

# EPA Review of Standards for Uranium and Thorium Milling Facilities

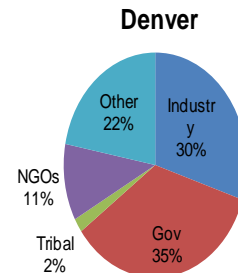
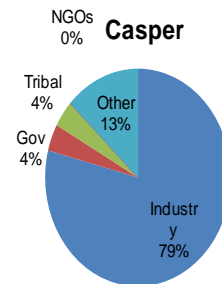
## PUBLIC INPUT MEETINGS REPORT

The US Environmental Protection Agency (EPA) is reviewing and may revise its regulatory standards, 40 CFR Part 192, for uranium and thorium milling. One of the many components of this review will involve input from the public. As such, EPA held two public information meetings: one in Casper, Wyoming and another in Denver, Colorado on May 24, 2010, and May 26, 2010, respectively. The purpose of these meetings was to provide the public an overview of the regulatory review and existing standards and to seek public input on the review of 40 CFR Part 192. Training Resources Group, Inc. (TRG) was contracted to provide assistance in meeting facilitation, coordination, and note-taking. This report summarizes the proceedings of the two meetings.

## ATTENDANCE

Combined, the attendee mix had a variety of representation from industry, government, NGOs, tribal communities, and other stakeholders. The Wyoming meeting had a total of 24 attendees: 19 individuals from industry, 1 individual from government, 1 individual representing tribal communities, and 3 individuals with other or unspecified affiliation. Turnout for the Denver meeting was markedly higher, presumably due to the concurrent National Mining Association meetings taking place at the same facility. 93 attendees registered for the Denver meeting, though the actual count may be slightly higher as some attendees did not wish to sign in at the registration table. Of the 93 recorded attendees, 28 individuals were from industry, 33 individuals were from government, 2 individuals were from tribal communities, 10 individuals were from NGOs, and 20 other individuals (subcontractors, community members, affiliation not specified, or other).

For the complete registration list, see attached document, 'EPA 40 CFR 192 Review – Public Information Meetings Registration.'



## MEETING STRUCTURE

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Both in Casper and Denver, the meetings began with opening remarks and introductions. EPA representative Loren Setlow from the Office of Radiation and Indoor Air then provided an overview (with assistance from Dan Jackson of EPA Region 8) of EPA regulatory review and existing standards. Members of the audience were then given the opportunity to submit questions to EPA. Following this Q&A session, the public was invited to provide input by signing up for five-minute presentations. In the remaining time, the floor was opened up for additional audience questions and input. Finally, Mr. Setlow thanked the audience for their participation and reiterated the Agency's commitment to continuing outreach, collecting and analyzing information, maintaining transparency, and collaborating with industry and state and federal agencies throughout the review process.

## PUBLIC INPUT PRESENTATIONS

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The EPA invited members of the public to provide five-minute presentations on the following topics:

- Changes in uranium industry technologies (such as utilization of the In-Situ Leaching recovery process as the principal current technology for extracting uranium) and their potential environmental impacts
- Revisions in EPA drinking and groundwater protection standards
- Judicial decisions concerning the existing regulations
- Issues relating to children's health, Tribal impacts, and environmental justice
- Dose and risk factors and scenarios for assessing radiological and non-radiological risk
- Facilities proposed in states outside existing uranium mining and milling areas
- Costs and benefits of possible revisions.

In Casper, Wyoming, two individuals signed up to provide input and a total of four\* individuals gave presentations; two individuals were from industry, one was affiliated with a tribal commission, and the last was a private citizen. In Denver, Colorado, 17 individuals signed up and 14\* provided input. At this meeting, public input was given by two individuals affiliated with industry; one individual from government; eight individuals from environmental or community groups; one individual from an association related to Tribal communities; and two individuals speaking as a private citizen or community member.

The majority of presentations included requests for EPA to further examine and/or consider revising specific issues, such as new dose limits, ACLs, cleanup methods and standards, reclamation milestones, groundwater corrective action plans, and Subpart W. Many raised concerns over impacts to human health and the environment, especially to children and indigenous populations. On the other hand, a few questioned whether the costs associated with revising the regulations were warranted, given the (perceived) low level of health and safety risk involved in uranium milling and mining. Several presenters entreated EPA to consider impacts to the Navajo Nation and other indigenous communities, specifically concerning drinking water and the proposal of four new facilities on Navajo lands. Environmental justice concerns, primarily the ability to participate in this and other regulatory review processes or related meetings, were also raised.

Finally, the majority of speakers expressed their appreciation to EPA both for conducting this review and for the opportunity to provide input during the process. A few presenters also extended invitations to EPA representatives to visit their communities to engage with those directly impacted by uranium milling and mining.

Below are the presentations captured from both meetings; EPA responses are included in italics.

*Notes:*

\*This number includes the two individuals who signed up to provide public input during the designated time as well as the two individuals who provided input in the 'open floor' session.

\*\*Of the 17 individuals who signed up to present input, three actually used their time to ask questions, making for a total of 14 public input presentations. We have included the questions from the three individuals in the Q&A section of the report.

## CASPER, WYOMING

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### **Oscar Paulson**

*Kennecott Uranium Company*

The scope of regulations is large – they cover a lot of things: cleanup of soils, alternate concentration limits, groundwater protection, effluent limitations to radon, radon releases following barrier replacement, radiation protection standards for state reference CFR Part 190. Given the broad scope of regulations and the efforts that will be required to do work for revision, is it necessary? Very low risks of Uranium recovery operations, conventional or ISR.

In the case of 20 pCi/m<sup>2</sup>-sec standard for radon emission – the Agency has said itself that the risks from current emissions are very low. From the preamble the Subpart W NESHAP from December 15, 1989: A NESHAP requiring that emissions from operating mill tailings piles limit their emissions to no more than 20 pCi/m<sup>2</sup>-sec represents current emissions. "EPA has determined that risks are low enough that it is unnecessary to reduce the already low risk from the tailings piles further."

