in grams.

B. Trench number or disposal unit designation.

C. Date of opening and closing of the disposal unit.

D. Volume of waste contained in the disposal unit.

E. Coordinates of the disposal unit.

The erection of interim monuments may be omitted if permanent monuments, required by Condition 73, are scheduled to be erected within six months of completion of the disposal unit.

68. The licensee shall initiate closure and stabilization measures as each trench is filled and covered in accordance with the schedule and performance criteria defined in the Final Environmental Impact Statement for the Commercial Low-Level Radioactive Waste Disposal Site, Richland Washington, dated May 28, 2004.

69. The licensee shall conduct closure and stabilization operations in accordance with the most recent department-approved Comprehensive Facility Utilization Plan and the Facility Closure and Stabilization Plan required by Condition 74 as each trench is filled and covered.

70. In addition to the requirements of Condition 69, the licensee shall design and construct interim disposal unit caps in accordance with the specifications contained in the Facility Standards Manual. Interim disposal unit caps shall be established within 3 months of completion of a disposal unit, or as described in the Comprehensive Facility Utilization Plan approved by the department.

71. The licensee shall submit a facility utilization report to the department by June 30 of each year. The report shall provide:

A. Identification of each disposal unit and description of all waste emplaced during the previous calendar year. A three-dimensional identification to describe the disposal location of each Class B, and C package of waste including the location of engineered barriers used to provide structural stability, and the disposal location of those wastes containing oils or chelates shall also be provided. The location of Class A waste shall be tracked three-dimensionally within 50 feet horizontally and within 10 feet in the vertical plane.

B. Percent of utilization for each operating stable and unstable trench or disposal unit filled during the previous calendar year.

C. Annual aerial photograph of the leasehold.

D. Summary, by waste class, of activities and quantities of radionuclides disposed.

E. A summary of disposal unit maintenance activities.

F. Any instances in which observed site characteristics were significantly different from those described in the application for the license.

G. The remaining capacity of the disposal facility and each open disposal unit.

H. A summary of each disposed radionuclide and its activity.

I. An updated source term for the facility that covers all waste disposed during the previous year.

J. A summary of waste packages that have been placed in secondary containment.

K. The volume of diffuse Naturally Occurring and Accelerator produced Radioactive Material (NARM) disposed.

L. An evaluation of waste disposed in secondary containment during the previous year.

M. Any other information the department may require.

72. As radioactive material buried may not be transferred by abandonment or otherwise, unless specifically authorized by the department, the expiration date of this license applies only to the above-ground activities and to the authority to bury radioactive material wastes at the location specified in <u>Condition 11</u>. The license continues in effect, and the responsibility and authority for possession of buried radioactive material wastes continues until the department finds that the plan established for preparation of the facility for transfer to another person or custodial agency has been satisfactorily implemented in a manner to reasonably assure protection of the public health and safety and the environment, and the department takes action to terminate the licensee's responsibility and authority under this license. All requirements for environmental monitoring, site inspection, maintenance, and site security continue whether wastes are being buried or not.

73. All trenches or disposal units shall be conspicuously marked with permanent, stable monuments at each end, consistent with the approved site closure plan required by Condition 74. Permanent monuments shall be designed to stand erect, well above the grade of the final trench cover, and in a manner which will not allow them to be covered or obscured by drifting sand during the institutional control period. Inscriptions shall be made so as to endure and remain legible well beyond the institutional control period. The permanent monuments shall be inscribed with the following information:

    A. Total activity of radioactive material, in curies, excluding source and special nuclear materials, total amount of source material in kilograms, and total amount of special nuclear material, in grams, in the trench.

    B. Trench number or other means of identifying the disposal unit.

    C. Date of opening and closing the disposal unit.

    D. Volume of waste in the disposal unit.

    E. Coordinates of the stable and unstable disposal units, including disposal unit depth and depth of cover at closure.

    This same information shall be reported to the Department of Health and the Department of Ecology within 30 days of closure of each trench or disposal unit.

74. Upon approval of the Trench Cap Design required by License Condition 68, the licensee shall review and update the July 1996 Facility Closure and Stabilization Plan within one year, and shall review and update the plan as necessary every four years thereafter. A copy of this review shall be submitted to the department upon completion of the review. The facility closure and stabilization plan shall address how the licensee meets or plans to meet the following requirements:

    A. Bury all waste in accordance with the requirements of the license.

    B. Dismantle, decontaminate (as required), and dispose of all structures, equipment, and materials that are not to be transferred to the site custodian.

    C. Document the arrangements and the status of the arrangements for orderly transfer of site control and for long-term care by the government custodian. Also document the agreement, if any, of state or federal governments to participate in, or accomplish, performance objectives. Specific arrangements to assure availability of funds to complete the site closure and stabilization plan shall be documented.

D. Direct gamma radiation levels from buried wastes shall be essentially background at any accessible above-ground location, as determined by evaluation of environmental data from the licensee, the U.S. Department of Energy, and its contractors.

E. Demonstrate by measurement and model during operations and after site closure that concentrations of radioactive material which may be released to the general environment in ground water, surface water, air, soil, plants, or animals will not result in any member of the public receiving an annual dose exceeding an equivalent to 25 millirems (0.25 mSv) to the whole body, 75 millirems (0.75 mSv) to the thyroid, and 25 millirems (0.25 mSv) to any other organ.

F. Render the site suitable for surface activities without resort to custodial care exceeding vegetation control, minor maintenance, and environmental monitoring. No active ongoing maintenance shall be necessary. Final conditions at the site must be acceptable to the government custodian and compatible with its plan for the site.

G. Demonstrate that all trench elevations are above water table levels, taking into account the complete history of seasonable fluctuations.

H. Eliminate the potential for erosion or loss of site or trench integrity due to factors such as ground water, surface water, wind, subsidence, and frost action. All slopes shall be sufficiently gentle to prevent slumping or gullying. The surface shall be stabilized to minimize erosion, settling, or slumping of caps.

I. Demonstrate that permanent trench markers are in place, stable, and keyed to benchmarks. Identifying information shall be clearly and permanently marked as required by Condition 67 of this license.

J. Compile and transfer to the department complete records of site maintenance and stabilization activities, trench elevation and locations, trench inventories, and monitoring data for use during custodial care for unexpected corrective measures and data interpretation.

K. Maintain a buffer zone to provide space to stabilize slopes, incorporate offsite surface water management features, assure that any future excavation on adjoining areas shall be evaluated for the potential to compromise trench or site integrity, and provide working space for unexpected mitigating measures, if needed, in the future. The buffer zone may be within the subleasehold or on adjacent land, provided written agreements are secured with persons owning or controlling adjacent lands, which shall allow the licensee or custodial agency the required access and actions.

L. Provide a secure passive site security system (e.g., a fence) that requires minimum maintenance.

M. Stabilize the site in a manner to minimize environmental monitoring requirements for the long-term custodial phase, and develop a monitoring program based on the stabilization plan.

N. Investigate the causes of any statistically significant levels of radioactive or hazardous materials in environmental samples taken during operation and stabilization. In particular, any evidence of unusual or unexpected rates or levels of radionuclide migration in or with the ground water shall be analyzed, and corrective measures implemented.

O. Eliminate the need for active water management measures, such as a sump or trench pumping and treatment of water to assure that wastes are not leached by standing water in the trenches.

P. Evaluate present and proposed activities on adjoining areas to determine their impact on the long-term performances of the site, and take reasonable action to identify and minimize the effects.

75. Upon completion of Phase II of Trench Cap construction, the licensee shall develop specific procedures, and implement a program, approved by the department, which is designed to study (A) erosion of soils onto and off of the facility, (B) methods of revegetation of closed trenches, and (C) subsidence of trenches, in accordance with criteria established by the department. Once approved, the licensee shall submit annual reports to the department by October 31 which discusses the results of the program.

76. Upon closure of each disposal unit, the licensee shall submit to the department a summary of:

A. All radionuclides and associated activities disposed in that trench.

B. Waste class totals by volume and activities.

C. Disposal locations and volume of chelates disposed.

D. A summary, to the extent practical, of the physical and chemical forms disposed.

77. Notwithstanding other requirements of this license or the sublease, one year prior to the anticipated transfer of the licensee's facility and buried radioactive waste to another person (including an agency of the state or federal government), the licensee shall submit a final version of the facility closure plan, including a schedule for implementation of all remaining plan elements prior to transfer, and a description of the mechanics of orderly transfer in coordination with the transferee.

FINANCIAL ASSURANCES

78. By June 30 of each year, the licensee shall submit the following financial documentation to the department:

    A. A copy of its financial report or a certified financial statement and Security and Exchange Commission (SEC) Form 10K.

    B. A copy of its financial or surety arrangements for closure and stabilization of the disposal facility.

    C. A copy of personnel and nuclear liability insurance held for the facility.

79. The licensee shall submit to the department a copy of site surveillance fees paid, within 45 days after the end of each calendar quarter.

80. The licensee shall conduct a quality assurance/quality control program in accordance with US Ecology Quality Assurance Manual, and Quality Assurance Procedures Manual QA-MA-2. Changes to these documents shall be submitted to the department within 30 days of the change.

81. **The licensee shall comply with the requirements set forth in Order dated November 29, 2005, signed by Gary Robertson, Director, Office of Radiation Protection, and made a part hereof by this reference. The licensee shall comply with any new requirements issued subsequent to date of original Order.**

82. **Effective 4 April 2008:**
The licensee shall comply with the requirements described in the Administrative Amendment to this license and the document (NRC ORDER EA-07-305, with attachments, dated 5 December 2007) entitled "Fingerprinting and Criminal History Records Check Requirements for Unescorted Access to Certain Radioactive Material". Those requirements listed in the U.S. Nuclear Regulatory Commission Order (implemented in accordance with the due dates given in the "Timeline Attachment" to the 5 March 2008 Administrative Amendment cover letter), shall be instituted as required as part of the licensee's Trustworthiness and Reliability component of the Increased Controls requirements.

By 3 July 2008, the licensee shall provide under oath or affirmation, to the state of Washington Department of Health and to the Nuclear Regulatory Commission, a certification that the Trustworthiness and Reliability Official is deemed trustworthy and reliable by the licensee as required in paragraph B.2 of the U.S. Nuclear Regulatory Commission (NRC) Order EA-07-305, published in the Federal Register on December 13, 2007 [72 FR 70901].

All fingerprints obtained by the licensee pursuant to this requirement must be submitted to the NRC for transmission to the U.S. Federal Bureau of Investigation (FBI). Additionally, the licensee's submission of fingerprints shall also be accompanied by a certification, under oath and affirmation, of the trustworthiness and reliability of the licensee's Trustworthiness and Reliability Official as required by paragraph B.2 of NRC Order EA-07-305.

The licensee shall complete implementation of the fingerprinting requirements by 1 October 2008. The licensee shall notify the state of Washington Department of Health and the U.S. Nuclear Regulatory Commission when they have achieved full compliance with the requirements described in the NRC Order. The notification shall be made within twenty-five (25) days after full compliance has been achieved.

The licensee shall notify the state of Washington Department of Health and the U.S. Nuclear Regulatory Commission within 24 hours if the results from a criminal history records check indicate that an individual is identified on the FBI's Terrorist Screening Data Base.

83. Except as specifically provided by this license, the licensee shall possess and use radioactive material described in Conditions 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in the documents listed below. The department's "Rules and Regulations for Radiation Protection," Title 246 WAC, shall govern the licensee's statements in applications or letters, unless statements are more restrictive than the regulations. Any change to the documents listed below shall require departmental approval in the form of an amendment to this license.

    A. Application and cover letter dated January 7, 1997.

    B. Facility Standards Manual, dated February 2003; Superseded by License Condition 83.D.

    C. Administrative amendment incorporating increased controls, dated November 30, 2005.

D. US Ecology Washington, Inc. Facility Standards Manual dated September 2006; Superseded by License Condition 83.F.

E. Letter and attachments dated March 29, 2007 RE: request to revise disposal limits for SNM and addition of requirement to dispose of Radium 226 sources in ECBs.

F. Letter and attachments dated December 20, 2007 RE: request to: eliminate experimental monitoring of vadose tritium and radon , solar still tritium, and radon in air; suspend vadose vapor sampling and groundwater sampling of hazardous constituent until after completion of the MTCA investigation; change gamma composite of air filters from monthly to quarterly; change tritium in air sampling from continuous to continuous for 30 days each quarter; change soil sampling from quarterly to once every 3 quarters; change vegetation sampling from quarterly to annually; change groundwater sampling from quarterly to once every 3 quarters; change all environmental TLDs to quarterly; change personal dosimetry exchange form quarterly to semi-annually; reduce vendor audits from every three years to every five years.

G. US Ecology Washington, Inc. Facility Standards Manual dated December 2007.

H. Administrative amendment; RE: adding new IC requirements for fingerprinting and criminal history checks.

FOR THE STATE OF WASHINGTON DEPARTMENT OF HEALTH

Date: March 5, 2008

By Kristin Elsen for
Mikel J. Elsen, Supervisor
Waste Management Section

APPENDIX A

WASTE CLASSIFICATION TABLE

License Number: WN-I019-2

Amendment 36

RADIONUCLIDES CONCENTRATION LIMITS IN CURIES/CUBIC METER**

Table 1 (long-lived)	Class A	Class C
C-14	≤0.8	≤8
C-14 in activated metal	≤8	≤80
Ni-59 in activated metal	≤22	≤220
Nb-94 in activated metal	≤0.02	≤0.2
Tc-99	≤0.3	≤3
I-129	≤0.008	≤0.08

CONCENTRATION LIMITS IN NANOCURIES/GRAM

Alpha emitting Transuranic radionuclides with half-lives greater than five years	≤10	≤100 with specific departmental approval
Radium 226	≤10	≤100 with specific departmental approval
Curium 242	≤2,000	≤20,000 with specific departmental approval
Plutonium 241	≤350	≤3,500

APPENDIX A

WASTE CLASSIFICATION TABLE

License Number: WN-I019-2

Amendment 36

RADIONUCLIDES	CONCENTRATION LIMITS IN CURIES/CUBIC METER**		
Table 2 (short-lived)	Class A	Class B	Class C
Total of all with half-life less than 5 years	≤700	♦	
H-3	≤40	♦ with specific departmental approval	
Co-60	≤700	♦	
Ni-63	≤3.5	≤70	≤700
Ni-63 in activated metal	≤35	≤700	≤7000
Sr-90	≤0.04	≤150	≤7000
Cs-137	≤1	≤44	≤4600

** Curies/cubic meter is equivalent to microcuries/cubic centimeter

♦ There are no limits established for these radionuclides in Class B or C wastes. Practical considerations such as the effects of external radiation and internal heat generation on transportation, handling, and disposal will limit the concentrations for these wastes. These wastes shall be Class B unless the concentrations of other nuclides in Table 2 determine the Waste to be Class C independent of these nuclides.