Other have looked into releases of radiation from sites – related to background:

- Dr. Gail de Planque's talk in 1994, related to background and dose: exposure to 15 millirems over a 70-year lifetime would result in a risk of 0.04%, a decade lower on this log scale. Added to the risk associated with low average and high annual doses from background, this risk is barely distinguishable. 15 millirems represents 5% of the annual average dose and is lost within the range of background. A lot of these doses from these facilities are very low and would be lost within background and indistinguishable from it.
- National Academy of Sciences: the NAS concluded that persons living at "distances greater than a kilometer (1.6 miles) from most uncontrolled Uranium mill tailings piles, and perhaps someone closer to some piles, would experience no significant increase in the lifetime radon lung cancer risk from the pile."
- EIS for the HRI facility in New Mexico: maximum estimated dose was less than 1% of the permissible limit and consistent with NCRP's negligible individual risk level (i.e. 1 millirem/year), defined as a level of average annual excess risk of fatal health effects attributable to radiation

exposure, below which further effort to reduce radiation level to the individual is unwarranted.

Two major epidemiological studies by Dr. J.D. Boice related to radiation risk to milling sites:

- Cancer mortality in a Texas county with prior uranium mining and milling activity, 1950-2001. In Karnes County, "no unusual patterns of cancer mortality can be seen in Karnes County in a period of over 50 years, suggesting that the uranium mining and milling operations had not increased cancer rates among residents."
- Cancer and noncancer mortality in persons living near uranium and vanadium mining and milling operations in Montrose County, Colorado, 1950-2000. Results: "there was no difference between the total cancer mortality rate in Montrose County and those in the comparison counties."

Risk should be the driving force of any regulatory effort. From the literature I've looked at, I cannot see any levels of risk that would justify this type of work.

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### **David Hare**

*Wind, River and Environmental Quality Commission for the Wind River Indian Reservation*

This is regarding an existing UMTRA site: Riverton site, on which I've been collecting data for the past 15 years.

I asked about DOE following tribal water quality standards. The tribes have adopted standards for tribal lands, including drinking water aspects to quality standards as most streams and rivers are considered potential drinking water sources. Currently, uranium levels are above those standards; adjacent tributaries and wetlands and stream with high level of uranium.

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### **Bob Hopkins**

*Energy consumer*

In terms of BTUs per capita, nuclear energy makes a great difference in how you live your life. No US or international energy producer produces more energy to use in our homes that has lower fatality rate (deaths per BTU).

Nuclear power is one of most well-studied environmental issues in the world, bar none. We know more about the little piece of emission that comes out of uranium. Can't change facts of life, or the physics. There is no safer energy than nuclear power. As far as I know, there have been only one or two deaths due to nuclear power in the US (research reactor in Idaho). We know what we're doing in this business – I'm not in the business. I would prefer nuclear power than anything from windmill, coal, etc.

EPA needs to think about this before you promulgate any more regulations on the industry.

*Loren Setlow, EPA: Before we develop any new regulations, there are a host of things we need to do to review: looking at the Paperwork Reduction Act, impacts on energy in the US, impacts to the industry that may be impacted by what we do (small business entities, etc); obligated as an Agency to follow dictates of the Mining and Mineral Policy after 1980. Also, the determination of this Administration that it will look towards greater reliance on nuclear energy. Under UMTRCA, requirements to look at standards we do have – looking at changes that have occurred since 1980, instances of excursions, and performance of the industry and the regulatory bodies. As a result of the risk assessment that we do, some sections could be grandfathered and left alone as an option should we decide to proceed. We will look at variety of things – we owe it to the public to do that as it's been so long since these rules were originally put out. Your comments have been heard – thank you.*

**Wayne Heili**  
*Uranerz Energy*

The presentation reviews current regulations that EPA enforces with the uranium industry. The discussion lacked topic points in the announcement. Given the lack of coverage on subject matter, EPA did not justify its proceeding with revisions. It is prudent to review the regulations, but without any identified benefits, I don't see benefits to take on the cost of revising.

*Loren Setlow, EPA: To clarify, we have not said we're revising these regulations. This is a pre-proposal stage. We're seeking public input on a variety of topics. We're developing our own information but seeking public input on issues to see areas of concern or support for current development (e.g. no harm from existing or changing standards). When and if EPA does develop new standards, all the information from our own review and the input we've utilized to develop the regulation will be put in a docket so people can understand the basis for review. This is an opportunity to learn what's on people's minds regarding developments on this particular activity.*

## DENVER, COLORADO

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**Oscar Paulson**  
*Kennecott Uranium Company*

- These regulations – 40 CFR 192 – are broad in scope and impact a lot of things: radon emission standards, release standards for soils and buildings; incorporate the double liner standards for impoundments, and subsume and incorporate alternate concentration limits. This is important because in a recent regulatory issue summary, the NRC stated that ISR licensees, must use 10 CFR 40 Appendix A criteria 5, which are the ACL standards used in groundwater standards in ISLs. Thus, changes in these regulations will impact ISLs and other things, since they would also impact existing NRC regulations and guidance, such as NUREG 1569 and NUREG 1620.
- Uranium recovery operations – both conventional or ISL – are very low risk, low dose-type operations because you're dealing with low-activity and naturally-occurring materials. In the case of groundwater restoration for ISLs, in-situ operations occur within exempted portions of aquifers. In these aquifers, once exempted, always exempted, so no one will have access to these waters.
- As a general rule, within the portions of these exempted aquifers that contain deposits, the groundwater has high levels of naturally occurring radionuclides – generally radium and possibly uranium. These are naturally contaminated, and because of the high levels of radium, they are naturally unusable. You could take water and treat the water to get it below the drinking standard to use it, but you wouldn't want to do that because concentrating the radium in a charcoal filter or non-exchange residue would be concentrating radioactive material. There are levels of radionuclides in some aquifers (specifically, referring to Geology of the Lost Creek Schroeckingerite deposits, Sweetwater County, Wyoming. U.S. Geological Survey Bulletin 1087-J) where they had documented levels of uranium in groundwater as high as 46 parts per million.
- With all of these high levels of naturally-occurring radionuclides in these aquifers; the fact that they're exempted; and that these operations generally low risk; under those circumstances, are the efforts to be spent on the reviews of these regulations worthwhile?

*Loren Setlow, EPA: There is no provision under the existing regulation in allowing or disallowing the repeal of an exemption. However, regardless of exemption status, the aquifer portion that is affected by the ISL activity still has to meet other standards. The portion that is not exempted is still USDW and beyond the exemption boundary cannot be affected by contamination moving beyond the exempted area. In terms of no access to water afterwards, the exemption only removes the portion of the aquifer from protection as a drinking water source, but it does not preclude it as a source of other uses, such as agricultural or industrial.*

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**Deb Harris**

*Wyoming Department of Environmental Quality*

At least for the DEQ, we would like to see if you could consider revision to ACLs to protect human health. We have worked with NRC and have had a good working relationship with them. I'm not sure how the revisions you are considering would impact the NRC and us, but we do have some concerns that we would still like to still see ACLs and MCLs be protective.

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**Sarah Fields**

*Uranium Watch*

I come from southeastern Utah, which is the center of (conventional) uranium mining/milling activities. Utah is an agreement state. I have several points I would like to make:

- It is important that EPA look at the history of all Title I sites. Particularly for conventional mills, regulation of Title I mills is a history of regulatory failures.
- I'm not sure what documents you'll be looking at. NRC should make available documents from 1975 to 1999. NRC took off from their electronic reading room, the Title I regulatory documents post 1999, so many of those are not readily available. NRC should also make available all pertinent regulatory documents, so you can see what actually happened at each of these Title I sites.
- There's an issue, particularly in New Mexico, where 11e.(2) byproduct materials were disposed of as backfill. Except for one, none of those mines were reclaimed according to EPA standards – they were ignored.
- Also part of 192 has a requirement of the establishment of reclamation milestones to be included in reclamation plans for mill tailing impoundments. This is associated with EPA's rescission of 40 CFR Part 61 Subpart T. With the Atlas Uranium Mill, those milestones were a joke. There are two tailing impoundments (White Mesa and Canyon City). At White Mesa, no reclamation milestones are included in the license, and none for the impoundment undergoing reclamation at the Cotter Mill in Canon City.
- In Part 192, you have a requirement for groundwater corrective action. At the former Atlas Mill, they had an exceedance of the standards and there was no groundwater action plan. Unfortunately, there seems to be no requirement that groundwater action plans actually work to reduce the amount of radium, uranium, and other unwanted chemical constituents in the groundwater. There was a continuous process of contamination of ground and surface water in Atlas water and that contamination continues today. Oakridge determined that the groundwater corrective action plan approved by NRC actually increased the amount of unwanted radioactive activity and other constituents in the groundwater. You can require a corrective action plan, but if you don't set requirements in it to be effective, it's meaningless.
- In the history of 192, you've had numerous problems in implementation. You need to take a hard look.

*Loren Setlow, EPA: A clarification: when Congress enacted UMTRCA, gave EPA a standard setting responsibility, but it left to NRC and agreement states the overseeing responsibilities. EPA has limited ability to do much, except through NEPA and discussions with agencies in what they are doing. The ultimate decision makers are DOE and NRC. EPA has limited authority under Congressional direction. Nevertheless, we are committed to conducting this review of operation facilities.*

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## Phil Egidi

I have been working on uranium recovery cleanups since 1983. I have a lot of experience under both Titles: EPA removal actions at Monticello; Title I mill site characterization at Bendix Field Engineering; Monticello superfund site at Jim Morat; and Title II regulation. I have lots of experience under both Titles, mostly from an implementation standpoint.

I would like you to consider the following:

- Look at standards with new dose limits because so many things have changed since UMTRCA was promulgated, particularly the public dose limit coming down to 100 millirems/year. The EIS EPA did – their default scenarios showed 5 pCi of radium coming out to about 135 millirems. There are questions about the protectiveness of the 5 pCi/gram limit. Would like to see the 15 go away because it's not been very workable and it's not been health-based.
- ALARA on the NRC and agreement states side of the house. It's an effective concept but not reflected in standards.
- ACLs for groundwater but no supplemental standards under Title II. It requires an NRC paper trail. You can get an ACL but not one for soil. Would like you to consider looking at that.
- UMTRCA also has no surface activity criteria, no surface release limits for material or equipment. Also no uranium cleanup standard. Time and time again, we will find properties with uranium contamination that has not been cleaned up because it was not radium-226. It's been difficult.
- I would also like to recognize Loren for the uranium overburden work on the TENORM side. It was very important for recognition of the exposure kids were getting on tribal lands.
- Hydrology – standard for Vanadium. The MCL for uranium has changed, and Colorado has promulgated a groundwater standard for molybdenum – please look at it.
- DOE – relative to \$250,000 in 1978 dollars for transfer – it's been very problematic. The Legacy Management Office in Grand Junction has a lot of experience and that value is problematic to DOE. Please look at that language.
- Impoundment designs in Appendix A: with changes in water balance caps, etc. would like there to be some flexibility for cap design and liner design. The practice has changed. Lots of efforts on ground with caps and liners – hopeful that can be considered.

I would like to extend an invitation for you to come to Grand Junction and have a meeting there. It would be important because of the legacy we have there. Colorado Department of Health has had an office there since 1969. It is ground zero for radon program and uranium mill tailings in America. We have lots of experience in cleanup and the legacy leftover. UMTRA program ended in 1998, and we still estimate 300,000-400,000 yards of tailing existing in Grand Junction. We have program that is still actively monitoring.