Note 1. Unless specifically restricted elsewhere in the license, the concentration of a radionuclide or radionuclide mixture may be averaged over the volume (or mass) of the waste and, if used, the solidification agent or matrix. The concentration of radionuclides in filters encapsulated with a solidification agent or matrix shall be averaged over the volume of the filter, not the solidification agent. The volume (mass) of packaging containers, liners or overpacks shall not be included in this calculation, nor shall the volume (mass) of the waste mixture be artificially increased by the addition of heavy, nondispersible solids or objects even if considered as waste. Further guidance is provided in "Low-Level Waste Licensing Branch Technical Position on Radioactive Waste Classification," May 1983, or successor documents issued by the U.S. Nuclear Regulatory Commission.

Note 2. The waste is Class A if none of the listed radionuclides is present. Waste packaged in accordance with Condition 39 of this license shall be Class A unstable and the words "Condition 39" shall be noted on the manifest or other documentation accompanying the waste package.

Note 3. There are no Class B values for Table 1 radionuclides; their presence classifies the waste as either Class A or Class C according to their concentrations.

Note 4. The waste class for mixtures of the listed radionuclides is determined by deriving for each radionuclide the ratio between its concentration in the mixture and its concentration limit in the table of this license and adding the resulting ratio values for each radionuclide group. All limits used in the calculations must be for the same waste class. The sum of the ratios for each radionuclide group must be equal to or less than 1.0, or the waste is the next higher classification than that used for the calculation.

If Class C limits are used in the calculation and the sum of ratios for either group exceeds 1.0, the waste is not acceptable for near-surface disposal without prior written approval from the department.

Note 5. If radioactive waste contains a mixture of radionuclides, some of which are listed on Table 1, and some of which are listed on Table 2, classification shall be determined as follows:

A. If the concentration of a nuclide listed in Table 1 does not exceed the Class A limit, the class shall be that determined by the concentration of nuclides listed in Table 2.

B. If the concentration of a nuclide listed in Table 1 exceeds the Class A limit, but does not exceed the Class C limit, the waste shall be Class C, provided the concentration of nuclides listed in Table 2 does not exceed the Class C value.

Note 6. If concentrations for any single radionuclide exceed the Class C values in the table, the waste is not acceptable for near-surface disposal under this license.

APPENDIX B

APPROVED SOLIDIFICATION MEDIA

License Number: WN-I019-2

Amendment 36

Only approved solidification media can be used. Approved solidification media are:

1. Atcor Cement
2. Aquaset I and II
3. Aztech (General Electric)
4. Bitumen* (Waste Chem and ATI)
5. Chem-Nuclear Cement
6. Concrete (Structural)
7. Delaware Custom Media
8. Dow Media
9. Envirostone
10. LN Technologies Portland Cement Formula for Oils
11. Pacific Nuclear Portland Cement
12. Petroset I and II
13. Safe T Set
14. SEG (Westinghouse - Hittman) Cement
15. Petroset -H
16. Aquaset -H
17. EMC Cement
18. Other solidification media and processes which have been approved by U.S. NRC and/or the department.

*Note: For waste types that require solidification, both oxidized bitumen and straight distilled are acceptable.

"Solidification" means a resultant waste form which is a free-standing solid and primarily relies upon a chemical reaction or encapsulation to contain the liquid. Approved stabilization media may also be used as solidification agents without conducting tests necessary to verify stability, provided the resulting waste form is a free-standing solid.

It is the responsibility of the person processing the waste into a solid form to adhere to a quality control program to verify the waste form is appropriate. If a material can also be used as a sorbent, the restrictions noted for its use in <u>Appendix F</u> shall apply to its use as a solidification agent.

APPENDIX C

APPROVED STABILIZATION MEDIA

License Number: WN-I019-2

Amendment 36

Only approved stabilization media may be used. Approved stabilization media are:

1. Aztech (General Electric)
2. Bitumen* (Waste Chem)
3. Concrete**
4. Dow Media (Vinyl Ester Styrene)
5. Veri Solidification Process
6. Other stabilization media and processes which have been reviewed and approved by U.S. NRC and the department as meeting waste form stability criteria.

*Note: Oxidized Bitumen only.

**Concrete, when used as an encapsulation medium around a small volume of radioactive material; e.g., a sealed source centered in a 55-gallon drum containing concrete, shall have a formulated compressive strength greater than or equal to 2500 psi.

APPENDIX D

CERTIFICATES OF COMPLIANCE FOR HIGH INTEGRITY CONTAINERS

License Number: WN-I019-2

Amendment 36

Only those High Integrity Containers which have been approved by the department and used in accordance with the Certificate of Compliance (C of C) may be used. Approved High Integrity Containers are:

C of C Number	Manufacturer	Package Identification Number
WN-HIC-01	Pacific Nuclear	DSHS-HIC-TMI-01
WN-HIC-02	Nuclear Packaging	DSHS-HIC-EA-50
WN-HIC-03	Chichibu Cement	DSHS-HIC-SFPIC 200L
WN-HIC-04	Chichibu Cement	DSHS-HIC-SFPIC 400L
WN-HIC-05	Nuclear Packaging	DSHS-HIC-EA 142-A
WN-HIC-06	Nuclear Packaging	DSHS-HIC-EA 50-A
WN-HIC-07	Nuclear Packaging	DSHS-HIC-EA 140-A
WN-HIC-08	Nuclear Packaging	DSHS-HIC-EA 190-A
WN-HIC-09	Nuclear Packaging	DSHS-HIC-EA 210-A
WN-HIC-10	Nuclear Packaging	DSHS-HIC-EA 50-C
WN-HIC-11	Nuclear Packaging	DSHS-HIC-EA 140-C
WN-HIC-12	Nuclear Packaging	DSHS-HIC-EA 142-C
WN-HIC-13	Nuclear Packaging	DSS-HIC-EA 190-C

APPENDIX D

CERTIFICATES OF COMPLIANCE FOR HIGH INTEGRITY CONTAINERS

License Number: WN-I019-2

Amendment 36

C of C Number	Manufacturer	Package Identification Number
WN-HIC-14	Nuclear Packaging	DSHS-HIC-EA 210-C
WN-HIC-15	(SEG) LN Technologies	DSHS-HIC-LN 179-H
WN-HIC-16	(SEG) LN Technologies	DSHS-HIC-LN 131-H
WN-HIC-17	(SEG) LN Technologies	DSHS-HIC-LN 118-H
WN-HIC-18	(SEG) LN Technologies	DSHS-HIC-LN 96-H

Other High-Integrity Containers which have been specifically approved by the department.

APPENDIX E

CERTIFICATES OF COMPLIANCE FOR ENGINEERED BARRIERS

License Number: WN-I019-2

Amendment 36

Only those Engineered Barriers approved by the department and/or NRC and used in accordance with the Certificate of Compliance (C of C) may be used. Approved Engineered Barriers are:

C of C Number	Issued To
WN-EB-01	US Ecology Washington, Inc.
WN-EB-02	US Ecology Washington, Inc.

Other Engineered Barriers which have been specifically approved by the department.

APPENDIX F

APPROVED SORBENTS

License Number: WN-I019-2

Amendment 36

Only those absorbents listed below have been approved by the state of Washington, Department of Health, Division of Radiation Protection, (department) for use in packaging and/or processing of incidental or unintentional radioactive liquids in accordance with License Condition 33.

Absorbency efficiencies and quantity of absorbent required vary. In all cases, it is the responsibility of the waste generator and/or packager to determine the efficiency and proper proportions of absorbent for incidental or unintentional liquids being absorbed. Note: Enough absorbent materials must be provided to absorb at least twice the volume of radioactive liquid contents.

Media

A. Clay Materials

1. Speedi Dri
2. Hi Dri
3. Florco
4. Florco X
5. Instant Dri
6. Safe T Sorb
7. Opalex
8. Moltan Plus

B. Diatomaceous Earths

1. Superfine
2. Floor Dry
3. Celetom
4. Safe N Dri
5. Solid-A-Sorb
6. Xtrasorb- 248

C. Perlite *

1. Chemsil 30
2. Chemsil 50
3. Chemsil 3030
4. Dicaperl HP2OO
5. Dicaperl HP5OO

D. Others

1. Dicalite Dicasorb
2. Petroset
3. Petroset II
4. Aquaset
5. Aquaset II
6. Safe T Set
7. SP-100
8. SP-400
9. Large Grain Superabsorbent crystals

* Note: Perlite products shall not be used for packaging animal carcasses.

Attachment 1
US Ecology Richland Materials

1.5 US Ecology Waste Acceptance Criteria

US Ecology Richland, Washington Facility
Waste Acceptance Criteria

The Richland facility disposes of Class A, B and C Low Level Radioactive Waste (LLRW) from Northwest and Rocky Mountain Compact states. Naturally Occurring and Accelerator Produced (NARM) and exempt radioactive material from any geographic location can also be accepted.

This summary is intended for initial waste acceptability screening only. It is the generator's responsibility to comply with U.S.DOT (49 CFR) requirements and other applicable regulations prior to waste shipment.

Accepted Wastes:

- LLRW generated in the Northwest Compact region (Oregon, Washington, Idaho, Montana, Wyoming, Utah, Alaska, Hawaii) & Rocky Mountain Compact region (Nevada, Colorado, New Mexico)
- NARM or Exempt Waste

Basic Requirements for Disposal:

- All waste must be properly packaged in closed containers.
- All waste must be classified in accordance with 10 CFR 61, Washington Administrative Code (WAC) 246-249 and the current NRC "Low-Level Waste Licensing Branch Technical Position on Radioactive Waste Classification"
    - Class B and C waste must meet 10 CFR 61 & WAC 246-249 stability requirements
- All generators disposing of waste at the facility must first obtain:

✓ A generator number
✓ A site use permit (issued by Washington Department of Ecology)
✓ An export permit (for Rocky Mountain Compact waste only)

Prohibited Wastes:

- Mixed waste
- Waste that contains or is capable of generating toxic gases, vapors or fumes
- Wastes containing pyrophoric, hazardous, dangerous or chemically explosive materials or materials which could react violently with water or moisture or when subjected to agitation
- Wastes containing unprocessed liquids
- Wastes containing special nuclear material (SNM) > 350 grams of U-235 or 200 grams of Pu or U-233 (total amount of SNM limited to unity)
- Wastes containing oil> 10% by weight

Please call or e-mail our professional customer service team if you have any questions:

(509) 377-2411 **Mike Ault: LLRW Disposal** mault@americanecology.com
(509) 946-4945 **Chuck White: NARM Disposal** **cwhite@americanecology.com**

Attachment 1
US Ecology Richland Materials

1.6 WDOH concurrence regarding WTP residuals status as source material, 12/20/10 e-mail from Mike Elsen and 12/31/08 letter from WDOH

Subject: FW: Midnite Mine Material Rad profile and LLRW Generator Registration

Chad,

Here is the WDOH concurrence. Provided the material does not qualify as mixed waste it is acceptable at USEW.

If you have any questions do not hesitate to call.

Mike

From: Elsen, Mike (DOH) [mailto:Mike.Elsen@DOH.WA.GOV]
Sent: Mon 20-Dec-10 2:24 PM
To: Mike Ault
Cc: Stoffel, Dorothy (DOH); Hale.Ellie@epamail.epa.gov; Murphy, Sean J (DOH)
Subject: FW: Midnite Mine Material Rad profile and LLRW Generator Registration

Mike-

This is in response to our conversation today regarding the acceptability of the sludge from the Dawn Mining Company- Midnite Mine at your facility. The material from the Midnite Mine was considered Source Material when DOH regulated the facility. Attached is our letter to the USEPA when we terminated the license for the Midnite Mine. The letter states that the license was issued for the production of source material incidental to the treatment of contaminated water at the Midnite Mine.

Provided that the material meets all requirements of your radioactive materials license WN-I019-2 the material is acceptable for disposal at your facility as source material and not 11(e)(2) material. Please let me know if you have any questions.

Mike

From: Mike Ault [mailto:MAULT@usecology.com]
Sent: Monday, December 20, 2010 12:21 PM
To: Elsen, Mike (DOH)
Subject: FW: Midnite Mine Material Rad profile and LLRW Generator Registration

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From: Chad Hyslop
Sent: Fri 17-Dec-10 2:07 PM
To: Mike Ault
Cc: Laura Lee Barry
Subject: FW: Midnite Mine Material Rad profile and LLRW Generator Registration

Can you please review? Also please note (below) that Toby requests a concurrence indicating we believe we can accept this material.

Thx,

Chad

From: Toby Wright [mailto:wrightenv@gmail.com]
Sent: Friday, December 17, 2010 9:14 AM
To: Chad Hyslop
Subject: Midnite Mine Material Rad profile and LLRW Generator Registration

Chad;

STATE OF WASHINGTON
DEPARTMENT OF HEALTH
OFFICE OF RADIATION PROTECTION
111 Israel Road SE • PO Box 47827 • Olympia, Washington 98504-7827
TDD Relary Services: 1-800-833-6388

December 31, 2008

Ms. Elly Hale, Project Manager
U.S. Environmental Protection Agency, Region 10
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101-3140

Dear Ms. Hale:

This is to follow up on our letter to you dated October 15, 2008. In that letter, we stated:

The NRC, from which DOH has delegated regulatory authority for radioactive material, stated its position clearly about radioactive materials licensing at CERCLA sites in a 1999 Directors Decision, DD-99-07. In this decision, NRC cites the permit exemption section of CERCLA, 42 U.S.C.A. 9621(e)(1), which provides: "(n)o Federal, State, or local permit shall be required for the portion of any removal or remedial action conducted entirely onsite, where such remedial action is selected and carried out in compliance with this section." As an Agreement State, it is our obligation to regulate radioactive material consistent with the practices of NRC. In light of the above, DOH intends to terminate the state of Washington radioactive materials license (WN-I0390-1) for the water treatment plant license on December 31, 2008."

The purpose of this letter is to notify you that effective January 1, 2009, the state of Washington radioactive materials license **WN-I0390-1**, which is issued to Dawn Mining Company for the production of source material incidental to the treatment of contaminated water at the Midnite Mine, is **terminated**. From discussions with you, it is our understanding that the U.S. EPA is ready to take over the regulation of radioactive material at the Midnite Mine as of January 1, 2009.

Attached is a copy of the license amendment which terminates the state of Washington radioactive materials license as well as our letter to John Mudge, President of Dawn Mining Company, notifying him of the terminated license. If you should have any questions, do not hesitate to contact me.

Sincerely,

Mikel J. Elsen, Supervisor
Waste Management Section

Enclosures

cc: Alice Blado, AAG
Dorothy Stoffel, DOH
Bob Nelson, DMC
John Mudge, DMC
Rudy Peone, Spokane Tribe of Indians

State of Washington

Radioactive Materials License

License Number WN-I0390-1

Amendment No. 3

Dawn Mining Company
5326 Uranium City Road
Ford, Washington 99013

Attention: Robert Nelson, General Manager

In accordance with the Department of Health letter dated December 31, 2008, your state of Washington Radioactive Materials License Number **WN-I0390-1** is hereby **TERMINATED**.