**Mario Atencio**

MASE, KIVA Club, ENDAUM, CARE

EPA is here to protect us. When you talk about extended outreach to communities, I ask that you open your eyes to real human costs. Industry is here to talk about cost ratio analyses. In the US, a human life is priced at about \$7 million, which is ludicrous. Think about your children, wife, and mother – are they worth \$7 million dollars? Is it really rational thinking that an aquifer, when permeable, the uranium and alkaloid will stay in one place and that exemption will not hurt anyone?

NRC granted license to HRI to mine an aquifer that's a source of drinking water. That's irrational. You say, it's just environment, but people are part of the environment. I'm an advisor to people to realize what existence is, what environment is, to rethink natural parks and why it's sacred.

You're bound by regulations and bureaucracies but EPA was created in the 70s to help people. It's hard to say no to licenses. You say you want to go back to pre-mining existing conditions. In some points, it's pristine. Industry can argue, but radon does come out of plugs. I've seen videos of it. Elevated levels of birth defects in Shiprock, New Mexico. Over 1,000 sites in Navajo – nothing has been reclaimed. Kids play on tailing piles. They don't know what they are.

Go wherever you come from – look down and think about what is the real human cost of mining aquifers of people may or may not drink from. Industry will say that given the cost-benefit ratio, but there's no guarantee that people may never drink from this aquifer, but it's life. You don't do that to water. You are 90-some percent water.

Please look at the human impacts and judicial decisions that happened with Church Rock and Crown Point. You are the people who sign off on these things – you look at the environmental impacts. People nitpick at definitions but realize this kills people. Thank you for listening and opening your mind.

*Loren Setlow, EPA: We've been working with the Navajo Nation, including our 5-year plan to address contamination problems with the Navajo communities. I have experienced things you have talked about. We have a special responsibility in EPA's tribal requirements and policies and executive order to take all this into consideration – tribal consultations. We've already gone to the Navajo Nation and have told them we want to listen to them and other tribes. This effort – before regulation – is usually not the practice. We appreciate your comments.*

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**Nadine Fadilla**

Multicultural Alliance for a Safer Environment, Navajo and Pueblo from New Mexico

MASE is a coalition of community groups in New Mexico – we work to address uranium legacy and to stop new mining in this area.

I'm part of the delegation that traveled to Denver to attend the conference. Our primary concern is the four ISL mines being proposed on the Navajo Nation. The Navajo Nation has a ban on uranium mining, and the local communities around Crown Point and Church Rock continue to oppose those projects.

That's a huge issue of concern to us. Communities in the Navajo Nation still rely on that groundwater as the sole source of drinking water. Those four proposed mines would irreversibly contaminate the sole source of drinking water for 15,000 of our community members.

We also ask that you consider the high rates of birth defects and cancer that our communities continue to suffer from, as well as the issues of environmental racism we're dealing with.



**Shannon Frances**

*Colorado American Indian Movement*

I was born in Tuba city and raised in Shiprock and Tuba City. If I wanted to return to farm and live there – it's a dead zone. You can't grow anything – grass, roses – everything dies. It never rains in Shiprock – I wonder why.

We don't drink the water. I can't return home to grow anything. If I returned, I would run risk of poisoning my children. We're connected to the elements – water, soil, air – we're connected to the land, whether it's contaminated or not. How can I return to my homeland in conditions as is? I can't. Ethically, what would you do? It's something that's important to me and my family. They still live there. They don't drink the water but it's our home. We're fighting to protect it.

I'm a perma-culture design instructor. Perma-culture (permanent agriculture) came from indigenous knowledge. The principles are care for the Earth, care for the people, and share abundance. That's an alignment of indigenous knowledge. As indigenous caretakers, we are here to protect what was given to us by our creator.

Come out to our communities, meet the people and the chapters, and listen to our stories. Work with the people directly. It means something.

I would like to learn more about health impact assessments. I would like to go back to my people with information so they are informed of what's going on.

I'm trying to teach bio-remediation: weaving traditional ecological knowledge with innovative science. Ruma-composting – composting with worms to make healthy soil. I understand that there's a long process with uranium tailing and toxic soil. I would like you to answer my question earlier re: reducing agents. I would like to start learning how to do bio-remediation, and any studies you could recommend, I would appreciate.

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**Jennifer Nordstrom**

*Think Outside the Bomb Network*

Think Outside the Bomb is the largest youth network for nuclear abolition in the US. Since 2005, we've organized national and regional conferences, focusing on education and community organization and creative expression.

This year, we're working in New Mexico and throughout the region to call attention upon the impacts and health and public safety of all these nuclear projects, especially those associated with uranium mining and nuclear weapons production.

I'd like to thank the people before me about human impacts because it's an ethical issue.

From Think Outside the Bomb: because EPA has jurisdiction over ISL mines in terms of SDWA, we request that the EPA not give the underwater injecting control permits for the four proposed mines on Navajo lands. These mines would exceed MCLs. The dissenting judge in the 10th Circuit Court of Appeals decision, delivered on May 18th, said about the Hydro Resources Inc. mine proposed on Navajo land that "HRI plans to mine the site, which will result in total radiation 9 to 15 times the permitted regulatory limit."

Currently, it's used as drinking water, and is the sole source for many communities. These mines can affect drinking water for 15,000 people. It is EPA's responsibility to protect this drinking water, and ask that you not issue those underwater injection control permits.

Dan Jackson, EPA: For the issuance of a UIC permit, it is accompanied by a draft permit with public notice and comment period for a minimum of 30 days, during which time EPA takes comments on the draft permit action and responds to them once the final decisions have been approached. Get in touch with the UIC program in Region 9 in San Francisco to request to be put on notification for any UIC actions you have concerns about. You can also email [uranium.review@epa.gov](mailto:uranium.review@epa.gov) and the information for Region 9 will be forwarded to you.

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**Lisa Fithian**

ACT

I want to express gratitude for this opportunity to participate.

I ask EPA to step forward in this next period with courage. The world is in crisis – there is devastation in oceans, land, and air. You've heard of a legacy of action against indigenous populations.

The vast majority of people in room and this conference are white. We have privilege and are afforded a lifestyle leading to the destruction of the planet and the decimation of cultures across the world. We have the power of our presence, but we can't come to the conference without paying \$250. You all are in position to do something about it. We will continue to act. We will not allow the opening of these four mines.

At what point will we, in the position of privilege, say enough is enough? We have to change the course. Let's try to create a situation where the environment is truly protected, the people are truly protected, and the water is treated as sacred as the land and air.

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**Steven Stormoen**

*Think Outside the Bomb Network, Coalition to Free the University of California*

A sociological theory that's gaining traction in environmental science: evolution of species follows not a slow and steady process but punctuated equilibrium. It is characterized by periods of stasis broken up by periods of rapid change, usually marked by some disastrous catalyst. Following this model, so too will this process come to describe global warming and the degradation of the environment, which in its current process, threatens to make our planet uninhabitable for our children. In some areas, like the Four Corners region or the Gulf of Mexico, sooner than others.

In 25, 50, 150 years, we'll come to understand, global temperatures rose and the coral reefs never recovered. BP spilled an unfathomable amount of oil into the Gulf of Mexico and the fisheries never recovered. Once upon a time, some accident happened and those exempted aquifers with ISL mines leaked and the water tables in those surrounding areas...you get the picture...they never recovered.

In light of the BP spill, we have to acknowledge that accidents do and they eventually will happen. When they happen, they are disastrous. How can we afford to take the risk with substances with half lives in the 10,000s or 100,000s of years? In this light, how can any standards of radionuclides or other hazardous materials in our drinking water (or water which may become our drinking water) be acceptable?

My advice for the EPA, NMA, NRC, and private uranium mining companies: listen to the native people and representatives of affected communities in this room. Stop this process now; stop new permits – it's not worth it.

**Matthew Garrington**

*Environment Colorado*

Environment Colorado is an environmental advocacy organization with 40,000 members and activists across the state. Thank you for this opportunity, and I look forward to participating in this process. I am very encouraged that EPA is looking at this tonight.

I encourage us to take a hard look at natural attenuation as a method applied for cleanup, even for Title I legacy sites. In Colorado, both the Grand Junction and Durango uranium mills saw an increased level of contamination, so I question whether it's good strategy to employ, even at sites that haven't been active in quite some time.

A critique on the process: it is discouraging that the NRC and NMA are holding a conference where people who may be less able to afford to attend have to pay twice the amount to attend. From a process standpoint, it is unfortunately and reflects poorly on the NRC.

Related to Class III permits under SDWA: thank you to the EPA for committing to a strong public process for those permits. I would also like to affirm some disappointments in draft guidance that could constitute a binding norm in how this would move forward. In 2008, the EPA engaged in conversations with the industry it was regulating. They did speak with the Department of Natural Resources in Colorado and Wyoming; however, there was no notice to the public that these conversations were happening and no opportunities for comment. I would strongly recommend that the EPA consider having open public meetings, even for regulation guidance on those Class III permits. There are some controversial projects for in-situ uranium mining in Colorado, such as the Centennial Projects in Weld County. I think it reflects poorly on the EPA to not offer up public opportunity to address what the guidance may look like for the Class III permit.

*Dan Jackson, EPA: Regarding the guidance issue: we put down some talking points and it was unfortunately got termed as a guidance but it's not. A true guidance from the EPA would undergo public review and comment. For that document, we were recording some discussions and the purpose was to put down ideas. It was not an official guidance.*

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**Katie Sweeney**

*National Mining Association*

There have been a lot of eloquent speakers – I've heard and learned a lot. Regarding the applicability of Subpart W to recovery operations or even evaporation ponds at conventional milling facilities, it appears to be a closed issue in EPA's mind, but legally, it's not a closed issue. Industry would probably strongly disagree with EPA's interpretation of whether Subpart W should or has ever applied. Legally, if you look at the history of those regulations, disagree with whether Subpart W does apply.

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**Gerald Brown**

*Community of Church Rock*

I have worked with EPA in the past and have worked with the community of Church Rock. A lot of the issues raised are environmental justice issues. We need to continue to improve on the relationship of interactions, not just with EPA as a regulatory agency. Not just Navajo and EPA, but those grassroots individuals. We need to bring them up to par. Communication is key. As we address one another, we talk about regulatory communication, but we are not on the same page. It goes back to those environmental justice issues, education, and low income community individuals. It's not an easy question to answer but it's something I'd like to see. We talk about five-year plans and integrating our

communities, but we have to somehow deal with this communication gap and the miscommunication of all our technical reports. Any technical reports – we have our technical liaison but he's just one person. How do you as EPA address that? How to get more funding to get more individuals to do outreach?

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**Carolina Reyes**

*Multicultural Alliance for a Safer Environment*

I drove some of the representatives from the Navajo Nation here. I dislike environmental injustice and environmental racism. I've seen and heard too much of it. To me, as a person, that's ignorance. I don't mean to be antagonistic. When dealing with issues on daily basis – those of you from the industry or who deal with regulations, ask yourself, am I an environmental racist? Do I allow environmental injustice to continue and occur?

Those permits are not going to continue and they will not pass. We will be watching you. We will be there. We will always stop it.

## AUDIENCE QUESTIONS to EPA

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Meeting attendees were given the opportunity to ask questions to the EPA representatives at two different points during the meetings. The majority of questions concerned existing regulations – getting clarification about issues such as aquifer exemptions (Safe Drinking Water Act), monitoring (Subpart A), occupational safety (Federal Radiation Protection Guidance), and human health and safety (Subpart D). Many questions were also posed about the EPA’s review of the standards – attendees were curious to hear what information EPA might take into account for analysis and what aspects of the regulation would be under consideration for revision. Other recurring question topics were: reclamation technology, restoration of groundwater, and tribal considerations (tribal standards, consultations, outreach).