FOR THE STATE OF WASHINGTON DEPARTMENT OF HEALTH

Date December 31, 2008

By ______________________
Mikel J. Elsen, Supervisor
Waste Management Section

Attachment 1
US Ecology Richland Materials

1.7 NRC Director's Decision, dated March 26, 1999

DD-99-07

UNITED STATES OF AMERICA NUCLEAR REGULATORY COMMISSION

OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS
Carl J. Paperiello, Director

In the Matter of	)	
	)	
The United States Army Corps of Engineers	)	
	)	Docket No. N/A
	)	
	)	
	)	(10 C.F.R. 2.206)

DIRECTOR'S DECISION UNDER 10 CFR § 2.206

I. INTRODUCTION

On October 15, 1998, Thomas B. Cochran, Ph.D., Director, Nuclear Program, Natural Resources Defense Council (NRDC) and James Sottile, IV, Caplin & Drysdale, Chartered, filed a petition on behalf of NRDC (the "petitioner") addressed to L. Joseph Callan, Executive Director for Operations, U.S. Nuclear Regulatory Commission (NRC). The petition requests that NRC exert authority to ensure that the Corps of Engineers' handling of radioactive materials in connection with the Formerly Utilized Sites Remedial Action Program (FUSRAP) is effected in accord with a properly issued license and all other applicable requirements.

II. BACKGROUND

During the 1940s, 1950s, and 1960s, the Manhattan Engineer District and the Atomic Energy Commission performed work at a number of sites throughout the United States as part of the nation's early atomic energy program. Although many of the sites were cleaned up under guidelines in effect at the time, residual contamination remains at many of the sites today. The contaminants at these sites involved primarily low levels of uranium, thorium, and radium, with their associated decay products. The U.S. Department of Energy (DOE) began FUSRAP in

1974 to study these sites and take appropriate cleanup action. By 1997, DOE had identified 46 sites in the program and had completed remediation at 25 sites with some ongoing operation, maintenance, and monitoring being undertaken by DOE. Remedial action was planned, underway, or pending final closeout at the remaining 21 sites.

On October 13, 1997, Congress passed the 1998 Energy and Water Development Appropriations Act,[1] which transferred administration of FUSRAP to the U.S. Army Corps of Engineers (the Corps or USACE) and appropriated $140,000,000 to the Corps for the completion of FUSRAP activities. The language in the law reads as follows:

> For the expenses necessary to administer and execute the Formerly Utilized Sites Remedial Action Program to clean up contaminated sites throughout the United States where work was performed as part of the nation's early atomic energy program, $140,000,000, to remain available until expended: *Provided*, that the unexpended balances of prior appropriations provided for these activities in this Act or any previous Energy and Water Development Appropriations Act may be transferred to and merged with this appropriation account, and thereafter, may be accounted for as one fund for the same time period as originally enacted.[2]

The legislative history behind this provision offers little guidance regarding the details of the Corps' new involvement. The Conference Committee report states that "(t)he conferees have agreed to transfer the Formerly Utilized Sites Remedial Action Program (FUSRAP) to the Corps of Engineers, and funding for this program is contained in Title I of the bill."[3] The House Appropriations Committee report indicates that this change stems from concerns over the cost

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[1]Energy and Water Development Appropriations Act, 1998, Pub. L. No. 105-62, 111 Stat. 1326 (1997)

[2] Id.

[3] H.R. Conf. Rep. No. 271, 105th Cong., 1st Sess., 85 (1997).

of the FUSRAP program under DOE. The Committee report concludes that "(c)learly, the problem must be in the contract management and contract administration function performed by the Department of Energy and the management and operating contractors who actually subcontract for most of the cleanup work."[4] Finally, citing the Corps' efforts under the Formerly Used Defense Sites (FUDS) program, the report indicates that there are significant cost and schedule efficiencies to be gained by "... having the Corps of Engineers manage the Department of Energy's FUSRAP program as well."[5]

Given the lack of guidance in the legislative history, two members of Congress sought to clarify the law's intent through subsequent correspondence. In a November 6, 1997, letter to Energy Secretary Federico Pena and Defense Secretary William Cohen, Senator Pete Domenici and Representative Joseph McDade indicated, among other things, that:

> Transfer of the FUSRAP program to the U.S. Army Corps of Engineers makes management, oversight, programming and budgeting, technical investigations, designs, administration, and other such activities directly associated with the execution of remediation work at the currently eligible sites a responsibility of the Corps of Engineers. It should be emphasized that *basic underlying authorities for the program remain unaltered and the responsibility of DOE* [emphasis added].

The Energy and Water Development Appropriations Act for fiscal year 1999 (FY99), P.L. 105-245, continued the Corps' involvement as the implementing agency for the FUSRAP. In particular, the 1999 Act provided that response actions by the United States Army Corps of Engineers under FUSRAP shall be subject to the administrative, procedural, and regulatory provisions of the Comprehensive Environmental Response, Compensation and Liability Act

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4 H.R. Rep. No. 190, 105th Sess., 99 (1997).

5 Id.

(CERCLA) (42 U.S.C. 9601 et seq.), and the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR, Chapter 1, Part 300. In addition, the 1999 Act provided that, "...except as stated herein, these provisions do not alter, curtail or limit the authorities, functions or responsibilities of other agencies under the Atomic Energy Act (42 U.S.C. 2011 et seq.)..."[6]

To date, NRC has not regulated activities conducted under FUSRAP, including those activities conducted by the Corps since the transfer of the program. The petitioner, however, believes that NRC should regulate the Corps' FUSRAP activities, arguing that the Appropriations Act did not purport to transfer authority over FUSRAP to the Corps. As such, according to the petitioner, the Corps may not legally administer the program absent proper oversight because, unlike DOE and (in most cases) DOE contractors, the Corps is not exempt from the licensing requirements of the Atomic Energy Act (see 42 U.S.C. § 2014(s)). The petitioner further indicates that DOE has publicly stated that it cannot extend its licensing exemption for private contractors to the Corps and that DOE has no regulatory authority over the Corps for the latter's FUSRAP activities. The petitioner concludes that "... the Corps does not have the legal authority to run FUSRAP without first obtaining a license from the NRC."

In support of its position, the petitioner notes that the institutional mission of the Corps is not focused on the safety and security of the nation's nuclear activities. In addition, NRC's failure to regulate the Corps' FUSRAP activities is claimed to be inconsistent with the intent of the laws governing the utilization and cleanup of nuclear materials. Finally, the petitioner adds that, with very few exceptions, Congress intended that no person should be permitted to handle nuclear materials except in accordance with a license issued by NRC.

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[6]Pub. L. No. 105-245, Title I.

In a November 30, 1998, letter NRC informed the petitioner that the petition had been received and was currently under review. On the same date, NRC forwarded the petition to the DOE and the Corps for their comment. In a January 12, 1999, letter, the Chief Counsel for the Corps, Robert M. Andersen, responded to NRC's request. DOE responded to NRC's request in a January 14, 1999, letter from William J. Dennison, Assistant General Counsel for Environment.

The Corps' Response

In its response, the Corps states that it is not required to obtain a license from NRC for its FUSRAP activities. The Corps' response emphasizes that Congress directed the Corps to conduct its FUSRAP activities pursuant to the CERCLA.[7] The Corps' principal argument is that no NRC license is required because of the federal permit waiver for on-site removal or remedial actions in § 121(e)(1) of CERCLA. The Corps also believes that the AEA exempts FUSRAP activity from NRC licensing. In its opinion, "Congress intended for USACE to fill the shoes of the AEC successor agency responsible for FUSRAP cleanup, that is DOE, an agency not considered a 'person' subject to licensing under the AEA." The Corps further posits that, in transferring the FUSRAP program, Congress expressed no intent that the agency obtain an NRC license for that activity and, instead, sought a seamless transition "unimpeded by procedural requirements outside of CERCLA."

Nevertheless, the Corps commits to meeting the substantive requirements of both the Atomic Energy Act (AEA) and CERCLA. It acknowledges that NRC license requirements may

[7]42 USC §9601 et seq.

apply to portions of FUSRAP response actions conducted off-site, beyond the scope of the permit waiver. The letter concludes by acknowledging that the substantive provisions of NRC regulations are applicable or relevant and appropriate requirements (ARARs) for many FUSRAP response actions under CERCLA and, as such, the Corps will look "... to NRC for guidance in interpreting and implementing these requirements on the sites."

DOE's Response

DOE's response differs in several respects from that of the Corps. On the matter of DOE's continued involvement with FUSRAP and oversight of the Corps, the Department "respectfully disagrees" with the Corps. According to its submittal, DOE is not authorized to regulate the Corps' FUSRAP activities and cannot transfer its AEA authorities to the Corps. In the Department's view, "(t)he transfer legislation did not make the Corps a DOE contractor, or otherwise subject the Corps' activities to the control or direction of DOE." The letter also indicates that DOE and the Corps are currently developing a memorandum of understanding (MOU) to clarify their respective roles and responsibilities as a result of the legislative transfer. Nevertheless, DOE believes that, with the exception of a few "administrative issues," there are no remaining issues between the two agencies that should affect NRC's disposition of the NRDC petition. The letter concludes that NRC should "evaluate the licensability of the Corps' activities in the same manner as it would evaluate the activities of any other 'person' within the meaning of the Atomic Energy Act." DOE defers to NRC on this question. The letter does not contain a DOE position concerning the viability of the Corps' CERCLA argument.

III. DISCUSSION

The NRC staff has completed its evaluation of the petitioner's requests and the responses from the Corps of Engineers and the Department of Energy. For the reasons discussed below, the NRC denies the petitioner's request insofar as it calls on NRC to require the Corps to obtain a license for activities conducted at FUSRAP sites.

CERCLA Permit Waiver

Pursuant to § 121(e)(1) of CERCLA, "(n)o Federal, State, or local permit shall be required for the portion of any removal or remedial action conducted entirely onsite, where such remedial action is selected and carried out in compliance with this section."[8] This provision waives any NRC license requirements that would apply to the Corps' activities at FUSRAP sites conducted pursuant to CERCLA.

The Corps argues that, because Congress specifically subjected FUSRAP sites to the provisions of CERCLA in the 1999 Act, section 121(e)(1) applies to Corps' response actions at FUSRAP sites. In developing regulations for the implementation of CERCLA, the Environmental Protection Agency (EPA) addressed the § 121(e)(1) waiver provision for federal agency CERCLA response actions in § 300.400(e) of the National Contingency Plan (NCP). That provision states, in pertinent part:

> "*Permit requirements*. (1) No federal, state, or local permits are required for on-site response actions conducted pursuant to CERCLA sections 104, 106, 120, 121, or 122. The term on-site means the areal extent of contamination and all suitable

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[8]See also, 10 CFR § 300.400(e).

areas in very close proximity to the contamination necessary for implementation of response actions."[9]

In the preamble of the final rule which proposed this section, EPA provided:

> Proposed § 300.400(e)(1) states that the permit waiver applies to all on-site actions conducted pursuant to CERCLA sections 104, 106, or 122; in effect, this covers all CERCLA removal and remedial actions (all "response" actions). However, a number of other federal agencies have inquired as to whether this language would reach response actions conducted pursuant to CERCLA sections 121 and 120. In response, EPA has made a non substantive clarification of the applicability of the permit waiver in CERCLA section 121(e)(1) to include on-site response actions conducted pursuant to CERCLA sections 120 and 121. . . . The addition of CERCLA section 120 simply recognizes that the permit waiver applies to federal facility cleanups conducted pursuant to CERCLA section 120(e), which are also selected and carried out in compliance with CERCLA section 121.[10]

Section 121(e)(1) applies to federal agencies such as the Corps in this case. The Corps may take the role of "lead agency" in a CERCLA cleanup action. The NCP defines "lead agency" as "the agency that provides the OSC/RPM to plan and implement response actions under the NCP. EPA, the USCG, another federal agency, or a state . . . may be the lead agency for a response action."[11] The NCP also states that "Federal agencies listed in § 300.175 have duties established by statute, executive order, or Presidential directive which may apply to federal response actions following, or in prevention of, the discharge of oil or release of a hazardous

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[9]40 CFR 300.400(e)(1).

[10]55 Fed. Reg. 8666, 8689 (1990) ("National Oil and Hazardous Substances Pollution Contingency Plan; Final Rule) (emphasis added). This change echoed EPA's intentions stated in the proposed rule: "EPA proposes to state that on-site permits are not required for response actions taken by EPA, other federal agencies, States, or private parties pursuant to CERCLA sections 104, 106, or 122." 53 Fed. Reg. 51394, 51406 (1988) ("National Oil and Hazardous Substances Pollution Contingency Plan; Proposed Rule) (emphasis added).

[11]40 CFR 300.5 (emphasis added). The definition goes on to state, "The federal agency maintains its lead agency responsibilities whether the remedy is selected by the federal agency for non-NPL sites or by EPA and the federal agency or by EPA alone under CERCLA section 120."

substance, pollutant, or contaminant."[12] The Corps, a branch of the U.S. Department of Defense, is among the agencies listed.[13] In the case of the FUSRAP program, Congress specifically designated the Corps as the "lead agency" in passing the 1999 Appropriations Act.[14]

As the Corps acknowledges in its letter, the permit waiver in § 121(e)(1) has been rarely addressed in the courts. In support of its position, the Corps does cite McClellan Ecological Seepage Situation (MESS) v. Cheney, a case which held that a Resource Conservation and Recovery Act (RCRA) permit was not required when activities which might otherwise require a RCRA permit took place at a site only as part of a CERCLA removal or remedial action.[15] In McClellan, MESS, a citizens' group, filed suit against the Secretary of Defense, with regard to cleanup actions being taken at McClellan Air Force Base, under RCRA and certain state laws. MESS claimed, inter alia, that McClellan was required to obtain a RCRA permit for the management of certain hazardous wastes on the base. The court held that an RCRA permit was not required, because the remedial activities were taken pursuant to CERCLA. The court relied on § 121(e)(1), stating, "Section 121(e) expressly provides that the activity does not have to be separately permitted."[16]

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[12]40 CFR 300.170.

[13]See 40 CFR 300.175(b)(4)(i).

[14]Pub. L. No. 105-245, Title I.

[15]763 F. Supp. 431 (E.D. Cal. 1989). This holding was later vacated on the basis of subject matter jurisdiction. See McClellan Ecological Seepage Situation (MESS) v. Perry, 47 F.3d 325 (9th Cir. 1995).

[16]763 F. Supp. 431, at 435. The court went on to note in dicta that where there has been treatment that requires a RCRA permit which is not associated with a remedial or removal action under CERCLA, such a permit would be required. Id.