### CASPER, WYOMING

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QUESTION	EPA RESPONSE
<p>Regarding the Riverton site, when natural attenuation was selected by DOE as remediation option, the Uranium standard (MCL for SDWH) was 0.044; shortly after the EPA changed the standard to 0.033. Is the DOE required to meet State or Tribal Water Quality Standards, which are based on EPA guidance?</p>	<p>DOE’s requirements must still meet requirements in CFR 40 Part 192 – the MCLs or background. Beyond that, for decisions on alternate concentration limits, there are 20-some factors they must also consider.</p>
<p>ISR has been prominent since well before 1995 revisions to Part 192. What changes in industry technologies are you referring to?</p>	<p>The use of ISL/ISR technologies is not referenced in the existing rule, except in the preamble and the definition of by-product material.</p> <p>We will look at various aspects of the technologies, such as the use of injection in production wells, surface piping, and processing facilities.</p>
<p>The distance between the monitor well ring and aquifer exemption boundary has not been specified. What is the distance and how is it determined?</p>	<p>It is not necessarily a set distance. For the application by EPA under the Safe Drinking Water Act, the regulations and exemption criteria require that the applicant for Class III injection wells show that the injection zone is (or is expected to be) commercially producible. In Region 8, we try to ascertain how much of that ore zone and the leaching operations will be affecting the aquifer relative to the need to commercially produce the ore body. Due to impacts and potential impacts on underground sources of drinking water, the idea is to keep impacts as small as feasible.</p> <p>What’s been happening is the licensee – for their state or NRC license– has been utilizing this same basic concept for their submissions to the federal or state licensing agencies as well as for requests for the injection well permits from EPA. Under 40</p>

CFR 192 Subpart D, the point of compliance (for monitoring) is defined, but the determination of that is left to discretion of NRC or agreement states.

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What do you project the costs of the revisions to be for the US taxpayers?

Not currently revising the rule, so it's just the salaries and the analyses that we're conducting. No exact figure – in the low 100,000s for the review.

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What is the definition of “commercially producible”?

There is no regulatory definition of “commercially producible. In the application for Class III injection wells under the SDWA, we would look at the zone – the ore body – expected to be recovered over a reasonable life of the project. We rely on what comes in with the injection well application. Generally, the boundaries of ISL ore bodies tend to be fairly distinct and we've got good information from groundwater modeling and ore studies provided by applicant to define the limits.

This question actually is addressing the SDWA requirements under UIC regulations, these are not up for Agency review at this time.

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When considering revisions to or promulgation of regulations, how does the EPA determine risk and at what level of risk are regulations needed?

In the review, we will look at:

- risk assessments conducted in 1983 when the rule was first promulgated – those are well documented processes
- any changes in the risk assessment methodologies
- dose and risk conversion factors that have been updated
- international and national recommendations from the National Research Council and ICRP
- EPA's risk range: one death in 10,000 to one death in 100,000 for exposures to the contaminants (1/10,000 to 1/100,000 risk range) and changes to risk assessment

This will be a transparent process – we will use as many peer review models as possible and will make available the factors we've utilized in this review. We will also be looking towards industry and stakeholders for inputs.

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Will this review take into account other elements, metals? We're finding high levels of vanadium, nickel, sediments – is there intention to look at sediment standards for some of these elements associated with uranium milling?

Everything is on the table – it's been long time since the rule has been reviewed. We want to see how well the rule has performed since it's been put out. Instances where Title I mills have gone on to become Superfund sites. Where have there been problems with excursions? Going to also look at various heavy metals, both in surface and groundwater.

EPA does represent the tribes in a trust capacity. DOE has been open to discussions with EPA but they're not required in their standards or management of facilities to consult with us on ACL determinations. Nevertheless, we have been able to have discussions with them, and our regional office has been monitoring the situation. Region 9 is working closely with the Navajo Nation and Hopis in monitoring what DOE has been

doing.

You referred to in your presentation, in-situ holding ponds and how they would be addressed in this consideration for rule-making. Why is in-situ impounding facilities being rolled into Subpart W and what's the thought process behind it?

John Cash

I'm on the work group for Subpart W. Those facilities are being covered under the definition of impoundment and by-product material in that regulation. When UMTRCA was promulgated, Congress included provisions that EPA would develop own regulation for these facilities under CAA and CWA. This creates "dual regulation." It was recognized and authorized by Congress. In that review, we needed to review evaporation ponds and their contributions of radon, certainly under the Subpart W.

There may be some benefits – we'll be providing information on the Subpart W website on this: last summer, we required operating companies to monitor radon emissions from their evaporation ponds. The results were surprising, but not surprising from what we expected – in those evaporation ponds, there were a number of facilities that had higher concentrations of dissolved radon than radon in the air near those facilities which exceeded the flux standard under the Subpart W. We've informed the NRC about it. Value in understanding it because of the potential impacts as occupational exposure to workers in facilities with evaporation ponds. We will also look at risk to public from facilities with evaporation ponds.

Will you compare that to total radon emissions from coal fire plants? What's that number versus a uranium mine? Is this the problem or that? Or, is there a problem at all?

That's a good question. No NESHAP standards on that yet. Mr. Reid Rosnik is the work group leader for that rule. You can submit the question at [UraniumReview@epa.gov](mailto:UraniumReview@epa.gov) and he'll get back to you. We will be at the National Uranium Mining meeting as well.

*Comment from audience member (Oscar Paulson):* Regarding particulate emissions from coal, there was a webpage on the Oakridge National Lab site maintained by Dr. Alex Gabbard on radionuclide particulates in coal mines. He cites EPA studies from the late 1970s.

## DENVER, COLORADO

### QUESTION

Is it economically or technologically possible to reclaim wells to pristine condition? How will companies reclaim aquifers?

Mario Atencio  
*Multicultural Alliance for a Safer Environment (New Mexico),*

### EPA RESPONSE

We can set standards for what we think is protective and it's up to the regulating agency (NRC or agreement state) to provide for restoration. This is part of our review to see what has happened in the history of these facilities – their ability to restore and meet our criteria. How protective are existing regulations and standards and how they have applied?