The Corps also cites United States v. City of Denver to uphold this interpretation of §121(e)(1).[17] In that case, the court held that CERCLA preempted a zoning ordinance which was in actual conflict with EPA's remedial order. The court stated, "[T]o hold that Congress intended that non-uniform and potentially conflicting zoning laws could override CERCLA remedies would fly in the face of Congress's [sic] goal of effecting prompt cleanups of the literally thousands of hazardous waste sites across the country."[18]

In passing the 1998 and 1999 Appropriations Acts, Congress gave no indication that it intended to suspend the waiver provision in §121(e)(1) of CERCLA in the context of the Corps' FUSRAP activities. The 1999 Act does say: "Provided further, That, except as stated herein, these provisions do not alter, curtail or limit the authorities, functions or responsibilities of other agencies under the Atomic Energy Act (42 U.S.C. 2011 et seq.)..." In its letter, DOE points to this language to support its argument that the Appropriations Act does not create any authority for it to regulate the Corps. In doing so, DOE interprets the term "provisions" as referring to the provisions of the Appropriations Act and not the provisions of CERCLA. The NRC staff agrees with DOE on this point. While the language appears to indicate that the transfer of the program to the Corps does not alter the extent of DOE and perhaps NRC authority under the AEA, there is no specific indication that the language is intended to direct NRC to regulate the Corps' administration of the FUSRAP program. In particular, there is no evidence that in including this phrase, Congress intended to limit the application of the §121(e)(1) permit waiver to the Corps'

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[17]100 F.3d 1509 (10th Cir. 1996).

[18]Id. at 1513. The Corps cited Ohio v. USEPA, 997 F.2d 1520 (D.C. Cir. 1993) in support of its § 121(e)(1) position. NRC would note that the case upholds a number of provisions in EPA's 1990 revision of the NCP, including § 121(e)(1). However, the court's discussion centers on EPA's definition of the term "onsite," and does not discuss the exemption provision, as a whole, in detail.

FUSRAP activities. In fact, nowhere in the reports for either the 1998 or 1999 Acts or in the text of the laws themselves did Congress give any hint that it intended NRC to regulate the Corps in its administration of the FUSRAP program. Instead, the inclusion of the specific reference to CERCLA suggests that Congress intended NRC to continue to refrain from regulating activities under the FUSRAP program even after DOE's role was reduced or discontinued.

As DOE states in its letter, the Corps has "consistently expressed the view that its authorities under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) ..." are sufficient for the Corps' administration of the FUSRAP program. By the time the 1999 Appropriations Act was passed, the Corps' administration of the FUSRAP program under CERCLA was a matter of public record[19] and NRC had not taken any steps to require the Corps to obtain a license from NRC. If Congress had intended NRC to regulate the Corps' activities at FUSRAP sites, it is likely that it would have specifically directed NRC to do so in passing the 1999 Appropriations Act.

We note, however, that the waiver in §121(e)(1) does not apply to off-site activities. To the extent that NRC and U.S. Department of Transportation (DOT) requirements apply to the transportation, transfer and disposal of Atomic Energy Act material taken off of FUSRAP sites, the Corps has committed to following applicable requirements, including those for transfer under the AEA, shipment under the Hazardous Materials Transportation Act, 49 U.S.C. § 5101, and NRC manifest requirements (e.g., 10 CFR §20.2006).[20]

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[19] See, e.g., Letter from Albert J. Genetti, Jr., U.S. Army Deputy Commander, U.S. Army Corps of Engineers, to Mr. Thomas B. Cochran and Ms. Barbara A. Finamore, Natural Resources Defense Council, May 20, 1998.

[20] While the Corps will be following NRC's requirements in this area, it is unlikely that any specific NRC license requirements would apply to shipments from FUSRAP sites. However,

NRC Authority Under UMTRCA

Many FUSRAP sites contain material over which NRC would have no regulatory jurisdiction regardless of whether the Corps is the lead agency in implementing the program and regardless of whether response actions by the Corps under the program are subject to CERCLA. In particular, of the 21 sites at which remediation has not yet been completed, 12 sites contain residual material resulting from activities that were not licensed by NRC at the time the Uranium Mill Tailings Act of 1978 (UMTRCA) became effective or at any time thereafter. As defined by the UMTRCA, NRC does not have authority to regulate cleanup of covered residual material resulting from an activity that was not so licensed.

The language of section 83 of the Atomic Energy Act (42 U.S.C. 2113(a)), was added to that Act by UMTRCA. Section 83 a. requires NRC to impose certain terms and conditions relating to cleanup with respect to any "license issued or renewed after the effective date" of section 83 for covered activities, and also imposes such terms or conditions on any such "license in effect on the date of enactment" of the section. No such responsibility was imposed upon NRC with respect to activities that were not under NRC license before the date of the enactment of section 83, if they were not licensed thereafter.

Prior to the enactment of UMTRCA, neither the AEC nor the NRC had statutory jurisdiction over residual material resulting from the processing of ore for source material. This position was taken by the AEC after careful legal analysis, and was subsequently adopted by the NRC when it succeeded to the AEC's regulatory functions. Though NRC exercised some

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the staff will request that the Corps contact NRC if it plans to ship material that does not meet one of the exemptions for a specific license in NRC regulations. See, e.g., 10 C.F.R. § 71.10.

control over such material in connection with licensed processing of ore for source material, it did not exercise jurisdiction at inactive sites where no license was in effect. UMTRCA was enacted because the Congress recognized that NRC did not have jurisdiction over radioactive residuals resulting from the extraction of uranium or thorium from ore processed for its source material content at inactive sites. This is evidenced by the floor remarks regarding the amended version of H.R. 13650, the bill that was enacted as UMTRCA. Senator Hart explained:

> Although the NRC licenses active uranium mining and milling activities, existing law does not permit the Commission to regulate the disposal of mill tailings once milling and mining operations cease and the operating license expires. It is that authority to regulate tailings after milling operations cease, that we propose be given to the NRC.[21]

Because the residual material at many FUSRAP sites was generated in activities that were not licensed when UMTRCA was enacted, or thereafter, NRC today has no basis to assert any regulatory authority over handling of the residuals at those sites.

The NRC staff notes that many of the remaining sites (i.e., sites containing materials other than mill tailings) also raise some significant jurisdictional questions in their own right. For instance, a few of the sites may still be in legal possession of DOE even though the Corps is conducting clean up at the site under FUSRAP. While the issue of possession appears to be a matter of continuing discussion between the Corps and DOE, it is highly unlikely that NRC would have authority to require a license for cleanup activities conducted at a site which continues to be a DOE-owned or controlled site. In addition, the concentration of radioactive material at some of the remaining sites may not be sufficient to trigger NRC license requirements. While NRC does not have information sufficient to reach a final conclusion for

[21]124 Cong. Rec. S18,748 (October 13, 1978).

specific sites, it is the NRC staff's understanding that some of these sites may contain only "unimportant quantities" of source material as defined under 10 CFR §40.13(a). If this is the case, the amount of material at these sites would not be sufficient to implicate NRC license requirements. Given the limitations of NRC jurisdiction under UMTRCA, the potential DOE ownership issues, and the possibility that several sites may contain "unimportant quantities" of source material, it is likely that the number of FUSRAP sites over which NRC may have jurisdiction would be very small even absent the CERCLA permit waiver.

The Corps' Authority Under the Appropriations Act

In its response, the Corps states that the AEA also exempts FUSRAP activity from NRC licensing because Congress intended the Corps to fill the shoes of DOE, an agency exempt from NRC regulatory requirements under most circumstances. DOE disagrees with this characterization, claiming that, for the most part, it has no role in the FUSRAP program at this time (regulatory, contractual, or otherwise). As such, in DOE's view, the Corps cannot rely on any exemption in the AEA to avoid regulation by NRC. Nevertheless, DOE acknowledges that the transfer to the Corps did not completely eliminate the Department's involvement with FUSRAP. While the issues have yet to be resolved, DOE may have responsibility for inventory reporting of government-owned FUSRAP sites to the General Services Administration and may be required to conduct post-cleanup monitoring at some sites after the Corps' clean up activities cease.

DOE and the Corps are working on an MOU to address their disagreements regarding the nature of the transfer of the FUSRAP program and their respective responsibilities under the program. Until the disagreement has been resolved, either by the agencies or by further direction from Congress, the NRC staff need not reach a conclusion on the matter. Nevertheless, in view of the clear applicability of CERCLA §121(e)(1) to the Corps' activity at FUSRAP sites, the staff does not believe that it would be appropriate to require the Corps to obtain an NRC license for its activity at FUSRAP sites.

IV. CONCLUSION

In sum, Congress has given NRC no clear directive to oversee USACE's ongoing effort under CERCLA to complete the FUSRAP cleanup project. Indeed, Congress has provided NRC no money and no personnel to undertake an oversight role. In addition, Congress has made it clear that the Corps is to undertake FUSRAP cleanup pursuant to CERCLA which waives permit requirements for onsite activities. In these circumstances, we are disinclined to read our statutory authority expansively, and to commit scarce NRC resources, to establish and maintain a regulatory program in an area where, under Congressional direction, a sister federal agency already is at work and has committed itself to following appropriate safety and environmental standards.

Accordingly, I deny the petition insofar as it requests NRC to impose licensing and other regulatory requirements on the Corps for that agency's handling of radioactive material at FUSRAP sites. Both the permit waiver provision of CERCLA and the ambiguity regarding DOE's role in the program lead me to the conclusion that NRC should not inject itself into the

FUSRAP program at this time. Absent specific direction from Congress to the contrary, NRC will continue to refrain from regulating the Corps in its clean up activities at FUSRAP sites.

As provided by 10 C.F.R. § 2.206, a copy of this Decision will be filed with the Secretary of the Commission for the Commission's review. The Decision will become the final action of the Commission 25 days after issuance, unless the Commission, on its own motion, institutes review of the Decision within that time.

Dated at Rockville, Maryland this 26th day of March, 1999.

FOR THE NUCLEAR REGULATORY COMMISSION

Original Signed By

Carl J. Paperiello, Director
Office of Nuclear Material Safety
and Safeguards

Attachment 2

Residuals Transportation Plan for the Midnite Mine Water Treatment Plant

Residuals and Ion-Exchange Resin Transportation Plan for the Midnite Mine Water Treatment Plant

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January 15, 2013

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Exhibit B: Documentation for US Ecology Richland Facility
- B.1: Radioactive Waste Shipment Certification Form RHF-31D
- B.2: Example Waste Manifest (NRC forms 540, 541)

Exhibit C: Documentation for Energy Fuels Inc. White Mesa Mill
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Exhibit D: Documentation for US Ecology Grand View Facility
- D.1: Land Disposal Restriction Form
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Exhibit E: Typical IX Resin Technical Data
DOWEX 21K XLT & RESINTECH SIR-1200

1 INTRODUCTION

This Residuals and Ion-Exchange Resin Transportation Plan (RTP) is provided as a supporting document to the Residuals Management Plan, which was prepared in accordance with the Statement of Work (SOW) for Interim Water Management (U.S. Environmental Protection Agency [EPA], 2008) for the Midnite Mine Superfund Site in accordance with the Unilateral Administrative Order (UAO) for Remedial Design and Remedial Action (EPA Docket No. Comprehensive Environmental Response Compensation and Liability Act [CERCLA]-10-2009-0026). The subsequent Consent Decree (CD) with its associated Statement of Work (CD-SOW) incorporates the requirements from the UAO into the CD. This plan has been prepared for Dawn Mining Company (DMC) and Newmont USA Limited (Newmont) by Wright Environmental Services Inc.

As discussed in the RMP, four potential off-site disposal areas have been identified that would be utilized in conjunction with the four different sludge management alternatives described in the RMP. The potential off-site disposal areas include:

- DMC's Millsite TDA-4 in Ford, Washington
- Energy Fuels, Inc. (Energy Fuels) White Mesa Mill near Blanding, Utah
- US Ecology's Grandview Facility in Idaho and ion-exchange resin transportation to Cameco's Smith Ranch ISL Central Processing Plant in Wyoming
- US Ecology's Richland Facility in Washington

The first disposal alternative, proposed as a short-term, interim disposal option only, is to continue the current WTP process for direct disposal of WTP sludge in the Dawn Millsite Tailings Disposal Area 4 (TDA-4). Final closure of the Dawn Millsite TDA has been delayed for reasons unrelated to past disposal of WTP sludge. Consequently, TDA-4 remains available as a viable, interim, short-term disposal option which is cost effective and has been approved by both the EPA and the Washington Department of Health (WDOH). This alternative is available and will be utilized through the 2013 treatment season. This alternative will not be available after 2013.

The second disposal alternative is to have the WTP residuals processed for their source material content by Energy Fuels (formerly Denison Mines) at their White Mesa Mill near Blanding, Utah. The Energy Fuels White Mesa Mill is a "licensed off-site facility;" its license is administrated by the Utah Department of Environmental Quality (UDEQ), Division of Radiation Control (DRC) under the U.S. Nuclear Regulatory Commission (NRC) Agreement State Program. At that time, DMC would seek permission from and coordinate with the EPA to implement the proposed long-term disposal alternative and\or the other alternative, as appropriate.

The third alternative is to modify the existing WTP system by adding an ion-exchange component. This component would selectively remove uranium from the mine water before the chemical precipitation step is used which produces sludge needing disposal. By removing uranium from the mine water before the sludge is produced, the sludge would not have levels of uranium in excess of 0.05 percent (%) and could therefore be disposed of at the US Ecology facility in Grandview, Idaho, located 70 miles southeast of Boise, Idaho. This alternative is predicated on the assumption that the uranium levels in the WTP residuals have been reduced using ion-exchange or similar method as part of the WTP process. Disposal costs at the Grandview facility are more cost effective than at the US Ecology Richland facility which is the only disposal option for the sludge with uranium in excess of 0.05%.

Under this alternative, the ion-exchange (IX) resin loaded with uranium would be transported to the Cameco Resources Smith Ranch ISL Central Processing Plant near Douglas, Wyoming for processing. The Cameco facility would remove the uranium from the resin and regenerate the exchange capacity of the resin. Subsequently, the resin would be transported back to the Midnite mine for re-use. Cameco's NRC radioactive materials license specifically allows Cameco to accept loaded ion-exchange resins from water treatment facilities. This alternative would be implemented after disposal at TDA-4 is no longer available and if reprocessing of the sludge is not available at the Energy Fuels facility.

The fourth disposal alternative is to dispose of residuals at the US Ecology's facility in Richland, Washington. This facility would be utilized for disposal of source material waste from the ion-exchange process. This facility could also be used as a contingency for disposal of the entire waste stream from the water treatment plant.

This RTP addresses the transportation to each of these four potential disposal facilities.