The means that industry use is known as 'pump and treat.' They take water out of ground, treat it, and put additional water into

*Navajo Nation*

aquifer until water is stabilized to restoration target. They also use injection of reducing agent to stop or mitigate release of radium or uranium or other metals to reach the point of stability.

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Is there any EPA regulations by which can un-exempt an exempt aquifer? Once exempted, always exempted?

Yes, once it takes place, the exempted portion of the aquifer is removed from protection under the SDWA as a drinking water source. We don't have regulations that reverse the exemption process. It always is considered exempted.

Katie Sweeney  
*National Mining Association*

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During the May 24, 2010 public meeting, EPA stated that some or all of the data collected by the uranium recovery licensees, at request of EPA during 2009 3rd quarter, related to their evaporation ponds, was turned over to NRC due to occupational exposure concern. What were those concerns that were brought up by EPA? Were they related to radon-222 or radium? If in fact data was provided to NRC, to whom was it provided; who in EPA provided it; and for which facilities?

Yes, EPA sent out to all uranium operators a section 112 letter from our Office of Enforcement and Compliance Assurance a couple years ago. We've collected radon flux data, and last year, asked facilities to provide us data from evaporation ponds. That information has not left our office. We're working with Region 8 to take the data that has been given and turn into flux data numbers. It has not left our office.

We have had discussions with NRC. The common knowledge is that evaporation ponds emit no radon. The data we've received from the last 6-8 months show that this is not the case. We're working to quantifying the data to see if we can get a flux rate to see if it's above or below 20 pCi/m<sup>2</sup>-sec. We want to get those calculations done in the next several weeks. I have no knowledge of reporting 'public health issues.'

Oscar Paulson  
*Kennecott Uranium Company*

I've spoken with Bill von Till at NRC. In my discussions with Bill, I've promised him that once data is packaged up, we'll send it to him. It will also be posted onto the Subpart W website.

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The definition of impoundment includes the ability to hold free liquids. Heap leach pads are designed to discharge all free liquids. Does EPA's 40 CFR 192 determination apply to heap leach apply to the heap leach pads or just the liquid holding ponds?

Interpreted by the NRC, the standards for 40 CFR 192 would be applied. NRC will be in the process of determining how best to apply them. The point here is that if you have input for us regarding the existing standards and how they might be applied or improved to reflect issues related to heap leach or ISL, we would appreciate that.

John Hamrick  
*Cotter*

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Do these regulations do anything to improve worker protection related to ore crushing and dust in the mills, including dust from yellow cake operations or acid leach? Do they address ingested, radioactive dust that passes through the digestive system?

The standards do apply to occupation exposure – there's a specific reference to the federal protection required for radiation. However, the NRC and agreement states have their own requirements for occupational protection standards.



Jerry Pyfer

1. For groundwater quality and evaluating restoration over the past 40 years, I suppose what you'll be doing is looking at groundwater restoration success and how close that got to pre-mining conditions and conducting an assessment to see that it's acceptable?
  2. There's a mountain of data on pre-mining water quality on ISL sites. In Texas, we do production-ary authorizations, which are detailed analyses on water quality. In Wyoming, mine unit packages are prepared. There's as much pre-mining water quality data available for review as post-restoration water quality data. Will you do a side-by-side evaluation of water quality by look at the pre-mining and post-restoration to look at the toxicity of that water that might have existed before mining? I think this is very important because there is a lot of criticism from the public aimed at our industry of the water quality after restoration.
1. Looking at our standards for restoration to background or equivalent to MCLs or application of ACL process – what happened to various well fields and operations? What were the targets restorations, what was achieved by the operators, and how the operations were received by the regulatory agency?
  2. We have been in contact with Texas DEQ. We intend to talk about further fields – we have some data, but not all. It will be part of our analysis.

Mark Pelizza  
*Uranium Resources*

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1. What is the status of the 1994 proposed revisions to the Federal Radiation Protection Guidance? How is the Radiation Protection Guidance going to impact what you may look at for dose limits?
  2. Do you consider the public dose limits to be 500 milligrams/year or 100 milligrams/year?
1. At the current time, the Agency has not re-started up its review. EPA under its authority from the Atomic Energy Act and authority given to it at its establishment, picked up standard settings requirements that were originally included in the authority of the Atomic Energy Commission, including radiation protection for the general public. The last version was from 1960 – very dated – there have been many changes since that time. EPA considered revising that in 1990s and in early 2000, but it has been put on hold due to resource constraints. We haven't restarted efforts that this point and I am not sure when that will happen. We are going on with current guidance that might be appropriate in

Phil Egidi

conducting our review.

2. EPA has a risk standard of  $1 \times 10^{-4}$  to  $1 \times 10^{-6}$  – we will be using that Agency standard in our general review.

1. Do you have reason to believe that existing ISR or milling facilities, operating under current radiation standards, are harming tribes or children? What effects have been demonstrated and in what studies? (Subpart D)
2. Based on NAS BEIR V and VII studies, is 25 millirem a reasonable limit, in light of the optimization recommendations delineated in ICRP60 and 103 with regard to social, economic, and health considerations? I'm considering specifically at 142.41(d): whole body+organ limit = 25 millirem ea.

1. We're still in the process of collecting data. We are conducting a GIS study on locations of existing, closed, and potential facilities to look at demographics associated with these facilities to look at effects on children, tribes, and other disadvantaged populations. We know that potential impacts to children can be more substantial as far as risk. We have heard that the Navajo Nation, in particular, has suffered from increased incidences of cancers. These were previous operations on the reservation, including uranium mines, and the fact that there's naturally occurring uranium in soils there. We'll have to take a look at that.
2. We are going to be looking at updated recommendations of advisory boards and panels, including the ICRP and BEIR VII report. As part of our review, we will examine how existing standards have worked with that, both radon protection and exposure. We will look at the existing standard for dose for public in our review.