1.1 Purpose and Objectives

The purpose of this RTP is to describe the shipping program and the requirements for transporting the WTP residuals and IX resin from the Midnite Mine WTP in accordance with the requirements of Section 12.2.3 of the ROD (EPA, 2006). The objective of this RTP is to ensure that the WTP residuals and IX resins are appropriately transported in accordance with the UAO, SOW, and ROD, as well as state and federal requirements.

1.2 Plan Organization

Section 2 presents the physical and radiological characteristics and the shipping classification of the WTP residuals and IX resins, which are used as the basis for determining the U.S. Department of Transportation (DOT) shipping requirements under 49 CFR Part 170 through Part 173. Section 3 presents the information regarding the selected material transport carrier. Section 4 presents the requirements for the shipping to the four potential disposal facilities based on the material DOT classification developed in Section 2. Referenced materials are included in specific exhibits to this RTP.

2 MATERIAL CHARACTERISTICS AND SHIPPING CLASSIFICATION

2.1 Material Characteristics

2.1.1 Residual Solids

Based on years of analytical testing on the WTP residuals, these materials contain greater than 0.05 percent natural uranium and are considered Source Material as per 10 CFR Part 810.3. Therefore, these materials are specifically exempted from the Resource Conservation and Recovery Act (RCRA) under 40 CFR Part 261.4 and are not listed as hazardous waste as defined by RCRA 40 CFR Part 261.3. In addition, based on analytical test results, these materials do not exhibit the characteristics of hazardous waste, including toxicity, ignitability, corrosivity, or reactivity. These material are not classified as a mixed waste.

While the effluent sludge produced as part of the ion-exchange process described in the RMP would have uranium concentrations less than 0.05 percent and would therefore not be considered Source Material, for the purposes of this transportation plan, it is assumed that the effluent sludge would be transported using the more stringent procedures required for Source Material.

2.1.2 Ion-Exchange Resins

IX resins to be used at the Midnite Mine are Type I or Type II strong base anionic exchange (SBAE) resins (MWH, 2011). SBAE resins equal or similar to Dowex 21K XLT or ResinTech SIR-1200 will be used. Based on initial loading from bench scale testing with site-specific waters the IX resins will be loaded with uranium to approximately 30,000 mg/kg to 44,000 mg/kg (Tetra Tech, 2010). The resins have individual bead densities of approximately 1.08 g/mL and shipping weights of approximately 670 g/L or 42 lbs/ft^3.

2.2 Material Shipping Classification

2.2.1 Residual Solids

The origin and radiological characteristics of the WTP residuals were used to establish the material transportation classification as per DOT requirements. The radionuclides present are all derived from a natural uranium ore deposit and have not been processed. The WTP residuals are classified as Source Material and meet the definition of Low Specific Activity (LSA) material per 49 CFR 173.403 for shipping purposes. These residuals meet LSA group I criteria (iii) for shipments to US Ecology of "Radioactive material excluding fissile material, for which the A2 value is unlimited." These residuals also meet LSA group I (i) criteria for shipments to the Energy Fuels White Mesa Mill.

> "uranium and thorium ores, concentrates of uranium and thorium ores, and other ores containing naturally occurring radionuclides, which are intended to be processed for use of these radionuclides."

The proper shipping name for this material per 49 CFR 172.101 is Radioactive Material, LSA-I non-fissile, Class 7, UN2912. The Washington Administrative Code classification of the material is Class A low level radioactive waste-Unstable (AU).

The allowable conveyance activity for transportation of uranium ores and Source Material is unlimited as per 49 CFR Part 173.427(e), Table 5. Uranium ores may be shipped unpackaged as per 173.427(c). All shipments will be consigned as exclusive use, as defined in 49 CFR Part 173.403, which essentially means that a single consignor having radiological training and resources appropriate for safe handling of the consignment has complete use and oversight of the loading and unloading of the consignment. As per 173.427(a)(6)(v), the shipments are exempt from placarding requirements except for the labeling and marking requirements identified in 173.427(6)(vi), and external contamination control limits per 173.443.

2.2.2 IX Resins

In order to classify the materials and develop the appropriate documentation for an IX resin shipment, the RSO or properly trained designee will determine the expected activity and mass for each consignment. In many cases the precise activity of a shipment is not known. Generally, this will be the case for virtually all environmental, operational, and process samples. It is acceptable to estimate the expected activity of a consignment using historical or media appropriate data to determine whether the consignment is a radioactive material. The RSO or designee will document the data and assumptions used to make this determination for each shipment. Based on historical experience with uranium recovery operations using IX resins, the loaded IX resins contain sufficient amounts of radionuclides to be classified as radioactive material, LSA-I non-fissile, Class 7, UN2912 as per 49 CFR 172.101. All shipments will be consigned as exclusive use, as defined in 49 CFR Part 173.403, which essentially means that a single consignor having radiological training and resources appropriate for safe handling of the consignment has complete use and oversight of the loading and unloading of the consignment.

Once the expected consignment activity and activity concentration is determined, the RSO or designee will consult the limits contained in the table contained in 49 CFR §173.436, "Table of Exempt Material Activity Concentrations and Exempt Consignment Activity Limits for Radionuclides". This table lists the concentration and activity limits for all radionuclides. In order to meet the definition of radioactive material, a planned shipment must exceed both the activity concentration limit and exempt consignment activity limit. If the shipment does not exceed both, it must be shipped as a nonhazardous material and may not be shipped as a radioactive material.

3 TRANSPORTATION CARRIER

CAST Transportation has been identified as the certified contract transportation carrier (Carrier) for WTP residual shipments to third party facilities. DMC will continue to transport the WTP residuals to the Dawn Millsite as long as that alternative is permissible. Documentation that the Carrier has and possesses current DOT Hazardous Materials Certificate (Reg 051509 550 028RT), Contingency Plan, Health and Safety Program, Hazardous Materials Security Plan, Interstate Commerce Commission Permit are provided in Exhibit A. The Carrier will transport the WTP residuals from the Midnite Mine WTP according to their Policy and Procedure Manual.

The Carrier will be notified when the packages (tanker trailer for IX resins or trailer with Super Sack®-type containers for WTP residual solids) will meet capacity and will pick up the trailer for transportation according to the appropriate scenario. No loading or unloading of the package(s) will be allowed between the Midnite Mine and designated disposal site as per 40 CFR Part 173.441(b)(1)(iii).

The Carrier will ensure that its drivers maintain the appropriate drivers certifications, endorsements, and emergency response training. Emergency response to incidents or accidents during transport will be the responsibility of the Carrier. The Carrier will adhere to the procedures and requirements identified in their Contingency Plan, Hazardous Materials Security Plan, Health and Safety Program, and DMC instructions to the Carrier.

All work will be conducted in a manner to minimize worker contact with radioactive materials and comply with the As Low As Reasonably Achievable (ALARA) principle, keeping radiation exposure as low as reasonably achievable. All work will be performed in accordance with Washington State regulations and DOT hazardous material transportation regulations, 49 CFR 171-180. Furthermore, the Carrier will maintain requisite insurance coverage at all times during the contract period.

The carrier will be responsible for providing and posting the appropriate markings, labels and\or placards on the transport vehicles going to the third party facilities.

4 TRANSPORTATION SCENARIOS

4.1 Transportation Scenario 1: Dawn Millsite TDA-4

This disposal alternative, will continue as a short-term, interim disposal option only and involves direct disposal of WTP sludge in the Dawn Millsite tailings disposal area 4 (TDA-4). This alternative is currently being implemented and will be ongoing only through the 2013 treatment season. This alternative will not be available after 2013. After 2013, DMC would seek permission from and coordinate with the EPA to implement the proposed long-term disposal alternative and\or the other alternative, as appropriate.

The WTP solids will continue to be shipped in accordance with the Dawn Millsite Radioactive Materials License (RML) (WN-I043-2) in the same manner as they have been for the past 10 years.

4.1.1 Shipping Containers

The WTP residuals will be transported in the existing DMC exclusive-use 13 cubic yard dump truck, which has been used for this purpose for the past 10 years.

4.1.2 Transportation

DMC's will drive the dump truck to the Dawn Millsite site once the truck is filled. Because the Dawn Millsite is located close to the Midnite Mine and the transportation cycle time is less than a few hours, no secondary truck will be required to allow continued operations and discharge of the WTP.

4.1.3 Shipping Papers and Documentation

4.1.3.1 Shipping Papers

DMC will perform the requisite scanning of radiation emanating from the loaded trailers as per 49 CFR 173.441. Shipping papers will be completed for each shipment of packages and provided to the Carrier. An example shipping paper is presented in Exhibit C.

4.1.3.2 Off-Site Rule Verification

This facility remains acceptable for receipt of the WTP residuals as confirmed with EPA Region 10.

4.2 Transportation Scenario 2: Energy Fuels White Mesa Mill

Under this scenario, the Midnite Mine WTP residuals will be loaded into tight-tarped dump trailers and driven to the Energy Fuels White Mesa Mill, where they will be off loaded and managed in accordance with their RML (No. UT 1900479) and processed for their source material content.

4.2.1 Shipping Containers

The Carrier will maintain an end-dump or side-dump multi-axel trailer with a capacity of up to 80,000 pounds gross vehicle weight (gvw) on site for loading of the WTP residuals. As described in Section 2.2 and as per 49 Part 173.427(c), the WTP residuals can be shipped in bulk and unpackaged. Secured tarpaulins will be used to protect contents from weather and leakage.

The trailers will be hauled by single-axel or multi-axel tractor trucks and will comply with all federal regulations including, but not limited to, 49 CFR Part 173.427(a)(6), 173.427(c), and 173.443. Each trailer is considered a single consignment or shipping package. Based on the physical characteristics of the WTP residuals (i.e., high percent solids and absence of free water), no bed liners are required, but may be used if deemed prudent by DMC.

4.2.2 Transportation

A Carrier representative will be present following completion of trailer loading and will secure the tarpaulin and transport the trailer to the Energy Fuels White Mesa Mill after external radiological measurements for contamination and for exposure have been completed. The Carrier will deliver an empty trailer to the site to allow for continued loading of the WTP residuals while transporting the full trailer. If practicable, a second trailer of equal or lesser capacity, also referred to as a "pup" trailer, may be added to the primary trailer to increase transportation efficiency.

The Carrier will empty their trucks as directed by Energy Fuels. The trailers will then be covered, externally decontaminated, and returned to the Midnite Mine for reloading. The unloading of the material, trailer decontamination, and release of the trailers at the Energy Fuels White Mesa Mill will be performed in accordance with the Energy Fuels RML and standard operating procures (SOP).

4.2.3 Shipping Papers and Documentation

4.2.3.1 Shipping Papers

DMC will perform the requisite scanning of radiation emanating from the loaded trailers as per 49 CFR 173.441. Shipping papers will be completed for each shipment of packages and provided to the Carrier. An example shipping paper is presented in Exhibit C.

4.2.3.2 Instructions to Carrier

The Carrier will be provided written instructions from DMC regarding the control of the material packages prior to taking possession of the transportation packages as per 40 CFR Part 173.427(6). These instructions are included in Exhibit A.

4.2.4 Off-Site Rule Verification

Should this alternative be required, the acceptability of the Energy Fuels White Mesa Mill to receive the WTP residuals will be confirmed with EPA Region 8 less than 60 days prior to shipping.

4.3 Transportation Scenario 3: US Ecology Grand View Facility & Cameco's Wyoming Facility

Under this alternative, DMC plans to ship the WTP residuals to the US Ecology Grand View RCRA treatment, storage and disposal facility near Boise, Idaho. It is assumed that the WTP residual solids uranium and radionuclide activity concentrations have been reduced through pretreatment of the influent water using IX or similar method to meet the Grand View Waste Acceptance Criteria. The WTP residuals would be shipped in accordance with the Grandview facility permits and RML. DMC will submit to US Ecology Grand View a Land Disposal Restriction Form and a Uniform Hazardous Waste Manifest with each shipment to the Grand View facility. Examples of these forms are included in Exhibit D.

In addition, this alternative involves transportation of loaded IX resins to Cameco Resources Wyoming uranium recovery facility near Douglas, Wyoming for stripping of the uranium and regeneration of the IX resin's exchange capacity. The stripped uranium would become part of Cameco's local uranium production stream and refined into yellow cake (uranium oxide or U_3O_8). The resin stripping would be performed in discrete batches involving only the resins from the DMC site, No intermixing of DMC's IX resins and Cameco's own IX resins would occur. The regenerated DMC IX resins would be transported back to the DMC site for re-use.

4.3.1 Residual Solids

4.3.1.1 Shipping Containers

The Grand View facility is licensed as a "bulk" facility. Therefore, the WTP residuals will be transported in tarped end-dump or side-dump trailers. The Carrier will maintain a multi-axel flat bed or enclosed trailer with a capacity of up to 80,000 pounds gvw on site for loading of the filled containers of the WTP residuals as they are produced.

4.3.1.2 Transportation

The Carrier will maintain an end-dump or side-dump multi-axel trailer with a capacity of up to 80,000 pounds gross vehicle weight (gvw) on site for loading of the WTP residuals. Secured tarpaulins will be used to protect contents from weather and leakage.

The trailers will be hauled by single-axel or multi-axel tractor trucks and will comply with all federal regulations. Each trailer is considered a single consignment or shipping package. Based on the physical characteristics of the WTP residuals (i.e., high percent solids and absence of free water), no bed liners are required, but may be used if deemed prudent by DMC.

The Carrier will deliver an empty trailer to the site to allow for continued loading of the WTP residuals while transporting the full trailer. If practicable, a second trailer of equal or lesser capacity, also referred to as a "pup" trailer, may be added to the primary trailer to increase transportation efficiency.

The trailers will be off loaded as directed by US Ecology Grand View personnel. The trailers will then be covered, externally decontaminated, and returned to the Midnite Mine for reloading. The unloading of the material, trailer decontamination, and release of the trailers at the Richland facility will be performed in accordance with the US Ecology Grand View facility's RML and standard operating procures (SOP).

4.3.1.3 Shipping Papers and Documentation

DMC will perform the requisite monitoring of surface contamination per 173.443 and radiation emanating from the loaded trailers as per 49 CFR 173.441. A Uniform Hazardous Materials Manifest will be completed by DMC and will accompany each shipment. Examples of this manifest form is included in Exhibit D. In addition, DMC will provide the Carrier with specific instructions for maintenance of the exclusive use shipment controls as per 40 CFR Part 173.427(6), emergency response guidance will be as per the Carrier's Contingency Plan. These instructions are included in Exhibit A.

4.3.1.3.1 Off-Site Rule Verification

The acceptability of the Grand View facility will be confirmed with the EPA Region 10 Off-Site Rule coordinator less than 60 days prior to shipping.

4.3.2 IX Resins

4.3.2.1 Shipping Containers

IX resin will be shipped from the Site using exclusive use[1], liquid tight tanker multi-axel trailers.

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[1] 49 CFR 173.403 - Definitions: *Exclusive use* means sole use by a single consignor of a conveyance for which all initial, intermediate, and final loading and unloading are carried out in accordance with the direction of the consignor or consignee. The consignor and the carrier must ensure that any loading or unloading is performed by personnel having radiological training and resources appropriate for safe handling of the consignment. The consignor must provide to the initial carrier specific written instructions for maintenance of exclusive use shipment controls, including the vehicle survey requirement of § 173.443 (c) as applicable, and include these instructions with the shipping paper information provided to the carrier by the consignor.

4.3.2.2 Transportation

The Carrier will provide exclusive use multi-axel tanker trailers for loading and transport of the IX resins. The trailers will be hauled by single-axel or multi-axel tractor trucks and will comply with all federal regulations. Each trailer is considered a single consignment or shipping package. The tanker will be loaded according to DMC's standard operating procures (SOP).

The tanker trailers will be off loaded as directed by Cameco personnel according to Cameco's SOP. The trailers will then be scanned, externally decontaminated as necessary, and returned to the Midnite Mine for reloading. The unloading of the material, trailer decontamination, and release of the trailers at the Richland facility will be performed in accordance with the US Ecology Grand View facility's RML and SOP.

4.3.2.3 Shipping Papers and Documentation

DMC will perform the requisite monitoring of surface contamination of radiation emanating from the loaded trailers as per 49 CFR 173.441. A Bill of Lading will be completed for all shipments of IX resin to or from the Cameo Facility. The Bill of Lading will include a description of material (Radioactive Material, UN2912, Low Specific Activity - I, ion-exchange resin containing natural uranium), the IX resin slurry weight (lbs), the uranium weight (lbs), the transportation classification of the IX resin (LSA, Exclusive Use Shipment) as well as the total activity of the shipment in MBq and Ci. Example Bills of Lading for loaded and stripped IX resins are included in Exhibit A.

Further, DMC will provide the Carrier with specific instructions for maintenance of the exclusive use shipment controls as per 40 CFR Part 173.427(6), emergency response guidance will be as per the Carrier's Contingency Plan. These instructions are included in Exhibit A. Off-Site Rule Verification

4.3.2.3.1 Off-Site Rule Verification

The acceptability of the Cameco's Wyoming facility will be confirmed with the EPA Region 10. Because the Cameco Facility does not routinely process hazardous substances from CERCLA sites and has not been subject to previous Off-Site Rule approvals, EPA Region 10 would coordinate this review with the EPA Region 8 Office Off-Site Rule coordinator, the Wyoming Department of Environmental Quality, Land Quality Division, and any local agencies that regulate Cameco's Wyoming facility. This first-time verification could take between one to several months.

4.4 Transportation Scenario 4: US Ecology Richland Facility

The small volume Source Material waste stream from the ion-exchange process or the bulk sludge from the water treatment plant could be disposed of at the US Ecology Richland Facility. The WTP residuals would be shipped in accordance with the Richland facility RML No. WN-I019-2. DMC will submit to US Ecology a Radioactive Waste Shipment Certification Form RHF-31D and a Waste Manifest with each shipment to the Richland facility. Examples of these forms are included in Exhibit B.

4.4.1 Shipping Containers

The Richland facility is not licensed as a "bulk" facility. Therefore, the WTP residuals will be transported in IP-1 Certified Pac Tec Lift bags or similar containers for bulk sludge or 55-gallon drums or similar containers for the small volume Source Material residuals from the ion-exchange process.

The lift bag containers are woven polypropylene flexible intermediate bulk containers (FIBC) for the shipping, handling, and storing of dry, flowable products. The containers typically have an open duffel top with web tie closure, flat bottom design, and a polyethylene or similar liner inserted and webbing lift loops.

The filled containers, also referred to as packages, will each be stenciled with the words identified below in letters equal to or greater than 1 inch in height as per 49 CFR Part 173.427(a)(6)(vi) and WAC 246-249-060:

RADIOACTIVE LSA-1
WAC Class AU
UN 2912
DMC-#
mm/dd/yyyy

The unique identification number (DMC-#) corresponds to the sequential package that was filled denoting the n[th] package filled that operating year (i.e., the 23[rd] bag filled in 2011, would be labeled MDC-23).

The Carrier will maintain a multi-axel flat bed or enclosed trailer with a capacity of up to 80,000 pounds gvw on site for loading of the filled containers of the WTP residuals as they are produced. The packages will be secured on the flatbed and covered with a tight tarp or will be secured within the enclosed trailer to prevent shifting during transport. If a different container is used, the characteristics will be comparable to those described above and will meet all necessary DOT and US Ecology Richland facility RML requirements.

4.4.2 Transportation

A Carrier representative will be present following completion of trailer loading of and will secure of the tarpaulin and transport the trailer to the US Ecology Richland facility after external radiological measurements for contamination and for exposure have been completed. The Carrier will deliver an empty trailer to the site to allow for continued loading of the WTP residuals while transporting the full trailer. If practicable, a second trailer of equal or lesser capacity, also referred to as a "pup" trailer, may be added to the primary trailer to increase transportation efficiency.

The flatbed trailers will be off loaded as directed by US Ecology personnel. The trailers will then be covered, externally decontaminated, and returned to the Midnite Mine for reloading. The unloading of the material, trailer decontamination, and release of the trailers at the Richland facility will be performed in accordance with the Richland facility's RML and standard operating procures (SOP).

4.4.3 Shipping Papers and Documentation

4.4.3.1 Shipping Papers and Manifests

DMC will perform the requisite monitoring of surface contamination per 173.443 and radiation emanating from the loaded trailers as per 49 CFR 173.441. A Hazardous Materials Manifest (also known as NRC forms 540 and 541) will be completed by DMC and will accompany each shipment. Examples of these manifest forms are included in Exhibit B. In addition, DMC will provide the Carrier with specific instructions for maintenance of the exclusive use shipment controls as per 40 CFR Part 173.427(6), emergency response guidance will be as per the Carrier's Contingency Plan. These instructions are included in Exhibit A.

4.4.3.2 Off-Site Rule Verification

40 CFR Part 300.440(a)(4) requires determination of:

"...the acceptability under this section of any facility selected for the treatment, storage, or disposal of CERCLA waste. EPA will determine if there are relevant releases or relevant violations at a facility prior to the facility's initial receipt of CERCLA waste. A facility which has previously been evaluated and found acceptable under this rule (or the preceding policy) is acceptable until the EPA Regional Office notifies the facility otherwise pursuant to 300.440(d)."

The acceptability of the US Ecology Richland facility has been confirmed with Mr. Adam Baron, the EPA Region 10 Off-Site Rule coordinator. The acceptability of this facility to receive the WTP residuals will be confirmed with EPA Region 10 less than 60 days prior to shipping.

5 REFERENCES

MWH, 2012. Midnite Mine Superfund Site Revision 0 Pilot-Scale Test Results for Uranium Removal Using Anionic Exchange Resins and Chemical Precipitation. Prepared for: Dawn Mining Company and Newmont USA Limited. December 31, 2012.

Tetra Tech, 2010. Midnite Mine Ion-Exchange Treatability Testing Data Report Revision 2. Prepared for: Dawn Mining Company and Newmont USA Limited. Section 2.2. June 28, 2010.

U.S. Environmental Protection Agency, 2008. Statement of Work (SOW) for Interim Water Management. Office of Environmental Cleanup EPA Region 10.

U.S. Environmental Protection Agency, 2009. Unilateral Administrative Order (AO) for Remedial Design and Remedial Action. EPA Docket No. CERCLA-10-2009-0026. 2009.

U.S. Environmental Protection Agency, 2010. Midnite Mine Superfund Site Spokane Indian Reservation Washington, Record of Decision. Office of Environmental Cleanup EPA Region 10. September, 2006.

Wright Environmental Services, 2010. Residuals Management Plan for the Midnite Mine Water Treatment Plant. December 29, 2010.

EXHIBIT A

CARRIER DOCUMENTS

A.1: Carrier DOT Hazardous Materials Transportation Certificate

A.2: Contingency Plan (Emergency Response), Health and Safety Program, Security Plan

A.3: Dawn Mining Company Instructions to Carrier

EXHIBIT A.1

CARRIER DOCUMENTS

Carrier DOT Hazardous Materials Transportation Certificate

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION

HAZARDOUS MATERIALS CERTIFICATE OF REGISTRATION FOR REGISTRATION YEAR(S) 2012-2015

Registrant: SOUTH PARK MOTOR LINES, INC., DBA, CAST TRANSPORTATION, INC.
Attn: RANDY B. WITHROW
9850 HAVANA ST
HENDERSON, CO 80640-8443

This certifies that the registrant is registered with the U.S. Department of Transportation as required by 49 CFR Part 107, Subpart G.

This certificate is issued under the authority of 49 U.S.C. 5108. It is unlawful to alter or falsify this document.

Reg. No: 051612 552 009UW **Issued: 01/14/2013** **Expires: 06/30/2015**

Record Keeping Requirements for the Registration Program

The following must be maintained at the principal place of business for a period of three years from the date of issuance of this Certificate of Registration:

(1) A copy of the registration statement filed with PHMSA; and
(2) This Certificate of Registration

Each person subject to the registration requirement must furnish that person's Certificate of Registration (or a copy) and all other records and information pertaining to the information contained in the registration statement to an authorized representative or special agent of the U. S. Department of Transportation upon request.

Each motor carrier (private or for-hire) and each vessel operator subject to the registration requirement must keep a copy of the current Certificate of Registration or another document bearing the registration number identified as the "U.S. DOT Hazmat Reg. No." in each truck and truck tractor or vessel (trailers and semi-trailers not included) used to transport hazardous materials subject to the registration requirement. The Certificate of Registration or document bearing the registration number must be made available, upon request, to enforcement personnel.

For information, contact the Hazardous Materials Registration Manager, PHH-52, Pipeline and Hazardous Materials Safety Administration, U.S. Department of Transportation, 1200 New Jersey Avenue, SE, Washington, DC 20590, telephone (202) 366-4109.

EXHIBIT A.2

CARRIER DOCUMENTS

Documentation: Contingency Plan (Emergency Response)

Health and Safety Program

Hazardous Materials Security Plan

CAST TRANSPORTATION

January 15, 2013

To whom it may concern:

This letter is certification that Cast Transportation has written, and trained our drivers on the Security Plan and Risk Assessments in accordance with 75 FR 10974-10989 and 49 CFR 172.800, subparts H and I, and 49 CFR 177.800. All Cast drivers are trained on Hazardous Materials per 49 CFR and also receive an Emergency Response and Comprehensive Contingency Plan which contains procedures and emergency response phone numbers in case of a spill or release.

Respectfully,

Michael Padilla

Michael Padilla
Safety Director
CAST Transportation
9850 Havana St
Henderson, CO 80640
303-534-6376

CAST TRANSPORTATION

January 15, 2013

To whom it may concern:

This letter is certification that CAST Transportation has a Health and Safety Program. It is incorporated in our Policy and Procedure manual and all drivers receive a copy and are trained on it during new hire orientation.

Respectfully,

Michael Padilla
Safety Director
CAST Transportation
9850 Havana St
Henderson, CO 80640
303-534-6376

EXHIBIT A.3

CARRIER DOCUMENTS

Dawn Mining Company Instructions to Carrier

The consignment material in each package is a US Department of Transportation (US DOT) Class 7 radioactive material that qualifies as a Low Specific Activity as per 49 CFR 173.403. The consignment material in each package is ***not*** a RCRA listed waste nor does it have RCRA hazardous waste characteristics.

Once the Carrier takes possession of the consignment material package(s), the Carrier shall maintain control of the package(s) at all time. The carrier shall at all times avoid any and all actions that will unnecessarily delay delivery or unnecessarily result in increased radiation levels or radiation exposures to the transport workers or members of the general public as per 49 CFR Part 174.427(6).

The Carrier shall not allow any loading or unloading of the consignment material package(s) between the Midnite Mine and the final destination of the consignment material package(s). In addition, the Carrier shall transport the consignment material in a safe and prudent manner such that no leakage occurs from the shipment during normal transportation.

The Carrier shall comply with and implement the requirements and guidance identified in their Emergency Response and Comprehensive Contingency Plan and Quality Assurance Plan as appropriate.

EXHIBIT A.4

CARRIER DOCUMENTS

Example Bills of Lading for IX Resins

BILL-OF-LADING & LICENSED MATERIAL SHIPPING FORM

EMERGENCY CONTACT PHONE:

Loaded Ion-Exchange Resin Shipment Shipment Date ________________

From:		To:	
SHIPPER LICENSE NO.	SHIPPER USDOT NO. USDOT	SHIPPER HAZMAT REG. NO.	SHIPPER TELEPHONE NO.

HM	DESCRIPTION OF MATERIAL AND PACKAGING	Slurry Weight (lbs)	Uranium Weight (lbs)	CLASSIFICATION
X	Radioactive Material, UN2912, Low Specific Activity - I, Ion-exchange resin containing uranium (natural). Activity: ________MBq (_______ Ci) Curie (Ci) = 7.1 E-7 x grams of uranium (natural) Megabecquerel (Mbq) = Ci x 3.7 E4			Low Specific Activity (LSA) Exclusive Use Shipment

Driver's Instructions:

The transport vehicle/tank must be surveyed prior to leaving the site and recorded on the backside of this form.

The receiving party must be notified of your departure and when to expect your arrival.

The tank must be inspected for leakage prior to leaving, halfway to the mine site and at the mine site. Any leakage found must be documented on the bottom of this form under comments and reported to the radiation safety department.

Drivers's Signature ________________________________ Date

Comments:

BILL-OF-LADING & LICENSED MATERIAL SHIPPING FORM

EMERGENCY CONTACT PHONE:

Stripped Ion-Exchange Resin Shipment Shipment Date ________________

From:		To:	
SHIPPER LICENSE NO.	SHIPPER USDOT NO. USDOT	SHIPPER HAZMAT REG. NO.	SHIPPER TELEPHONE NO.

HM	DESCRIPTION OF MATERIAL AND PACKAGING	Slurry Weight (lbs)	Uranium Weight (lbs)	CLASSIFICATION
X	Radioactive Material, UN2912, Low Specific Activity - I, Ion-exchange resin containing uranium (natural). Activity: ________MBq (_______ Ci) Curie (Ci) = 7.1 E-7 x grams of uranium (natural) Megabecquerel (Mbq) = Ci x 3.7 E4			Low Specific Activity (LSA) Exclusive Use Shipment

Driver's Instructions:

The transport vehicle/tank must be surveyed prior to leaving the site and recorded on the backside of this form.

The receiving party must be notified of your departure and when to expect your arrival.

The tank must be inspected for leakage prior to leaving, halfway to the mine site and at the mine site. Any leakage found must be documented on the bottom of this form under comments and reported to the radiation safety department.