Tom Johnson

1. Several family members have passed away from cancer in the Shiprock area, and we have many concerns around safe drinking water. What are the reducing agents? You said they try to stop contamination and leaking – how do you know they're safe for our communities?
2. Can we get this presentation?

1. Reducing agents will be included in our review.
2. It will also be put on website, or you can email [uraniumreview@epa.gov](mailto:uraniumreview@epa.gov). Also, we do have a big outreach effort, especially to the tribes. We've recently given a presentation to the National Tribal Water Council. I will be speaking at the National Tribal Science Forum in Michigan as well as the Navajo Uranium Contamination Workshop in Tuba City. We hope to have similar public meetings; it will depend on the timing and resources. We are very concerned on the impacts on the tribes – Hopis, Navajo, Pueblo – the southwestern communities

Shannon Frances  
*Colorado American Indian Movement*

Can you provide an example of a mine that has used ISL method that was successful in restoring the water to pre-existing condition without it relaxing the government remediation standards?

We are conducting reviews. I've heard statements that there's a facility that has done it. There are other studies from the USGS about many facilities in Texas that have had one or two or more constituents that went above baseline for MCL.

Nadine Fadilla

*PUBLIC INFORMATION MEETINGS REPORT*

*Multicultural Alliance for a Safer  
Environment, Navajo and Pueblo  
from New Mexico*

How long does it take until it's actually safe? In Shiprock, people are living there and there are high rates of cancer. For a dead zone, how long does it take to remediate the soil?

Is there a microclimate zone that is created?

Shannon Francis  
*Colorado American Indian Movement*

One of the problems we have with many of the lands out there is that there are both naturally occurring uranium and arsenic and other metals in the soil. If there is a contaminated site, you have to look at the source of the contamination and the growing conditions of that soil.

In terms of water, that's a hydrological cycle and to my knowledge, I've not seen anything where uranium mining and production has affected the precipitation rate.

In Subpart A Section 192.02, it says standards are designed to be (a) effective for 1000 years, and footnote 1 says monitoring after disposal is not required after a year or so. Footnote 2 says that for at least a one year period, the standard only applies to the atmosphere. Is that true? Are there no standards there?

Darrell Alex  
*Multicultural Alliance for a Safer Environment*

Subpart A refers to closed uranium mills. It was a design standard; once the site is reclaimed to a certain radiation level...the site is held in perpetuity by DOE. DOE does annual inspections of these facilities. The design standard was designed for 1,000 years.

1. How does EPA assess its interaction with tribal members? Do you have a survey or a format to assess yourself in your effectiveness in interaction with Navajo? How do you assess your effectiveness to the communities? Do you have any documentation with metrics?
2. Does EPA have any tools to assist low income communities to travel or attend these community meetings? Are there any incentives through which EPA can reimburse community members?

Gerald Brown  
*Community of Church Rock*

1. EPA has policy of tribal consultation with tribes affected by potential rule-making. In this case, it's a review. We have already opened the door with the Navajo and are considering sending a letter to the President of the Navajo Nation. I would suggest that chapters bring it up to the National Council.  
  
I'll personally make sure we demonstrate what we've done in meeting your concerns. If in fact this were to go to a regulation, we're required under executive order and EPA requirements to talk about all the steps we've taken for this consultation. This Administration and this EPA Administrator have stated that we are going to redouble our effort to work with the First Nations.
2. We don't have the funds for it, but whatever methods we use, we intend to make sure it reaches those communities.

How far are the aquifer exemption boundaries set in monitoring ring and how are they calculated? For the monitoring ring, how far out? Is it based on time of travel? Will it be set at a 500-foot boundary? Does the industry know?

Parker Sokolosky  
*Wyoming Department of  
Environmental Quality*

The DEQ will also be looking at permit applications. Boundaries are based upon the conditions at the site. It is not necessarily 50 or 200 feet; that's why I emphasize that the cartoon depiction is not to scale. Conditions at the site are the most important considerations – it will show where the commercial producibility of the ore body extends. We use that information to help define what area will be considered for the exemption.

For state UIC permitting action, EPA would not set the exemption area. The state would do that.

The EPA has an approval process and retains a responsibility for approving an aquifer exemption by the state. It is approved as a revision to the delegated program. Once the state makes its application and provides the data that shows the criteria for exemption can be met and they believe an exemption is warranted, they will forward that to EPA and EPA will make a decision.

We have no guidance on specific distance. The criteria for this exemption looks at commercial producibility. It would be tied to closely to the commercial producibility for that zone.

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In some instances, that authority to determine the exemption area has not been delegated to a state. In Colorado, South Dakota, and tribal lands in New Mexico, the EPA would make those determinations, correct?

Matthew Garrington  
*Environment Colorado*

Yes, for non-delegated UIC programs, the EPA would be in a situation to determine the area to be exempted. That exemption becomes part of the draft permit action so there's an opportunity for public comment that would be connected to permit.

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What direction is EPA going to go with in regards to generic EIS and EIS? To me, it sounds like rubber-stamping EIS. Is there a constant baseline level? What's the difference between the two?

Mario Atencio  
*MASE, KIVA Club / ENDAUM / CARE*

The NRC developed a generic EIS, which looked at the production process for ISLs/ISRs. NRC developed scenarios and gave information about previous studies. They looked at regions in the US where they anticipated development to take place. The intent was to provide a basic document to be a reference document for individual site assessments conducted for new license applications. Originally, they intended to conduct environmental assessments and make determinations based on the review, be it an EIS or not, as part of the NEPA requirement, or associated with a license approval. There was a determination from the new NRC Chairman that they would prepare an EIS for every new application. They are called a Supplemental EIS because they're still using the GEIS as the basis for their review. They also provided a more extended review in accordance with NEPA and their own regulations for new facilities. EPA had commented on the draft and final GEISs as well as three draft SEISs for new facilities. We had some real concerns with those drafts, and NRC is trying to address those concerns as they

move forward.