Drivers's Signature ________________________________ Date

Comments:

EXHIBIT B

DOCUMENTATION FOR US ECOLOGY RICHLAND FACILITY

B.1: Radioactive Waste Shipment Certification Form RHF-31D

B.2: Example Waste Manifest (NRC forms 540 and 541)

EXHIBIT B.1

DOCUMENTATION FOR US ECOLOGY RICHLAND FACILITY

Radioactive Waste Shipment Certification Form RHF-31D

RADIOACTIVE WASTE SHIPMENT CERTIFICATION FOR SHIPMENTS TO THE COMMERCIAL RADIOACTIVE WASTE DISPOSAL FACILITY OR RADIOACTIVE WASTE PROCESSOR

The following certification, completed as applicable, is made to the state of Washington:

Certification is hereby made to the state of Washington that the radioactive waste described on manifest/bill of lading No.____________ has been inspected and it has been determined that the materials are properly classified, described, packaged, marked, and labeled, and are in proper condition for transportation according to the applicable federal and state regulations, laws, rules, and licenses.

The undersigned shall indemnify and hold harmless the state of Washington from any and all claims, suits, losses, charges, and expenses on account of injuries to any and all persons whomsoever, and any and all property damage arising or growing out of or in any manner connected with this shipment to the extent that the claims, suits, losses, charges, or expenses are caused in whole or in part by negligent acts or omissions of the undersigned.[1]

Except for any violation of applicable state or federal statute or regulation or license condition respecting packaging and shipment, inspection and acceptance of any item or container or material covered by this certification by the state of Washington or a duly authorized contractor shall release the party who executed this certificate from any and all requirements of indemnification and hold harmless from injury or loss.

SECTION A:
GENERATOR: Dawn Mining Company
(Company or Agency Name)

PERMIT NUMBER: NA

VOLUME OF WASTE IN THIS SHIPMENT:

BY: TITLE:
(Printed Name)

SIGNATURE: DATED:

SECTION B:
BROKER: No Broker Used
(Company Name)

PERMIT NUMBER:

VOLUME OF WASTE IN THIS SHIPMENT:

BY: TITLE:
(Printed Name)

SIGNATURE: DATED:

SECTION C:
CARRIER:
(Company Name)

VOLUME OF WASTE IN THIS SHIPMENT:

BY: TITLE: DRIVER
(Printed Name)

SIGNATURE: DATED:

DOH RHF-31D
Updated 3/01

[1] Federal government agencies entering into this certification are subject to all applicable federal law including, but not limited to, the Federal Tort Claims Act and the Anti-Deficiency Act.

EXHIBIT B.2

DOCUMENTATION FOR US ECOLOGY RICHLAND FACILITY

Example Waste Manifest (NRC forms 540, 541)

APPROVED BY OMB: NO. 3150-0164
EXPIRES: 08/31/2013

Estimated burden per response to comply with this information collection request: 45 minutes. This uniform manifest is required by NRC to meet reporting requirements of Federal and State Agencies for the safe transportation and disposal of low-level waste. Send comments regarding burden estimate to the Records and FOIA/Privacy Services Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects.resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0164), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

NRC FORM 540
(6-2010)

U.S. NUCLEAR REGULATORY COMMISSION

UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST

SHIPPING PAPER

1. EMERGENCY TELEPHONE NUMBER (Include Area Code)

ORGANIZATION

2. IS THIS AN "EXCLUSIVE USE" SHIPMENT?
- [ ] YES
- [ ] NO

3. TOTAL NUMBER OF PACKAGES IDENTIFIED ON THIS MANIFEST =====>

4. DOES EPA REGULATED WASTE REQUIRING A MANIFEST ACCOMPANY THIS SHIPMENT?
If "Yes," provide Manifest Number
- [ ] YES
- [ ] NO

EPA MANIFEST NUMBER

5. SHIPPER - NAME AND FACILITY

SHIPPER I.D. NUMBER
- [ ] COLLECTOR
- [ ] PROCESSOR
- [ ] GENERATOR TYPE (Specify)

USER PERMIT NUMBER

SHIPMENT NUMBER

CONTACT

TELEPHONE NUMBER (Include Area Code)

6. CARRIER - Name and Address

EPA I.D. NUMBER

SHIPPING DATE

CONTACT

TELEPHONE NUMBER (Include Area Code)

SIGNATURE - Authorized carrier acknowledging waste receipt

DATE

7. NRC FORM 540 AND 540A PAGE 1 OF ______ PAGE(S)
NRC FORM 541 AND 541A ______ PAGE(S)
NRC FORM 542 AND 542A ______ PAGE(S)
ADDITIONAL INFORMATION ______ PAGE(S)

8. MANIFEST NUMBER
(Use this number on all continuation pages)

9. CONSIGNEE - Name and Facility Address

CONTACT

TELEPHONE NUMBER (Include Area Code)

SIGNATURE - Authorized consignee acknowledging waste receipt

DATE

10. CERTIFICATION

This is to certify that the herein-named materials are properly classified, described, packaged, marked, and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation. This also certifies that the materials are classified, packaged, marked, and labeled and are in proper condition for transportation and disposal as described in accordance with the applicable requirements of 10 CFR Parts 20 and 61, or equivalent state regulations.

AUTHORIZED SIGNATURE

TITLE

DATE

11. U.S. DEPARTMENT OF TRANSPORTATION DESCRIPTION (Including proper shipping name, hazard class, UN ID number, and any additional information)	12. DOT LABEL "RADIOACTIVE"	13. TRANSPORT INDEX	14. PHYSICAL AND CHEMICAL FORM	15. INDIVIDUAL RADIONUCLIDES	16. TOTAL PACKAGE ACTIVITY IN SI UNITS	17. LSA/SCO CLASS	18. TOTAL WEIGHT OR VOLUME (Use appropriate units)	19. IDENTIFICATION NUMBER OF PACKAGE

FOR CONSIGNEE USE ONLY

APPROVED BY OMB: NO. 3150-0166
EXPIRES: 08/31/2013

Estimated burden per response to comply with this information collection request: 3.3 hours. This uniform manifest is required by NRC to meet reporting requirements of Federal and State Agencies for the safe transportation and disposal of low-level waste. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects.resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0166), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

NRC FORM 541
(8-2010)

U.S. NUCLEAR REGULATORY COMMISSION

UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST

CONTAINER AND WASTE DESCRIPTION

Additional Nuclear Regulatory Commission (NRC) Requirements for Control, Transfer and Disposal of Radioactive Waste

1. MANIFEST TOTALS							
NUMBER OF PACKAGES/ DISPOSAL CONTAINERS	NET WASTE VOLUME (m^3)	NET WASTE WEIGHT (kg)	SPECIAL NUCLEAR MATERIAL (grams)				
			U-233	U-235	Pu	TOTAL	
ACTIVITY (MBq)							SOURCE (kg)
ALL NUCLIDES		TRITIUM	C-14	Tc-99	I-129		

2. MANIFEST NUMBER

3. PAGE ____ OF ____ PAGE(S)

4. SHIPPER NAME

SHIPPER I.D. NUMBER

DISPOSAL CONTAINER DESCRIPTION							WASTE DESCRIPTION FOR EACH WASTE TYPE IN CONTAINER							
5. CONTAINER IDENTIFICATION NUMBER/ GENERATOR ID NUMBER(S)	6. CONTAINER DESCRIPTION (See Note 1)	7. VOLUME (m^3)	8. WASTE AND CONTAINER WEIGHT (kg)	9. SURFACE RADIATION LEVEL ☐ (µSv/hr) ☐ (mSv/hr)	10. SURFACE CONTAMINATION MBq/100cm^2		PHYSICAL DESCRIPTION			14. CHEMICAL DESCRIPTION		15. RADIOLOGICAL DESCRIPTION		16. WASTE CLASSIFICATION AS-Class A Stable AU-Class A Unstable B-Class B C-Class C
					ALPHA	BETA-GAMMA	11. WASTE DESCRIPTOR (See Note 2)	12. APPROXIMATE WASTE VOLUME(S) IN CONTAINER	13. SORBENT SOLIDIFICATION, STABILIZATION, MEDIA (See Note 3)	CHEMICAL FORM/ CHELATING AGENT	WEIGHT % CHELATING AGENT (if > 0.1%)	INDIVIDUAL RADIONUCLIDES AND ACTIVITY (MBq) AND CONTAINER TOTAL, OR CONTAINER TOTAL ACTIVITY AND RADIONUCLIDE PERCENT		

NOTE 1: Container Description Codes. For containers/ waste requiring disposal in approved structural overpacks, the numerical code must be followed by "-OP."

1. Wooden Box or Crate
2. Metal Box
3. Plastic Drum or Pail
4. Metal Drum or Pail
5. Metal Tank or Liner
6. Concrete Tank or Liner
7. Polyethylene Tank or Liner
8. Fiberglass Tank or Liner
9. Demineralizer
10. Gas Cylinder
11. Bulk Unpackaged Waste
12. Unpackaged Components
13. High Integrity Container
19. Other. Describe in item 8, or additional page

NOTE 2: Waste Descriptor Codes. (Choose up to three which predominate by volume.)

20. Charcoal
21. Incinerator Ash
22. Soil
23. Gas
24. Oil
25. Aqueous Liquid
26. Filter Media
27. Mechanical Filter
28. EPA or State Hazardous
29. Demolition Rubble
30. Cation Ion-exchange Media
31. Anion Ion-exchange Media
32. Mixed Bed Ion-exchange Media
33. Contaminated Equipment
34. Organic Liquid (except oil)
35. Glassware or Labware
36. Sealed Source/Device
37. Paint or Plating
38. Evaporator Bottoms/Sludges/Concentrates
39. Compactible Trash
40. Noncompactible Trash
41. Animal Carcass
42. Biological Material (except animal carcass)
43. Activated Material
59. Other, Describe in item 11, or additional page

NOTE 3: For solidification media that meet disposal site structural stability requirements, the numerical code must be followed by "-S." For all solidification media, the vendor (manufacturer) and brand name must also be identified in item 13. Code 100=NONE REQUIRED.

Sorption

60. Speedi Dri
61. Celetom
62. Floor Dry/ Superfine
63. Hi Dri
64. Safe T Sorb
65. Safe N Dri
66. Florco
67. Florco X
68. Solid A Sorb
69. Chemsil 30
70. Chemsil 50
71. Chemsil 3030
72. Dicaperl HP200
73. Dicaperl HP500
74. Petroset
75. Petroset II
76. Aquaset
77. Aquaset II
89. Other. Describe in item 13, or additional page

Solidification

90. Cement
91. Concrete (encapsulation)
92. Bitumen
93. Vinyl Chloride
94. Vinyl Ester Styrene
99. Other. Describe in item 13, or additional page
100. None Required

EXHIBIT C.1

DOCUMENTATION FOR ENERGY FUELS WHITE MESA MILL

Example Shipping Papers

STRAIGHT BILL OF LADING

Shipper number:
Date Shipped:

Consignee (to)		Shipper (from)	
NAME Energy Fuels, Inc.		NAME Dawn Mining Co.	
STREET 6425 South Highway 191, P.O. Box 809		STREET 5326 Uranium City Rd	
CITY, STATE Blanding, UT	ZIP 84511	CITY, STATE Ford, WA	ZIP 99013
ROUTE			Vehicle number:

ESTIMATED CUBIC YARDS	DOT Proper shipping name and description	Weight (Tons) (SUBJECT TO CORRECTION)	Rate	CHARGES (for Carrier use only)
	Shipping Name: Radioactive Material-LSA 1 *(non-fissile)* **Hazard Class:** Class 7 **Identification Number:** UN 2912 **Packaging:** Bulk-Unpackaged **Quantity:** ____TBq (_ _____ Ci) **Radionuclide(s):** U-Nat. and associated decay chain progeny **Form:** Solid (Unrefined Uranium Ore) **Transport Index:** ________			

RECEIVED, subject to the classification and lawfully filed tariffs if applicable, or the individually determined rates in effect on the date of the issue of Bill of Lading, the property described above in apparent good order, except as noted (contents and conditions of packages unknown), marked, consigned, and destined as indicated above which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to the usual place of delivery at said destination, if on its route, otherwise party at any time interested in all or any said property, that every service to be performed hereunder shall be subject to all the bill of lading terms and conditions in the governing classification on the date of shipment.

Shipper hereby certifies that he is familiar with all the bill of lading terms and conditions in the governing classifications and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

Special Instructions: This shipment of uranium ore has been consigned by Denison and is being shipped as an exclusive (sole) use shipment. Accordingly, the contents of this shipment must be loaded at the Mine and unloaded at the Mill, absent any unloading or additional loading prior to delivery at the Mill. The transportation conveyance trailer must be utilized only for uranium ore transport until such time that mill personnel conduct a survey of the interior and exterior of the trailer and determine that the trailer can be released for unrestricted use. All signage related to the radioactive material shipment must be removed from the conveyance trailer.

Emergency Contact Phone Number	(435) 678-2221
Signature:	Date:

Received at White Mesa Mill on ____________________, 20 _ by ____________________

EXHIBIT D

DOCUMENTATION FOR US ECOLOGY GRAND VIEW FACILITY

D.1: Land Disposal Restriction Form

D.2: Uniform Hazardous Waste Manifest

EXHIBIT D.1

DOCUMENTATION FOR US ECOLOGY GRAND VIEW FACILITY

Land Disposal Restriction Form

US Ecology, Inc. Land Disposal Restriction Form

USEcology, Inc.

GENERATOR: ____________ EPA I.D. NUMBER: ____________

WASTE STREAM or PROFILE NUMBER: ____________ MANIFEST DOC. NO. ____________ LINE NO. ________

WASTE IS A: ☐ WASTEWATER ☐ NON-WASTEWATER ☐ DEBRIS

NOTIFICATION FREQUENCY: ☐ ONE TIME ☐ REQUIRED WITH EACH SHIPMENT

EPA WASTE CODES (from 40 CFR 268.40) ______ ______ ______ ______ ______ ______
______ ______ ______ ______ ______ ______ ______

UHC's (Underlying Hazardous Constituents 40 CFR 268.48)? ☐ No ☐ Yes - List: ____________

A. ☐ **Restricted Waste Meets Treatment Standards (40 CFR 268.7(a) (3))**

F The restricted waste identified above meets the treatment standards in 40 CFR 268.40 or **Alternative LDR treatment standards for contaminated soil 40CFR268.49** and can be landfill disposed without further treatment. I have attached all supporting analytical data, where available.

I certify under penalty of law that I personally have examined and am familiar with the waste through analysis and testing or through knowledge of the waste to support this certification that the waste complies with the treatment standards specified in 40 CFR Part 268 Subpart D. I believe that the information I submitted is true, accurate and complete. I am aware that there are significant penalties for submitting a false certification, including the possibility of a fine and imprisonment.

B. ☐ **Restricted Waste Treated To Treatment Standards (40 CFR 268.7(b) (I) & 268.7 (b) (2))**

The treatment residue, or extract of such residue, or the restricted waste identified above has been tested to assure that the treatment residues or extract meet all applicable treatment standards in 40 CFR 268.40 and/or performance standards in 40 CFR 268.45. I have attached all supporting analytical data, where available.

I certify under penalty of law that I personally have examined and am familiar with the waste through analysis and testing or through knowledge of the waste to support this certification that the waste complies with the treatment standards specified in 40 CFR Part 268 Subpart D. I believe that the information I submitted is true, accurate and complete. I am aware that there are significant penalties for submitting a false certification, including the possibility of a fine and imprisonment.

C. ☐ **Restricted Waste With Technology Based Treatment Standards (40 CFR 268.7(b) (4))**

F **I certify under penalty of law that I personally have examined and am familiar with the treatment technology and operation of the treatment process used to support this certification and that based on my inquiry of those individuals immediately responsible for obtaining this information. I believe that the treatment process has been operated and maintained properly so as to comply with the treatment standards specified in 40 CFR 268.40, without impermissible dilution of the prohibited waste. I am aware that there are significant penalties for submitting a false certification, including the possibility of a fine and imprisonment.**

D. ☐ **Restricted Waste Decharacterized But Requires Treatment For UHC (40 CFR 268.9)**

F **I certify under penalty of law that the waste has been treated in accordance with the requirements of 40 CFR 268.40 to remove the hazardous characteristic. This decharacterized waste contains Underlying Hazardous Constituents (UHC) that require further treatment to meet the universal treatment standards. I am aware that there are significant penalties for submitting a false certification, including the possibility of a fine and imprisonment.**

E. ☐ **Restricted Waste Subject To Treatment (40 CFR 268.7(a) (2))**

The restricted waste identified above must be treated to the applicable treatment standards in 40 CFR 268.40, or treated to comply with applicable prohibitions set forth in Part 268.32 or RCRA Section 3004(d). I have attached all supporting analytical data, where available.

F. ☐ **Hazardous Debris Subject To Treatment (40 CFR 268.45)**

This hazardous debris identified above must be treated to the alternative treatment standards in 40 CFR 268.45.

G. ☐ **Restricted Waste Subject To A Variance or Extension (40 CFR 268.7(a) (4))**

This restricted waste identified above is subject to a case by case exemption under 40 CFR 268.5, an exemption under 40 CFR 268.6 or a nationwide capacity variance under Subpart C of 40 C R 268, and is not prohibited from land disposal. LDR prohibitions become effective on ______ (date) for this restricted waste. The corresponding treatment standard(s) are promulgated in 40 CFR 268.40. I have attached all supporting analytical data, where available.

H. ☐ **Restricted Waste Managed In A "Lab Pack" (40 CFR 268.7(a) (9))**

I certify under penalty of law that I personally have examined and am familiar with the waste and that the lab pack contains only waste that have been excluded under appendix IV to 40 CFR Part 268 and that this lab pack will be sent to a combustion facility in compliance with the alternative treatment standards for lab packs at 40 CFR 268.42(c). I am aware that there are significant penalties for submitting a false certification, including the possibility of a fine and imprisonment.

I certify and warrant that the information that appears on this form, and appended documents, is true and correct. I have correctly indicated how my waste is to be managed in accordance with 40 CFR 268. My certification is based on personal examination of the information submitted, or is based on my inquiries of those individuals responsible for obtaining the information.

Authorized Signature ____________ **Title** ____________ **Date** ________

UHC list from 40 CFR Part 268.48 available upon request

EXHIBIT D.2

DOCUMENTATION FOR US ECOLOGY GRAND VIEW FACILITY

Uniform Hazardous Waste Manifest

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number | 2. Page 1 of | 3. Emergency Response Phone | **4. Manifest Tracking Number**

GENERATOR

5. Generator's Name and Mailing Address

Generator's Site Address (if different than mailing address)

Generator's Phone:

6. Transporter 1 Company Name — U.S. EPA ID Number

7. Transporter 2 Company Name — U.S. EPA ID Number

8. Designated Facility Name and Site Address — U.S. EPA ID Number

Facility's Phone:

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
	1.					
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name | Signature | Month | Day | Year

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:

Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name | Signature | Month | Day | Year

Transporter 2 Printed/Typed Name | Signature | Month | Day | Year

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator) — U.S. EPA ID Number

Facility's Phone:

18c. Signature of Alternate Facility (or Generator) | Month | Day | Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name | Signature | Month | Day | Year

EXHIBIT E

TYPICAL IX RESIN TECHNICAL DATA

DOWEX 21K XLT & RESINTECH SIR-1200

DOWEX 21K XLT

A Uniform Particle Size, High Capacity, Strong Base Anion Exchange Resin for Mineral Processing Applications

Product	Type	Matrix	Functional group
DOWEX* 21K XLT	Type I strong base anion	Styrene-DVB, gel	Quaternary amine

Guaranteed Sales Specifications		
Total exchange capacity, min.	eq/L	1.4
Water content	%	50 - 60
Bead size distribution		
Volume median diameter	µm	525 - 625
Uniformity coefficient, max.	%	1.1

Typical Physical and Chemical Properties		
Ionic form as delivered		Cl^-
Total swelling (Cl ⇒ OH), approx.	%	18 - 20
Whole uncracked beads, min.	%	90
Particle density, approx.	g/mL	1.08
Shipping weight, approx.	g/L	670
	lbs/ft^3	42

Recommended Operating Conditions

- Maximum operating temperature:
  - OH^- form: 60°C (140°F)
  - Cl^- form: 100°C (212°F)
- pH range: 0 - 14
- Bed depth, min.: 800 mm (2.6 ft)
- Flow rates:
  - Service/fast rinse: 5 - 60 m/h (2 - 24 gpm/ft^2)
  - Backwash: See figure 1
  - Co-current regeneration/displacement rinse: 1 - 10 m/h (0.4 - 4 gpm/ft^2)
  - Counter-current regeneration/displacement rinse: 5 - 20 m/h (2 - 8 gpm/ft^2)
- Total rinse requirement: 3 - 6 Bed volumes
- Regenerant:
  - Type: NaCl/Carbonate
  - Temperature: Ambient or up to 50°C (122°F) for silica removal
- Organic loading, max.: 3g $KMnO_4$/L resin

* Trademark of The Dow Chemical Company
DOWEX Ion Exchange Resins

Form No. 177-01893-1005

Typical properties and applications

DOWEX 21K XLT type 1 strong base anion resin has excellent kinetics, excellent regeneration efficiency and outstanding physical stability. The uniform sized beads give maximum performance for all packed bed systems. DOWEX 21K XLT represents the state-of-the-art in mineral processing resins.

Packaging

5 cubic foot fiber drums

Figure 1. Pressure Drop vs. Flow Rate

For DOWEX 21 Resins, Cl, deg. F

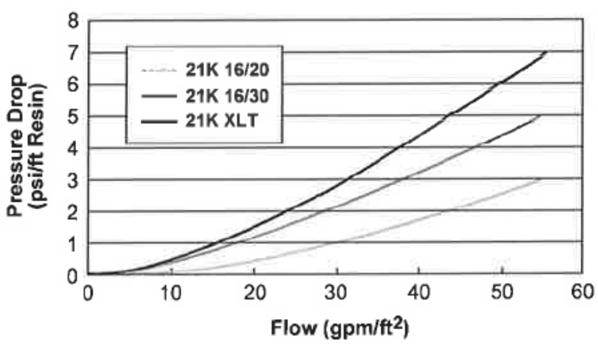
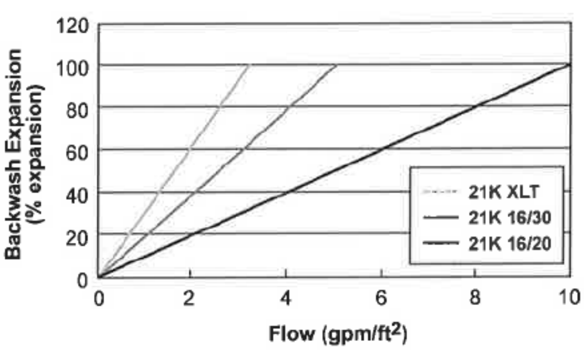


Figure 2. Backwash Expansion vs. Flow Rate

For DOWEX 21 Resins, Cl, deg. F



DOWEX Ion Exchange Resins
For more information about DOWEX resins, call the Dow Li uid Separations business:

North America:	1-800-447-4369
Latin America:	(+55) 11-5188-9222
Europe:	(+32) 3-450-2240
Pacific:	+60 3 7958 3392
Japan:	+813 5460 2100
China:	+86 21 2301 9000

http://www.dowex.com

Form No. 177-01893-1005

RESINTECH®

SIR-1200

SELECTIVE ANION EXCHANGE RESIN
TYPE ONE, CHLORIDE FORM

RESINTECH SIR-1200 is a high capacity, shock resistant, gelular Type One, strongly basic anion resin supplied in the chloride form as moist, tough, highly uniform, spherical beads. ResinTech SIR-1200 is intended for use in special chemical processing and ionic removal applications. Other ionic forms are available by special request.

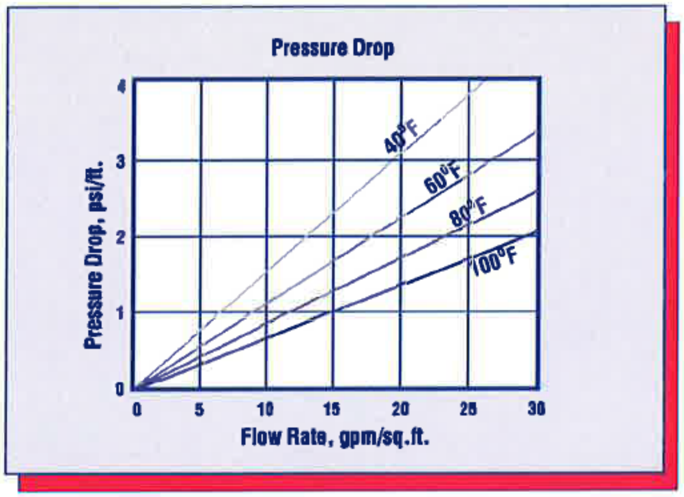
FEATURES & BENEFITS

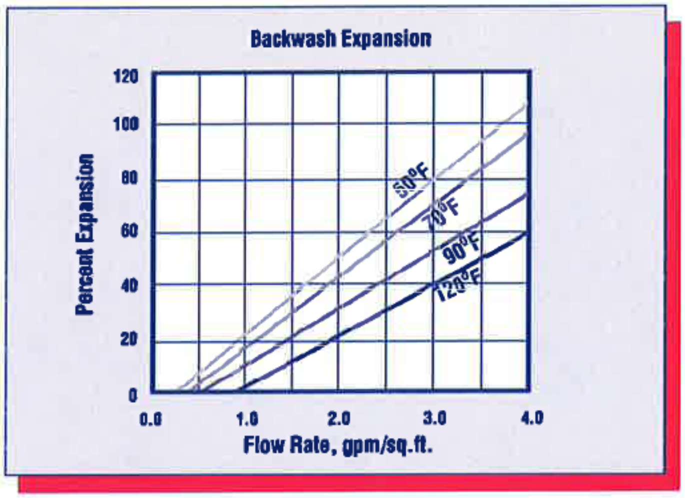
- **HIGHLY UNIFORM PARTICLE SIZE**
  95% of all beads are in the minus 16 to plus 40 mesh range; giving a LOWER PRESSURE DROP while maintaining SUPERIOR KINETICS.

- **HIGH TOTAL CAPACITY**
  High total capacity allows greater capacity in applications where high levels of regeneration are used, or in one-time use applications such as precious metal recovery and ionic removal.

- **SUPERIOR PHYSICAL STABILITY**
  Over 93% sphericity combined with high crush strengths and highly uniform particle size provide greater resistance to bead breakage due to mechanical, thermal or osmotic stresses.

HYDRAULIC PROPERTIES





PRESSURE DROP

The graph above shows the expected pressure loss per foot of bed depth as a function of flow rate at various water temperatures.

BACKWASH

After each cycle the resin bed should be backwashed at a rate that expands the bed 50 to 75 percent. This will remove any foreign matter or fines and reclassify the bed.

RESINTECH® SIR-1200

TYPICAL PROPERTIES

Polymer Structure	Styrene Crosslinked with DVB
Functional Group	R-N- $(CH_3)_3^+X^-$
Ionic Form, as shipped	Chloride
Physical Form	Tough, Spherical Beads
Screen Size Distribution	16-45 Nominal
+16 mesh	<2 Percent
-40 mesh	<2 Percent
pH Range	0 to 14
Sphericity	90+ Percent min.
Uniformity Coefficient	Approx. 1.5
Water Retention	
Cl Form	43 to 47 Percent
Solubility	Insoluble
Approximate Shipping Weight	
Cl Form	44 lbs cu. ft.
Total Capacity	
Cl Form	1.40 meq / mL min

SUGGESTED OPERATING CONDITIONS

Maximum Temperature	
Salt form	170°F (75°C)
Minimum Bed Depth	24 inches
Backwash Rate	50 to 75 % Bed Expansion
Regenerant Concentration*	2 to 6 %
Regenerant Flow Rate	0.25-1.0 gpm / cu.ft.
Regenerant Contact Time	At least 60 Minutes
Regenerant Level	4 to 10 lbs / cu.ft.
Displacement Rinse Rate	Same as Regenerant Flow
Displacement Rinse Volume	10 to 15 gal / cu.ft.
Fast Rinse Volume	35-60 gal. / cu.ft.
Service Flow Rate	2-4 gpm / cu.ft.
Fast Rinse Rate	Same as Service Flow Rate

OPERATING CAPACITY

The operating capacity of *RESINTECH SIR-1200* for acid removal at various regeneration levels when treating an influent with a concentration of 500 ppm, as $CaCO_3$, is shown in the following table.

Pounds $NaOH/ft^3$	Capacity Kilograms per cubic foot			
	HCl	H_2SO_4	H_2SiO_3	H_2CO_3
4	11.3	14.0	14.7	18.6
6	12.8	16.3	17.3	19.8
8	14.3	13.3	19.5	21.6
10	15.5	20.0	22.2	22.2

APPLICATIONS

RESINTECH SIR-1200's high total capacity make it ideal for applications such as precious metal recovery, radwaste disposal and pu-rification of toxic waste streams. Its lower porosity also provides an increased resistance to osmotic and physical shock.

RESINTECH SIR-1200's high total capacity and low swelling on re-generation provides maximum operating capacity in cartridge deionization applications for all applications from ultra pure water to waste treatment and precious metal recoveries.

***CAUTION:DO NOT MIX ION EXCHANGE RESIN WITH STRONG OXIDIZING AGENTS.** Nitric acid and other strong oxidizing agents can cause explosive reactions when mixed with organic materials,such as ion exchange resins.

SIR-1200062405